

Online Appendix

The Effects of Need-Based Financial Aid on Employment and Earnings: Experimental Evidence from the Fund for Wisconsin Scholars

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Table A1. Estimated effect of FFWS grant offer on annual employment, by institution type and inclusion of baseline characteristics

Year	4-Year University			2-Year Institution		
	Control Group Mean	No Covariate Adjustment	Covariate Adjusted	Control Group Mean	No Covariate Adjustment	Covariate Adjusted
Year 1	0.812	-0.024*** (0.006)	-0.026*** (0.006)	0.877	-0.005 (0.005)	-0.005 (0.006)
<i>N</i>		34,221	33,580		19,783	19,267
Year 2	0.828	-0.019*** (0.006)	-0.020*** (0.006)	0.892	-0.002 (0.005)	-0.002 (0.005)
<i>N</i>		34,221	33,580		19,783	19,267
Year 3	0.815	-0.011* (0.006)	-0.013* (0.007)	0.877	0.001 (0.006)	0.001 (0.006)
<i>N</i>		30,545	29,934		19,262	18,755
Year 4	0.821	-0.008 (0.007)	-0.010 (0.007)	0.863	-0.001 (0.006)	-0.001 (0.006)
<i>N</i>		26,618	26,053		17,197	16,718
Year 5	0.814	-0.004 (0.008)	-0.005 (0.008)	0.853	-0.003 (0.007)	-0.003 (0.007)
<i>N</i>		22,473	21,949		14,761	14,346
Year 6	0.779	-0.019** (0.009)	-0.019** (0.009)	0.840	0.000 (0.001)	0.001 (0.008)
<i>N</i>		18,155	17,705		11,631	11,297
Year 7	0.753	-0.021* (0.011)	-0.022* (0.011)	0.822	-0.002 (0.010)	-0.002 (0.010)
<i>N</i>		14,031	13,668		8,778	8,505
Year 8	0.731	-0.038** (0.015)	-0.038** (0.015)	0.811	-0.004 (0.013)	-0.005 (0.013)
<i>N</i>		9,206	8,957		5,821	5,640

NOTE: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Robust standard error in parentheses below coefficient estimate. Each coefficient is from a separate regression and is the estimate for an indicator of receiving an FFWS grant offer. All regressions contain fixed effects for cohort and post-

randomization year. Regressions in covariate adjusted columns also contain measures of student gender, race/ethnicity, and English learner status in high school. Covariate-adjusted regression for students in 2-year institution also contains an indicator for technical college enrollment.

Table A2. Estimated effect of FFWS grant offer on annual earnings, by institution type and inclusion of baseline characteristics

Year	4-Year University			2-Year Institution		
	Control Group Mean	No Covariate Adjustment	Covariate Adjusted	Control Group Mean	No Covariate Adjustment	Covariate Adjusted
Year 1	3,884.05	-258.42*** (60.43)	-263.39*** (60.87)	6,655.07	-68.45 (89.79)	-51.04 (90.61)
<i>N</i>		34,221	33,580		19,783	19,267
Year 2	5,896.71	-474.27*** (92.42)	-471.09*** (93.13)	9,886.24	-67.46 (136.65)	-60.38 (137.44)
<i>N</i>		34,221	33,580		19,783	19,267
Year 3	7,331.31	-407.11*** (124.67)	-396.44*** (125.91)	12,669.79	35.0 (181.91)	11.9 (181.49)
<i>N</i>		30,545	29,934		19,262	18,755
Year 4	9,095.81	-297.72* (162.92)	-314.33** (164.42)	14,760.66	82.92 (224.47)	91.46 (223.59)
<i>N</i>		26,618	26,053		17,197	16,718
Year 5	13,709.98	-393.5 (261.18)	-421.69 (262.66)	16,904.32	251.26 (278.88)	314.56 (278.20)
<i>N</i>		22,473	21,949		14,761	14,346
Year 6	18,190.94	-791.74** (368.12)	-775.06** (370.63)	19,325.17	477.83 (355.56)	497.90 (354.70)
<i>N</i>		18,155	17,705		11,631	11,297
Year 7	20,609.22	-1138.43** (481.56)	-1095.09** (484.18)	21,090.53	-42.56 (452.07)	-20.43 (450.44)
<i>N</i>		14,031	13,668		8,778	8,505
Year 8	22,037.94	-1570.18** (658.55)	-1599.09** (663.03)	22,558.73	-405.64 (601.42)	-304.26 (599.33)
<i>N</i>		9,206	8,957		5,821	5,640

NOTE: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error in parentheses below coefficient estimate. Each coefficient is from a separate regression and is the estimate for an indicator of receiving an FFWS grant offer. All regressions contain fixed effects for cohort. Regressions in

covariate adjusted columns also contain measures of student gender, race/ethnicity, and English learner status in high school. Covariate-adjusted regression for students in 2-year institution also contains an indicator for technical college enrollment.

Table A3. Estimated effect of FFWS grant offer on employment sector, by post-randomization year and sector

Sector	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Agriculture	-0.003** (0.002)	-0.001 (0.002)	0.002 (0.002)	0.000 (0.002)	0.000 (0.002)	0.001 (0.002)	-0.004 (0.002)	-0.005* (0.003)
Mining	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001* (0.001)	0.001 (0.001)	0.000 (0.001)
Utilities	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.002 (0.002)
Construction	-0.002 (0.002)	-0.001 (0.003)	0.002 (0.003)	0.001 (0.003)	0.003 (0.003)	0.003 (0.004)	0.003 (0.004)	0.000 (0.005)
Manufacturing	0.004 (0.004)	0.002 (0.004)	0.006 (0.005)	-0.002 (0.005)	-0.007 (0.006)	0.011* (0.007)	-0.010 (0.008)	-0.004 (0.010)
Wholesale Goods	-0.001 (0.002)	-0.003 (0.002)	-0.005* (0.003)	-0.004 (0.003)	-0.003 (0.004)	0.000 (0.004)	0.006 (0.005)	0.003 (0.006)
Retail	-0.007 (0.007)	-0.012* (0.007)	-0.009 (0.008)	0.003 (0.008)	-0.005 (0.008)	-0.002 (0.008)	-0.007 (0.009)	-0.003 (0.010)
Transportation	-0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.006** (0.003)	-0.002 (0.003)	0.002 (0.003)	-0.006 (0.004)	-0.007 (0.005)
Information	-0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.002 (0.003)	0.002 (0.004)	0.003 (0.004)	0.013*** (0.005)
Finance	-0.004** (0.002)	-0.005** (0.002)	-0.005* (0.003)	0.000 (0.004)	0.005 (0.004)	0.005 (0.005)	-0.003 (0.006)	-0.011 (0.008)
Real Estate	0.001 (0.002)	0.000 (0.002)	0.000 (0.002)	0.001 (0.002)	0.000 (0.002)	0.004* (0.002)	0.000 (0.003)	-0.004 (0.003)
Professional	0.001 (0.002)	0.001 (0.002)	-0.001 (0.003)	0.001 (0.004)	-0.005 (0.004)	-0.001 (0.005)	-0.001 (0.006)	0.002 (0.007)
Management	0.000 (0.001)	0.000 (0.001)	-0.001 (0.002)	0.000 (0.002)	0.000 (0.002)	-0.001 (0.003)	0.003 (0.003)	-0.002 (0.004)

Table A3. Estimated effect of FFWS grant offer on employment sector, by post-randomization year and sector

Sector	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Waste Management	-0.008** (0.004)	-0.007 (0.005)	-0.006 (0.005)	-0.007 (0.006)	-0.008 (0.006)	-0.002 (0.007)	-0.008 (0.007)	-0.004 (0.009)
Education Services	-0.004 (0.003)	-0.001 (0.003)	0.009*** (0.003)	0.000 (0.004)	0.008 (0.005)	-0.001 (0.006)	-0.001 (0.007)	0.006 (0.010)
Health Care	0.004 (0.003)	0.009* (0.003)	0.002 (0.003)	-0.005 (0.004)	0.005 (0.005)	0.000 (0.006)	0.005 (0.007)	-0.011 (0.010)
Arts & Recreation	0.000 (0.004)	0.000 (0.004)	0.003 (0.004)	0.006 (0.004)	0.004 (0.004)	-0.005 (0.004)	0.002 (0.005)	-0.002 (0.006)
Food Service/Accommodations	-0.019*** (0.007)	-0.012 (0.007)	-0.011 (0.007)	-0.013 (0.008)	-0.005 (0.008)	-0.010 (0.008)	-0.007 (0.009)	-0.019** (0.010)
Other	0.001 (0.003)	-0.005 (0.004)	-0.004 (0.004)	-0.005 (0.004)	-0.002 (0.004)	-0.004 (0.004)	-0.006 (0.005)	-0.008 (0.006)
Public Administration	-0.005 (0.003)	-0.004 (0.003)	-0.002 (0.003)	-0.001 (0.004)	-0.003 (0.004)	-0.005 (0.005)	-0.003 (0.006)	-0.001 (0.007)
Unclassified	-0.001 (0.001)	-0.001** (0.001)	-0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)
<i>N</i>	34,221	34,221	30,545	26,618	22,473	18,155	14,031	9,206

NOTE: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error in parentheses below coefficient estimate. Each coefficient is from a separate regression and is the estimate for an indicator of receiving an FFWS grant offer. All regressions for a given year estimated in a Seemingly Unrelated Regression framework. All regressions contain fixed effects for cohort.

Table A4. Effect of FFWS grant offer on any loan debt, by loan type and year after randomization

Year	Any Loans	Any Subsidized Loans	Any Unsubsidized Loans
Year 1	-0.038*** (0.006)	-0.044*** (0.006)	-0.071*** (0.008)
<i>N</i>	34,221	34,221	34,221
Year 2	-0.029*** (0.006)	-0.033*** (0.006)	-0.063*** (0.008)
<i>N</i>	34,221	34,221	34,221
Year 3	-0.030*** (0.006)	-0.032*** (0.006)	-0.061*** (0.008)
<i>N</i>	30,545	30,545	30,545
Year 4	-0.025*** (0.006)	-0.025*** (0.006)	-0.052*** (0.008)
<i>N</i>	26,618	26,618	26,618
Year 5	-0.024*** (0.006)	-0.025*** (0.006)	-0.052*** (0.009)
<i>N</i>	22,473	22,473	22,473
Year 6	-0.023*** (0.007)	-0.024*** (0.007)	-0.050*** (0.010)
<i>N</i>	18,155	18,155	18,155
Year 7	-0.030*** (0.008)	-0.032*** (0.008)	-0.044*** (0.012)
<i>N</i>	14,031	14,031	14,031
Year 8	-0.028*** (0.010)	-0.030*** (0.010)	-0.042*** (0.015)
<i>N</i>	9,206	9,206	9,206

Note: ***p<0.10, **p<0.05, *p<0.01. Robust standard error in parentheses below coefficient estimate. Each coefficient is from a separate regression and is the estimate for an indicator of receiving an FFWS grant offer. All regressions contain fixed effects for cohort.

Table A5. Effect of FFWS grant offer on cumulative loan debt, by unmet need level and year after randomization

Year	Cumulative Loan Debt			
	N	High Unmet Need	Low Unmet Need	Difference
Year 1	34,115	-196.60*** (54.11)	-850.18*** (54.66)	-653.58*** (76.88)
Year 2	34,115	-449.18*** (104.84)	-1512.91*** (105.91)	-1063.74*** (148.96)
Year 3	30,478	-812.14*** (171.18)	-2189.59*** (174.38)	-1377.44*** (244.28)
Year 4	26,554	-1067.01*** (249.80)	-2644.59*** (257.20)	-1577.58*** (358.40)
Year 5	22,419	-1160.58*** (311.25)	-2875.90*** (323.57)	-1715.33*** (448.76)
Year 6	18,107	-1112.94*** (362.28)	-2870.31*** (379.63)	-1757.37*** (524.47)
Year 7	13,991	-1186.00*** (433.96)	-2752.84*** (457.81)	-1566.85** (630.69)
Year 8	9,175	-1348.58** (558.10)	-3158.09*** (593.77)	-1809.51** (814.81)

Note: ***p<0.10, **p<0.05, *p<0.01. Robust standard error in parentheses below coefficient estimate. Each row presents results from a separate regression containing an indicator for receiving an FFWS offer, an indicator for low unmet need, the interaction of those two terms, and a cohort fixed effect.

Table A6. Effect of FFWS grant offer on employment and earnings, by gender and year after randomization

Year	Employment				Earnings			
	<i>N</i>	Male	Female	Difference	<i>N</i>	Male	Female	Difference
Year 1	33,580	-0.036*** (0.010)	-0.018** (0.008)	0.017 (0.013)	33,580	-159.01* (95.338)	-331.13*** (79.271)	-172.13 (123.934)
Year 2	33,580	-0.026*** (0.009)	-0.016** (0.008)	0.010 (0.012)	33,580	-450.28*** (146.022)	-477.38*** (121.413)	-27.10 (189.821)
Year 3	29,934	-0.018* (0.010)	-0.009 (0.009)	0.009 (0.014)	29,934	-220.09 (196.951)	-510.00*** (164.303)	-290.91 (256.396)
Year 4	26,053	-0.016 (0.011)	-0.005 (0.009)	0.011 (0.014)	26,053	-135.44 (256.720)	-415.81* (214.833)	-280.38 (334.620)
Year 5	21,949	-0.001 (0.012)	-0.008 (0.010)	-0.007 (0.016)	21,949	-443.56 (411.947)	-372.77 (343.187)	70.79 (535.920)
Year 6	17,705	-0.013 (0.015)	-0.023* (0.012)	-0.010 (0.019)	17,705	-427.81 (575.809)	-951.33* (486.428)	-523.53 (753.370)
Year 7	13,668	-0.020 (0.018)	-0.023 (0.015)	-0.003 (0.023)	13,668	-1170.33 (753.227)	-967.41 (635.208)	202.92 (985.145)
Year 8	8,957	-0.033 (0.023)	-0.042** (0.019)	-0.009 (0.030)	8,957	-1870.71* (1034.842)	-1239.65 (867.978)	631.06 (1350.510)

Note: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error in parentheses below coefficient estimate. For each panel of the table, each row presents results from a separate regression containing an indicator for receiving an FFWS offer, an indicator for female, the interaction of those two terms, and a cohort fixed effect.

Table A7. Effect of FFWS grant offer on employment in a "public interest" sector, by conditioning on employment and by post-randomization year

	Effect of Offer	Conditional on employment
Year 5	0.009 (0.009)	0.013 (0.011)
Year 6	-0.004 (0.010)	0.005 (0.013)
Year 7	0.003 (0.012)	0.016 (0.015)
Year 8	-0.006 (0.015)	0.014 (0.019)

NOTE: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error clustered by student in parentheses below coefficient estimate. All coefficients in a column from a single OLS regression predicting annual employment in a public interest sector, where we define public interest sectors to be educational services, health care, arts and recreation, and public administration. Each coefficient is an estimate from an interaction between the indicator for receiving an FFWS grant offer and an indicator for the respective post-randomization year. All regressions contain fixed effects for cohort and post-randomization year.

Table A8. Coefficient on indicator for receiving an FFWS grant offer after conditioning on postsecondary enrollment, by post-randomization year

Year	Employment		Earnings	
	Condition on Enrollment	No Condition on Enrollment (Main Results)	Condition on Enrollment	No Condition on Enrollment (Main Results)
Year 1	-0.022*** (0.006)	-0.023*** (0.006)	-228.40*** (59.14)	-284.64*** (58.63)
Year 2	-0.019*** (0.006)	-0.019*** (0.006)	-365.19*** (85.33)	-482.95*** (89.52)
Year 3	-0.012* (0.007)	-0.011 (0.007)	-293.73** (116.53)	-404.16*** (124.42)
Year 4	-0.008 (0.007)	-0.008 (0.007)	-176.57 (155.15)	-288.54* (163.84)
Year 5	-0.004 (0.008)	-0.004 (0.008)	-286.71 (248.57)	-363.53 (258.39)
Year 6	-0.019** (0.009)	-0.020** (0.009)	-809.50** (357.07)	-776.91** (362.37)
Year 7	-0.022* (0.011)	-0.022* (0.012)	-1103.00** (469.45)	-1138.05** (470.84)
Year 8	-0.038** (0.015)	-0.038** (0.015)	-1586.65** (656.00)	-1576.17** (656.50)
<i>N</i>	193,605	193,605	193,605	193,605
<i>N</i> Students	34,221	34,221	34,221	34,221

NOTE: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error clustered by student in parentheses below coefficient estimate. All coefficients in a column from a single OLS regression predicting annual employment (left panel) or earnings (right panel) in the state of Wisconsin. Each coefficient is an estimate from an interaction between the indicator for receiving an FFWS grant offer and an indicator for the respective post-randomization year. All regressions contain fixed effects for cohort and post-randomization year. Regressions in condition on enrollment columns also contain an indicator for enrollment in a UW System institution.

Table A9. Coefficients and standard errors for interaction between FFWS offer indicator and student characteristic from OLS model predicting confirmed Wisconsin residency, by student characteristic and year

	FFWS X ACT Composite Score	FFWS X BA Degree- UW System	FFWS X BA Degree- Any Institution	FFWS X Gross Family Income/ \$10,000	FFWS X UW System GPA
Year 5	-0.002 (0.002)	-0.003 (0.012)	-0.009 (0.012)	0.003 (0.003)	-0.009 (0.008)
<i>N</i>	21,782	22,473	22,473	22,419	22,084
Year 6	-0.002 (0.002)	-0.008 (0.018)	-0.005 (0.017)	0.004 (0.004)	-0.016 (0.011)
<i>N</i>	17,518	18,155	18,155	18,107	17,876
Year 7	-0.003 (0.003)	-0.014 (0.022)	-0.024 (0.022)	0.003 (0.005)	-0.040*** (0.014)
<i>N</i>	13,451	14,031	14,031	13,991	13,836
Year 8	-0.002 (0.004)	-0.023 (0.029)	-0.037 (0.028)	0.004 (0.007)	-0.054*** (0.017)
<i>N</i>	8,674	9,206	9,206	9,175	9,111

Note: *** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$. Robust standard error in parentheses below coefficient estimate. Each coefficient is from a separate regression and is the estimated coefficient for an interaction between an indicator for receiving an FFWS grant offer and the student characteristic listed in each column header from an OLS model predicting confirmed Wisconsin residency. All regressions contain fixed effects for cohort.

Table A10. Coefficient on indicator for receiving an FFWS grant offer, by college graduation status and post-randomization year

Year	Employment			Earnings		
	No Grad	Grad	Difference	No Grad	Grad	Difference
Year 1	-0.025*** (0.007)	-0.018 (0.012)	0.007 (0.014)	-288.68*** (72.24)	-169.54 (111.90)	119.14 (133.15)
Year 2	-0.020*** (0.007)	-0.009 (0.011)	0.011 (0.013)	-471.85*** (109.41)	-354.34** (169.48)	117.51 (201.66)
Year 3	-0.010 (0.008)	-0.010 (0.011)	0.000 (0.014)	-268.71* (151.17)	-490.51*** (212.74)	-221.80 (260.89)
Year 4	-0.012 (0.009)	-0.002 (0.011)	0.010 (0.014)	-104.52 (206.70)	-447.77* (259.67)	-343.25 (331.75)
Year 5	0.008 (0.011)	-0.012 (0.011)	-0.020 (0.016)	21.67 (358.43)	-877.96 (387.01)	-899.62 (527.22)
Year 6	-0.003 (0.014)	-0.026** (0.013)	-0.022 (0.013)	196.18 (537.72)	-1,713.14*** (505.19)	-1,909.32** (737.39)
Year 7	-0.004 (0.017)	-0.027* (0.015)	-0.022 (0.023)	55.81 (720.64)	-2,095.10*** (651.35)	-2,150.91 (971.23)
Year 8	-0.009 (0.022)	-0.049** (0.020)	-0.040 (0.030)	-642.37 (974.13)	-2,218.79** (899.38)	-1,576.42 (1325.72)

Note: ***p<0.10, **p<0.05, *p<0.01. Robust standard error in parentheses below coefficient estimate. For each panel of the table, each row presents results from a separate regression containing an indicator for receiving an FFWS offer, an indicator for ever earning a BA, the interaction of those two terms, and a cohort fixed effect.