A Simple, Consistent, and More Accurate Measurement and Model of China's GDP Growth – 2022 Update

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In 2021, we published a simple, consistent, and alternative measurement of China's real GDP growth. Unlike typical national GDP accounting, which computes hundreds of GDP components, our simple model used only three variables: (1) energy consumption (*econog*), (2) CO2 emissions (*co2g*), and (3) international merchandise trade amount (*eximg*).

All three input variables are statistically significant predictors for the real GDP growth rates during the period of 2001 to 2019 for the 14 largest economies in the world: Australia, Brazil, Canada, France, Germany, India, Italy, Japan, Mexico, Russia, South Korea, Spain, U.K., and US including developed, emerging, and developing countries. We suggest these input growths will be a good predictor of China's GDP growth as well.

Given growing concerns of deflating China's real estate bubble, we test whether a housing market indicator is a significant predictor of GDP growth of a country. We find the evidence that a simple variable—nominal housing price growth[1] (*hpg*) is a significant predictor. With home price growth variable, we could capture financial service related activities not included with other three variables.

- The estimation of our four-variable pooling OLS model is as follows (R-squared=0.72):

Equation 11

RGDP =	1.36	+	0.47	* ECONG +	0.12	* CO2G +	0.05	* EXIMG +	0.09	*HPG
(t-stat = 9)			(7.4)		(2.4)		(4.6)		(5.6)	

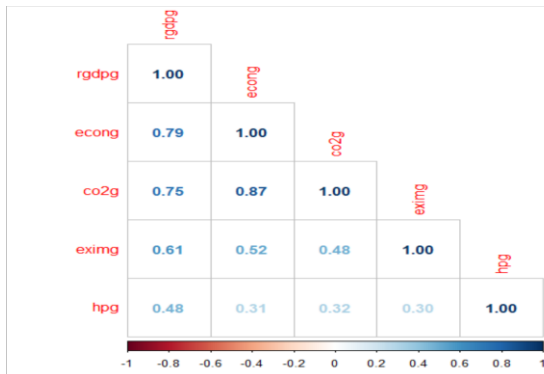- Compared to our original three-variable pooling OLS model as follows (R-squared=0.69):

Equation 12

| RGDP =	1.60	+	0.40	* ECONG +	0.16	* CO2G +	0.06	* EXIMG
(t-stat = 14)			(6.5)		(3.5)		(6.7)	

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[1] Data source is from the residential property prices in Bank for International Settlements.

- A simple correlation between all the variables in the model:

	rgdpg	econg	co2g	eximg	hpg
rgdpg	1.00				
econg	0.79	1.00			
co2g	0.75	0.87	1.00		
eximg	0.61	0.52	0.48	1.00	
hpg	0.48	0.31	0.32	0.30	1.00

China's economic growth is slowing down according to China's National Bureau of Statistics. GDP growth in Q2 2022 measured from the previous year was 0.4%, down from 4.8% in Q1 2022. For the combined first six months of 2022, GDP grew 2.5% from the first half of 2021. The UCLA Anderson Forecast developed an alternative model to estimate China's GDP growth. The latest model incorporates home price growth to capture the financial services sector's contribution to GDP. Using the updated model (Equation 11), China's GDP growth rate for the first half of 2022 is estimated to be 0.7%, considerably lower than the official Chinese estimate (Figure 4). The lower growth rate in our estimate was driven by declines in primary energy consumption, -1%, CO_2 emissions, -4.1%, and home prices, -2%.

Official Estimates and Anderson Forecast Estimates of China's Real GDP Growth Rates
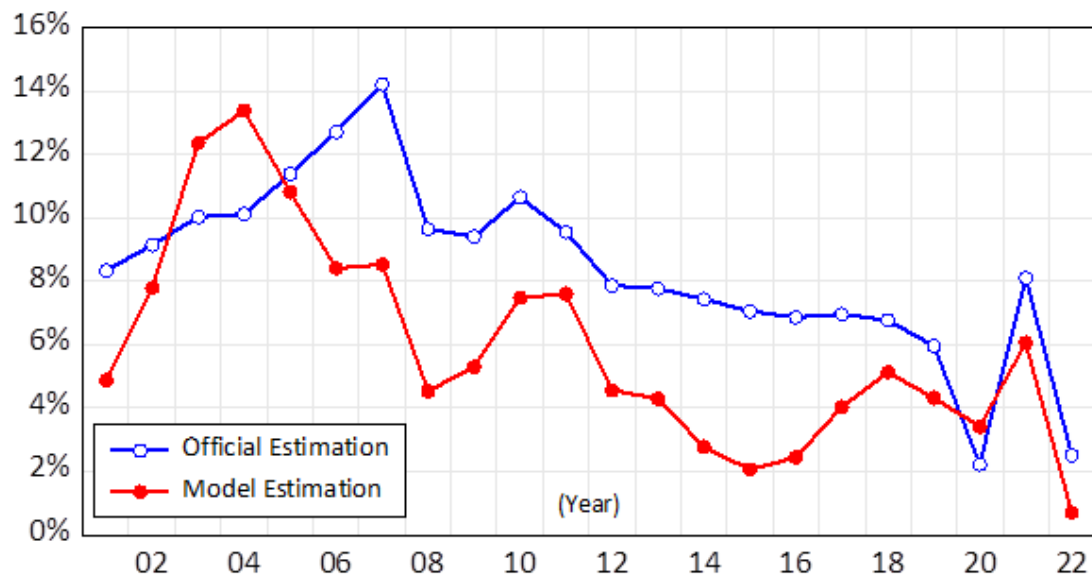
Sources: CEIC and The UCLA Anderson Forecast