Data Insight

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Real Gross Domestic Income for Saudi Arabia: A Measure of National Income

A country's national income is defined as the total market value of its output. The most used measure for national income is gross domestic product (GDP). One way to estimate GDP for a country is to sum its government consumption, private consumption, investment, and exports minus its imports. The components of GDP are deflated using a base year to control for inflation (or deflation) over time. While this adjustment effectively controls for changing prices, it may not properly reflect the purchasing power availed or taken away by volatile oil prices for oil-dependent economies.

To remedy this, real gross domestic income (GDI) is calculated to capture changes in the purchasing power of an economy due to changes in import and export prices. Real GDI is defined to be real GDP plus a terms of trade adjustment (IMF 2020). The adjustment captures the changing relationship between import and export prices. Generally, real GDI and real GDP are equivalents (Bureau of Economic Analysis 2017). However, the International Monetary Fund (IMF) (2003) and Pierru and Matar (2014) show that real GDI diverges from real GDP for oil-dependent economies. They assess Saudi Arabia's real GDI until 2010 and highlight that some macroeconomic indicators, like consumption, are more closely associated with it than with the country's real GDP.

When export prices rise faster than import prices, the terms of trade improve, leading to a boost in income. When import prices rise faster, the terms of trade deteriorate. According to the IMF (2003), the calculation of real GDI subtracts real net exports from real GDP and adds real net exports deflated by a single price index. This is shown by Equation 1. For a country that depends on export revenues from a few goods and primarily imports, that price index may represent the basket of imported goods.

$$Real\ GDI_t = \left[Real\ GDP - \left(\frac{X}{P_x} - \frac{M}{P_m}\right) + \left(\frac{X-M}{P}\right)\right]_t \tag{1}$$

Where,

t = time increments, typically quarters of a year or years

X = nominal value of exports in t

M = nominal value of imports in t

P_x = the average export price deflator

P_m = the average import price deflator

$\left(\dfrac{X}{P_x} - \dfrac{M}{P_m}\right)$ = the real net exports component of real GDP

P = a deflator that represents final expenditures on consumption

This Data Insight presents the estimated real GDI for Saudi Arabia. The Saudi real GDI series is constructed for a time increment of one year (Figure 1). It starts in 1986, due to that being the initial year of the peg between the Saudi riyal and United States dollar, and goes through 2019. Saudi real GDP, as presented by SAMA (2020), is computed using constant 2010 prices. Hence, it only varies in quantity, meaning that it does not capture the volatility of average annual oil prices and their effect on the Saudi economy. On the other hand, Saudi real GDI is better correlated with the real oil price than is its real GDP. As Figure 1 shows, periods of high or low oil prices are properly reflected in real GDI.

Real GDP, X, M, P_x, and P_m are gathered from the Saudi Arabian Monetary Authority (SAMA) (2020). The data for P_x and P_m from SAMA (2020) only go back to the year 2000, so we opted to estimate P_x and P_m for the years before 2000 using data from CEIC (2020) that runs from 1986 to 2013. CEIC (2020) acquired these data from past releases from Saudi Arabia's General Authority for Statistics. We then rebased the data for P_x and P_m from CEIC (2020), and combined the rebased values for the years between 1986 and 2000 with the post-2000 data for P_x and P_m from SAMA (2020). This produced a data series for P_x and P_m that covers the full period between 1986 and 2019.

Following the IMF (2003), a consumer price index (CPI) is usually used as a proxy for P. Since Saudi Arabia imports most of its machinery, clothes, electronic devices, and other consumer goods, and that goods are imported from many regions, the nominal net exports are instead deflated by a world-averaged CPI. We estimate the world CPI using the raw inflation data from the World Bank (2020).

Figure 1. Saudi real GDI, Saudi real GDP, and the real Arab Light price from 1986 to 2019.
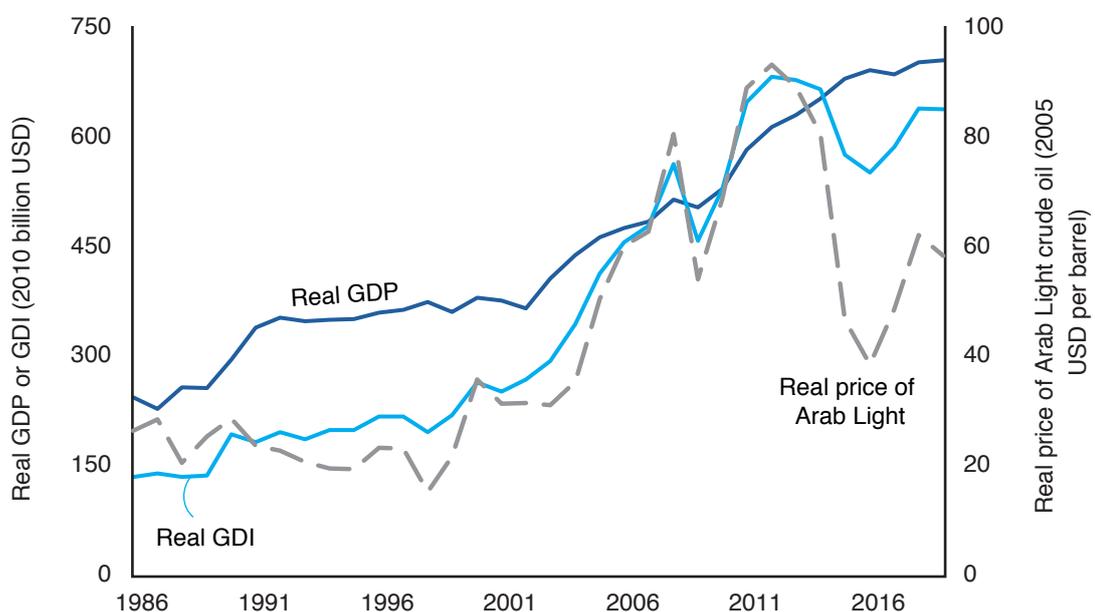
Sources: KAPSARC estimations for real GDI using GDP data from SAMA (2020) and global inflation data from the World Bank (2020).

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The real GDI data series from 1986 is available at: Real Gross Domestic Income (RGDI) for Saudi Arabia

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