

Figure 1: Simulation with  $B = 500$ ,  $p = 2$ ,  $\mu_\alpha = 10$ ,  $X_{i,t} \stackrel{iid}{\sim} \Gamma(1, 10)$ ,  $\delta_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\delta^2 \mathbf{I}_p)$ ,  $\gamma_i \sim \mathcal{N}(2\mathbf{1}_p, \sigma_\gamma^2 \mathbf{I}_p)$   
*Parametric bootstrap* conditioned on donor pool

$n$	$\sigma_\alpha = \sigma_\delta = \sigma_\gamma$	Bias				Consistency					
		$ \hat{\alpha}_{\text{adj}}^\dagger - \mathbb{E}(\hat{\alpha}_{\text{adj}}) $	$ \hat{\alpha}_{\text{wadj}}^\dagger - \mathbb{E}(\alpha_1) $	Mean	SD	$\hat{\alpha}_{\text{adj}}$	Mean	SD	$\hat{\alpha}_{\text{wadj}}$	Mean	SD
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