Figure 1: Simulation with $B = 500$, $p = 13$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$ with $\sigma_\alpha = \sigma_\delta = \sigma_\gamma = \xi$ and $\sigma = 1$

		Bias		Consistency						
				Guess			Proposition			
n	ξ	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\alpha_1)\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	Best
5	0.01	0.49 (0.025)	87.849 (5.435)	1 (0)	1 (0)	1 (0)	0.994 (0.006)	0.994 (0.006)	0.994 (0.006)	0.547 (0.038)
	0.1	2.522 (0.145)	87.943 (5.439)	1 (0)	1 (0)	1 (0)	0.994 (0.006)	1 (0)	0.994 (0.006)	0.535 (0.038)
	1	24.742 (1.416)	94.691 (5.73)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.482 (0.038)
	10	247.144 (14.155)	340.365 (20.666)	0.81 (0.03)	1 (0)	0.785 (0.032)	0.624 (0.037)	0.618 (0.037)	0.6 (0.038)	0.418 (0.038)
10	0.01	0.318 (0.018)	73.775 (4.612)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.606 (0.038)
	0.1	1.761 (0.104)	74.152 (4.582)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.606 (0.038)
	1	17.24 (1.068)	81.285 (4.698)	1 (0)	1 (0)	1 (0)	0.994 (0.006)	0.994 (0.006)	0.994 (0.006)	0.515 (0.039)
	10	172.201 (10.724)	303.791 (17.261)	0.785 (0.032)	0.995 (0.006)	0.78 (0.032)	0.594 (0.038)	0.63 (0.038)	0.606 (0.038)	0.388 (0.038)
15	0.01	0.27 (0.017)	71.654 (4.19)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.63 (0.038)
	0.1	1.464 (0.086)	71.711 (4.205)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.617 (0.038)
	1	14.269 (0.853)	76.912 (4.646)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.519 (0.039)
	10	142.469 (8.536)	296.668 (17.064)	0.775 (0.033)	1 (0)	0.77 (0.033)	0.506 (0.039)	0.562 (0.039)	0.506 (0.039)	0.37 (0.038)
25	0.01	0.232 (0.013)	64.937 (4.244)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.72 (0.035)
	0.1	1.256 (0.073)	65.025 (4.247)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.707 (0.036)
	1	12.162 (0.723)	70.93 (4.515)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.543 (0.039)
	10	121.364 (7.22)	284.488 (16.044)	0.755 (0.034)	1 (0)	0.75 (0.034)	0.561 (0.039)	0.598 (0.038)	0.573 (0.039)	0.341 (0.037)

Figure 2: Simulation with $B = 500$, $p = 13$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$ with $\sigma_\alpha = \sigma_\delta = \sigma_\gamma = \xi$ and $\sigma = 1$

n	ξ	Distance to α_1			Distance to y_{1,T_1^*+1}			
		$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	Original	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
5	0.01	92.181 (5.464)	87.929 (5.429)	92.945 (5.38)	530.941 (8.26)	93.09 (5.466)	88.921 (5.425)	80.044 (5.572)
	0.10	92.318 (5.438)	88.749 (5.4)	92.877 (5.376)	531.7 (8.237)	93.106 (5.448)	89.688 (5.41)	80.098 (5.557)
	1.00	110.408 (6.359)	112.895 (6.552)	111.143 (6.292)	539.293 (9.574)	109.803 (6.456)	113.673 (6.7)	97.704 (6.383)
	10.00	608.083 (40.543)	658.75 (41.166)	609.478 (40.379)	765.376 (43.2)	603.461 (40.802)	663.964 (42.019)	551.147 (39.204)
10	0.01	85.761 (4.759)	73.781 (4.611)	85.251 (4.74)	531.34 (7.832)	88.001 (4.75)	75.942 (4.725)	71.843 (5.031)
	0.10	85.596 (4.751)	74.36 (4.589)	85.115 (4.726)	531.207 (7.831)	87.862 (4.751)	76.32 (4.716)	72.035 (4.998)
	1.00	98.904 (5.657)	96.941 (5.8)	97.58 (5.694)	529.882 (9.24)	101.594 (5.697)	97.905 (5.945)	85.258 (5.777)
	10.00	552.629 (34.136)	607.916 (38.656)	550.047 (34.131)	683.331 (39.175)	554.845 (34.507)	605.65 (39.468)	485.177 (33.536)
15	0.01	87.845 (4.815)	71.604 (4.189)	88.125 (4.791)	522.679 (7.39)	82.717 (4.425)	67.234 (3.908)	66.963 (4.715)
	0.10	87.665 (4.817)	71.361 (4.214)	87.888 (4.799)	521.797 (7.332)	81.85 (4.372)	66.395 (3.884)	66.524 (4.638)
	1.00	97.832 (6.358)	90.733 (5.995)	97.7 (6.377)	512.982 (8.56)	87.039 (5.482)	81.835 (5.463)	73.372 (5.429)
	10.00	574.299 (37.641)	654.146 (39.801)	575.021 (37.553)	637.811 (40.745)	542.636 (37.393)	642.185 (39.776)	472.829 (35.937)
25	0.01	87.619 (5.42)	64.935 (4.244)	87.506 (5.452)	536.46 (8.637)	89.397 (5.392)	64.912 (4.341)	73.355 (5.577)
	0.10	87.71 (5.422)	65.27 (4.254)	87.66 (5.45)	536.872 (8.656)	89.643 (5.381)	65.457 (4.347)	73.752 (5.557)
	1.00	102.741 (6.359)	89.279 (5.823)	103.025 (6.374)	540.993 (10.266)	105.581 (6.364)	91.855 (5.991)	88.773 (6.427)
	10.00	549.418 (35.903)	622.006 (39.938)	550.127 (35.928)	727.414 (44.214)	564.311 (37.046)	645.792 (41.356)	483.044 (36.321)

Figure 3: Simulation with $B = 500$, $p = 13$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$ with $\sigma_\alpha = \sigma_\delta = \sigma_\gamma = \xi$ and $\sigma = 1$

		Bias		Consistency						
				Guess			Proposition			
σ	ξ	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\alpha_1)\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	Best
0.01	0.01	0.169 (0.01)	76.675 (4.145)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	0.1	1.689 (0.097)	76.96 (4.113)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	1	16.886 (0.967)	82.841 (4.136)	1 (0)	1 (0)	1 (0)	0.99 (0.007)	0.99 (0.007)	0.99 (0.007)	0.49 (0.035)
	10	168.862 (9.673)	285.512 (15.176)	0.805 (0.028)	1 (0)	0.805 (0.028)	0.6 (0.035)	0.64 (0.034)	0.61 (0.035)	0.39 (0.035)
0.1	0.01	0.172 (0.009)	76.675 (4.145)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	0.1	1.69 (0.096)	76.959 (4.113)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	1	16.888 (0.967)	82.843 (4.136)	1 (0)	1 (0)	1 (0)	0.99 (0.007)	0.99 (0.007)	0.99 (0.007)	0.49 (0.035)
	10	168.863 (9.673)	285.516 (15.177)	0.805 (0.028)	1 (0)	0.805 (0.028)	0.6 (0.035)	0.64 (0.034)	0.61 (0.035)	0.39 (0.035)
1	0.01	0.299 (0.016)	76.676 (4.146)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	0.1	1.717 (0.094)	76.955 (4.115)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0.575 (0.035)
	1	16.902 (0.964)	82.862 (4.137)	1 (0)	1 (0)	1 (0)	0.99 (0.007)	0.99 (0.007)	0.99 (0.007)	0.5 (0.035)
	10	168.877 (9.669)	285.55 (15.179)	0.805 (0.028)	1 (0)	0.805 (0.028)	0.6 (0.035)	0.64 (0.034)	0.61 (0.035)	0.39 (0.035)
10	0.01	2.554 (0.135)	76.839 (4.163)	1 (0)	1 (0)	1 (0)	0.995 (0.005)	0.995 (0.005)	0.995 (0.005)	0.58 (0.035)
	0.1	2.992 (0.159)	77.151 (4.13)	1 (0)	1 (0)	1 (0)	0.995 (0.005)	0.995 (0.005)	0.995 (0.005)	0.555 (0.035)
	1	17.173 (0.944)	83.103 (4.162)	1 (0)	1 (0)	1 (0)	0.985 (0.009)	0.985 (0.009)	0.985 (0.009)	0.475 (0.035)
	10	169.006 (9.636)	285.896 (15.206)	0.815 (0.028)	0.99 (0.007)	0.815 (0.028)	0.6 (0.035)	0.635 (0.034)	0.595 (0.035)	0.39 (0.035)

Figure 4: Simulation with $B = 500$, $p = 13$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$ with $\sigma_\alpha = \sigma_\delta = \sigma_\gamma = \xi$ and $\sigma = 1$

n	ξ	Distance to α_1			Distance to y_{1,T_1^*+1}			
		$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	Original	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	0.01	85.948 (4.276)	76.692 (4.147)	85.209 (4.274)	528.147 (6.889)	85.951 (4.276)	76.695 (4.147)	85.213 (4.274)
	0.1	85.929 (4.292)	77.266 (4.143)	85.285 (4.275)	528.004 (6.902)	85.933 (4.292)	77.269 (4.143)	85.288 (4.275)
	1	101.477 (5.2)	99.05 (5.352)	100.02 (5.222)	526.567 (8.306)	101.473 (5.201)	99.054 (5.352)	100.016 (5.222)
	10	548.968 (31.633)	601.281 (35.144)	548.938 (31.382)	682.184 (34.939)	548.965 (31.633)	601.279 (35.144)	548.936 (31.382)
0.1	0.01	85.948 (4.276)	76.692 (4.147)	85.209 (4.274)	528.163 (6.89)	85.984 (4.275)	76.722 (4.146)	85.244 (4.273)
	0.1	85.93 (4.292)	77.265 (4.143)	85.286 (4.275)	528.019 (6.903)	85.962 (4.291)	77.297 (4.143)	85.317 (4.274)
	1	101.478 (5.2)	99.053 (5.353)	100.02 (5.222)	526.582 (8.306)	101.447 (5.204)	99.093 (5.351)	100.009 (5.223)
	10	548.967 (31.633)	601.288 (35.144)	548.939 (31.382)	682.21 (34.937)	548.936 (31.634)	601.266 (35.146)	548.913 (31.382)
1	0.01	85.95 (4.278)	76.693 (4.148)	85.207 (4.277)	528.328 (6.913)	86.342 (4.286)	77.023 (4.165)	85.593 (4.285)
	0.1	85.938 (4.294)	77.259 (4.145)	85.291 (4.277)	528.184 (6.926)	86.292 (4.303)	77.625 (4.159)	85.635 (4.288)
	1	101.483 (5.201)	99.085 (5.356)	100.025 (5.223)	526.747 (8.321)	101.876 (5.186)	99.583 (5.348)	100.416 (5.207)
	10	548.96 (31.634)	601.365 (35.146)	548.942 (31.382)	682.566 (34.907)	548.647 (31.642)	601.128 (35.174)	548.68 (31.383)
10	0.01	85.983 (4.303)	76.838 (4.164)	85.243 (4.303)	532.662 (10.924)	95.803 (9.139)	86.002 (9.122)	95.029 (9.159)
	0.1	86.024 (4.313)	77.384 (4.17)	85.376 (4.298)	532.518 (10.923)	95.654 (9.138)	86.636 (9.117)	94.865 (9.155)
	1	101.618 (5.209)	99.563 (5.387)	100.092 (5.241)	531.081 (11.776)	112.214 (9.311)	110.67 (9.524)	110.65 (9.333)
	10	548.888 (31.638)	602.172 (35.161)	548.982 (31.384)	691.056 (35.11)	554.266 (31.854)	610.467 (35.492)	554.565 (31.52)

Figure 5: Simulation with $B = 500$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$

			Bias				Consistency					
			$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$		$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\alpha_1)\rvert$		$\hat{\alpha}_{\text{adj}}$		$\hat{\alpha}_{\text{wadj}}$		$\hat{\alpha}_{\text{IVW}}$	
Conditioned on donor pool	n	$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Yes	5	0.01	0.378	0.278	23.501	24.750	0.883	0.322	0.968	0.176	0.888	0.316
		0.1	0.376	0.280	23.898	25.036	0.883	0.322	0.963	0.190	0.888	0.316
		1	0.475	0.361	37.088	35.880	0.819	0.386	0.899	0.302	0.846	0.362
		10	3.211	2.310	262.724	248.469	0.479	0.501	0.399	0.491	0.489	0.501
	10	0.010	0.288	0.204	14.047	17.544	0.908	0.290	0.978	0.146	0.924	0.266
		0.1	0.288	0.206	14.308	17.230	0.913	0.283	0.978	0.146	0.929	0.257
		1	0.368	0.289	29.406	27.615	0.875	0.332	0.940	0.238	0.859	0.349
		10	2.482	1.991	269.148	237.737	0.484	0.501	0.424	0.496	0.473	0.501
	15	0.01	0.228	0.156	13.238	20.303	0.918	0.276	0.989	0.105	0.923	0.267
		0.1	0.228	0.159	13.429	20.757	0.918	0.276	0.989	0.105	0.923	0.267
		1	0.306	0.250	27.568	34.442	0.874	0.333	0.934	0.249	0.879	0.327
		10	2.244	1.687	241.401	258.458	0.571	0.496	0.495	0.501	0.571	0.496
	25	0.01	0.166	0.130	9.429	17.388	0.951	0.216	1.000	0.000	0.946	0.227
		0.1	0.165	0.130	10.167	17.436	0.941	0.237	1.000	0.000	0.941	0.237
		1	0.224	0.177	26.818	27.688	0.870	0.337	0.973	0.163	0.876	0.331
		10	1.637	1.234	236.164	219.509	0.476	0.501	0.470	0.500	0.470	0.500
No	5	0.01	0.563	0.416	23.309	21.997	0.881	0.325	0.973	0.163	0.886	0.318
		0.1	0.572	0.418	23.287	22.063	0.876	0.331	0.978	0.146	0.886	0.318
		1	0.780	0.541	31.936	31.629	0.859	0.348	0.941	0.237	0.854	0.354
		10	4.576	3.430	234.162	233.069	0.497	0.501	0.508	0.501	0.503	0.501
	10	0.01	0.397	0.334	14.389	14.932	0.903	0.297	0.995	0.074	0.930	0.256
		0.1	0.397	0.332	14.587	15.244	0.908	0.290	0.995	0.074	0.924	0.265
		1	0.505	0.402	25.992	24.056	0.822	0.384	0.941	0.237	0.849	0.359
		10	3.261	2.682	198.241	189.375	0.514	0.501	0.546	0.499	0.503	0.501
	15	0.01	0.328	0.263	15.140	20.615	0.935	0.247	0.995	0.074	0.941	0.237
		0.1	0.330	0.261	15.302	20.544	0.930	0.256	0.995	0.074	0.946	0.227
		1	0.429	0.330	27.192	26.992	0.881	0.325	0.930	0.256	0.892	0.311
		10	2.848	2.084	215.233	206.064	0.557	0.498	0.481	0.501	0.568	0.497
	25	0.01	0.272	0.217	10.929	16.447	0.929	0.258	1.000	0.000	0.951	0.217
		0.1	0.273	0.220	11.164	16.300	0.929	0.258	1.000	0.000	0.945	0.228
		1	0.345	0.292	24.009	23.306	0.896	0.306	0.973	0.163	0.896	0.306
		10	2.228	1.658	210.408	191.603	0.503	0.501	0.514	0.501	0.503	0.501

Figure 6: Simulation with $B = 500$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$

		Distance to α_1						Distance to y_{1,T_1^*+1}					
		$\hat{\alpha}_{\text{adj}}$		$\hat{\alpha}_{\text{wadj}}$		$\hat{\alpha}_{\text{IVW}}$		$\hat{\alpha}_{\text{adj}}$		$\hat{\alpha}_{\text{wadj}}$		$\hat{\alpha}_{\text{IVW}}$	
n	$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
5	0.01	39.006	29.790	23.499	24.750	38.449	29.796	39.172	29.898	23.850	25.088	38.613	29.912
	0.1	39.071	30.153	23.887	25.033	38.592	30.030	39.246	30.298	24.217	25.404	38.749	30.208
	1	45.280	39.102	37.082	35.858	45.100	38.377	45.333	39.510	37.297	36.438	45.150	38.910
	10	238.885	213.098	262.993	248.979	235.384	213.618	235.935	213.034	265.972	248.877	233.500	213.889
10	0.01	32.923	25.108	14.047	17.540	32.915	25.528	34.154	31.810	15.243	25.488	34.102	31.912
	0.1	32.902	24.918	14.325	17.221	32.893	25.304	34.080	31.566	15.299	25.103	34.016	31.656
	1	39.667	30.195	29.378	27.723	39.381	30.642	40.060	33.935	29.299	30.039	39.893	34.104
	10	229.242	216.447	269.202	238.050	228.843	217.382	221.625	200.081	260.784	223.970	221.954	202.704
15	0.01	33.270	27.758	13.238	20.306	33.314	27.659	32.971	26.537	12.918	18.749	32.991	26.373
	0.1	33.302	28.198	13.432	20.769	33.278	28.141	32.994	26.769	13.048	18.940	32.940	26.671
	1	39.711	38.647	27.705	34.535	39.427	38.554	38.819	35.071	26.698	30.470	38.648	34.958
	10	220.118	236.916	242.215	259.740	218.877	237.403	211.176	216.143	233.495	242.694	209.973	217.840
25	0.01	31.998	26.312	9.431	17.390	31.935	26.571	31.430	26.627	9.396	17.642	31.350	26.925
	0.1	32.439	26.532	10.181	17.440	32.349	26.815	31.924	26.843	9.961	17.803	31.812	27.180
	1	39.626	35.654	26.819	27.758	39.384	35.932	39.366	35.336	26.136	27.142	39.128	35.736
	10	201.498	203.724	236.364	219.555	201.599	202.235	196.654	194.228	227.013	208.938	196.500	193.487

Figure 7: Simulation with $B = 1000$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$
Parametric Bootstrap

		Bias		Distance to α_1			Consistency			Risk (RMSE)		
$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	n	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\hat{\alpha}_{\text{wadj}})\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	5	0.427	31.551	18.782	31.543	20.433	1	1	1	15.990	28.751	17.641
	10	0.345	0.229	9.050	0.231	10.958	1	1	1	9.152	0.128	11.061
	15	0.366	0.484	26.292	0.483	26.787	1	1	1	27.020	1.210	27.514
	25	0.051	0.354	15.215	0.350	16.792	1	1	1	16.671	1.106	18.248
0.1	5	0.411	8.599	20.659	8.683	16.075	1	1	1	19.527	9.815	14.943
	10	0.004	1.130	31.834	1.121	31.999	1	1	1	32.712	0.243	32.878
	15	0.252	0.866	38.477	0.842	36.201	1	1	1	35.230	2.406	32.954
	25	0.017	4.273	54.846	4.297	56.049	1	1	1	54.996	4.447	56.198
1	5	0.559	163.417	170.584	165.212	169.204	1	1	1	169.681	164.310	168.301
	10	0.732	19.168	1.209	17.658	1.682	1	1	1	3.467	19.915	3.940
	15	0.191	29.582	64.219	29.695	64.982	0	0	0	66.393	31.870	67.157
	25	0.098	11.948	10.795	10.349	13.788	1	1	1	6.907	6.461	9.900
10	5	2.643	70.552	35.244	75.090	32.894	1	0	1	35.600	74.734	33.251
	10	2.169	402.211	492.828	396.902	477.584	0	0	0	494.029	398.102	478.784
	15	1.652	233.576	122.126	226.641	51.038	0	0	0	120.853	225.368	49.766
	25	1.361	32.038	141.835	38.483	144.553	1	1	1	140.890	39.428	143.608

Figure 8: Simulation with $B = 1000$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$
Non-Parametric Bootstrap on Disparate Time-series and Parametric Bootstrap on AR(1)

		Distance to α_1			Consistency			Risk (RMSE)					
$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	n	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\hat{\alpha}_{\text{wadj}})\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	5	0.878	28.114	18.782	31.543	20.433	1	1	1	15.990	28.751	17.641
	10	0.188	38.905	53.551	33.746	50.732	1	1	1	52.770	32.966	49.951
	15	0.444	11.330	55.929	1.315	56.176	0	1	0	55.106	0.493	55.353
	25	0.152	3.808	28.886	0.001	27.829	1	1	1	28.941	0.056	27.884
0.1	5	0.043	15.456	26.529	16.324	26.033	1	1	1	26.927	16.722	26.431
	10	0.909	16.352	49.877	13.378	49.589	0	1	0	50.708	14.209	50.420
	15	0.071	6.139	18.978	1.843	18.979	1	1	1	19.025	1.890	19.026
	25	0.494	4.348	35.455	1.936	35.103	1	1	1	34.736	1.217	34.384
1	5	0.693	49.543	70.448	40.387	74.051	0	1	0	70.334	40.273	73.937
	10	1.503	114.715	75.710	137.942	77.281	0	0	0	75.918	138.150	77.489
	15	0.527	58.683	54.621	61.984	59.130	0	0	0	55.290	62.653	59.799
	25	0.102	25.270	18.639	19.991	16.631	1	1	1	18.664	20.015	16.655
10	5	6.774	125.588	162.639	118.031	131.336	0	0	0	164.165	119.557	132.862
	10	0.136	0.123	17.116	77.778	17.950	1	0	1	16.400	78.493	17.235
	15	0.863	248.954	148.942	346.958	147.408	0	1	0	149.775	347.791	148.242
	25	1.411	75.169	211.568	55.516	217.682	1	1	0	211.948	55.895	218.061

Figure 9: Simulation with $B = 1000$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$, $n = 10$

		Bias		Distance to α_1			Consistency		
$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	σ	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\hat{\alpha}_{\text{wadj}})\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	0.01	0.005	26.505	68.635	26.523	70.356	1	1	1
	0.1	0.008	32.825	66.651	32.833	66.038	1	1	1
	1	0.209	55.052	77.779	55.048	78.677	1	1	1
	10	0.659	8.906	18.182	8.942	16.392	1	1	1
0.1	0.01	0.041	4.850	48.389	4.856	48.773	1	1	1
	0.1	0.022	9.665	28.105	9.704	32.457	1	1	1
	1	0.284	7.249	34.603	7.087	33.139	1	1	1
	10	4.720	1.418	23.743	1.188	18.955	1	1	1
1	0.01	0.249	126.966	144.470	126.197	145.266	1	1	1
	0.1	0.344	1.140	37.688	0.809	36.918	1	1	1
	1	0.744	39.141	44.573	38.778	45.929	0	0	0
	10	0.557	5.551	5.608	6.090	0.695	1	1	1
10	0.01	2.555	195.978	198.593	195.032	194.004	0	0	0
	0.1	3.715	356.227	381.530	362.799	385.934	1	1	1
	1	0.820	532.508	463.159	536.718	477.354	0	0	0
	10	5.600	297.116	89.179	276.026	86.527	0	0	0

Figure 10: Simulation with $B = 1000$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \mathcal{N}(10, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$

		Bias		Distance to α_1			Consistency		
$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	n	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\hat{\alpha}_{\text{wadj}})\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	5	0.261	6.226	9.817	6.246	11.876	1	1	1
	10	0.026	67.109	70.703	67.091	70.475	1	1	1
	15	0.160	0.418	37.747	0.427	39.294	1	1	0
	25	0.081	1.324	43.263	1.278	44.056	1	1	1
0.1	5	0.556	1.153	3.147	1.176	4.424	1	1	1
	10	0.076	3.897	51.714	3.877	53.642	1	1	1
	15	0.083	7.656	13.325	7.683	14.124	1	1	1
	25	0.029	0.666	27.716	0.646	25.711	1	1	1
1	5	0.613	11.998	40.189	12.346	41.000	1	1	1
	10	0.969	46.131	3.982	47.802	5.740	1	1	1
	15	0.349	17.527	32.923	17.757	32.635	1	1	1
	25	0.012	22.422	19.373	22.514	18.918	1	1	1
10	5	6.004	213.822	197.780	220.413	194.041	0	0	0
	10	3.039	754.690	494.622	747.898	476.112	0	0	0
	15	0.923	302.770	242.758	287.948	245.405	1	1	1
	25	1.703	298.133	207.077	322.499	218.913	0	0	0

Figure 11: Simulation with $B = 1000$, $p = 2$, $\mu_\alpha = 10$, $X_{i,t} \overset{iid}{\sim} \Gamma(1, 10)$, $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$, $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$, $n = 10$

		Bias		Distance to α_1			Consistency		
$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	σ	$\lvert\hat{\alpha}^\dagger_{\text{adj}} - \text{E}(\hat{\alpha}_{\text{adj}})\rvert$	$\lvert\hat{\alpha}^\dagger_{\text{wadj}} - \text{E}(\hat{\alpha}_{\text{wadj}})\rvert$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$	$\hat{\alpha}_{\text{adj}}$	$\hat{\alpha}_{\text{wadj}}$	$\hat{\alpha}_{\text{IVW}}$
0.01	0.01	0.009	5.558	30.823	5.559	31.390	1	1	1
	0.1	0.001	0.169	4.072	0.162	1.176	1	1	1
	1	0.766	16.604	37.504	16.621	35.608	1	1	1
	10	3.169	9.673	59.918	9.860	57.710	1	0	1
0.1	0.01	0.024	29.621	71.619	29.792	71.856	0	0	0
	0.1	0.020	3.244	24.438	3.301	20.709	1	1	1
	1	0.031	17.347	52.090	17.399	54.809	1	1	1
	10	1.969	19.863	55.848	19.521	56.731	1	1	1
1	0.01	0.102	38.132	99.657	40.849	99.075	1	0	1
	0.1	0.840	10.813	11.913	11.610	11.229	1	1	1
	1	0.300	59.262	3.435	59.195	0.154	1	1	1
	10	0.027	23.931	34.353	24.517	36.478	1	1	1
10	0.01	2.659	282.806	83.313	272.595	102.973	0	0	0
	0.1	2.148	75.597	103.570	88.656	85.908	1	0	1
	1	1.339	642.765	591.299	647.793	571.320	0	0	0
	10	8.033	105.833	166.808	118.156	171.404	0	0	0