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# Who's Patenting in the University? Evidence from the Survey of Doctorate Recipients

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## Appendix B: Additional Results
Not for Publication

**Contents:**

Table B1
Percentage Distribution of Number of **Patents Granted** and *Articles Published*

| Field | 0 | 1-5 | 6-10 | >10 |
|---|---|---|---|---|
| All Academe (N=10,962) | **94.2**<br>*14.4* | **5.6**<br>*40.8* | **0.1**<br>*20.9* | **0.1**<br>*23.9* |
| Computer (N=1,159) | **98.6**<br>*23.5* | **1.4**<br>*47.3* | ***<br>*16.7* | ***<br>*12.5* |
| Life (N=5,936) | **95.2**<br>*12.7* | **4.7**<br>*40.6* | ***<br>*21.5* | ***<br>*25.2* |
| Physical (N=2,156) | **93.2**<br>*15.5* | **6.4**<br>*37.3* | ***<br>*20.4* | ***<br>*27.1* |
| Engineer (N=1,711) | **89.1**<br>*12.6* | **10.6**<br>*41.8* | ***<br>*22.7* | ***<br>*23.0* |

*** Cells with 6 or fewer people have been suppressed at the request of Science Resources Statistics, National Science Foundation.

Table B2
Patent Granted by Publication Distribution
(All Academe, N=10,962)

| Number of Patents | 0 Articles | 1-5 Articles | 6-10 Articles | 11-96 Articles | Total |
|---|---|---|---|---|---|
| 0 | 14.19 | 39.36 | 19.56 | 21.11 | 94.22 |
| 1-5 | 0.20 | 1.45 | 1.30 | 2.61 | 5.56 |
| 6-10 | 0.00 | 0.00 | 0.00 | 0.12 | 0.12 |
| 11-47 | 0.00 | *** | *** | 0.06 | 0.10 |

******* Cells with 6 or fewer people have been suppressed at the request of Science Resources Statistics, National Science Foundation.

Table B3
Definition of the Technology Transfer Office (TTO) Variables*

| Variable | Definition |
|---|---|
| *Tto90dum* | =1 if the individual is employed at institution with a TTO that started in 1990 or earlier |
| *Ttogd1* | =1 if the individual is employed at institution with a TTO that started between 1991 and 2000 |
| *Ttogd2* | = 1 if the individual is employed at institution without a TTO or possibly unknown TTO status |

* The TTO variables were constructed from data obtained from the Association of University Technology Managers (AUTM) surveys.

Table B4
Summary Statistics for Key Variables by TT0 Status – Big Data

| Variable | Mean | St. Dev | Range |
|---|---|---|---|
| All Observations (N=10962) | | | |
| *Tto90dum* | 0.498 | 0.500 | 0-1 |
| *Ttogd1* | 0.372 | 0.483 | 0-1 |
| *Ttogd2* | 0.123 | 0.336 | 0-1 |
| *Uspapp95* | 0.196 | 0.961 | 0-42 |
| *Article95* | 8.090 | 10.434 | 0-96 |
| *Instpat* | 56.14 | 109.158 | 0-443 |
| If *Tto90dum=1* (N=5463) | | | |
| *Tto90dum* | | | 1-1 |
| *Ttogd1* | | | 0-0 |
| *Ttogd2* | | | 0-0 |
| *Uspapp95* | 0.249 | 1.152 | 0-42 |
| *Article95* | 9.771 | 11.344 | 0-96 |
| *Instpat* | 96.449 | 134.495 | 0-443 |
| | | | |
| If *Tto90dum* =0 (N=5499): | | | |
| *Tto90dum* | | | 0-0 |
| *Ttogd1* | 0.741 | 0.438 | 0-1 |
| *Ttogd2* | 0.259 | 0.438 | 0-1 |
| *Uspapp95* | 0.143 | 0.720 | 0-19 |
| *Article95* | 6.421 | 9.144 | 0-96 |
| *Instpat* | 16.099 | 50.662 | 0-341 |
| | | | |
| Excluding *Ttogd1=1* (N=6886) | | | |
| *Tto90dum* | 0.793 | 0.405 | 0-1 |
| *Ttogd1* | | | 0-0 |
| *Ttogd2* | 0.207 | 0.405 | 0-1 |
| *Uspapp95* | 0.230 | 1.082 | 0-42 |
| *Article95* | 9.618 | 11.167 | 0-96 |
| *Instpat* | 81.130 | 124.654 | 0-443 |

Table B5
Summary Statistics for Key Variables by TT0 Status – Small Data

| Variable | Mean | St. Dev | Range |
|---|---|---|---|
| All Observations (N=5976) | | | |
| *Tto90dum* | 0.722 | 0.448 | 0-1 |
| *Ttogd1* | 0.127 | 0.332 | 0-1 |
| *Ttogd2* | 0.151 | 0.359 | 0-1 |
| *Uspapp95* | 0.234 | 1.069 | 0-42 |
| *Article95* | 9.996 | 11.422 | 0-96 |
| *Instpat* | 86.918 | 129.265 | 0-443 |
| If *Tto90dum=1* (N=4315) | | | |
| *Tto90dum* | | | 1-1 |
| *Ttogd1* | | | 0-0 |
| *Ttogd2* | | | 0-0 |
| *Uspapp95* | 0.254 | 1.152 | 0-42 |
| *Article95* | 10.140 | 11.585 | 0-96 |
| *Instpat* | 108.308 | 140.582 | 0-443 |
| | | | |
| If *Tto90dum* =0 (N=1661): | | | |
| *Tto90dum* | | | 0-0 |
| *Ttogd1* | 0.445 | 0.498 | 0-1 |
| *Ttogd2* | 0.545 | 0.498 | 0-1 |
| *Uspapp95* | 0.182 | 0.809 | 0-17 |
| *Article95* | 9.622 | 10.982 | 0-96 |
| *Instpat* | 30.990 | 66.815 | 0-341 |
| | | | |
| Excluding *Ttogd1=1* (N=5220) | | | |
| *Tto90dum* | 0.827 | 0.379 | 0-1 |
| *Ttogd1* | | | 0-0 |
| *Ttogd2* | 0.173 | 0.379 | 0-1 |
| *Uspapp95* | 0.238 | 1.100 | 0-42 |
| *Article95* | 10.097 | 11.570 | 0-96 |
| *Instpat* | 93.999 | 132.579 | 0-443 |

Table B6

Summary Results from ZINB and Optimal GMM
With TTO Variables and Instruments for *Article95* – Academe Total[a]
Dependent Variable: *Uspapp95*

| Model | Selected Explanatory Variables[b] | | | | | | Log-likelihood (P-value for J-test) |
|---|---|---|---|---|---|---|---|
| | *Article95* | | | | *Tto90dum* and (*Ttogd1*) | | |
| | Estimate | t-ratio | Marginal Effect | Elasti-city | Estimate | t-ratio | |
| Big Data (N=10962): | | | | | | | |
| 1. ZINB (As in Table 6) | 0.042** | 2.15 | 0.007 | 0.341 | - | - | -4424.201 |
| 2. ZINB | 0.036* | 1.81 | 0.006 | 0.294 | -0.425* | -1.75 | -4422.207 |
| 3. ZINB | 0.036* | 1.75 | 0.006 | 0.288 | -0.365 (0.090) | -1.14 (0.28) | -4422.162 |
| 4. ZINB[d] | 0.043 | 1.53 | 0.008 | 0.412 | - | - | -3164.648 |
| 5. ZINB[d] | 0.042 | 1.50 | 0.008 | 0.403 | 0.022 | 1.18 | -3163.869 |
| 6. GMM (As in Table 7) | 0.268** | 1.96 | 0.051 | 2.169 | - | - | (0.395) |
| 7. GMM | 0.242* | 1.75 | 0.041 | 1.956 | 0.035 | 0.102 | (0.430) |
| | | | | | | | |
| Small Data (N=5976): | | | | | | | |
| 1. ZINB (As in Table 6) | 0.107*** | 4.44 | 0.025 | 1.070 | - | - | -2834.199 |
| 2. ZINB | 0.107*** | 4.40 | 0.024 | 1.069 | -0.127 | -0.37 | -2834.122 |
| 3. ZINB | 0.107*** | 4.39 | | | -0.252 (0.247) | -0.56 (0.46) | -2834.007 |
| 4. ZINB[d] | 0.107*** | 4.36 | 0.024 | 1.080 | - | - | -2494.709 |
| 5. ZINB[d] | 0.107*** | 4.30 | 0.024 | 1.076 | -0.232 | -0.54 | -2494.542 |
| 6. GMM (As in Table 7) | 0.138* | 1.65 | 0.026 | 1.382 | - | - | (0.231) |
| 7. GMM | 0.118* | 1.76 | 0.021 | 1.183 | 0.147 | 0.995 | (0.164) |

* (**) [***] Statistically significantly different from zero at the 10% (5%) [1%] level of significance.
(a) All t-ratios are based on robust standard errors.
(b) Other explanatory variables and instruments are the same as those reported in Table 6 of the paper.

(c) For ZINB model, TTO variables are included in the inflation part only. Negative coefficients in the inflation part indicate positive effect on patenting.
(d) Regression excludes individuals employed at institutions with no TTO by 2000; observations with Ttogd1=1 are dropped from the analysis. The resulting sample size is N = 6886 for the big data and N = 5220 for the small data.

Table B7
Summary Results from ZINB Regressions: Specifications With and Without Instruments for *Article95* – Academe Total
Dependent variable: *Uspapp95*

| Specification | *Article95*[a] | |
|---|---|---|
| | Estimate | t-ratio |
| With instruments using big data | 0.042** | 2.15 |
| Without instruments using big data | 0.042*** | 11.84 |
| | | |
| With instruments using small data | 0.107*** | 4.44 |
| Without instruments using small data | 0.040*** | 9.80 |

* (**) [***] Statistically significantly different from zero at the 10% (5%) [1%] level of significance.

(a) Other control variables include those listed in Table 6 of the paper. Adding *Tto90dum* to the set of explanatory variables does not change the results in this table. Detailed results are available upon request from the authors

Table B8
Summary Results from Optimal GMM and Nonlinear Least Squares (NLS): Specifications With and Without Instruments for *Article95* – Academe Total
Dependent variable: *Uspapp95*

| Specification | *Article95*[a] | |
|---|---|---|
| | Estimate | t-ratio |
| Optimal GMM using big data | 0.268** | 1.96 |
| NLS (without instruments) using big data | 0.077*** | 10.98 |
| | | |
| Optimal GMM using small data | 0.138* | 1.65 |
| NLS (without instruments) using small data | 0.047*** | 8.53 |

* (**) [***] Statistically significantly different from zero at the 10% (5%) [1%] level of significance.

(b) Other control variables include those listed in Table 7 of the paper. Adding *Tto90dum* to the set of explanatory variables does not change the substantive results in this table. Detailed results are available upon request from the authors.