

PCR and Measurement Error

Isaac Liu

May 10, 2021

Application: GDP 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 the World Bank's PPP adjusted GDP per capita. In the right column I regress the same life expectancy measure on the first principal component combining 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.

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.

	<i>Life Expectancy at Birth (Years)</i>	
	(1)	(2)
PC1		0.225*** (0.005)
GDP Per Capita, PPP	0.321*** (0.009)	
Observations	11,708	11,708
R^2	0.103	0.152
Adjusted R^2	0.103	0.152
Residual Std. Error	0.947	0.921
F Statistic	1346.994***	2091.763***
<i>Note:</i> *p<0.1; **p<0.05; ***p<0.01 All variables are standardized.		

Though the coefficients are not readily interpretable, they do differ from each other

ADD TEST to show coefficients differ? I think this also would not be easy to interpret since the independent variables are different...

In both cases, they are significant.

Notably, we demonstrate a higher R^2 using the principal component model.

Appendix

Figure 1: Correlations Between Economic Measures and Life Expectancy

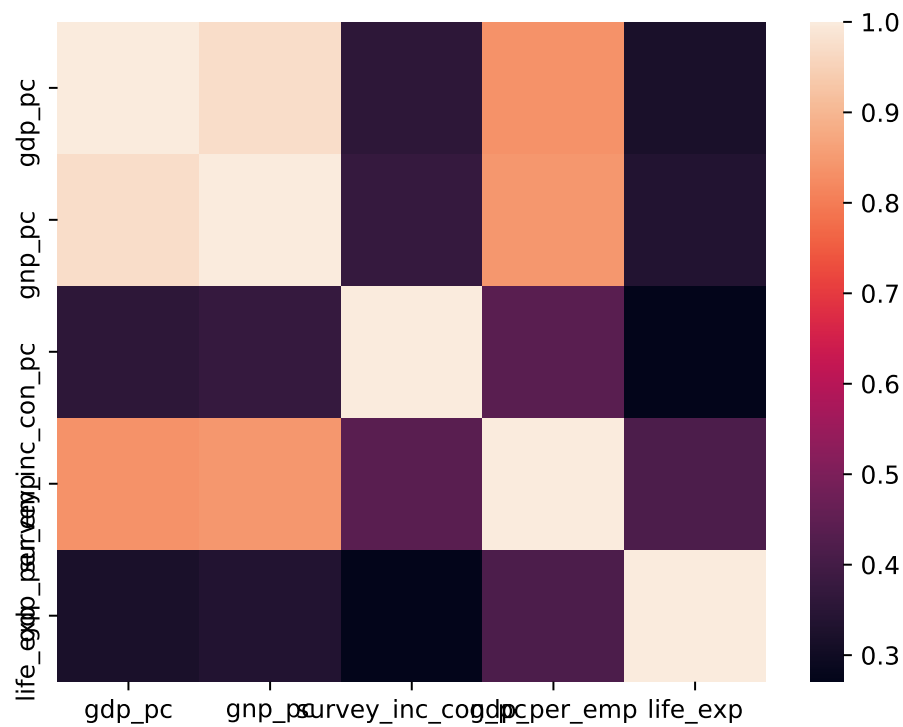


Figure 2: Economic Measures PCA Loadings

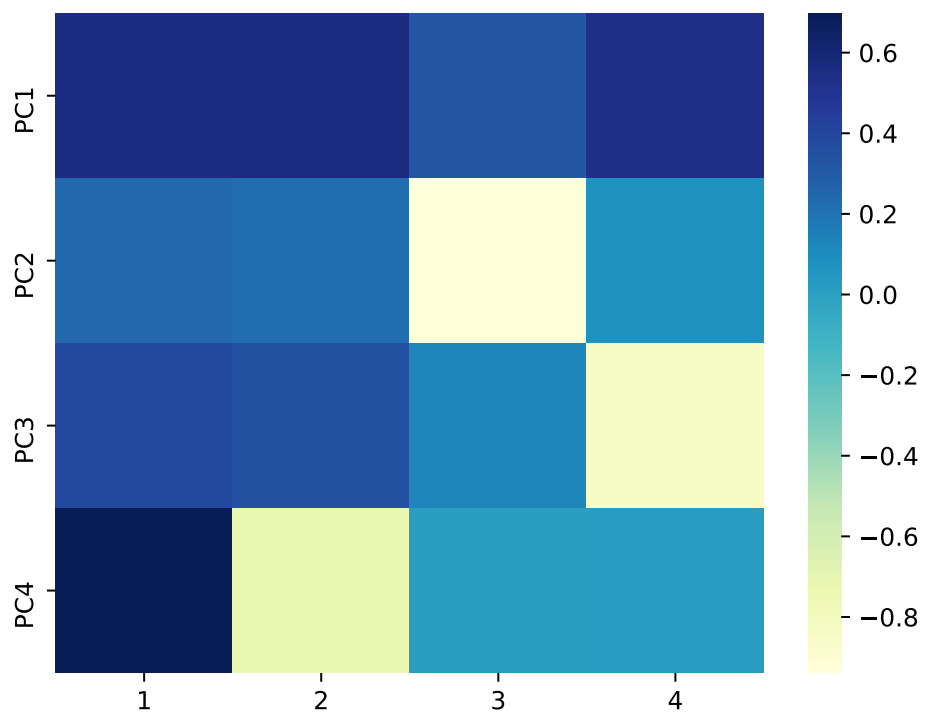


Figure 3: Economic Measures PCA Share of Variance Explained

