1 Study II: Simulation Results

Table 1: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel AR(1) model with one component and effects are considered to be fixed.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	**0.948**	**0.934**	**0.961**	**0.958**	**0.870**	**0.871**	**0.928**	**0.912**
	$Q = 2$	0.994	0.968	0.999	0.985	0.946	0.925	0.981	0.952
	$Q = 3$	1.024	0.991	1.020	1.001	0.993	0.962	1.011	0.978
	$Q = 4$	1.042	1.004	1.033	1.012	1.020	0.985	1.030	0.992
	$Q = 5$	1.053	1.014	1.043	1.019	1.035	0.999	1.042	1.003
	$Q = 6$	1.062	1.020	1.049	1.023	1.046	1.009	1.053	1.010
PC.MAR.RE	$Q = 1$	0.949	**0.934**	0.962	**0.958**	**0.870**	**0.871**	**0.928**	**0.912**
	$Q = 2$	0.995	0.969	1.000	0.986	0.947	0.925	0.982	0.952
	$Q = 3$	1.025	0.991	1.020	1.001	0.994	0.962	1.012	0.978
	$Q = 4$	1.043	1.005	1.034	1.013	1.021	0.985	1.030	0.993
	$Q = 5$	1.055	1.015	1.044	1.020	1.036	0.999	1.043	1.003
	$Q = 6$	1.063	1.021	1.050	1.024	1.047	1.009	1.053	1.011
PC.MVAR.FE	$Q = 2$	**0.948**	0.935	0.962	0.959	0.871	**0.871**	**0.928**	**0.912**
	$Q = 3$	0.949	0.936	0.963	0.959	0.871	**0.871**	0.929	**0.912**
	$Q = 4$	0.951	0.936	0.964	0.959	0.872	**0.871**	0.929	**0.912**
	$Q = 5$	0.951	0.938	0.966	0.960	0.872	**0.871**	0.930	0.913
	$Q = 6$	0.953	0.938	0.967	0.961	0.872	**0.871**	0.930	0.913
PC.MVAR.RE	$Q = 2$	0.951	0.936	0.963	0.960	0.872	**0.871**	0.929	**0.912**
	$Q = 3$	0.953	0.937	0.965	0.962	0.873	**0.871**	0.931	0.913
	$Q = 4$	0.957	0.939	0.969	0.964	0.875	0.872	0.932	0.913
	$Q = 5$	0.958	0.942	0.976	0.967	0.877	0.873	0.934	0.915
	$Q = 6$	0.963	0.946	0.984	0.969	0.880	0.874	0.937	0.916
PC.VAR	$Q = 1$	0.965	0.944	0.982	0.967	0.896	0.881	0.946	0.920
	$Q = 2$	0.986	0.952	1.003	0.975	0.914	0.893	0.966	0.928
	$Q = 3$	1.011	0.958	1.020	0.987	0.938	0.903	0.989	0.938
	$Q = 4$	1.038	0.970	1.043	1.000	0.960	0.913	1.017	0.950
	$Q = 5$	1.063	0.986	1.067	1.015	0.987	0.926	1.051	0.965
	$Q = 6$	1.086	1.001	1.105	1.030	1.016	0.937	1.083	0.980
AR		0.971	0.949	1.012	0.991	0.905	0.887	0.988	0.954
MAR.FE		0.953	0.938	0.985	0.978	0.877	0.876	0.962	0.942
MAR.RE		0.954	0.938	0.987	0.979	0.877	0.876	0.963	0.942
MVAR.FE		0.953	0.938	0.967	0.961	0.872	**0.871**	0.930	0.913
MVAR.RE		0.966	0.945	0.982	0.969	0.879	0.874	0.937	0.916
VAR		1.098	1.005	1.123	1.029	1.024	0.934	1.088	0.984

Table 2: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with two components and effects are considered to be fixed.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	0.980	0.943	0.998	0.966	0.988	0.962	1.003	0.984
	$Q = 2$	0.897	0.883	0.945	0.924	0.925	0.912	0.963	0.950
	$Q = 3$	0.895	0.881	0.953	0.928	0.924	0.911	0.971	0.954
	$Q = 4$	0.896	0.881	0.970	0.941	0.924	0.910	0.983	0.962
	$Q = 5$	0.896	0.882	0.990	0.962	0.924	0.910	1.001	0.977
	$Q = 6$	0.895	0.883	1.022	0.987	0.924	0.911	1.024	0.996
PC.MAR.RE	$Q = 1$	0.981	0.943	0.998	0.967	0.988	0.962	1.003	0.984
	$Q = 2$	0.898	0.883	0.945	0.925	0.925	0.913	0.963	0.950
	$Q = 3$	0.896	0.882	0.953	0.928	0.924	0.911	0.971	0.954
	$Q = 4$	0.896	0.882	0.970	0.941	0.924	0.910	0.984	0.963
	$Q = 5$	0.896	0.882	0.991	0.962	0.925	0.910	1.001	0.978
	$Q = 6$	0.895	0.883	1.023	0.988	0.924	0.911	1.024	0.996
PC.MVAR.FE	$Q = 2$	**0.877**	**0.862**	**0.936**	**0.911**	**0.911**	**0.895**	**0.954**	**0.940**
	$Q = 3$	0.878	0.863	0.937	0.912	**0.911**	**0.895**	**0.954**	**0.940**
	$Q = 4$	0.879	0.863	0.939	0.913	0.912	0.896	0.955	**0.940**
	$Q = 5$	0.881	0.864	0.940	0.913	0.912	0.896	0.955	0.941
	$Q = 6$	0.883	0.865	0.942	0.914	0.913	0.896	0.955	0.941
PC.MVAR.RE	$Q = 2$	0.878	0.863	0.938	0.913	0.912	0.896	0.955	**0.940**
	$Q = 3$	0.881	0.865	0.941	0.914	0.913	0.896	0.956	0.941
	$Q = 4$	0.883	0.866	0.945	0.916	0.914	0.897	0.957	0.942
	$Q = 5$	0.887	0.867	0.950	0.918	0.916	0.898	0.959	0.942
	$Q = 6$	0.893	0.870	0.955	0.921	0.918	0.899	0.961	0.944
PC.VAR	$Q = 1$	0.991	0.950	1.007	0.972	1.002	0.969	1.013	0.988
	$Q = 2$	0.994	0.957	1.008	0.975	1.009	0.973	1.024	0.995
	$Q = 3$	1.017	0.966	1.028	0.985	1.033	0.986	1.048	1.006
	$Q = 4$	1.047	0.976	1.054	0.997	1.057	0.998	1.075	1.019
	$Q = 5$	1.076	0.985	1.079	1.012	1.087	1.011	1.108	1.033
	$Q = 6$	1.110	1.000	1.119	1.027	1.118	1.025	1.144	1.048
AR		0.921	0.895	0.989	0.957	0.953	0.924	1.007	0.977
MAR.FE		0.900	0.884	0.969	0.946	0.927	0.912	0.981	0.966
MAR.RE		0.900	0.884	0.969	0.946	0.928	0.913	0.981	0.966
MVAR.FE		0.883	0.865	0.942	0.914	0.913	0.896	0.955	0.941
MVAR.RE		0.895	0.870	0.957	0.921	0.919	0.899	0.961	0.944
VAR		1.026	0.926	1.091	0.981	1.070	0.964	1.118	1.010

Table 3: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with three components and effects are considered to be fixed.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	1.001	0.964	1.021	0.982	1.002	0.946	1.017	0.972
	$Q = 2$	0.926	0.886	0.970	0.927	0.950	0.854	0.984	0.910
	$Q = 3$	0.899	0.867	0.954	0.918	0.917	0.837	0.965	0.903
	$Q = 4$	0.899	0.867	0.961	0.925	0.917	0.837	0.972	0.910
	$Q = 5$	0.899	0.867	0.976	0.937	0.917	0.837	0.982	0.925
	$Q = 6$	0.899	0.867	1.000	0.957	0.917	0.837	1.006	0.949
PC.MAR.RE	$Q = 1$	1.001	0.964	1.021	0.982	1.002	0.946	1.017	0.972
	$Q = 2$	0.926	0.886	0.971	0.927	0.950	0.854	0.984	0.910
	$Q = 3$	0.900	0.868	0.955	0.919	0.917	0.837	0.965	0.904
	$Q = 4$	0.900	0.867	0.962	0.926	0.917	0.837	0.972	0.911
	$Q = 5$	0.900	0.868	0.977	0.937	0.917	0.837	0.983	0.925
	$Q = 6$	0.900	0.868	1.001	0.958	0.917	0.837	1.007	0.949
PC.MVAR.FE	$Q = 2$	0.915	0.873	0.966	0.917	0.933	0.833	0.974	0.897
	$Q = 3$	**0.872**	**0.838**	**0.937**	**0.898**	**0.885**	**0.799**	**0.944**	**0.876**
	$Q = 4$	0.873	0.839	0.939	**0.898**	0.886	**0.799**	0.945	0.877
	$Q = 5$	0.874	0.840	0.940	0.899	0.886	**0.799**	0.946	0.877
	$Q = 6$	0.876	0.840	0.941	0.900	0.886	0.800	0.946	0.877
PC.MVAR.RE	$Q = 2$	0.917	0.874	0.968	0.918	0.935	0.834	0.974	0.898
	$Q = 3$	0.877	0.840	0.943	0.900	0.887	0.800	0.946	0.877
	$Q = 4$	0.881	0.841	0.947	0.903	0.888	0.801	0.947	0.878
	$Q = 5$	0.884	0.844	0.952	0.905	0.890	0.802	0.949	0.879
	$Q = 6$	0.891	0.846	0.956	0.907	0.892	0.803	0.952	0.880
PC.VAR	$Q = 1$	1.014	0.968	1.028	0.986	1.013	0.951	1.026	0.975
	$Q = 2$	0.980	0.926	1.002	0.960	1.037	0.919	1.044	0.956
	$Q = 3$	1.009	0.941	1.026	0.975	1.066	0.921	1.078	0.965
	$Q = 4$	1.040	0.954	1.053	0.989	1.091	0.933	1.104	0.977
	$Q = 5$	1.067	0.967	1.086	1.003	1.116	0.946	1.136	0.991
	$Q = 6$	1.101	0.980	1.126	1.019	1.148	0.958	1.173	1.005
AR		0.927	0.879	0.992	0.944	0.944	0.847	1.003	0.931
MAR.FE		0.901	0.868	0.969	0.933	0.919	0.836	0.979	0.919
MAR.RE		0.902	0.869	0.970	0.933	0.919	0.837	0.979	0.919
MVAR.FE		0.876	0.840	0.941	0.900	0.886	0.800	0.946	0.877
MVAR.RE		0.890	0.846	0.959	0.907	0.892	0.803	0.952	0.880
VAR		1.032	0.900	1.097	0.966	1.038	0.863	1.106	0.944

Table 4: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel AR(1) model with one component and effects are considered to be random.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	**0.952**	0.868	0.978	0.893	0.916	0.859	0.955	0.892
	$Q = 2$	0.999	0.923	1.010	0.939	0.972	0.916	0.996	0.938
	$Q = 3$	1.026	0.962	1.028	0.969	1.008	0.956	1.020	0.967
	$Q = 4$	1.043	0.986	1.040	0.988	1.029	0.979	1.034	0.985
	$Q = 5$	1.055	1.001	1.047	1.000	1.043	0.995	1.044	0.998
	$Q = 6$	1.062	1.011	1.053	1.009	1.053	1.006	1.051	1.007
PC.MAR.RE	$Q = 1$	**0.952**	**0.866**	**0.977**	**0.889**	**0.914**	**0.854**	**0.954**	**0.889**
	$Q = 2$	1.000	0.922	1.010	0.936	0.971	0.914	0.996	0.937
	$Q = 3$	1.026	0.961	1.029	0.968	1.007	0.955	1.020	0.966
	$Q = 4$	1.044	0.986	1.041	0.987	1.029	0.979	1.034	0.984
	$Q = 5$	1.056	1.001	1.048	0.999	1.043	0.994	1.045	0.997
	$Q = 6$	1.063	1.012	1.053	1.009	1.053	1.006	1.052	1.007
PC.MVAR.FE	$Q = 2$	0.953	0.869	0.978	0.894	0.916	0.859	0.955	0.892
	$Q = 3$	0.954	0.869	0.980	0.894	0.917	0.859	0.955	0.892
	$Q = 4$	0.955	0.870	0.981	0.895	0.917	0.860	0.956	0.892
	$Q = 5$	0.956	0.870	0.984	0.895	0.918	0.860	0.956	0.892
	$Q = 6$	0.958	0.871	0.986	0.896	0.918	0.860	0.957	0.893
PC.MVAR.RE	$Q = 2$	0.954	**0.866**	0.978	0.891	0.915	0.856	0.955	**0.889**
	$Q = 3$	0.956	0.868	0.982	0.893	0.917	0.857	0.957	0.890
	$Q = 4$	0.961	0.869	0.985	0.894	0.920	0.858	0.958	0.891
	$Q = 5$	0.963	0.873	0.992	0.897	0.922	0.859	0.960	0.892
	$Q = 6$	0.969	0.874	0.998	0.900	0.923	0.860	0.963	0.893
PC.VAR	$Q = 1$	0.968	0.870	0.986	0.892	0.929	0.858	0.968	0.893
	$Q = 2$	0.986	0.882	1.012	0.903	0.951	0.867	0.989	0.901
	$Q = 3$	1.010	0.894	1.036	0.913	0.971	0.877	1.013	0.911
	$Q = 4$	1.029	0.904	1.066	0.923	0.996	0.887	1.036	0.923
	$Q = 5$	1.061	0.914	1.103	0.936	1.024	0.899	1.066	0.937
	$Q = 6$	1.091	0.926	1.136	0.952	1.050	0.908	1.102	0.951
AR		0.974	0.876	1.017	0.929	0.936	0.864	1.003	0.930
MAR.FE		0.956	0.874	0.999	0.925	0.921	0.865	0.981	0.925
MAR.RE		0.956	0.871	0.999	0.922	0.920	0.860	0.981	0.923
MVAR.FE		0.958	0.871	0.986	0.896	0.918	0.860	0.957	0.893
MVAR.RE		0.975	0.875	0.997	0.899	0.921	0.858	0.964	0.893
VAR		1.105	0.927	1.128	0.952	1.058	0.913	1.110	0.949

Table 5: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with two components and effects are considered to be random.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	0.996	0.960	1.002	0.983	1.007	0.964	1.013	0.978
	$Q = 2$	0.896	0.881	0.923	0.931	0.928	0.886	0.957	0.905
	$Q = 3$	0.895	0.880	0.929	0.935	0.928	0.885	0.962	0.907
	$Q = 4$	0.895	0.880	0.939	0.946	0.928	0.885	0.977	0.926
	$Q = 5$	0.895	0.880	0.966	0.959	0.928	0.885	0.996	0.935
	$Q = 6$	0.895	0.880	1.015	0.994	0.928	0.883	1.029	0.979
PC.MAR.RE	$Q = 1$	0.967	0.918	0.982	0.957	0.968	0.918	0.986	0.945
	$Q = 2$	0.832	0.812	0.883	0.884	0.863	0.809	0.914	0.848
	$Q = 3$	0.832	0.812	0.891	0.893	0.865	0.810	0.921	0.850
	$Q = 4$	0.834	0.812	0.906	0.912	0.867	0.809	0.943	0.881
	$Q = 5$	0.832	0.811	0.941	0.928	0.866	0.809	0.969	0.891
	$Q = 6$	0.832	0.810	1.003	0.976	0.869	0.806	1.015	0.943
PC.MVAR.FE	$Q = 2$	0.883	0.868	0.912	0.921	0.912	0.868	0.947	0.894
	$Q = 3$	0.883	0.868	0.913	0.922	0.913	0.868	0.948	0.894
	$Q = 4$	0.884	0.869	0.914	0.922	0.913	0.868	0.948	0.895
	$Q = 5$	0.886	0.869	0.916	0.923	0.913	0.868	0.949	0.895
	$Q = 6$	0.887	0.870	0.917	0.923	0.914	0.868	0.949	0.895
PC.MVAR.RE	$Q = 2$	**0.767**	**0.739**	**0.832**	**0.830**	**0.799**	**0.724**	**0.860**	**0.792**
	$Q = 3$	0.770	0.741	0.837	0.833	0.800	0.725	0.863	0.793
	$Q = 4$	0.774	0.743	0.843	0.836	0.802	0.726	0.868	0.797
	$Q = 5$	0.778	0.745	0.853	0.839	0.804	0.726	0.875	0.799
	$Q = 6$	0.783	0.747	0.864	0.847	0.806	0.727	0.885	0.805
PC.VAR	$Q = 1$	0.969	0.918	0.983	0.957	0.969	0.918	0.987	0.945
	$Q = 2$	1.013	0.978	1.019	0.997	1.039	0.982	1.036	0.961
	$Q = 3$	1.039	0.988	1.045	1.009	1.061	0.994	1.061	0.973
	$Q = 4$	1.071	1.000	1.071	1.021	1.089	1.006	1.087	0.985
	$Q = 5$	1.109	1.015	1.104	1.034	1.119	1.019	1.118	0.999
	$Q = 6$	1.146	1.032	1.142	1.050	1.152	1.032	1.158	1.016
AR		0.844	0.813	0.918	0.909	0.877	0.808	0.943	0.870
MAR.FE		0.897	0.882	0.948	0.950	0.933	0.885	0.976	0.926
MAR.RE		0.843	0.813	0.913	0.909	0.873	0.808	0.938	0.869
MVAR.FE		0.887	0.870	0.917	0.923	0.914	0.868	0.949	0.895
MVAR.RE		0.785	0.748	0.857	0.841	0.807	0.728	0.875	0.799
VAR		0.862	0.776	0.938	0.876	0.896	0.761	0.977	0.838

Table 6: Simulation Results Study II. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with three components and effects are considered to be random.

		$N = 20$				$N = 60$			
	Number of	Noise Error 5%		Noise Error 50%		Noise Error 5%		Noise Error 50%	
Methods	Components	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$	$T = 50$	$T = 100$
PC.MAR.FE	$Q = 1$	1.012	0.967	1.010	0.974	1.024	0.952	1.024	0.971
	$Q = 2$	0.917	0.889	0.924	0.919	0.930	0.863	0.956	0.897
	$Q = 3$	0.885	0.854	0.898	0.901	0.903	0.827	0.934	0.869
	$Q = 4$	0.885	0.854	0.903	0.903	0.903	0.827	0.935	0.871
	$Q = 5$	0.885	0.854	0.909	0.909	0.903	0.827	0.942	0.871
	$Q = 6$	0.885	0.854	0.918	0.920	0.903	0.827	0.955	0.874
PC.MAR.RE	$Q = 1$	0.991	0.940	0.992	0.955	1.002	0.923	1.005	0.949
	$Q = 2$	0.879	0.838	0.890	0.875	0.890	0.811	0.920	0.855
	$Q = 3$	0.830	0.777	0.852	0.845	0.841	0.754	0.886	0.811
	$Q = 4$	0.830	0.777	0.860	0.848	0.841	0.754	0.888	0.813
	$Q = 5$	0.830	0.777	0.867	0.855	0.841	0.754	0.899	0.814
	$Q = 6$	0.830	0.777	0.879	0.872	0.841	0.754	0.917	0.817
PC.MVAR.FE	$Q = 2$	0.904	0.873	0.916	0.911	0.917	0.855	0.950	0.890
	$Q = 3$	0.860	0.823	0.873	0.875	0.877	0.804	0.918	0.851
	$Q = 4$	0.861	0.823	0.875	0.875	0.877	0.804	0.918	0.851
	$Q = 5$	0.862	0.824	0.876	0.876	0.878	0.804	0.918	0.851
	$Q = 6$	0.864	0.824	0.878	0.877	0.878	0.804	0.919	0.852
PC.MVAR.RE	$Q = 2$	0.825	0.772	0.858	0.836	0.833	0.758	0.886	0.814
	$Q = 3$	**0.690**	**0.622**	**0.762**	**0.736**	**0.699**	**0.608**	**0.788**	**0.699**
	$Q = 4$	0.694	0.623	0.768	0.738	0.701	**0.608**	0.790	0.700
	$Q = 5$	0.699	0.625	0.776	0.743	0.703	0.609	0.795	0.701
	$Q = 6$	0.704	0.627	0.783	0.749	0.705	0.610	0.801	0.703
PC.VAR	$Q = 1$	0.993	0.940	0.993	0.955	1.003	0.923	1.006	0.949
	$Q = 2$	1.021	1.008	0.969	0.975	1.040	0.927	1.010	0.941
	$Q = 3$	1.195	1.143	1.106	1.074	1.191	1.084	1.131	1.056
	$Q = 4$	1.225	1.157	1.142	1.085	1.220	1.098	1.156	1.070
	$Q = 5$	1.255	1.171	1.179	1.100	1.256	1.114	1.189	1.085
	$Q = 6$	1.289	1.186	1.222	1.119	1.292	1.130	1.228	1.103
AR		0.834	0.776	0.875	0.860	0.843	0.754	0.907	0.828
MAR.FE		0.887	0.855	0.916	0.915	0.904	0.829	0.949	0.887
MAR.RE		0.831	0.776	0.871	0.860	0.840	0.754	0.903	0.827
MVAR.FE		0.864	0.824	0.878	0.877	0.878	0.804	0.919	0.852
MVAR.RE		0.704	0.627	0.785	0.748	0.706	0.611	0.801	0.706
VAR		0.760	0.646	0.847	0.770	0.773	0.633	0.878	0.733

2 Study III: Simulation Results

Table 7: Simulation Results Part III. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with random effects, persons are clustered in groups with similar dynamics, and the differences between clusters are large.

Cluster		$N = 20$ and 2 Clusters			$N = 20$ and 4 Clusters			$N = 20$ and 4 Clusters			$N = 60$ and 4 Clusters		
Size	Method	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$
Equal	AR	1.237	1.226	1.212	1.233	1.220	1.207	1.213	1.223	1.224	1.242	1.211	1.206
	MAR.FE	1.254	1.270	1.279	1.253	1.274	1.270	1.225	1.273	1.293	1.265	1.252	1.285
	MAR.RE	1.206	1.213	1.205	1.204	1.206	1.200	1.187	1.211	1.218	1.207	1.196	1.200
	MVAR.FE	1.218	1.222	1.222	1.211	1.232	1.231	1.203	1.243	1.260	1.244	1.225	1.265
	MVAR.RE	**1.089**	**1.046**	**1.018**	**1.065**	**1.043**	**1.023**	**1.076**	**1.050**	**1.031**	**1.069**	**1.041**	**1.021**
	VAR	1.161	1.068	1.025	1.140	1.068	1.033	1.136	1.068	1.038	1.149	1.067	1.030
Minority	AR	1.226	1.199	1.205	1.240	1.213	1.209	1.241	1.235	1.207	1.246	1.224	1.207
	MAR.FE	1.240	1.246	1.282	1.246	1.256	1.267	1.264	1.302	1.270	1.273	1.286	1.299
	MAR.RE	1.196	1.187	1.199	1.209	1.199	1.202	1.211	1.224	1.200	1.217	1.211	1.200
	MVAR.FE	1.181	1.169	1.193	1.177	1.193	1.199	1.238	1.266	1.236	1.249	1.250	1.265
	MVAR.RE	**1.080**	**1.034**	**1.019**	**1.067**	**1.044**	**1.018**	**1.089**	**1.053**	**1.026**	**1.074**	**1.041**	**1.021**
	VAR	1.148	1.055	1.027	1.150	1.071	1.028	1.151	1.074	1.033	1.146	1.064	1.030
Majority	AR	1.236	1.217	1.201	1.227	1.216	1.208	1.254	1.214	1.203	1.246	1.213	1.217
	MAR.FE	1.260	1.252	1.250	1.236	1.265	1.289	1.266	1.271	1.259	1.255	1.267	1.295
	MAR.RE	1.208	1.205	1.194	1.194	1.201	1.201	1.223	1.201	1.198	1.213	1.198	1.210
	MVAR.FE	1.210	1.210	1.196	1.196	1.212	1.235	1.227	1.232	1.218	1.219	1.231	1.260
	MVAR.RE	**1.073**	**1.049**	**1.021**	**1.066**	**1.040**	**1.023**	**1.089**	**1.050**	**1.020**	**1.075**	**1.040**	**1.023**
	VAR	1.136	1.070	1.029	1.144	1.066	1.032	1.159	1.070	1.028	1.153	1.065	1.032

Table 8: Simulation Results Part III. The prediction error estimates across simulation conditions when the data generation model is a multilevel VAR(1) model with fixed effects, persons are clustered in groups with similar dynamics, and the differences between clusters are large.

Cluster		$N = 20$ and 2 Clusters			$N = 60$ and 2 Clusters			$N = 20$ and 4 Clusters			$N = 60$ and 4 Clusters		
Size	Method	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$
Equal	AR	1.111	1.075	1.074	1.108	1.085	1.076	1.130	1.097	1.077	1.101	1.091	1.077
	MAR.FE	1.071	1.063	1.072	1.069	1.071	1.078	1.094	1.086	1.083	1.070	1.084	1.081
	MAR.RE	1.070	1.056	1.066	1.067	1.065	1.068	1.090	1.078	1.070	1.063	1.074	1.069
	MVAR.FE	1.033	1.029	1.043	1.038	1.040	1.044	1.084	1.071	1.066	1.051	1.064	1.065
	MVAR.RE	**1.023**	**1.009**	**1.006**	**1.015**	**1.007**	**1.004**	**1.058**	**1.031**	**1.009**	**1.020**	**1.023**	**1.012**
	VAR	1.143	1.057	1.029	1.141	1.062	1.028	1.164	1.072	1.025	1.130	1.066	1.029
Minority	AR	1.125	1.091	1.077	1.118	1.092	1.082	1.110	1.094	1.077	1.129	1.083	1.081
	MAR.FE	1.077	1.072	1.068	1.071	1.074	1.075	1.078	1.084	1.081	1.095	1.073	1.084
	MAR.RE	1.078	1.071	1.067	1.071	1.072	1.073	1.074	1.077	1.071	1.090	1.066	1.073
	MVAR.FE	**1.023**	1.021	1.020	1.023	1.027	1.020	1.065	1.067	1.063	1.076	1.053	1.066
	MVAR.RE	1.028	**1.020**	**1.009**	**1.018**	**1.017**	**1.008**	**1.042**	**1.031**	**1.013**	**1.048**	**1.016**	**1.015**
	VAR	1.152	1.071	1.032	1.149	1.072	1.033	1.139	1.072	1.028	1.158	1.059	1.033
Majority	AR	1.116	1.084	1.082	1.115	1.090	1.081	1.112	1.098	1.095	1.120	1.092	1.078
	MAR.FE	1.080	1.072	1.080	1.077	1.077	1.081	1.076	1.088	1.098	1.086	1.085	1.077
	MAR.RE	1.077	1.067	1.073	1.073	1.072	1.072	1.072	1.081	1.087	1.081	1.075	1.070
	MVAR.FE	1.039	1.036	1.048	1.043	1.046	1.044	1.058	1.056	1.059	1.051	1.053	1.050
	MVAR.RE	**1.029**	**1.017**	**1.011**	**1.019**	**1.015**	**1.006**	**1.043**	**1.027**	**1.018**	**1.028**	**1.022**	**1.012**
	VAR	1.146	1.065	1.032	1.146	1.068	1.030	1.151	1.067	1.034	1.140	1.068	1.031

Table 9: Simulation Results Study III. The estimation accuracy (standard errors) in percentage across simulation conditions when $P = 4$, $N = 60$ and persons are equally distributed across clusters.

Population		2 Clusters						4 Clusters					
		Small Differences			Large Differences			Small Differences			Large Differences		
Model	Method	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$	$T = 50$	$T = 100$	$T = 200$
MVAR.FE	AR	1.331	1.125	1.086	1.819	1.469	1.474	1.388	1.140	0.984	1.771	1.567	1.475
		(0.032)	(0.046)	(0.019)	(0.056)	(0.074)	(0.051)	(0.035)	(0.026)	(0.023)	(0.041)	(0.042)	(0.062)
	MAR.FE	1.088	1.162	1.168	1.523	1.426	1.537	1.210	1.226	1.115	1.566	1.617	1.639
		(0.056)	(0.039)	(0.047)	(0.075)	(0.075)	(0.053)	(0.032)	(0.030)	(0.042)	(0.053)	(0.050)	(0.064)
	MAR.RE	1.023	1.018	1.044	1.472	1.330	1.416	1.116	1.051	0.951	1.468	1.472	1.447
		(0.039)	(0.045)	(0.026)	(0.066)	(0.070)	(0.049)	(0.022)	(0.024)	(0.027)	(0.047)	(0.039)	(0.062)
	MVAR.FE	0.620	0.684	0.691	0.772	0.706	0.926	0.876	0.974	0.906	1.301	1.317	1.335
		(0.042)	(0.070)	(0.044)	(0.058)	(0.067)	(0.081)	(0.035)	(0.042)	(0.043)	(0.055)	(0.065)	(0.083)
	MVAR.RE	**0.325**	**0.185**	**0.104**	**0.360**	**0.191**	**0.102**	**0.524**	**0.379**	**0.217**	**0.620**	**0.394**	**0.225**
		(0.012)	(0.010)	(0.004)	(0.015)	(0.010)	(0.003)	(0.019)	(0.014)	(0.006)	(0.021)	(0.013)	(0.007)
	VAR	2.317	0.989	0.455	2.255	0.971	0.449	2.277	1.022	0.488	2.281	0.969	0.441
		(0.041)	(0.020)	(0.013)	(0.026)	(0.014)	(0.008)	(0.041)	(0.022)	(0.008)	(0.030)	(0.013)	(0.006)
MVAR.RE	AR	3.286	3.118	3.223	3.652	3.531	3.394	3.391	3.161	3.221	3.705	3.530	3.534
		(0.067)	(0.084)	(0.059)	(0.070)	(0.074)	(0.043)	(0.083)	(0.048)	(0.058)	(0.082)	(0.080)	(0.073)
	MAR.FE	3.916	4.048	4.502	4.463	4.287	4.285	4.134	4.194	4.321	4.311	4.613	4.634
		(0.112)	(0.108)	(0.225)	(0.113)	(0.110)	(0.075)	(0.113)	(0.171)	(0.164)	(0.100)	(0.195)	(0.141)
	MAR.RE	3.215	3.150	3.251	3.612	3.540	3.402	3.357	3.181	3.239	3.627	3.537	3.553
		(0.074)	(0.095)	(0.060)	(0.076)	(0.080)	(0.044)	(0.084)	(0.050)	(0.059)	(0.082)	(0.085)	(0.075)
	MVAR.FE	3.419	3.477	3.931	3.721	3.549	3.538	3.806	3.841	3.949	3.983	4.286	4.361
		(0.133)	(0.080)	(0.193)	(0.130)	(0.088)	(0.063)	(0.083)	(0.141)	(0.136)	(0.100)	(0.175)	(0.139)
	MVAR.RE	**1.122**	**0.640**	**0.345**	**1.122**	**0.636**	**0.362**	**1.157**	**0.658**	**0.365**	**1.166**	**0.632**	**0.366**
		(0.018)	(0.009)	(0.006)	(0.021)	(0.010)	(0.007)	(0.023)	(0.017)	(0.006)	(0.016)	(0.012)	(0.005)
	VAR	2.076	0.900	0.408	2.069	0.859	0.419	1.987	0.892	0.419	1.977	0.859	0.431
		(0.048)	(0.017)	(0.009)	(0.019)	(0.017)	(0.008)	(0.033)	(0.020)	(0.006)	(0.033)	(0.016)	(0.007)