Appendix

Appendix A The firs-stage regression results of PSM method with the farmers in the full sample

Variables	Cooperative participation		Technology adoption	
	Coeff.	Std. Err.	Coeff	Std. Err.
Social network				
Party membership	0.186	0.379	-0.129	0.330
Sales range	0.100	0.107	0.192*	0.100
Degree of Cooperation	0.104	0.122	0.391***	0.115
Social trust				
Government support	0.187*	0.114	0.079	0.102
Village education level	0.023**	0.009	0.020**	0.008
Agricultural insurance	0.094	0.299	0.774***	0.263
Social participation				
Agricultural training	1.730***	0.326	0.472	0.356
Agricultural information service	1.713***	0.370	0.213	0.360
Agricultural skill	0.720**	0.292	0.583**	0.266
Agricultural input				
Labor share	-0.451	0.663	0.117	0.630
Farmland area	-0.181	0.196	0.162	0.162
Farmer characteristics				
Gender	0.752**	0.355	-0.023	0.350
Age	-0.044***	0.016	-0.003	0.016
Education of household head	-0.063	0.167	0.040	0.160
Migrant workers	-0.057	0.202	0.097	0.198
Non- farm income	-2.530***	0.630	-0.273	0.573
Regional characteristics				
Market distance	-0.052**	0.023	-0.038*	0.023
Village terrain	0.777**	0.376	-0.163	0.309
Constant	-1.195	1.345	-4.918***	1.311
N	396		396	
LR chi2(18)	141.91		50.08	
Prob > chi2	0.000		0.000	
Pseudo R2	0.282		0.108	
Log likelihood	-181.106		-207.972	

Note: *, **, and *** indicate significant levels at 10, 5, and 1% respectively.

Appendix B Data balance test of PSM with the farmers in the full sample

Variables	Cooperative participation		Technology adoption	
	%Bias	p-Value	%Bias	p-Value
Social network				
Party membership	2.4	0.791	8.5	0.534
Sales range	-2.8	0.726	2	0.882
Degree of Cooperation	-0.6	0.944	1.4	0.920
Social trust				
Government support	-4	0.650	4.6	0.736
Village education level	17.5	0.027	4.4	0.754
Agricultural insurance	24.4	0.005	3.8	0.786
Social participation				
Agricultural training	-0.6	0.935	2.2	0.860
Agricultural information service	6	0.382	3.8	0.774
Agricultural skill	14.5	0.099	4.6	0.733
Agricultural input				
Labor share	15	0.092	-0.6	0.967
Farmland area	31.1	0.000	10.6	0.411
Farmer characteristics				
Gender	4.4	0.574	6.3	0.645
Age	13.9	0.11	-2.4	0.855
Education of household head	-3.1	0.7	4.4	0.752
Migrant workers	1.2	0.876	-2.1	0.876
Non- farm income	-0.6	0.934	1.5	0.910
Regional characteristics				
Market distance	9.1	0.216	-2.1	0.867
Village terrain	9.6	0.256	-1.2	0.932

Appendix C The first-stage regression results of PSM method with low income farmers

Variables	Cooperative participation		Technology adoption	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Social network				
Party membership	0.456	0.667	-0.885	0.825
Sales range	0.107	0.171	0.231	0.197
Degree of Cooperation	0.217	0.217	0.846***	0.254

Social trust				
Government support	0.292	0.185	0.173	0.197
Village education level	-0.000	0.018	0.027	0.020
Agricultural insurance	0.645	0.526	1.062*	0.543
Social participation				
Agricultural training	1.392***	0.468	0.426	0.569
Agricultural information service	1.759***	0.483	-0.270	0.508
Agricultural skill	-0.328	0.456	0.670	0.476
Agricultural input				
Labor share	-0.296	1.040	0.611	1.199
Farmland area	0.143	0.322	0.718**	0.348
Farmer characteristics				
Gender	1.100**	0.535	-0.500	0.550
Age	-0.039	0.025	-0.011	0.028
Education of household head	-0.265	0.253	0.420	0.272
Migrant workers	-0.121	0.311	-0.161	0.366
Non- farm income	-2.188**	0.995	-0.905	1.173
Regional characteristics				
Market distance	-0.064	0.048	0.050	0.050
Village terrain	0.362	0.607	-0.720	0.637
Constant	-1.083	2.410	-8.693***	2.674
N	181		181	
LR chi2(18)	58.13		46.04	
Prob > chi2	0.000		0.000	
Pseudo R2	0.262		0.232	
Log likelihood	-82.090		-76.218	

Note: *, **, *** indicate significant levels at 10%, 5%, and 1% respectively.

Appendix D   Data balance test with low income farmers

Variables	Cooperative participation		Technology adoption	
	%Bias	p-Value	%Bias	p-Value
Social network				
Party membership	-2.9	0.816	-6.8	0.748
Sales range	-17	0.177	5.5	0.798
Degree of Cooperation	-13.9	0.267	-6	0.781
Social trust				
Government support	5.2	0.672	12.9	0.558

Village education level	11	0.329	2.8	0.895
Agricultural insurance	35.9	0.005	7.5	0.755
Social participation				
Agricultural training	12.6	0.286	2.8	0.895
Agricultural information service	0.5	0.960	2.4	0.916
Agricultural skill	16.8	0.188	-7.4	0.739
Agricultural input				
Labor share	36	0.010	10.1	0.627
Farmland area	33.5	0.008	5.6	0.757
Farmer characteristics				
Gender	7.2	0.576	1.1	0.965
Age	12.4	0.36	1.3	0.955
Education of household head	-5.2	0.699	0.6	0.98
Migrant workers	-2.4	0.824	6.2	0.76
Non- farm income	-9.8	0.39	0.3	0.989
Regional characteristics				
Market distance	12.2	0.242	5.7	0.812
Village terrain	24.2	0.041	11.3	0.632