

# Online Appendix

## *Benchmarking U.S. University Patent Value and Commercialization Efforts: A New Approach*

### **FOnline Table 1: U.S. Universities and Their PDPASSs.**

We manually match the university names with their PDPASSs using the assignee file (1976-2006) of the NBER patent data. We first examine the NBER patent assignee name file, focus on the assignees in the category of “U.S. University,” and manually harmonize the PDPASSs for each university. To ensure full coverage, we search the university names in other categories and extract their PDPASSs. For example, Purdue Research Foundation of the Purdue University is in the category of “U.S. Institute.” Our resulting sample is 362 universities.

uni_code	Name	PDPASS	uni_code	Name	PDPASS
U1	ACAD OF APPLIED SCI	10205990	U223	SPELMAN COLLEGE	12847735
U1	ACAD OF APPLIED SCI	12177703	U224	SPRINGFIELD COLLEGE	11833736
U2	ALABAMA A&M UNIV	13099221	U225	ST JOHNS UNIV	10597806
U3	ALCORN STATE UNIV	13218771	U226	ST LOUIS UNIV	10383391
U4	ALFRED UNIV	10262334	U226	ST LOUIS UNIV	12224461
U4	ALFRED UNIV	11071946	U226	ST LOUIS UNIV	12307452
U5	ALKANSAS STATE UNIV	12905751	U227	STANFORD UNIV	10052880
U6	ALVERNO COLLEGE	12751071	U227	STANFORD UNIV	10085770
U7	AMBASSADOR COLLEGE	11367305	U227	STANFORD UNIV	12589299
U9	AMERICAN LANGUAGE ACAD	11110495	U227	STANFORD UNIV	12959736
U10	AMERICAN UNIV	10562759	U227	STANFORD UNIV	13083418
U11	AMERICAN UNIV OF TECHNOLOGY	10287189	U227	STANFORD UNIV	13141479
U12	AMHERST COLLEGE	12598036	U227	STANFORD UNIV	21027770
U13	APPALACHAIN STATE UNIV	11883123	U227	STANFORD UNIV	21478343
U14	ARIZONA STATE UNIV	10586414	U227	STANFORD UNIV	22274727
U14	ARIZONA STATE UNIV	10916444	U228	STARMARK ANIMAL BEHAVIOR CENTER	12706967
U14	ARIZONA STATE UNIV	11750489	U229	STATE UNIV OF NEW YORK	10457174
U14	ARIZONA STATE UNIV	13118987	U229	STATE UNIV OF NEW YORK	10506876
U15	ART CENT COLLEGE OF DESIGN	12846166	U229	STATE UNIV OF NEW YORK	12494736
U16	ASSOCIATION OF AMERICAN UNIVERSITIES	11678831	U229	STATE UNIV OF NEW YORK	13107693
U17	AT STILL UNIV OF HEALTH SCI	12672896	U229	STATE UNIV OF NEW YORK	13117389
U18	AUBURN UNIV	10206900	U229	STATE UNIV OF NEW YORK	21917944
U18	AUBURN UNIV	10996882	U230	STEPHEN F AUSTIN STATE UNIV	-16787
U18	AUBURN UNIV	11012600	U231	STEVENS INST OF TECH	11021612
U19	AVIATION SUPPLIES & ACADEMICS	10931538	U231	STEVENS INST OF TECH	22918193

U20	BALL STATE UNIV	12544684	U232	SYRACUSE UNIV	10230164
U21	BAYLOR COLLEGE OF MEDICINE	11671697	U232	SYRACUSE UNIV	10625734
U22	BAYLOR UNIV	11130200	U233	TEMPLE UNIV	10843583
U22	BAYLOR UNIV	11141078	U233	TEMPLE UNIV	22503640
U22	BAYLOR UNIV	12374742	U233	TEMPLE UNIV	22912002
U22	BAYLOR UNIV	12840679	U234	TENNESSEE TECHNOLOGICAL UNIV	12667795
U23	BEMIDJI STATE UNIV	11414638	U235	TEXAS A&M UNIV	10834168
U24	BLIND FAITH SCHOOL OF MUSIC & ART	13121340	U235	TEXAS A&M UNIV	11616790
U25	BOISE STATE UNIV	12792627	U235	TEXAS A&M UNIV	21698632
U26	BOSTON COLLEGE	11266208	U235	TEXAS A&M UNIV	21991443
U27	BOSTON UNIV	10676948	U235	TEXAS A&M UNIV	22579636
U27	BOSTON UNIV	11282111	U236	TEXAS CHRISTIAN UNIV	12881011
U27	BOSTON UNIV	12923205	U237	TEXAS LUTHERAN UNIV	13060087
U28	BOWIE STATE UNIV	23055717	U238	TEXAS STATE UNIV	23152176
U29	BOWLING GREEN STATE UNIV	10931188	U239	TEXAS TECH UNIV	10666462
U30	BRADLEY UNIV	11765786	U239	TEXAS TECH UNIV	12864691
U31	BRANDEIS UNIV	11614407	U239	TEXAS TECH UNIV	12970897
U32	BRIGHAM YOUNG UNIV	11208780	U239	TEXAS TECH UNIV	13003183
U33	BROWN UNIV	10659299	U239	TEXAS TECH UNIV	22359003
U33	BROWN UNIV	10810030	U239	TEXAS TECH UNIV	22400311
U33	BROWN UNIV	12039323	U239	TEXAS TECH UNIV	22464759
U34	BRYN MAWR COLLEGE	12172060	U240	TEXAS WESLEYAN UNIV	11255546
U35	CALIFORNIA INST OF TECH	10212849	U241	THOMAS JEFFERSON UNIV	12233242
U35	CALIFORNIA INST OF TECH	10968828	U242	TOURO COLLEGE	11068476
U35	CALIFORNIA INST OF TECH	11532066	U243	TOWSON UNIV	21216599
U35	CALIFORNIA INST OF TECH	12756450	U244	TRINITY UNIV	11402737
U35	CALIFORNIA INST OF TECH	12962121	U245	TROY UNIV	12127624
U35	CALIFORNIA INST OF TECH	13108675	U246	TRUMAN STATE UNIV	12676105
U35	CALIFORNIA INST OF TECH	13208934	U247	TUFTS UNIV	10178972
U35	CALIFORNIA INST OF TECH	20961588	U247	TUFTS UNIV	11184034
U36	CALIFORNIA POLYTECHNIC STATE UNIV	10266866	U247	TUFTS UNIV	11598631
U37	CALIFORNIA STATE UNIV	10932917	U247	TUFTS UNIV	11880040
U37	CALIFORNIA STATE UNIV	11328517	U247	TUFTS UNIV	21959307
U37	CALIFORNIA STATE UNIV	11635555	U248	TULANE UNIV	10893927
U37	CALIFORNIA STATE UNIV	21564750	U248	TULANE UNIV	11014189
U38	CALVIN COLLEGE	12084416	U248	TULANE UNIV	11487378
U39	CARGENIE MELLON UNIV	10545965	U248	TULANE UNIV	22101801
U40	CARROLL COLLEGE	22293949	U248	TULANE UNIV	22495964

U41	CASE WESTERN RESERVE UNIV	11702110	U249	TUSKEGEE UNIV	10960490
U41	CASE WESTERN RESERVE UNIV	11991624	U250	UNIFORMED SERVICES UNIV OF HEALTH SCI	12454297
U41	CASE WESTERN RESERVE UNIV	21727241	U250	UNIFORMED SERVICES UNIV OF HEALTH SCI	22680937
U41	CASE WESTERN RESERVE UNIV	22823322	U250	UNIFORMED SERVICES UNIV OF HEALTH SCI	22743534
U41	CASE WESTERN RESERVE UNIV	23106232	U251	UNION UNIV	10971488
U42	CATHOLIC UNIV OF AMERICA	11381523	U252	UNITY SCHOOL OF CHRISTIANITY	11313193
U43	CENT MICHIGAN UNIV	12906223	U253	UNIV ADVANCED BIO IMAGING ASSOCIATES	11979661
U44	CENTENARY COLLEGE OF LOUISIANA	22391824	U254	UNIV CENT DEL CARIBE	22589357
U45	CHAPMAN COLLEGE	10829901	U255	UNIV CORP FOR ATMOSPHERE RES	11451045
U46	CITY UNIV OF NEW YORK	10878585	U256	UNIV HEALTHSYSTEM CONSORTIUM	13103470
U46	CITY UNIV OF NEW YORK	11242285	U257	UNIV OF AKRON	11037269
U46	CITY UNIV OF NEW YORK	11370797	U258	UNIV OF ALABAMA	10049068
U46	CITY UNIV OF NEW YORK	11736050	U258	UNIV OF ALABAMA	10685560
U46	CITY UNIV OF NEW YORK	13138208	U258	UNIV OF ALABAMA	11185055
U47	CLARK UNIV	11748183	U258	UNIV OF ALABAMA	13060486
U48	CLARKSON UNIV	11418797	U258	UNIV OF ALABAMA	20728027
U49	CLEMSON UNIV	12487493	U258	UNIV OF ALABAMA	21259067
U49	CLEMSON UNIV	12648438	U258	UNIV OF ALABAMA	22090093
U50	CLEVELAND STATE UNIV	12475096	U259	UNIV OF ALASKA	11456796
U51	COCKERILL SAMBRE CAMPUS UNIV DU SART TILMAN	22132506	U260	UNIV OF ARIZONA	10298599
U52	COLLEGE OF AMERICAN PATHOLOGISTS	12538533	U260	UNIV OF ARIZONA	10586414
U53	COLLEGE OF HOLY CROSS	12462375	U260	UNIV OF ARIZONA	11043586
U54	COLLEGE OF MEDICINE & DENTISTRY OF NEW JERSEY	10429743	U260	UNIV OF ARIZONA	11750489
U55	COLLEGE OF NEW JERSEY	11597056	U260	UNIV OF ARIZONA	11821347
U56	COLLEGE OF WILLIAM & MARY	12230512	U260	UNIV OF ARIZONA	12975849
U57	COLLEGE PARK IND INC	11258570	U260	UNIV OF ARIZONA	13092071
U58	COLLEGE SAVINGS BANK	10822055	U260	UNIV OF ARIZONA	22358845
U59	COLORADO SCHOOL OF MINES	11039458	U261	UNIV OF ARKANSAS	-19842
U60	COLORADO STATE UNIV	10703054	U261	UNIV OF ARKANSAS	-18135
U60	COLORADO STATE UNIV	22142825	U261	UNIV OF ARKANSAS	10320721
U60	COLORADO STATE UNIV	23194527	U261	UNIV OF ARKANSAS	11210319
U61	COLUMBIA UNIV	-3449	U261	UNIV OF ARKANSAS	11979879
U61	COLUMBIA UNIV	10561876	U261	UNIV OF ARKANSAS	13183790
U61	COLUMBIA UNIV	12510710	U262	UNIV OF BALTIMORE	13030169
U61	COLUMBIA UNIV	13060440	U263	UNIV OF CALIFORNIA	10207181
U61	COLUMBIA UNIV	21275191	U263	UNIV OF CALIFORNIA	10574877
U61	COLUMBIA UNIV	21708108	U263	UNIV OF CALIFORNIA	11275757
U61	COLUMBIA UNIV	21841668	U263	UNIV OF CALIFORNIA	11403026

U61	COLUMBIA UNIV	22032616	U263	UNIV OF CALIFORNIA	11491547
U61	COLUMBIA UNIV	22745935	U263	UNIV OF CALIFORNIA	11835845
U62	CORNELL UNIV	10061102	U263	UNIV OF CALIFORNIA	12965526
U62	CORNELL UNIV	10075544	U263	UNIV OF CALIFORNIA	13011309
U62	CORNELL UNIV	13114994	U263	UNIV OF CALIFORNIA	13031273
U62	CORNELL UNIV	22439140	U263	UNIV OF CALIFORNIA	13096429
U63	CREIGHTON UNIV	11404632	U263	UNIV OF CALIFORNIA	13130981
U63	CREIGHTON UNIV	11483474	U263	UNIV OF CALIFORNIA	13153610
U63	CREIGHTON UNIV	22870461	U263	UNIV OF CALIFORNIA	21880971
U64	DARTMOUTH COLLEGE	10398824	U263	UNIV OF CALIFORNIA	22128483
U64	DARTMOUTH COLLEGE	13074801	U263	UNIV OF CALIFORNIA	23213594
U64	DARTMOUTH COLLEGE	23184628	U263	UNIV OF CALIFORNIA	23253509
U65	DAVIDSON COLLEGE	10510509	U264	UNIV OF CENT FLORIDA	11719517
U66	DENVER PUBLIC SCHOOLS	11622732	U264	UNIV OF CENT FLORIDA	13073164
U67	DOWLING COLLEGE	11963203	U264	UNIV OF CENT FLORIDA	13099239
U68	DREXEL UNIV	10954865	U265	UNIV OF CHICAGO	10154594
U68	DREXEL UNIV	11315969	U265	UNIV OF CHICAGO	11423007
U68	DREXEL UNIV	11765555	U265	UNIV OF CHICAGO	12796484
U68	DREXEL UNIV	11940708	U265	UNIV OF CHICAGO	13062601
U68	DREXEL UNIV	13118803	U265	UNIV OF CHICAGO	21343459
U68	DREXEL UNIV	21467059	U266	UNIV OF CINCINNATI	10041121
U69	DUGUESNE UNIV	11269645	U266	UNIV OF CINCINNATI	10622190
U70	DUKE UNIV	10381645	U266	UNIV OF CINCINNATI	21616788
U70	DUKE UNIV	10811240	U267	UNIV OF COLORADO	11023299
U70	DUKE UNIV	11118479	U267	UNIV OF COLORADO	11481253
U70	DUKE UNIV	11914519	U267	UNIV OF COLORADO	12265471
U70	DUKE UNIV	22672650	U267	UNIV OF COLORADO	13125454
U70	DUKE UNIV	31462732	U267	UNIV OF COLORADO	13131054
U71	EAST CAROLINA UNIV	12187351	U268	UNIV OF CONNECTICUT	10685585
U71	EAST CAROLINA UNIV	22093804	U268	UNIV OF CONNECTICUT	11231993
U72	EAST TENNESSEE STATE UNIV	10799878	U268	UNIV OF CONNECTICUT	12551316
U73	EASTERN MICHIGAN UNIV	11659189	U269	UNIV OF DAYTON	11580808
U74	EASTERN VIRGINIA MED SCHOOL	10776979	U270	UNIV OF DELAWARE	10967975
U74	EASTERN VIRGINIA MED SCHOOL	11290554	U271	UNIV OF DENVER	10531434
U74	EASTERN VIRGINIA MED SCHOOL	11568736	U272	UNIV OF DETROIT MERCY	22210580
U74	EASTERN VIRGINIA MED SCHOOL	13248021	U273	UNIV OF FLORIDA	10062206
U74	EASTERN VIRGINIA MED SCHOOL	21158600	U273	UNIV OF FLORIDA	11645650
U74	EASTERN VIRGINIA MED SCHOOL	21940531	U273	UNIV OF FLORIDA	11914084

U74	EASTERN VIRGINIA MED SCHOOL	22381251	U273	UNIV OF FLORIDA	12304022
U75	EASTERN WASHINGTON UNIV	12794799	U273	UNIV OF FLORIDA	12940121
U76	EMORY UNIV	11907114	U273	UNIV OF FLORIDA	13067084
U76	EMORY UNIV	12952537	U273	UNIV OF FLORIDA	21531655
U76	EMORY UNIV	13153100	U273	UNIV OF FLORIDA	22795882
U76	EMORY UNIV	21940314	U274	UNIV OF GEORGIA	10709716
U77	ERSKINE COLLEGE	12208271	U274	UNIV OF GEORGIA	10743899
U78	FAIRFIELD UNIV	10326534	U274	UNIV OF GEORGIA	20980632
U79	FERRIS STATE UNIV	12744811	U274	UNIV OF GEORGIA	21024097
U80	FLORIDA A&M UNIV	10688530	U274	UNIV OF GEORGIA	31292804
U81	FLORIDA ATLANTIC UNIV	11374602	U275	UNIV OF HARTFORD	11289490
U81	FLORIDA ATLANTIC UNIV	11397556	U276	UNIV OF HAWAII	10643212
U82	FLORIDA INST OF TECH	11653616	U276	UNIV OF HAWAII	11798517
U82	FLORIDA INST OF TECH	21264587	U277	UNIV OF HEALTH SCI	10832755
U83	FLORIDA INT UNIV	11351849	U278	UNIV OF HOUSTON	10359318
U84	FLORIDA STATE UNIV	10572253	U278	UNIV OF HOUSTON	11083253
U85	FORDHAM UNIV	12483494	U278	UNIV OF HOUSTON	11826512
U86	FORMAN SCHOOL	12512261	U278	UNIV OF HOUSTON	11973901
U87	FORT VALLEY STATE COLLEGE	10945959	U278	UNIV OF HOUSTON	12008832
U88	FRANCISCAN UNIV OF STEUBENVILLE	12857699	U278	UNIV OF HOUSTON	12950314
U89	GEORGE MASON UNIV	12053388	U278	UNIV OF HOUSTON	21504424
U89	GEORGE MASON UNIV	13160830	U279	UNIV OF IDAHO	10495969
U90	GEORGE WASHINGTON UNIV	10643340	U280	UNIV OF ILLINOIS	10041842
U90	GEORGE WASHINGTON UNIV	11232401	U280	UNIV OF ILLINOIS	10568328
U91	GEORGETOWN UNIV	10420768	U280	UNIV OF ILLINOIS	13082277
U91	GEORGETOWN UNIV	23160283	U280	UNIV OF ILLINOIS	13176072
U92	GEORGIA INST OF TECH	10245256	U280	UNIV OF ILLINOIS	13209235
U92	GEORGIA INST OF TECH	11201574	U280	UNIV OF ILLINOIS	21997696
U92	GEORGIA INST OF TECH	11907114	U280	UNIV OF ILLINOIS	23017867
U92	GEORGIA INST OF TECH	12242425	U281	UNIV OF IOWA	10062450
U92	GEORGIA INST OF TECH	13168377	U281	UNIV OF IOWA	10430486
U92	GEORGIA INST OF TECH	13189746	U281	UNIV OF IOWA	13108782
U92	GEORGIA INST OF TECH	21544042	U281	UNIV OF IOWA	13212573
U93	GEORGIA REGENTS UNIV	10495486	U281	UNIV OF IOWA	21559317
U94	GEORGIA STATE UNIV	11063676	U281	UNIV OF IOWA	21619052
U94	GEORGIA STATE UNIV	13058237	U281	UNIV OF IOWA	22019136
U94	GEORGIA STATE UNIV	31917686	U281	UNIV OF IOWA	22148979
U94	GEORGIA STATE UNIV	32072969	U282	UNIV OF KANSAS	10077203

U95	GLOBAL PETROLEUM RESOURCES INST	10834168	U282	UNIV OF KANSAS	10144154
U96	GONZAGA UNIV	10148287	U282	UNIV OF KANSAS	10764366
U97	GOSHEN COLLEGE	10490341	U282	UNIV OF KANSAS	11157105
U98	GRAND VALLEY STATE UNIV	11530764	U282	UNIV OF KANSAS	11652313
U99	HAMPSHIRE COLLEGE	12134308	U282	UNIV OF KANSAS	12422786
U100	HAMPTON UNIV	12750799	U283	UNIV OF KENTUCKY	10367449
U101	HARVARD UNIV	10441766	U283	UNIV OF KENTUCKY	11623208
U101	HARVARD UNIV	10669916	U283	UNIV OF KENTUCKY	13166469
U101	HARVARD UNIV	11644197	U283	UNIV OF KENTUCKY	21124944
U101	HARVARD UNIV	13092079	U283	UNIV OF KENTUCKY	22503627
U101	HARVARD UNIV	21754150	U283	UNIV OF KENTUCKY	22630049
U101	HARVARD UNIV	21836318	U283	UNIV OF KENTUCKY	22731487
U101	HARVARD UNIV	22120144	U284	UNIV OF LOUISIANA	10906343
U101	HARVARD UNIV	23194752	U284	UNIV OF LOUISIANA	12681831
U101	HARVARD UNIV	31904374	U285	UNIV OF LOUISVILLE	10317341
U102	HATHAWAY BROWN SCHOOL	12723620	U285	UNIV OF LOUISVILLE	11059353
U103	HOFSTRA UNIV	21517215	U285	UNIV OF LOUISVILLE	11298212
U104	HONOLULU UNIV	12479573	U285	UNIV OF LOUISVILLE	13062808
U105	HOWARD UNIV	11630148	U286	UNIV OF MAINE	10640468
U106	HUMBOLDT STATE UNIV	12503249	U287	UNIV OF MARYLAND	11191953
U107	IDAHO STATE UNIV	12717588	U287	UNIV OF MARYLAND	11358284
U108	ILLINOIS INST OF TECH	11788448	U287	UNIV OF MARYLAND	11632204
U109	ILLINOIS STATE UNIV	10949075	U287	UNIV OF MARYLAND	11714398
U110	INDIANA UNIV	10592322	U287	UNIV OF MARYLAND	12256952
U110	INDIANA UNIV	11793501	U287	UNIV OF MARYLAND	13133766
U110	INDIANA UNIV	12961647	U287	UNIV OF MARYLAND	13138078
U110	INDIANA UNIV	21779511	U287	UNIV OF MARYLAND	23091698
U111	IOWA STATE UNIV	-19842	U288	UNIV OF MASSACHUSETTS	10644545
U111	IOWA STATE UNIV	10241419	U288	UNIV OF MASSACHUSETTS	11043142
U111	IOWA STATE UNIV	12637792	U288	UNIV OF MASSACHUSETTS	11078564
U111	IOWA STATE UNIV	13166241	U288	UNIV OF MASSACHUSETTS	11159519
U111	IOWA STATE UNIV	21589443	U288	UNIV OF MASSACHUSETTS	11249757
U111	IOWA STATE UNIV	22014247	U288	UNIV OF MASSACHUSETTS	11533895
U112	ITHACA COLLEGE	32157288	U288	UNIV OF MASSACHUSETTS	11947081
U113	JACKSON STATE UNIV	12641196	U288	UNIV OF MASSACHUSETTS	11979607
U114	JACKSONVILLE STATE UNIV	12606791	U288	UNIV OF MASSACHUSETTS	12673072
U115	JAMES MADISON UNIV	12217658	U288	UNIV OF MASSACHUSETTS	22669651
U116	JIT INST OF TECH INC	11540480	U288	UNIV OF MASSACHUSETTS	32465352

U117	JOHN COSTANZA INST OF TECH	-19842	U289	UNIV OF MEDICINE & DENISTRY OF NEW JERSEY	10805756
U117	JOHN COSTANZA INST OF TECH	12298980	U289	UNIV OF MEDICINE & DENISTRY OF NEW JERSEY	13081942
U118	JOHNS HOPKINS UNIV	10272382	U289	UNIV OF MEDICINE & DENISTRY OF NEW JERSEY	13179673
U118	JOHNS HOPKINS UNIV	11701894	U289	UNIV OF MEDICINE & DENISTRY OF NEW JERSEY	22823702
U118	JOHNS HOPKINS UNIV	21796135	U290	UNIV OF MEMPHIS	11618897
U119	JOHNSON & WALES UNIV	11079610	U290	UNIV OF MEMPHIS	11701534
U120	JORDAN COLLEGE	10335223	U291	UNIV OF MIAMI	10488380
U121	KANSAS STATE UNIV	10144154	U291	UNIV OF MIAMI	10759815
U121	KANSAS STATE UNIV	11312062	U291	UNIV OF MIAMI	12362255
U121	KANSAS STATE UNIV	22576010	U291	UNIV OF MIAMI	22730154
U122	KENT STATE UNIV	11421533	U292	UNIV OF MICHIGAN	10633647
U123	KIRKWOOD COMMUNITY COLLEGE	11093484	U292	UNIV OF MICHIGAN	10986768
U124	LAWRENCE TECHNOLOGICAL UNIV	11231979	U293	UNIV OF MINNESOTA	10088481
U124	LAWRENCE TECHNOLOGICAL UNIV	12267391	U293	UNIV OF MINNESOTA	11296379
U124	LAWRENCE TECHNOLOGICAL UNIV	12890518	U293	UNIV OF MINNESOTA	12952537
U125	LE TOURNEAU UNIV	10926566	U293	UNIV OF MINNESOTA	13174559
U126	LEHIGH UNIV	11235848	U293	UNIV OF MINNESOTA	13243336
U126	LEHIGH UNIV	12652233	U293	UNIV OF MINNESOTA	21341069
U127	LIFE CHIROPRACTIC COLLEGE WEST	10343025	U293	UNIV OF MINNESOTA	22906363
U128	LOMA LINDA UNIV	11515547	U294	UNIV OF MISSISSIPPI	10973250
U128	LOMA LINDA UNIV	11564411	U294	UNIV OF MISSISSIPPI	12115690
U128	LOMA LINDA UNIV	12803206	U295	UNIV OF MISSOURI	11007415
U129	LOUISIANA STATE UNIV	10140805	U295	UNIV OF MISSOURI	21097646
U129	LOUISIANA STATE UNIV	11062023	U296	UNIV OF MONTANA	10691564
U129	LOUISIANA STATE UNIV	11627788	U297	UNIV OF NEBRASKA	10109390
U129	LOUISIANA STATE UNIV	11947081	U297	UNIV OF NEBRASKA	12997875
U129	LOUISIANA STATE UNIV	12966870	U297	UNIV OF NEBRASKA	13156532
U129	LOUISIANA STATE UNIV	13009436	U297	UNIV OF NEBRASKA	33202059
U129	LOUISIANA STATE UNIV	13166469	U298	UNIV OF NEVADA	10237009
U129	LOUISIANA STATE UNIV	13209300	U298	UNIV OF NEVADA	11703838
U129	LOUISIANA STATE UNIV	21195745	U298	UNIV OF NEVADA	13071491
U129	LOUISIANA STATE UNIV	21685347	U298	UNIV OF NEVADA	13109172
U129	LOUISIANA STATE UNIV	21735512	U298	UNIV OF NEVADA	21844711
U129	LOUISIANA STATE UNIV	21952168	U298	UNIV OF NEVADA	21958662
U129	LOUISIANA STATE UNIV	22154284	U298	UNIV OF NEVADA	22186847
U129	LOUISIANA STATE UNIV	22637947	U298	UNIV OF NEVADA	22808133
U129	LOUISIANA STATE UNIV	43036639	U298	UNIV OF NEVADA	22814869
U130	LOUISIANA TECH UNIV	10126534	U298	UNIV OF NEVADA	22887683

U130	LOUISIANA TECH UNIV	12813408	U298	UNIV OF NEVADA	23202059
U130	LOUISIANA TECH UNIV	13190783	U299	UNIV OF NEW HAMPSHIRE	11724210
U130	LOUISIANA TECH UNIV	23072046	U299	UNIV OF NEW HAMPSHIRE	22689966
U131	LOYOLA UNIV CHICAGO	11947185	U300	UNIV OF NEW MEXICO	10913424
U132	LOYOLA UNIV MARYLAND	11561939	U300	UNIV OF NEW MEXICO	12773626
U133	MACOMB INTERMEDIATE SCHOOL DISTRICT	12317057	U300	UNIV OF NEW MEXICO	22240157
U134	MARION COUNTY SCHOOL BOARD	11775373	U301	UNIV OF NEW ORLEANS	11437146
U135	MARQUETTE UNIV	10660599	U301	UNIV OF NEW ORLEANS	12416380
U136	MARSHALL UNIV	11841525	U301	UNIV OF NEW ORLEANS	12452671
U137	MASSACHUSETTS INST OF TECH	10669916	U302	UNIV OF NORTH CARLOINA	10478431
U137	MASSACHUSETTS INST OF TECH	11527095	U302	UNIV OF NORTH CARLOINA	11068582
U137	MASSACHUSETTS INST OF TECH	11947081	U302	UNIV OF NORTH CARLOINA	21292761
U137	MASSACHUSETTS INST OF TECH	12641479	U302	UNIV OF NORTH CARLOINA	21616739
U137	MASSACHUSETTS INST OF TECH	12991382	U302	UNIV OF NORTH CARLOINA	21946714
U137	MASSACHUSETTS INST OF TECH	13006194	U302	UNIV OF NORTH CARLOINA	22104572
U137	MASSACHUSETTS INST OF TECH	13106289	U302	UNIV OF NORTH CARLOINA	22160569
U137	MASSACHUSETTS INST OF TECH	22536443	U302	UNIV OF NORTH CARLOINA	23027322
U137	MASSACHUSETTS INST OF TECH	22576921	U302	UNIV OF NORTH CARLOINA	23126469
U137	MASSACHUSETTS INST OF TECH	22955839	U303	UNIV OF NORTH DAKOTA	11031073
U138	MCNEESE STATE UNIV	12702967	U303	UNIV OF NORTH DAKOTA	11354521
U139	MED COLLEGE OF WISCONSIN	10580239	U303	UNIV OF NORTH DAKOTA	11877098
U139	MED COLLEGE OF WISCONSIN	10820459	U303	UNIV OF NORTH DAKOTA	12520107
U140	MED UNIV OF SOUTH CAROLINA	10995833	U304	UNIV OF NORTH FLORIDA	12458745
U141	MEHARRY MED COLLEGE	13126305	U305	UNIV OF NORTH TEXAS	10740277
U142	MERCER UNIV	12595514	U305	UNIV OF NORTH TEXAS	11784144
U142	MERCER UNIV	12655110	U305	UNIV OF NORTH TEXAS	12290304
U143	MIAMI UNIV	10834376	U306	UNIV OF NORTHERN IOWA	10669932
U143	MIAMI UNIV	12555248	U307	UNIV OF NOTRE DAME	10098786
U144	MICHIGAN STATE UNIV	10194972	U307	UNIV OF NOTRE DAME	11206968
U144	MICHIGAN STATE UNIV	13020373	U308	UNIV OF OKLAHOMA	10699216
U144	MICHIGAN STATE UNIV	13205811	U309	UNIV OF OREGON	10199918
U145	MICHIGAN TECH UNIV	10077900	U309	UNIV OF OREGON	10461110
U146	MILWAUKEE SCHOOL OF ENG	12409581	U309	UNIV OF OREGON	21141378
U147	MINNESOTA STATE UNIV	11729349	U309	UNIV OF OREGON	22250176
U148	MISSISSIPPI STATE UNIV	11300457	U310	UNIV OF PACIFIC	10069498
U148	MISSISSIPPI STATE UNIV	11640190	U311	UNIV OF PENNSYLVANIA	10553405
U148	MISSISSIPPI STATE UNIV	12603782	U311	UNIV OF PENNSYLVANIA	21448010
U148	MISSISSIPPI STATE UNIV	22458885	U311	UNIV OF PENNSYLVANIA	22163973



U149	MISSOURI STATE UNIV	12562207	U311	UNIV OF PENNSYLVANIA	22529353
U150	MONTANA STATE UNIV	10309530	U311	UNIV OF PENNSYLVANIA	41937492
U150	MONTANA STATE UNIV	10442746	U312	UNIV OF PITTSBURGH	10816904
U150	MONTANA STATE UNIV	10507582	U312	UNIV OF PITTSBURGH	11580909
U150	MONTANA STATE UNIV	12730146	U312	UNIV OF PITTSBURGH	13038211
U151	MONTCLAIR STATE COLLEGE	10998921	U312	UNIV OF PITTSBURGH	13098395
U152	MOREHOUSE SCHOOL OF MEDICINE	22229917	U312	UNIV OF PITTSBURGH	13157514
U153	NEW JERSEY INST OF TECH	10367156	U312	UNIV OF PITTSBURGH	13159719
U153	NEW JERSEY INST OF TECH	10630367	U312	UNIV OF PITTSBURGH	22651595
U154	NEW MEXICO HIGHLANDS UNIV	13174959	U312	UNIV OF PITTSBURGH	22834880
U156	NEW MEXICO STATE UNIV	10477157	U313	UNIV OF PORTLAND	12519096
U156	NEW MEXICO STATE UNIV	11784545	U314	UNIV OF PUERTO RICO	11159294
U155	NEW MEXICO TECH	10707696	U315	UNIV OF RHODE ISLAND	10211036
U155	NEW MEXICO TECH	10710305	U315	UNIV OF RHODE ISLAND	10332373
U157	NEW YORK CHIROPRACTIC COLLEGE	11001730	U315	UNIV OF RHODE ISLAND	11401123
U158	NEW YORK INST OF TECH	10323560	U316	UNIV OF ROCHESTER	10813351
U159	NEW YORK MED COLLEGE	11880029	U316	UNIV OF ROCHESTER	21383171
U160	NEW YORK UNIV	10225626	U316	UNIV OF ROCHESTER	23216874
U160	NEW YORK UNIV	10935256	U316	UNIV OF ROCHESTER	32265471
U160	NEW YORK UNIV	11038949	U317	UNIV OF SCI IN PHILADELPHIA	12403630
U160	NEW YORK UNIV	11853445	U318	UNIV OF SCRANTON	11695871
U160	NEW YORK UNIV	12839335	U319	UNIV OF SOUTH ALABAMA	10685560
U160	NEW YORK UNIV	13241582	U320	UNIV OF SOUTH CAROLINA	10464990
U161	NICHOLLS STATE UNIV	12274275	U320	UNIV OF SOUTH CAROLINA	11249621
U162	NORTH CAROLINA A&T STATE UNIV	12268714	U320	UNIV OF SOUTH CAROLINA	12753388
U163	NORTH CAROLINA CENT UNIV	11099366	U320	UNIV OF SOUTH CAROLINA	23046248
U164	NORTH CAROLINA STATE UNIV	10559924	U321	UNIV OF SOUTH FLORDIA	11233875
U164	NORTH CAROLINA STATE UNIV	11506123	U321	UNIV OF SOUTH FLORDIA	22073133
U164	NORTH CAROLINA STATE UNIV	13226041	U321	UNIV OF SOUTH FLORDIA	22669149
U164	NORTH CAROLINA STATE UNIV	23129971	U322	UNIV OF SOUTHERN CALIFORNIA	10578763
U165	NORTH DAKOTA STATE UNIV	10566870	U322	UNIV OF SOUTHERN CALIFORNIA	12328900
U165	NORTH DAKOTA STATE UNIV	10923756	U322	UNIV OF SOUTHERN CALIFORNIA	12758297
U165	NORTH DAKOTA STATE UNIV	11143192	U322	UNIV OF SOUTHERN CALIFORNIA	21438481
U165	NORTH DAKOTA STATE UNIV	12042637	U323	UNIV OF SOUTHERN MISSISSIPPI	11695908
U165	NORTH DAKOTA STATE UNIV	22032783	U323	UNIV OF SOUTHERN MISSISSIPPI	13039998
U166	NORTHEASTERN OHIO MED UNIV	11520028	U324	UNIV OF TENNESSEE	10395128
U167	NORTHEASTERN UNIV	11750270	U324	UNIV OF TENNESSEE	11073675
U168	NORTHERN ARIZONA UNIV	10586414	U324	UNIV OF TENNESSEE	11302430

U168	NORTHERN ARIZONA UNIV	11750489	U324	UNIV OF TENNESSEE	12727218
U168	NORTHERN ARIZONA UNIV	13126467	U324	UNIV OF TENNESSEE	12955536
U169	NORTHERN ILLINOIS UNIV	11371840	U324	UNIV OF TENNESSEE	21028705
U169	NORTHERN ILLINOIS UNIV	22044652	U324	UNIV OF TENNESSEE	21683109
U170	NORTHWEST MISSOURI STATE UNIV	12249694	U325	UNIV OF TEXAS	10179127
U171	NORTHWESTERN POLYTECHNIC UNIV	10901441	U325	UNIV OF TEXAS	11586204
U172	NORTHWESTERN UNIV	10265747	U325	UNIV OF TEXAS	12098212
U172	NORTHWESTERN UNIV	10935258	U325	UNIV OF TEXAS	13056214
U172	NORTHWESTERN UNIV	11495704	U325	UNIV OF TEXAS	13094961
U172	NORTHWESTERN UNIV	12057950	U325	UNIV OF TEXAS	13143500
U172	NORTHWESTERN UNIV	21478822	U325	UNIV OF TEXAS	20941968
U172	NORTHWESTERN UNIV	21802904	U325	UNIV OF TEXAS	21683220
U173	NOVA SOUTHEASTERN UNIV	10706233	U325	UNIV OF TEXAS	21722946
U173	NOVA SOUTHEASTERN UNIV	12380965	U325	UNIV OF TEXAS	22038636
U174	OAK RIDGE ASSOC UNIVERSITIES	10926602	U325	UNIV OF TEXAS	22101963
U174	OAK RIDGE ASSOC UNIVERSITIES	10933394	U325	UNIV OF TEXAS	22232724
U175	OAKLAND UNIV	12935463	U325	UNIV OF TEXAS	22265484
U176	OHIO NORTHERN UNIV	11589089	U325	UNIV OF TEXAS	22656893
U177	OHIO STATE UNIV	10875627	U325	UNIV OF TEXAS	22727731
U177	OHIO STATE UNIV	11671339	U325	UNIV OF TEXAS	31946946
U177	OHIO STATE UNIV	13062757	U326	UNIV OF TOLEDO	10651445
U177	OHIO STATE UNIV	13085082	U326	UNIV OF TOLEDO	11209129
U177	OHIO STATE UNIV	22412940	U327	UNIV OF TULSA	11783568
U177	OHIO STATE UNIV	22662337	U328	UNIV OF UTAH	10266457
U178	OHIO UNIV	11132407	U328	UNIV OF UTAH	10424292
U178	OHIO UNIV	23101755	U328	UNIV OF UTAH	11973831
U179	OKLAHOMA STATE UNIV	10042480	U328	UNIV OF UTAH	12979735
U179	OKLAHOMA STATE UNIV	10708257	U328	UNIV OF UTAH	13058323
U179	OKLAHOMA STATE UNIV	21419483	U329	UNIV OF VERMONT	10941045
U180	OLD DOMINION UNIV	10367573	U329	UNIV OF VERMONT	11313813
U180	OLD DOMINION UNIV	12618692	U329	UNIV OF VERMONT	21128253
U181	OREGON HEALTH SCI UNIV	11075430	U329	UNIV OF VERMONT	22014112
U181	OREGON HEALTH SCI UNIV	11223730	U330	UNIV OF VIRGINIA	-19842
U181	OREGON HEALTH SCI UNIV	11602038	U330	UNIV OF VIRGINIA	10170460
U181	OREGON HEALTH SCI UNIV	21729163	U330	UNIV OF VIRGINIA	10261198
U181	OREGON HEALTH SCI UNIV	21752368	U330	UNIV OF VIRGINIA	11045478
U182	OREGON STATE UNIV	-19842	U331	UNIV OF WASHINGTON	10239303
U182	OREGON STATE UNIV	10242939	U331	UNIV OF WASHINGTON	10886396

U182	OREGON STATE UNIV	10382255	U331	UNIV OF WASHINGTON	11277015
U182	OREGON STATE UNIV	10461110	U331	UNIV OF WASHINGTON	11534084
U182	OREGON STATE UNIV	13150579	U331	UNIV OF WASHINGTON	13062709
U182	OREGON STATE UNIV	21632142	U331	UNIV OF WASHINGTON	21940712
U182	OREGON STATE UNIV	21710031	U332	UNIV OF WEST FLORIDA	11606937
U182	OREGON STATE UNIV	22595588	U333	UNIV OF WISCONSIN	-18138
U183	PACE UNIV	12564893	U333	UNIV OF WISCONSIN	10758279
U184	PENN STATE UNIV	10126251	U333	UNIV OF WISCONSIN	11011139
U184	PENN STATE UNIV	10880590	U333	UNIV OF WISCONSIN	11091862
U184	PENN STATE UNIV	11381814	U333	UNIV OF WISCONSIN	11186941
U184	PENN STATE UNIV	12069216	U333	UNIV OF WISCONSIN	13174902
U184	PENN STATE UNIV	12242850	U333	UNIV OF WISCONSIN	13205491
U184	PENN STATE UNIV	12547753	U333	UNIV OF WISCONSIN	13241558
U184	PENN STATE UNIV	13142419	U333	UNIV OF WISCONSIN	22391743
U184	PENN STATE UNIV	21368573	U333	UNIV OF WISCONSIN	52256503
U185	PEPPERDINE UNIV	11608189	U334	UNIV OF WYOMING	11661065
U186	PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE	10268206	U334	UNIV OF WYOMING	11835948
U186	PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE	11687112	U335	UNIVERSITIES SPACE RES ASSOC	12108009
U187	PITTSBURG STATE UNIV	12673354	U336	UTAH STATE UNIV	10102878
U188	POLYTEC PACKAGING	11348040	U336	UTAH STATE UNIV	11777166
U189	PORTLAND STATE UNIV	10547299	U337	VALDOSTA STATE UNIV	12122456
U189	PORTLAND STATE UNIV	12059871	U338	VANDERBILT UNIV	10427180
U189	PORTLAND STATE UNIV	13142317	U338	VANDERBILT UNIV	11800654
U190	PRINCETON UNIV	10982333	U338	VANDERBILT UNIV	12958157
U190	PRINCETON UNIV	12941661	U338	VANDERBILT UNIV	13241160
U190	PRINCETON UNIV	13051753	U338	VANDERBILT UNIV	22085597
U190	PRINCETON UNIV	13153412	U338	VANDERBILT UNIV	22540680
U190	PRINCETON UNIV	13202451	U339	VAUGHN COLLEGE OF AERONAUTICS AND TECHNOLOGY	10967685
U190	PRINCETON UNIV	21645396	U340	VILLANOVA UNIV	10113411
U191	PURDUE UNIV	10035219	U341	VIRGINIA COMMONWEALTH UNIV	11421012
U191	PURDUE UNIV	10366981	U341	VIRGINIA COMMONWEALTH UNIV	11710180
U191	PURDUE UNIV	10398726	U342	VIRGINIA STATE UNIV	11788508
U191	PURDUE UNIV	10537031	U343	VIRGINIA TECH	10039044
U191	PURDUE UNIV	11901537	U343	VIRGINIA TECH	11187277
U191	PURDUE UNIV	32065493	U343	VIRGINIA TECH	11198954
U192	REED COLLEGE	23011649	U343	VIRGINIA TECH	12551167
U193	REGIS COLLEGE	10943971	U343	VIRGINIA TECH	12790182
U194	RENSSELAER POLYTECHIN INST	10403068	U343	VIRGINIA TECH	12942141

U194	RENSSELAER POLYTECHIN INST	22673373	U343	VIRGINIA TECH	21187277
U195	RICE UNIV	12224373	U343	VIRGINIA TECH	21231411
U195	RICE UNIV	12969084	U343	VIRGINIA TECH	21542029
U195	RICE UNIV	13148999	U343	VIRGINIA TECH	21917775
U195	RICE UNIV	13238100	U343	VIRGINIA TECH	22113740
U195	RICE UNIV	22555676	U344	WABASH COLLEGE	10622914
U196	ROANOKE COLLEGE	10866925	U345	WAKE FOREST UNIV	10806683
U197	ROCHESTER INST OF TECH	12641750	U345	WAKE FOREST UNIV	11643499
U198	ROCKEFELLER UNIV	11196703	U345	WAKE FOREST UNIV	12301988
U199	ROCKHURST UNIV	12065608	U345	WAKE FOREST UNIV	12624616
U200	ROSALIND FRANKLIN UNIV	21741747	U345	WAKE FOREST UNIV	13108395
U201	ROSE HULMAN INST OF TECH	12759972	U346	WASHINGTON STATE UNIV	11522428
U202	RUSH UNIV	12713330	U347	WASHINGTON UNIV ST LOUIS	10035548
U202	RUSH UNIV	13101393	U347	WASHINGTON UNIV ST LOUIS	10775140
U203	RUTGERS UNIV	10045993	U347	WASHINGTON UNIV ST LOUIS	12448185
U203	RUTGERS UNIV	10088481	U347	WASHINGTON UNIV ST LOUIS	12941559
U203	RUTGERS UNIV	11102710	U347	WASHINGTON UNIV ST LOUIS	22526196
U203	RUTGERS UNIV	11231993	U348	WAYNE STATE UNIV	10427180
U203	RUTGERS UNIV	13133618	U348	WAYNE STATE UNIV	10847404
U203	RUTGERS UNIV	13156493	U348	WAYNE STATE UNIV	31739712
U203	RUTGERS UNIV	13178411	U349	WEBER STATE UNIV	11896922
U203	RUTGERS UNIV	22265502	U350	WELLESLEY COLLEGE	12407978
U204	SACRAMENTO CITY UNIFIED SCHOOL DISTRICT	13118155	U351	WEST VIRGINIA UNIV	11146459
U205	SAGINAW VALLEY STATE UNIV	10883133	U351	WEST VIRGINIA UNIV	12644624
U206	SALEM INT UNIV	12840486	U352	WESTERN ILLINOIS UNIV	13033405
U207	SALISBURY UNIV	11612069	U353	WESTERN KENTUCKY UNIV	12663898
U208	SAN DIEGO STATE UNIV	12407625	U354	WESTERN MICHIGAN UNIV	11903740
U209	SAN JOSE STATE UNIV	11643621	U355	WESTERN UNIV OF HEALTH SCI	12859058
U209	SAN JOSE STATE UNIV	22947749	U355	WESTERN UNIV OF HEALTH SCI	12949269
U210	SANTA CLARA UNIV	21273474	U356	WESTERN WASHINGTON UNIV	10149309
U211	SETON HALL UNIV	12105148	U356	WESTERN WASHINGTON UNIV	10487689
U212	SHAW UNIV	10183841	U356	WESTERN WASHINGTON UNIV	12740543
U213	SIENA COLLEGE	10577917	U357	WHEELING JESUIT UNIV	12481346
U214	SMITH COLLEGE	10817258	U358	WICHITA STATE UNIV	11029736
U215	SOUTH DAKOGA SCHOOL OF MINES & TECH	11214687	U359	WIDNER UNIV	10162939
U216	SOUTH DAKOTA STATE UNIV	11777429	U360	WRIGHT STATE UNIV	10182806
U217	SOUTHEASTERN ILLINOIS COLLEGE	10960577	U361	YALE UNIV	11892773
U218	SOUTHEASTERN UNIV	11118387	U361	YALE UNIV	22196517

U218	SOUTHEASTERN UNIV	13086585	U361	YALE UNIV	22362025
U219	SOUTHERN COLLEGE OF OPTOMETRY	12759985	U361	YALE UNIV	23141298
U220	SOUTHERN ILLINOIS UNIV	10988029	U362	YESHIVA UNIV	10062715
U220	SOUTHERN ILLINOIS UNIV	13254608	U362	YESHIVA UNIV	10302665
U221	SOUTHERN METHODIST UNIV	11672060	U362	YESHIVA UNIV	12941547
U221	SOUTHERN METHODIST UNIV	13225986	U362	YESHIVA UNIV	20518059
U222	SOUTHERN UNIV & A&M COLLEGE	10988029	U362	YESHIVA UNIV	22793193

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**Online Table 2: Distributions of Characteristics of Patents Granted to Listed Firms and Universities in the U.S.**

We compare the distribution of patent quality/importance (the citations received in five years after the patent is granted), patent originality (one minus the Herfindahl-Hirschman Index (HHI) of citations given to other patents over patent subcategories), patent generality (one minus the HHI of citations received from other patents over patent subcategories), patent basicness (the ratio of the number of references to prior "non-patent documents" divided by the total references), and international patent family affiliation of patents granted to listed public firms and universities. The definitions of patent originality, generality, and basicness follow Trajtenberg, Henderson, and Jaffe (1997). We also compare their distributions in the following three periods: 1976-1985, 1986-1995, and 1996-2010. We split our whole sample period (1976-2010) into three almost equal sub-periods to examine the evolution of patent forward citation, patent originality, and patent generality over time. We split our sample at 1985-1986 due to the adoption of the Bayh-Dole Act at 1980 and the surge of personal computer industry at early 1980s. We also split our sample at 1995-1996 for the “.com bubble” started around 1996-1997. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively, when comparing the mean of universities’ patents with the mean of listed firms’ patents.

**Panel A**

Panel A reports summary statistics for patent quality/importance (number of forward citations within 5 years) (A1), patent generality (A2), patent originality (A3), patent basicness (A4), number of claims (A5), and the indicator variable for international patent family affiliation (A6) in the following three periods: 1976-1985, 1986-1995, and 1996-2010.

<b>Panel A1: Summary Statistics of Forward 5yr Citations</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	3.97***	6.76***	5.34	2.88	5.63	5.28
<b>Median</b>	2.00	4.00	2.00	2.00	3.00	2.00
<b>Standard Deviation</b>	6.45	9.96	10.63	4.09	8.29	10.03
<b>Minimum</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>25th Percentile</b>	1.00	1.00	0.00	0.00	1.00	0.00
<b>75th Percentile</b>	5.00	8.00	6.00	4.00	7.00	6.00
<b>95th Percentile</b>	14.00	24.00	23.00	10.00	19.00	21.00
<b>99th Percentile</b>	29.00	47.00	52.00	19.00	39.00	48.00
<b>Maximum</b>	109.00	173.00	213.00	152.00	286.00	539.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692

Panel A (continued)

<b>Panel A2: Summary Statistics of Patent Generality</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	0.46***	0.48***	0.43***	0.42	0.43	0.35
<b>Median</b>	0.51	0.53	0.50	0.47	0.48	0.33
<b>Standard Deviation</b>	0.29	0.29	0.33	0.31	0.30	0.33
<b>Minimum</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>25th Percentile</b>	0.22	0.26	0.00	0.07	0.16	0.00
<b>75th Percentile</b>	0.68	0.70	0.69	0.67	0.67	0.63
<b>95th Percentile</b>	0.87	0.86	1.00	0.90	0.87	1.00
<b>99th Percentile</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>Maximum</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692



Panel A (continued)

<b>Panel A3: Summary Statistics of Patent Originality</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	0.27***	0.37***	0.44***	0.25	0.35	0.38
<b>Median</b>	0.00	0.40	0.50	0.00	0.33	0.40
<b>Standard Deviation</b>	0.37	0.35	0.33	0.36	0.34	0.32
<b>Minimum</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>25th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>75th Percentile</b>	0.62	0.67	0.70	0.56	0.67	0.66
<b>95th Percentile</b>	1.00	1.00	1.00	1.00	1.00	0.87
<b>99th Percentile</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>Maximum</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692

Panel A (continued)

<b>Panel A4: Summary Statistics of Patent Basicness</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	0.25***	0.411***	0.50***	0.07	0.10	0.12
<b>Median</b>	0.05	0.38	0.54	0.00	0.00	0.00
<b>Standard Deviation</b>	0.33	0.35	0.34	0.17	0.19	0.20
<b>Minimum</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>25th Percentile</b>	0.00	0.00	0.18	0.00	0.00	0.00
<b>75th Percentile</b>	0.50	0.73	0.81	0.00	0.13	0.17
<b>95th Percentile</b>	1.00	1.00	1.00	0.44	0.50	0.59
<b>99th Percentile</b>	1.00	1.00	1.00	1.00	0.88	0.89
<b>Maximum</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692

Panel A (continued)

<b>Panel A5: Summary Statistics of Number of Claims</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	14.65***	16.71***	22.22***	10.96	13.77	18.35
<b>Median</b>	11.00	14.00	18.00	9.00	11.00	16.00
<b>Standard Deviation</b>	15.83	13.28	18.39	9.41	11.31	13.74
<b>Minimum</b>	0.00	0.00	0.00	1.00	1.00	1.00
<b>1st Percentile</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>5th Percentile</b>	2.00	3.00	4.00	2.00	2.00	4.00
<b>25th Percentile</b>	7.00	8.00	10.00	5.00	6.00	9.00
<b>75th Percentile</b>	19.00	21.00	28.00	14.00	18.00	23.00
<b>95th Percentile</b>	36.00	40.00	55.00	27.00	33.00	42.00
<b>99th Percentile</b>	62.00	63.00	90.00	46.00	54.00	68.00
<b>Maximum</b>	642.00	219.00	309.00	298.00	868.00	683.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692

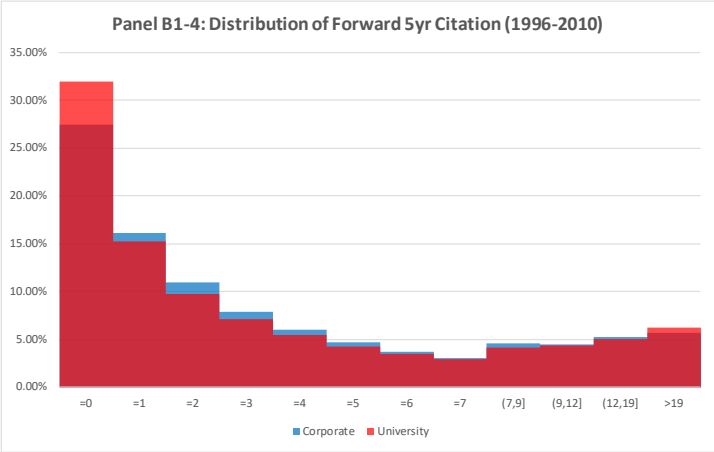
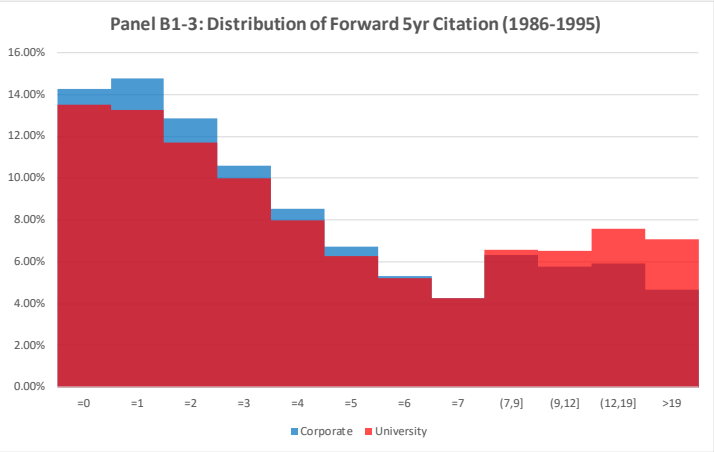
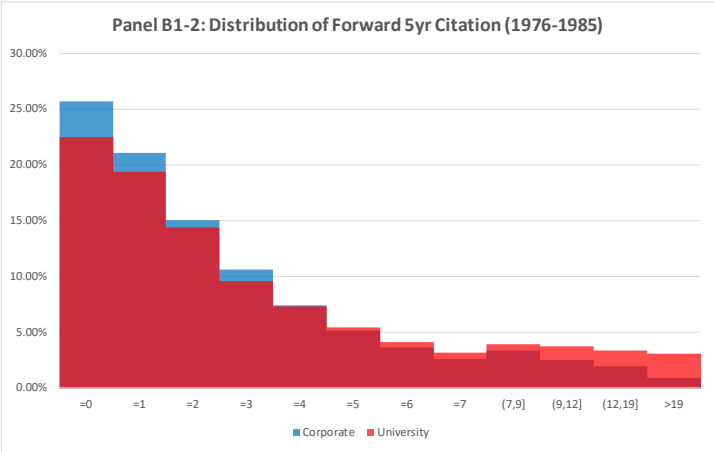
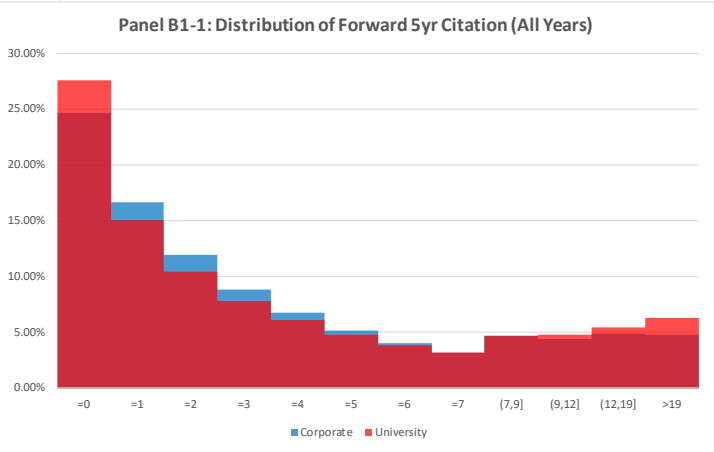
Panel A (continued)

<b>Panel A6: Summary Statistics of International Family</b>						
	<b>Universities</b>			<b>Public Firms</b>		
	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>	<b>1976-1985</b>	<b>1986-1995</b>	<b>1996-2010</b>
<b>Mean</b>	0.21***	0.32***	0.56***	0.48	0.57	0.60
<b>Median</b>	0.00	0.00	1.00	0.00	1.00	1.00
<b>Standard Deviation</b>	0.41	0.47	0.50	0.50	0.50	0.49
<b>Minimum</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>25th Percentile</b>	0.00	0.00	0.00	0.00	0.00	0.00
<b>75th Percentile</b>	0.00	1.00	1.00	1.00	1.00	1.00
<b>95th Percentile</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>99th Percentile</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>Maximum</b>	1.00	1.00	1.00	1.00	1.00	1.00
<b>#Obs</b>	4,646	15,915	57,319	213,285	262,794	885,692

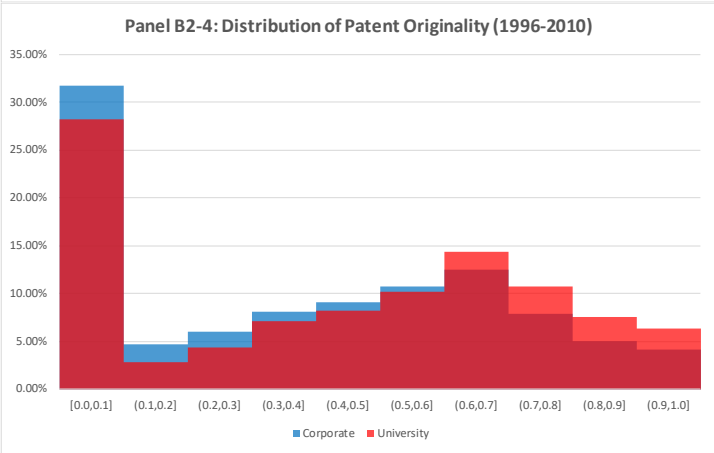
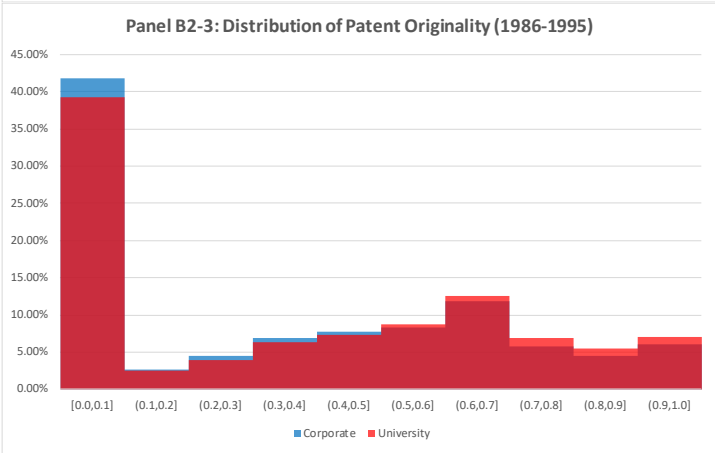
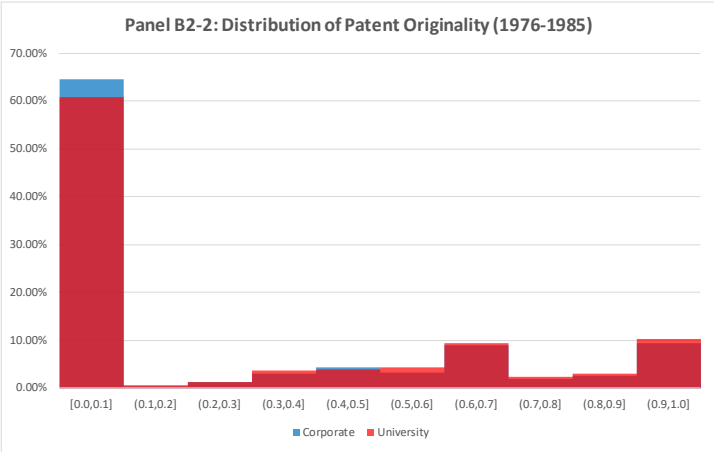
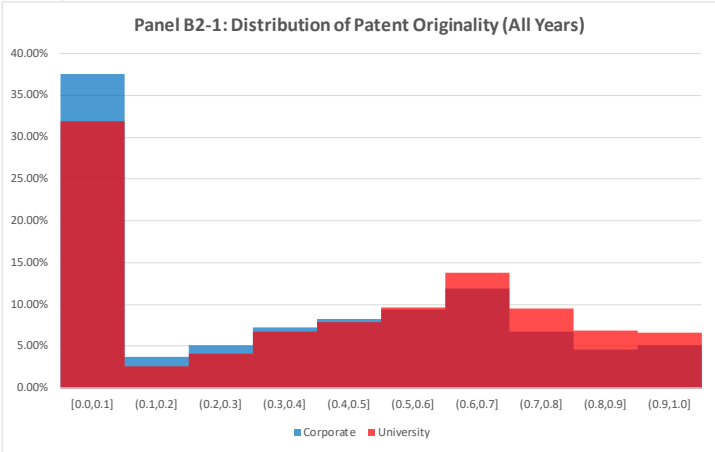
**Panel B**

Panel B shows the distributions of patent quality/importance (number of forward citations within 5 years), patent originality, patent generality, and patent basicness of listed public firms and universities. For quality/importance, we compute the frequency of observations within each category of entities for twelve intervals (citation equal to 0 (5th-20th percentile), citation equal to 1 (25th-40th percentile), citation equal to 2 (45th-50th percentile), citation equal to 3 (55th-60th percentile), citation equal to 4 (65th percentile), citation equal to 5 (70th percentile), citation equal to 6 (75th percentile), citation equal to 7 (80th percentile), citation larger than 7 and smaller than or equal to 9 (85th percentile), citation larger than 9 and smaller than or equal to 12 (90th percentile), citation larger than 12 and smaller than or equal to 19 (95th percentile), and citation larger than 19). For the distributions of patent originality, generality, and basicness (all bounded from 0 to 1), we report their frequencies in each equal bin between 0 to 1. For number of claims, we compute the frequency of observations within each category of entities for ten intervals (smaller than 4 (10th percentile), larger than 4 and smaller than 7 (20th percentile), larger than 7 and smaller than 9 (30th percentile), larger than 9 and smaller than 11 (40th percentile), larger than 11 and smaller than 14 (50th percentile), larger than 14 and smaller than 17 (60th percentile), larger than 17 and smaller than 20 (70th percentile), larger than 20 and smaller than 23 (80th percentile), larger than 23 and smaller than 31 (90th percentile), and larger than 31). We also compare their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).

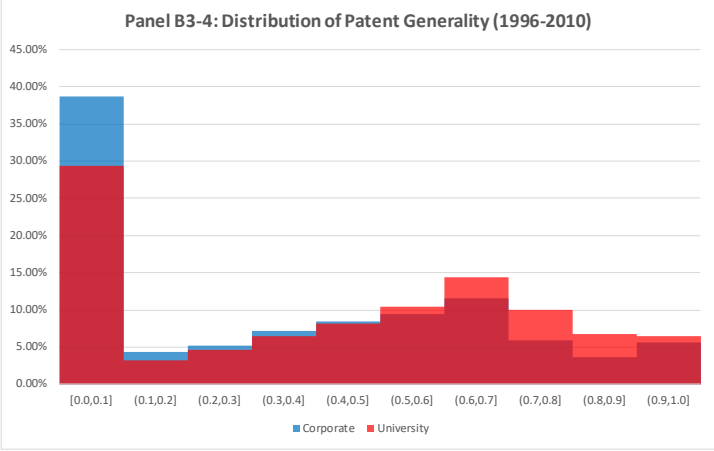
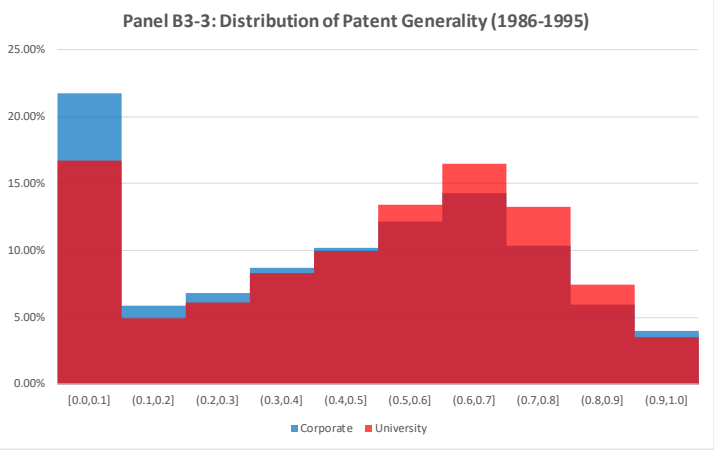
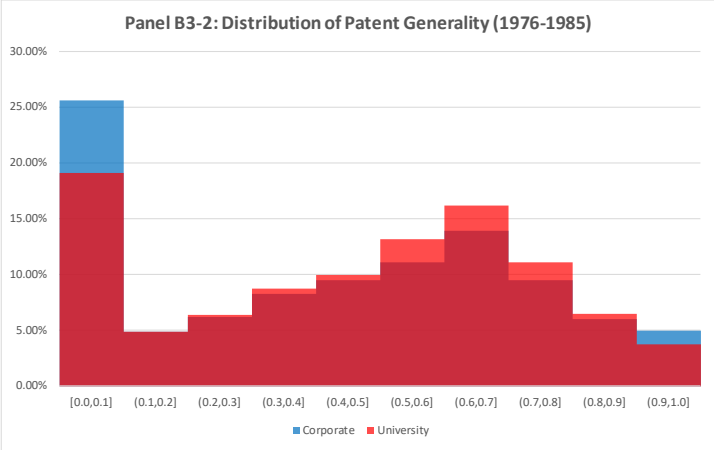
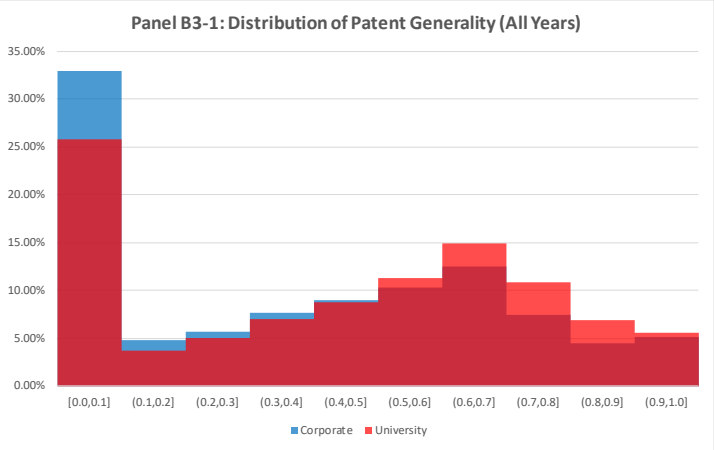
**Panel B (continued)**



**Panel B (continued)**

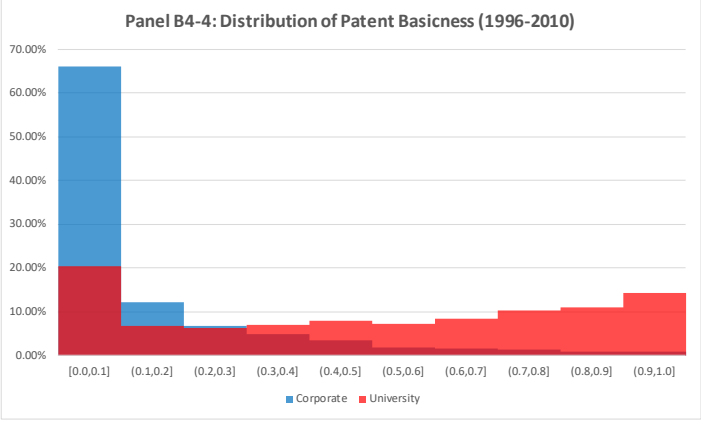
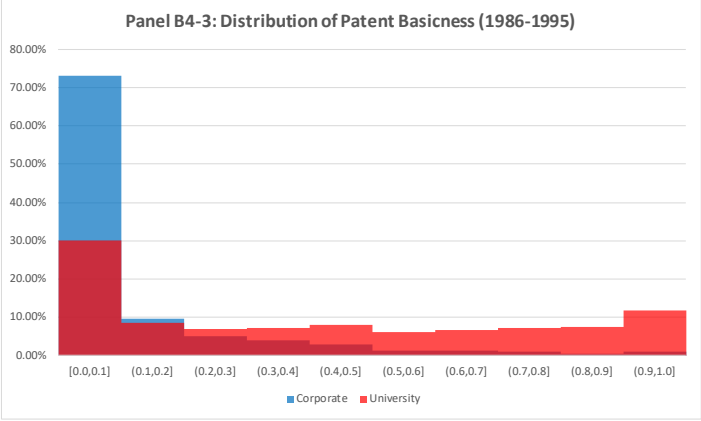
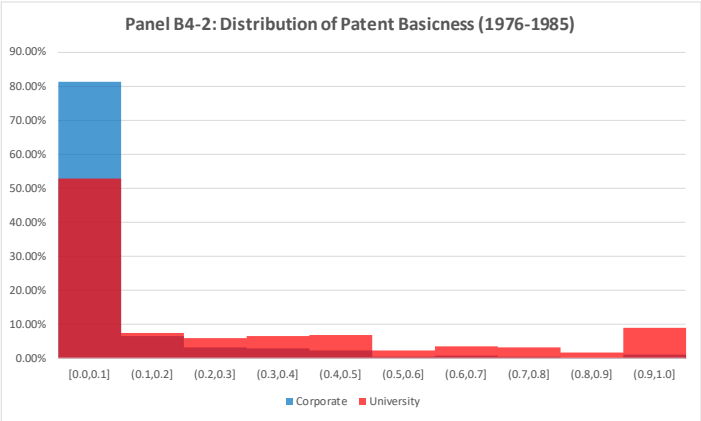
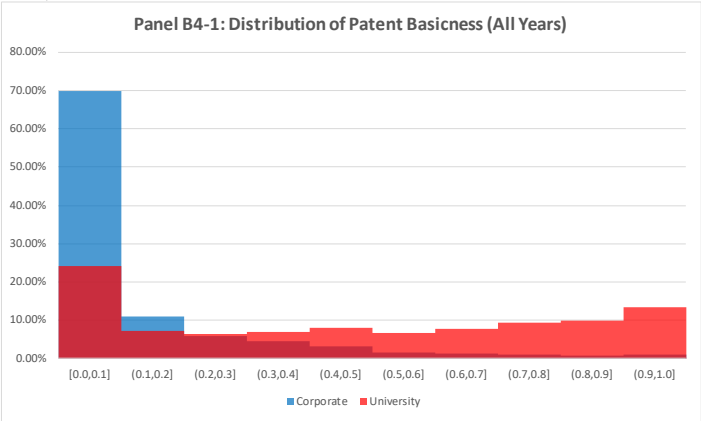


**Panel B (continued)**

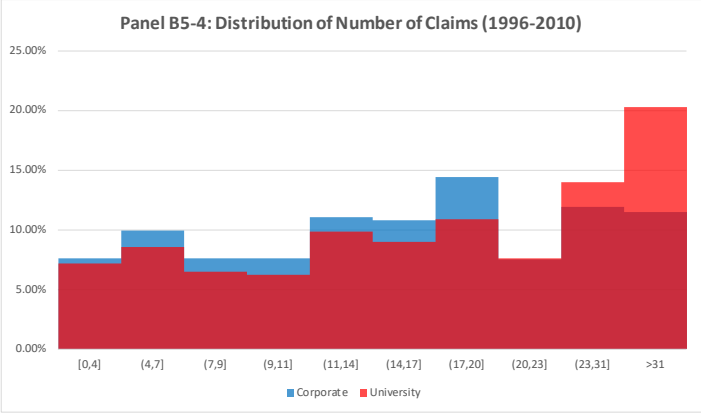
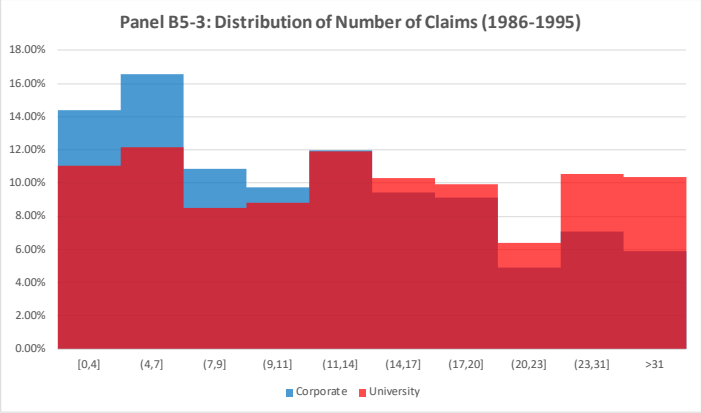
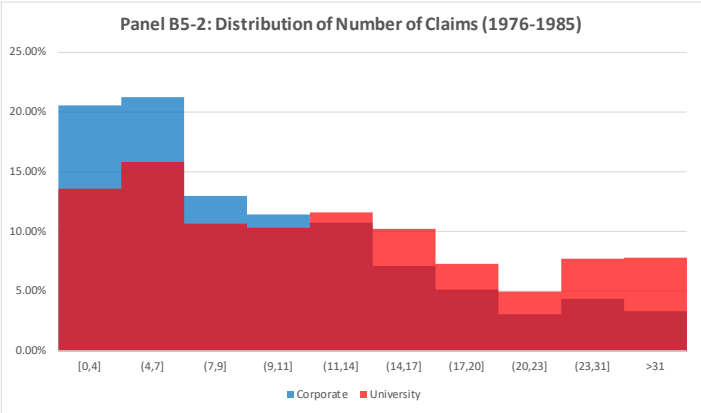
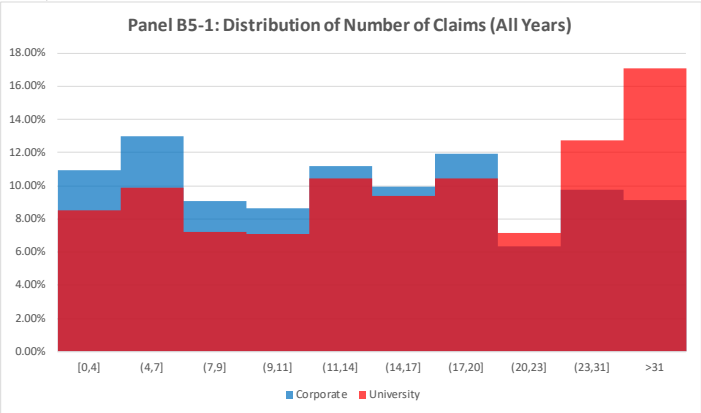




**Panel B (continued)**

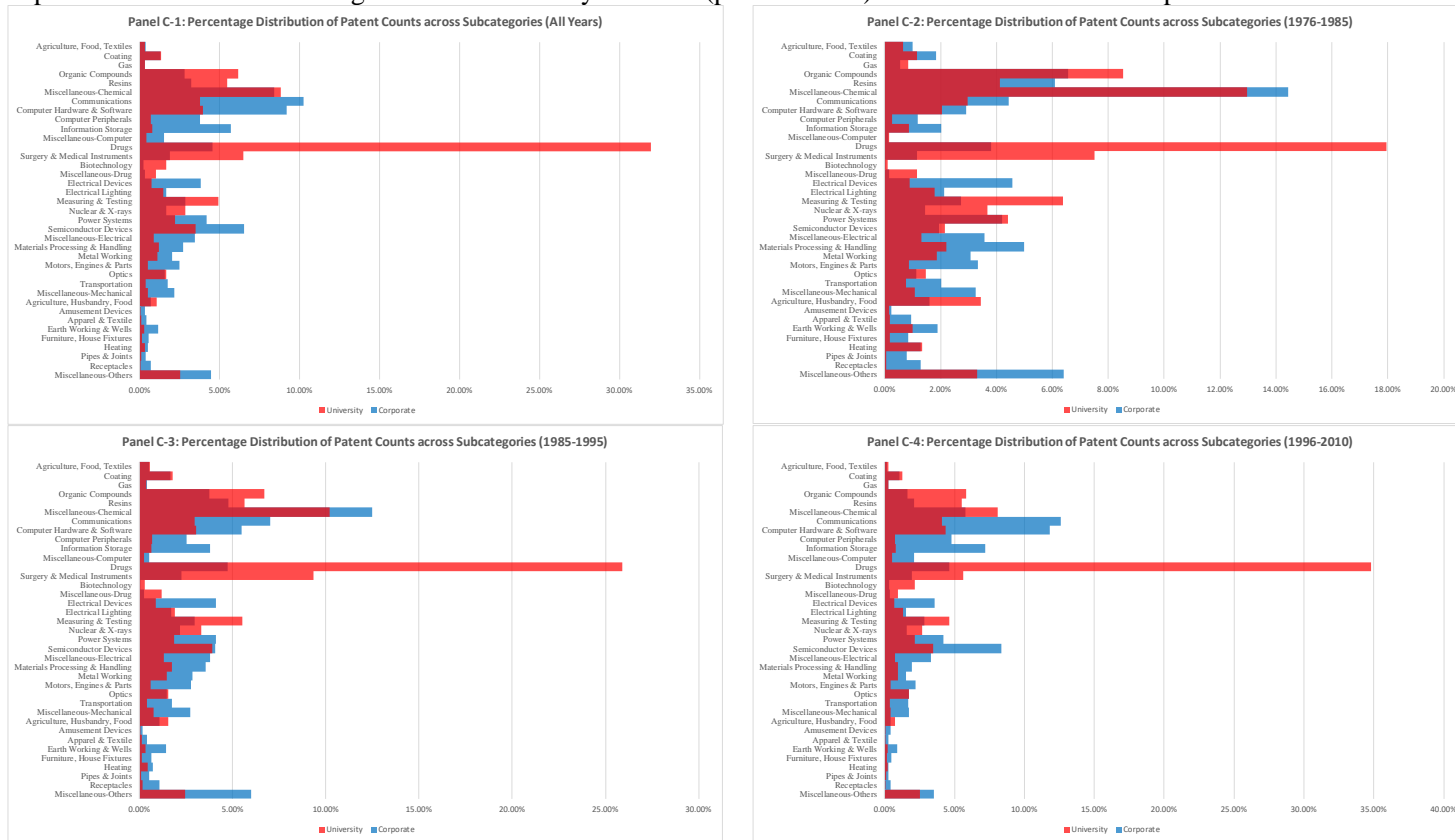


**Panel B (continued)**



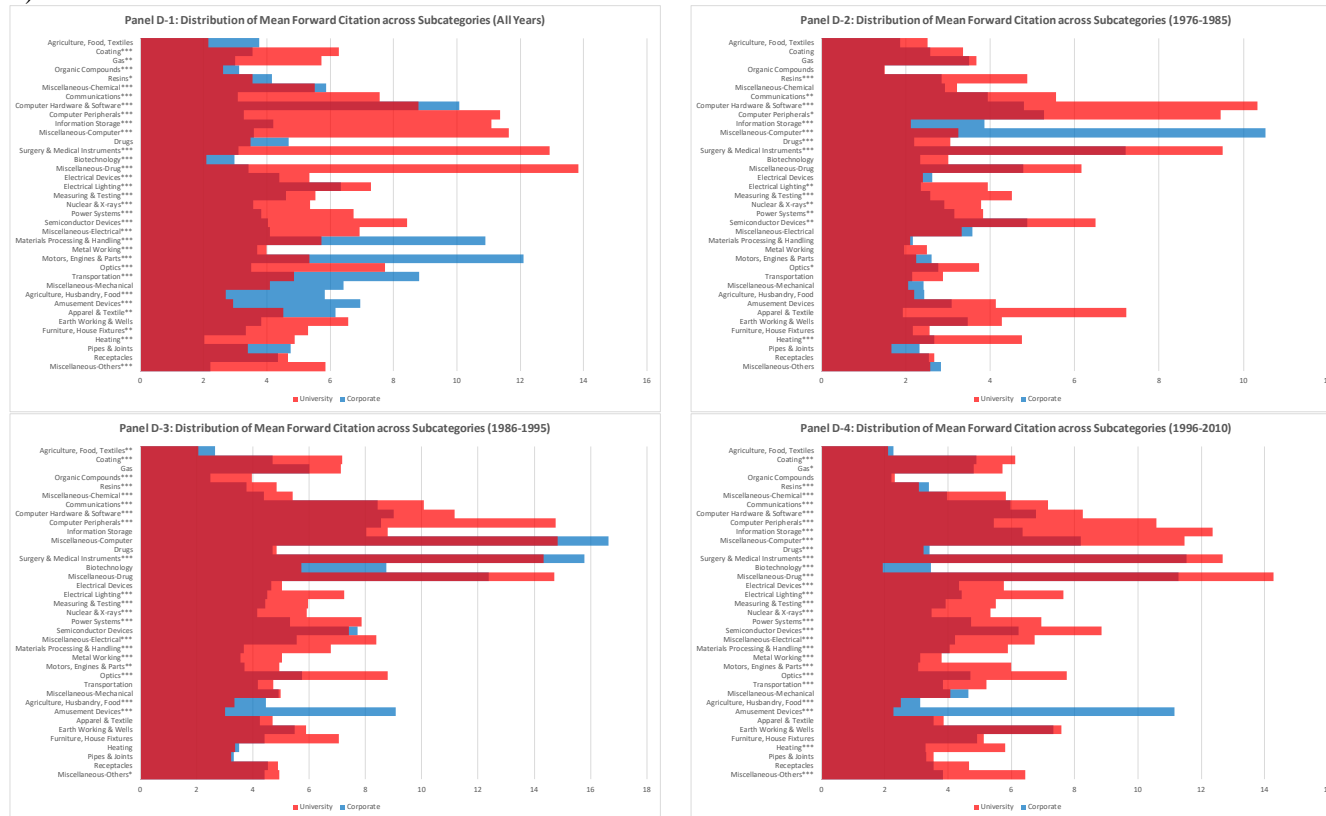
## Panel C

Panel C compares the number of patents granted in each subcategory of listed public firms and universities. Percentages are reported within each category of entities. We also compare their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years). A Kolmogorov-Smirnov test confirms that distributions of patent counts across subcategories are statistically different ( $p$ -value $<0.01$ ) between universities and public firms.



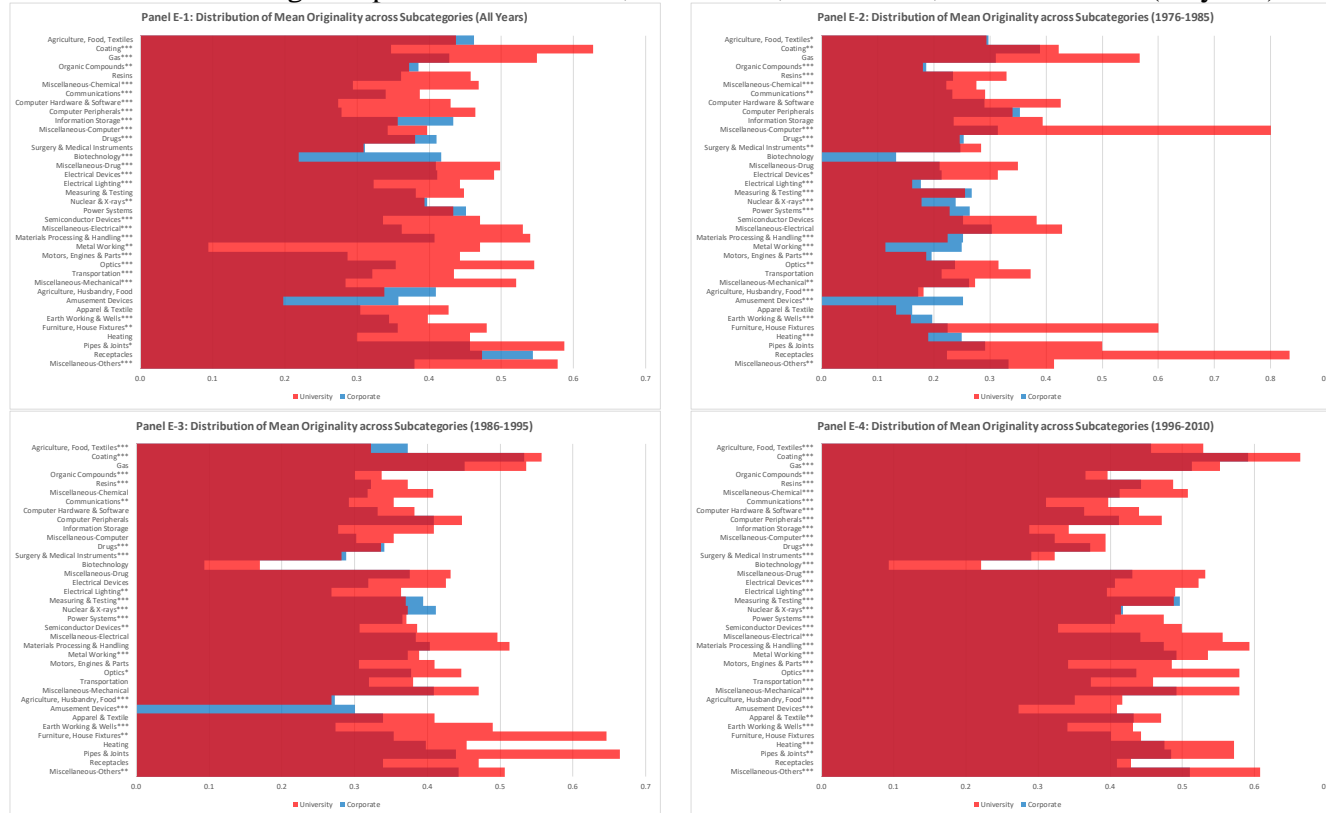
## Panel D

Panel D reports the mean patent quality/importance (number of forward citations within 5 years) in each subcategory within each category of entities (i.e., public firm and university). We report the statistical significance of the difference between corporates and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also compare their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).



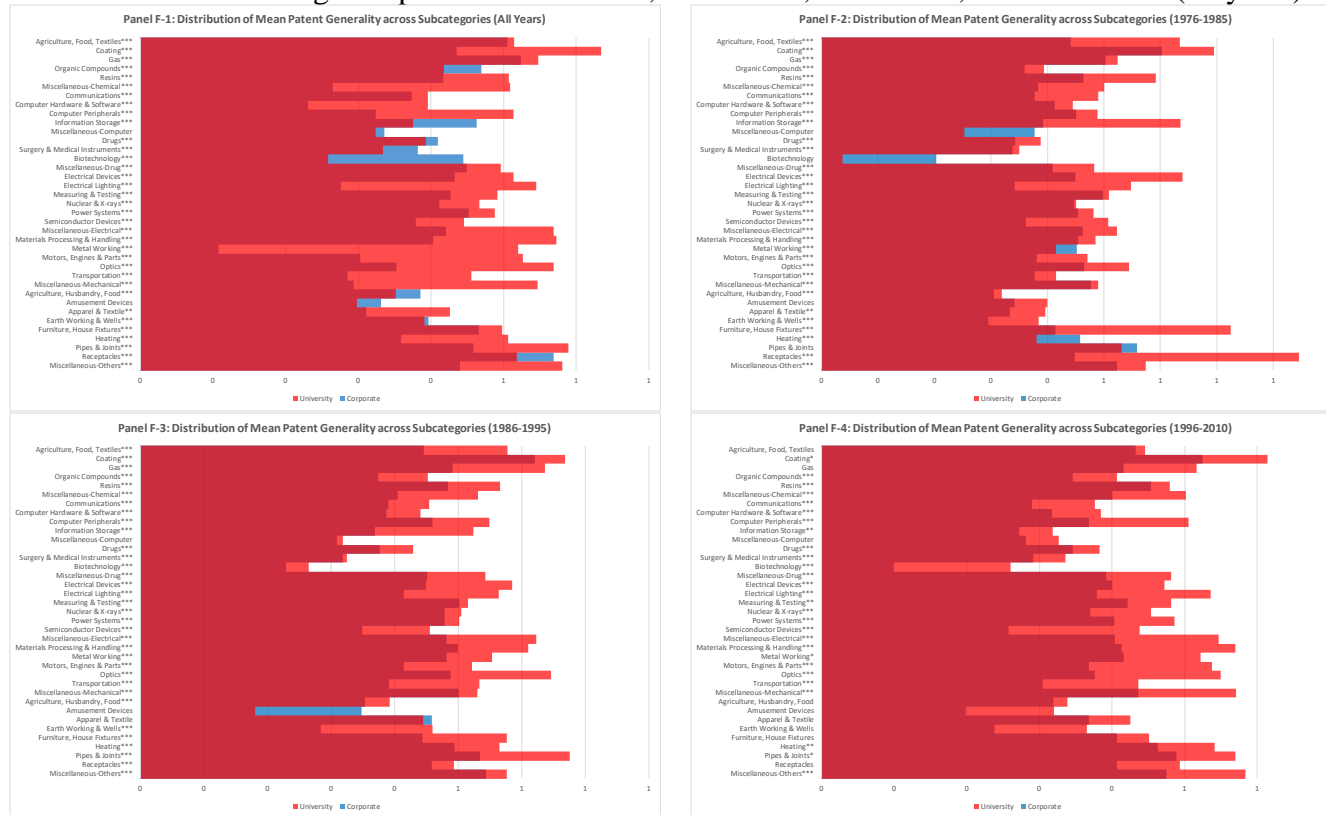
## Panel E

Panel E reports the mean patent originality (one minus the HHI of citations given to other patents over patent subcategories) in each subcategory within each category of entities (i.e., corporate and university). We test the statistical significance of the difference between corporates and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also compare their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).



## Panel F

Panel F reports the mean patent generality (one minus the HHI of citations received from other patents over patent subcategories) in each subcategory within each category of entities (public firm and university). We report the statistical significance of the difference between public firms and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also report their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).



## Panel G

Panel G reports the mean patent basicness (the ratio of the number of references to prior "non-patent documents" divided by the total references) in each subcategory within each category of entities (public firm and university). We report the statistical significance of the difference between public firms and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also report their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).



## Panel H

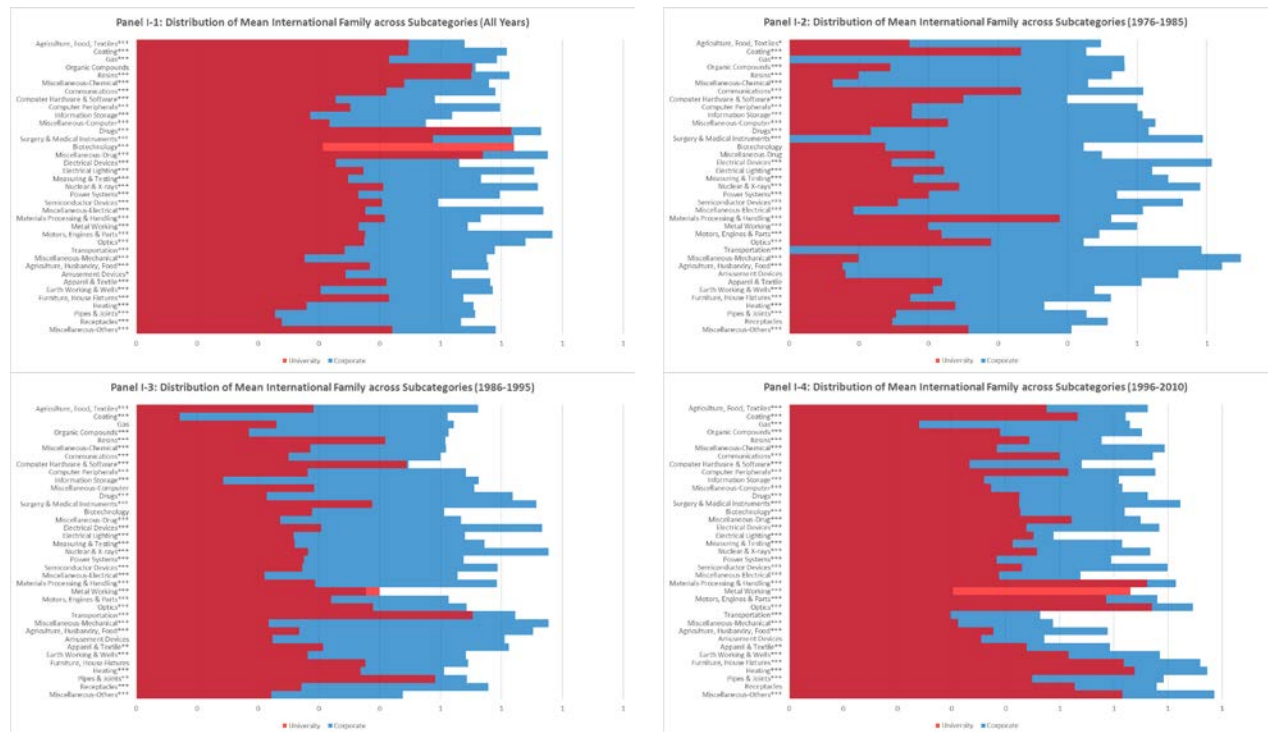
Panel H reports the mean number of claims in each subcategory within each category of entities (public firm and university). We report the statistical significance of the difference between public firms and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also report their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).





## Panel I

Panel I reports the mean of the indicator variables for whether a patent is affiliated with international patent families or not in each subcategory within each category of entities (public firm and university). We report the statistical significance of the difference between public firms and universities in each subcategory with two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. We also report their distributions in the following four periods: 1976-1985, 1986-1995, 1996-2010, and 1976-2010 (all years).



**Online Table 3: Summary Statistics of Lifetime Revenue and Characteristics of Licensed and Unlicensed Patents in a U.S. Research-Oriented University.**

Using a patent licensing dataset provided by a prominent research-oriented U.S. university, we report the distribution of lifetime revenue (in millions), estimated patent value (in millions), maximum royalty rate (in percentage), license fee (in millions), exclusivity, number of technologies (patented and unpatented) in the licensing agreement/package, number of patents in the agreement/package, number of inventors, patent quality, patent generality, patent originality, patent basicness, number of claims, and international family of licensed patents in Panel A. To calculate estimated patent value (PatVal), we first adopt regression model (2) in Table 2 and estimate the coefficients on patent characteristics, and then we input the coefficient estimates and patent characteristics of each university patent and compute its PatVal. PatVal is set to be zero if it is estimated as negative. We report the distribution of estimated patent value (in millions), number of inventors, patent quality, patent generality, patent originality, patent basicness, number of claims, and international family of unlicensed patents in Panel B. We also compare these variables' averages across the licensed and unlicensed groups using two-sample t-test. \*\*\*, \*\*, \* indicate significance levels of 1%, 5%, and 10%, respectively. Lifetime revenue and license fee is split evenly to each intellectual property item in the same licensed agreement. Estimated patent value, lifetime revenue, and license fee are winsorized by their 1% and 99% percentiles. Sample period: 1976-2010.

<b>Panel A: Licensed Patents</b>								
	<b>Mean</b>	<b>Std</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>#Obs</b>
Actual Patent Lifetime Revenue	0.10	0.23	0.00	0.00	0.01	0.04	1.03	765
Estimated Patent Value (PatVal)	0.37***	0.11	0.09	0.29	0.38	0.45	0.57	765
Max Royalty Rate	3.44	3.49	0.00	0.75	3.00	5.00	25.00	765
License Fee	0.01	0.04	0.00	0.00	0.00	0.01	0.41	765
Exclusivity	0.61	0.49	0	0	1	1	1	765
#IP in package	17.45	26.87	1	3	7	19	99	765
#Patent in package	13.14	18.53	1	2	6	17	68	765
#Inventor	2.73***	1.43	1	2	2	3	16	765
Quality	7.34***	9.19	0	1	4	11	98	765
Generality	0.41***	0.31	0.00	0.00	0.50	0.64	1.00	765
Originality	0.33***	0.31	0.00	0.00	0.33	0.59	1.00	765
Basicness	0.55***	0.31	0.00	0.31	0.55	0.83	1.00	765
Claims	15.9**	13.20	1.00	7.00	12.00	21.00	104.00	765
International Family	0.69***	0.46	0	0	1	1	1	765
<b>Panel B: Unlicensed Patents</b>								
	<b>Mean</b>	<b>Std</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>	<b>#Obs</b>
Estimated Patent Value (PatVal)	0.3	0.11	0.08	0.22	0.31	0.38	0.57	821
#Inventor	2.44	1.21	1	2	2	3	12	821
Quality	3.11	5.68	0	0	1	4	93	821
Generality	0.32	0.33	0.00	0.00	0.28	0.60	1.00	821
Originality	0.27	0.33	0.00	0.00	0.00	0.58	1.00	821
Basicness	0.48	0.36	0.00	0.13	0.50	0.83	1.00	821
Claims	14.60	11.69	1.00	6.00	12.00	20.00	86.00	821
International Family	0.39	0.49	0	0	0	1	1	821

**Online Table 4: Efficiency of Patent Value Production across U.S. Universities.**

Across the 147 U.S. universities in Table 5 with non-missing 11 university characteristic variables, we execute non-parametric Data Envelopment Analyses (DEA) to examine the efficiency of patent value production from university inputs of R&D, Faculties, FTE, NSF, NIH, Age, Carnegie, TTO, MedicalSchool, BusinessSchool, and IvyLeague. *Total Inefficiency* is measured by one minus the estimated theta. To measure *Input Inefficiency* of a factor that is free of scale, we use the estimated slack divided by the factor mean across universities.

	Mean	STD
Total Inefficiency	0.42	0.55
Input Inefficiency: R&D	0.09	0.46
Input Inefficiency: Faculty	0.14	0.25
Input Inefficiency: FTE	0.12	0.34
Input Inefficiency: NSF	0.12	0.54
Input Inefficiency: NIH	0.26	0.65
Input Inefficiency: Age	0.16	0.30
Input Inefficiency: Carnegie	0.28	0.66
Input Inefficiency: TTO	0.12	0.50
Input Inefficiency: MedicalSchool	0.30	0.35
Input Inefficiency: BusinessSchool	0.16	0.51
Input Inefficiency: IvyLeague	0.16	1.09

**Online Table 5: The Ratios of Social Value to Private Value for University Patents.**

We display the distribution of the ratios of estimated social value over estimated private value for patents of U.S. universities. The estimation of the private value of a patent follows the methodology described in Table 3. After a university patent is granted, we can measure its social value as the citation-weighted sum of private value (our estimated value) of subsequent patents that cite it. For example, if Patent X is cited by Patents A and B with private values of \$10 million and \$1million, respectively, and if Patents A and B cite 10 prior patents and 1 patent, respectively, then the social value of Patent X is \$2 million ( $10/10 + 1/1$ ). This approach is motivated by (and conceptually similar to) Trajtenberg (1990). In the following table, we present the summary statistics of the ratio of each university patent's ratio of social value to private value. For example, if Patent X's private value is 10, then this ratio is  $2/10 = 0.2$ . As a result, we may also apply our methodology to benchmark patents by social value that is also measurable (and is based on private value in our example). If a patent is not cited in a given time window, we set its social value as zero. All variables are winsorized at their 1 and 99 value percentiles.

	<b>Forward 5 Years</b>	<b>Forward 10 Years</b>	<b>Forward All Years</b>
<b>Mean</b>	0.33	0.61	0.79
<b>Median</b>	0.11	0.23	0.28
<b>Standard Deviation</b>	0.53	0.92	1.23
<b>Minimum</b>	0.00	0.00	0.00
<b>1st Percentile</b>	0.00	0.00	0.00
<b>5th Percentile</b>	0.00	0.00	0.00
<b>25th Percentile</b>	0.00	0.00	0.00
<b>75th Percentile</b>	0.43	0.82	1.01
<b>95th Percentile</b>	1.45	2.56	3.36
<b>99th Percentile</b>	2.78	4.93	6.71
<b>Maximum</b>	2.78	4.93	6.71
<b>#Obs</b>	77,880	77,880	77,880