PCR and Measurement Error

Isaac Liu

May 12, 2021

Application: Government Share of Healthcare Spending and Life Expectancy

In the left column in the table below I first regress the life expectancy at birth for all individuals in a given country and year on a measure of government spending as a share of total health expenditure. In the middle column I include the economic controls/covariates of GDP per capita (PPP), GNI per capita (PPP), Survey Mean Income/Consumption Per Capita, ILO GDP per person employed, and Net Foreign Assets Per Capita, all from the World Bank. In the rightmost column I instead use the first principal component combining these covariates.

I standardize all variables by subtracting the mean and dividing by the standard deviation, linearly interpolate data between known observations, and remove country-years with missing values for any of the economic indicators.

	Life Expectancy at Birth (Years)			
	(1)	(2)	(3)	(4)
Government Share of Health Expenditure	0.552***	0.304***	0.022***	0.315***
	(0.019)	(0.018)	(0.007)	(0.018)
GDP Per Capita PPP		-0.511***	-0.038	
		(0.064)	(0.034)	
GNP Per Capita PPP		0.700***	0.006	
		(0.061)	(0.013)	
Survey Income/Consumption Per Capita		0.012	-0.003	
		(0.016)	(0.002)	
GDP Per Employed Person		0.332***	-0.040	
		(0.033)	(0.045)	
PC1				0.293***
				(0.011)
Fixed Effects	No	No	Yes	No
Observations	1,965	1,965	1,965	1,965
R^2	0.305	0.519	0.987	0.489
Adjusted R^2	0.304	0.518	0.985	0.489
Residual Std. Error	0.834	0.695	0.121	0.715
F Statistic	860.658***	422.624***	922.311***	940.989***

Note: *p<0.1; **p<0.05; ***p<0.01

All variables are standardized.

Appendix

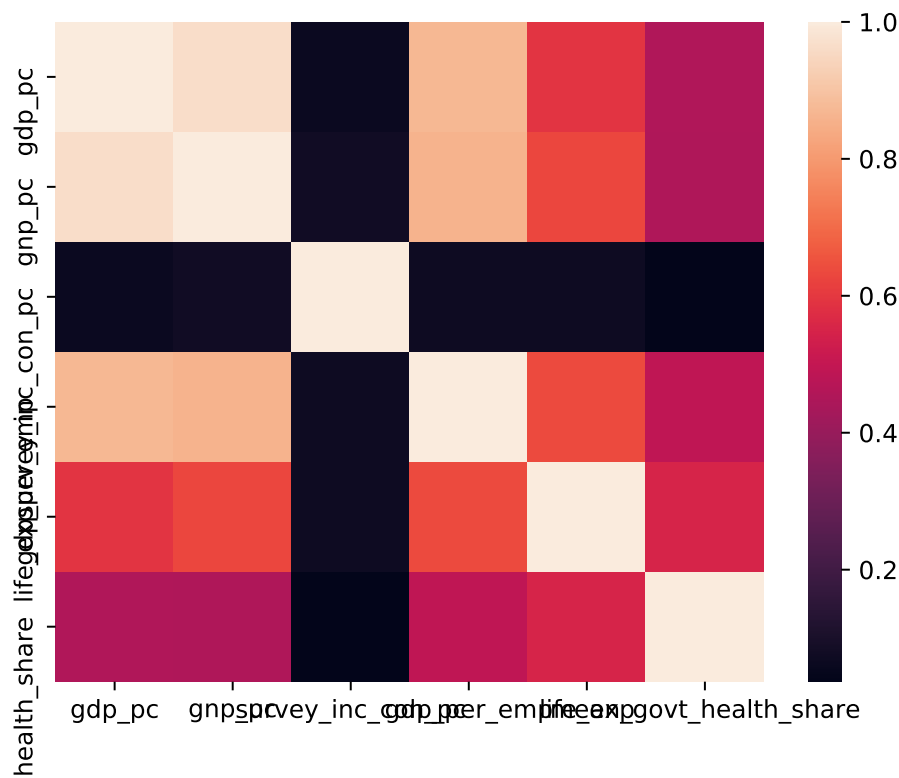Figure 1: Correlations Between Covariates and Life Expectancy
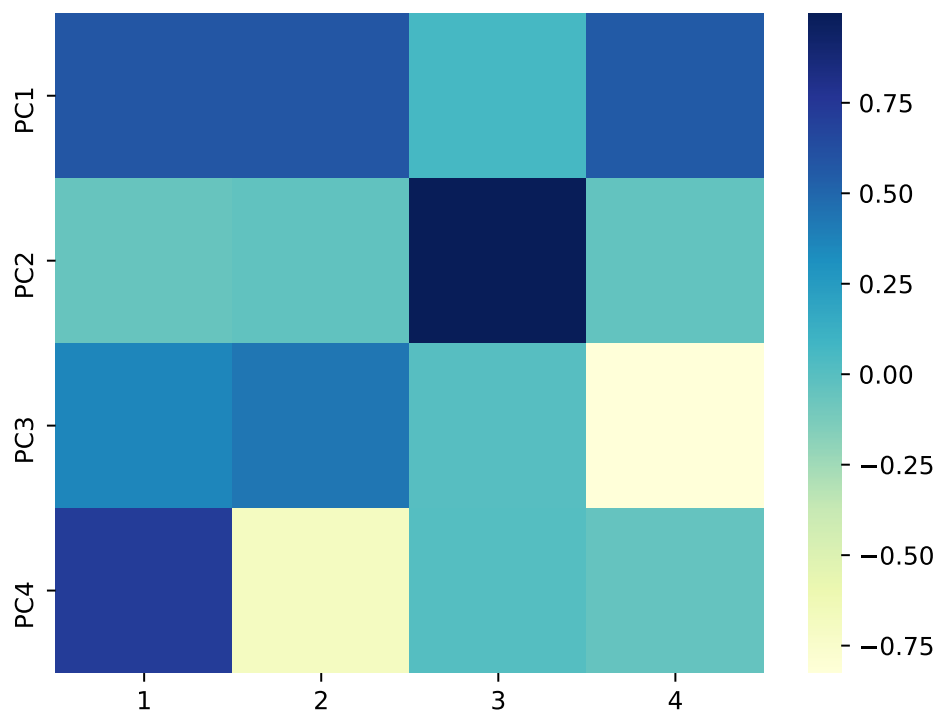
Figure 2: Economic Measures PCA Loadings

Figure 3: Economic Measures PCA Share of Variance Explained

Cumulative explained variance
3 Principal Components explain [95.0%] of the variance.