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*Supplementary information*

# THE EFFECTS OF PUBLIC R&D SUBSIDIZED LOANS ON FIRMS' R&D OUTPUTS: EVIDENCE FROM CHINA

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## Average marginal effects

Table S1. Average marginal effects of direct R&D grants on firms' exploratory patent applications (Model 2 in Table 3)

| | dy/dx | Std.Err. | z | P > z | [95%Conf. | Interval] |
|---|---|---|---|---|---|---|
| Subsidy | 0.192 | 0.033 | 5.730 | 0.000 | 0.126 | 0.257 |
| Tech_diver | –0.119 | 0.026 | –4.580 | 0.000 | –0.169 | –0.068 |
| Tech_capa | –0.009 | 0.015 | –0.580 | 0.563 | –0.038 | 0.021 |
| Pre_subsidy | –0.029 | 0.042 | –0.690 | 0.490 | –0.111 | 0.053 |
| Hi_edu | –0.006 | 0.140 | –0.040 | 0.967 | –0.280 | 0.268 |
| Pat_stock | 1.239 | 0.215 | 5.760 | 0.000 | 0.817 | 1.660 |
| RD_int | 0.257 | 0.166 | 1.550 | 0.121 | –0.068 | 0.583 |
| Cap_int | –1.656 | 0.732 | –2.260 | 0.024 | –3.092 | –0.221 |
| Firm_Age | 0.054 | 0.029 | 1.830 | 0.067 | –0.004 | 0.111 |
| Firm_Size | –0.022 | 0.054 | –0.400 | 0.689 | –0.127 | 0.084 |
| RD_Dpart | 0.071 | 0.061 | 1.160 | 0.246 | –0.049 | 0.191 |
| Hi_Tech | –0.132 | 0.074 | –1.780 | 0.075 | –0.277 | 0.013 |

*Note*: Number of observations = 1,398; including a set of industrial, regional and year dummies (not reported).

Table S2. Average marginal effects of direct R&D grants with subsidized loans on firms' exploratory patent applications (Model 3 in Table 3)

| | dy/dx | Std.Err. | z | P > z | [95%Conf. | Interval] |
|---|---|---|---|---|---|---|
| Subsidy | 0.249 | 0.039 | 6.340 | 0.000 | 0.172 | 0.326 |
| Sub_loans | 0.063 | 0.071 | 0.880 | 0.377 | –0.077 | 0.203 |
| Subsidy × Sub_loans | –0.212 | 0.089 | –2.380 | 0.017 | –0.386 | –0.037 |
| Tech_diver | –0.115 | 0.026 | –4.470 | 0.000 | –0.166 | –0.065 |
| Tech_capa | –0.005 | 0.015 | –0.360 | 0.721 | –0.035 | 0.024 |
| Pre_subsidy | –0.040 | 0.042 | –0.940 | 0.346 | –0.122 | 0.043 |
| Hi_edu | 0.044 | 0.141 | 0.310 | 0.757 | –0.233 | 0.320 |
| Pat_stock | 1.280 | 0.216 | 5.940 | 0.000 | 0.858 | 1.703 |
| RD_int | 0.251 | 0.166 | 1.510 | 0.130 | –0.074 | 0.577 |
| Cap_int | –1.678 | 0.734 | –2.290 | 0.022 | –3.116 | –0.240 |
| Firm_Age | 0.052 | 0.029 | 1.770 | 0.076 | –0.005 | 0.109 |
| Firm_Size | –0.019 | 0.054 | –0.360 | 0.719 | –0.125 | 0.086 |
| RD_Dpart | 0.075 | 0.061 | 1.220 | 0.223 | –0.045 | 0.194 |
| Hi_Tech | –0.124 | 0.074 | –1.670 | 0.095 | –0.269 | 0.021 |

*Note*: Number of observations = 1,398; including a set of industrial, regional and year dummies (not reported).

Table S3. Average marginal effects of direct R&D grants on firms' new product sales (Model 5 in Table 3)

| | dy/dx | Std.Err. | z | P > z | [95%Conf. | Interval] |
|---|---|---|---|---|---|---|
| Subsidy | 0.098 | 0.025 | 3.950 | 0.000 | 0.049 | 0.146 |
| Tech_diver | –0.000 | 0.018 | –0.030 | 0.979 | –0.037 | 0.036 |
| Tech_capa | –0.009 | 0.010 | –0.850 | 0.397 | –0.029 | 0.012 |
| Pre_subsidy | –0.018 | 0.033 | –0.550 | 0.582 | –0.082 | 0.046 |
| Hi_edu | 0.035 | 0.109 | 0.320 | 0.748 | –0.179 | 0.250 |
| Pat_stock | –0.042 | 0.179 | –0.230 | 0.815 | –0.392 | 0.308 |
| RD_int | 0.088 | 0.111 | 0.790 | 0.429 | –0.130 | 0.306 |
| Cap_int | –0.233 | 0.560 | –0.420 | 0.677 | –1.330 | 0.864 |
| Firm_Age | –0.011 | 0.026 | –0.410 | 0.681 | –0.062 | 0.040 |
| Firm_Size | 0.022 | 0.044 | 0.490 | 0.625 | –0.065 | 0.108 |
| RD_Dpart | 0.215 | 0.040 | 5.400 | 0.000 | 0.137 | 0.293 |
| Hi_Tech | –0.008 | 0.047 | –0.180 | 0.859 | –0.101 | 0.084 |

*Note*: Number of observations = 1,118; including a set of industrial, regional and year dummies (not reported).

Table S4. Average marginal effects of direct R&D grants with subsidized loans on firms' new product sales (Model 6 in Table 3)

| | dy/dx | Std.Err. | z | P > z | [95%Conf. | Interval] |
|---|---|---|---|---|---|---|
| Subsidy | 0.055 | 0.028 | 1.980 | 0.047 | 0.001 | 0.109 |
| Sub_loans | 0.009 | 0.061 | 0.150 | 0.881 | –0.110 | 0.128 |
| Subsidy × Sub_loans | 0.157 | 0.067 | 2.340 | 0.019 | 0.025 | 0.288 |
| Tech_diver | –0.005 | 0.018 | –0.290 | 0.773 | –0.041 | 0.031 |
| Tech_capa | –0.011 | 0.010 | –1.030 | 0.302 | –0.031 | 0.010 |
| Pre_subsidy | –0.022 | 0.033 | –0.670 | 0.504 | –0.085 | 0.042 |
| Hi_edu | –0.016 | 0.110 | –0.140 | 0.888 | –0.231 | 0.200 |
| Pat_stock | –0.087 | 0.178 | –0.490 | 0.624 | –0.437 | 0.262 |
| RD_int | 0.084 | 0.111 | 0.760 | 0.448 | –0.133 | 0.301 |
| Cap_int | –0.194 | 0.557 | –0.350 | 0.728 | –1.285 | 0.898 |
| Firm_Age | –0.010 | 0.026 | –0.390 | 0.700 | –0.060 | 0.041 |
| Firm_Size | 0.018 | 0.044 | 0.400 | 0.686 | –0.068 | 0.104 |
| RD_Dpart | 0.212 | 0.040 | 5.340 | 0.000 | 0.134 | 0.289 |
| Hi_Tech | –0.015 | 0.047 | –0.310 | 0.753 | –0.107 | 0.077 |

*Note*: Number of observations = 1,118; including a set of industrial, regional and year dummies (not reported).

According to Table S1, receiving R&D subsidies increases firms' exploratory patent applications by 19.2%. Table S2 shows that the exploratory patent applications of firms receiving both direct grants and subsidized loans during the same period are 21.2% less than firms only receiving direct grants. At the same time, the exploratory patent applications of firms receiving both direct grants and subsidized loans during the same period are 3.7% (0.249–0.212) higher than the average level by the firms never receiving any types of R&D subsidies.

According to Table S3, receiving R&D subsidies increases firms' new product sales by 9.8%. Table S4 indicates that the new product sales of firms receiving both direct grants and subsidized loans during the same period are 15.7% higher than firms only receiving direct grants. Furthermore, the new product sales of firms receiving both direct grants and subsidized loans during the same period are 21.2% (0.157+0.055) higher than the average level by the firms never receiving any types of R&D subsidies.