

The Mismatch between Household Surveys and National Accounts Consumption Data

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Adam Smith's famous quote that "consumption is the sole and end purpose of all production" underlines the importance of studying consumption. At the aggregate level, consumption is composed of consumer, firm and government spending on land, goods and services and net demand for domestic commodities by foreigners. Given its political nature, government spending is often treated as given in aggregate analysis. That leaves three major components of consumption: household consumption, investment and net exports. The objective of this brief note is to investigate the soundness of household consumption data in Pakistan which accounts for 70 percent of share in nominal GDP in 2010.

It is a worthwhile exercise for several reasons. First, officially the consumption series (C) for Pakistan is not gathered independently but derived from the net of output (Y) and the expenditure items including investment (I), government consumption (G), and net exports (NX) from the aggregate resource identity $C = Y - I - G - NX$ (Baqai 1965). This feature alone invites concerns regarding the robustness of the aggregate consumption series. Second, the series plays a crucial role in the evaluation of aggregate activity, business cycles, growth and poverty.

Take the example of poverty. Researchers forecast poverty measures by taking the projected values from private consumption expenditure data and impose this, as an assumption, on mean growth rates for household survey data. The main reason for this assumption is that the frequency of survey data collection is at a much lower frequency than required for time series analysis. Similarly, the fit of business cycle models to match empirical moments heavily rely on 'neat' aggregate series. For such reasons it is important to assess the goodness of consumption data.

One method to verify the robustness of aggregate consumption series is to reconcile it with household survey data sets – a method used in Ravallion (2003). Household data sets are independently collected by statistical agencies and fortunately there exists for Pakistan irregular historical household survey data

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during the period of 1984-2008. In total, we have available 13 most recent waves of household survey which we map with corresponding national accounts data.

Our main finding is that the relation between the aggregate and household real consumption per capita data sets for the period of 1984-2008 is systematically upward biased in levels and growth terms. Moreover, the extent of these mismatches has recently worsened. The paper is organized as follows, section 2 discusses data and methodology, section 3 presents the results and the final section concludes.

2. Data and methodology

We use two simple empirical models following Ravallion (2003) to find out the extent to which private consumption from national accounts explains the average household consumption expenditure from survey data.

The first model runs the growth in real consumption per capita at time t obtained from household surveys, $\Delta c_{S,t}$ on the same variable at t but from national accounts data $\Delta c_{N,t}$ where the lower case $c = C/L$ is short form for real consumption per capita:

$$\Delta c_{S,t} = \alpha + \beta \Delta c_{N,t} + \xi \quad (1)$$

In (1) when $\alpha = 0$ and $\beta = 1$ the consumption growth as per national accounts is unbiased estimate of the same in survey data where residual is assumed to have zero mean.

We extend this model by controlling for business cycles using interacting dummies as follows:

$$\Delta c_{S,t} = \alpha + ((1 - D)\beta_d + D\beta_u)\Delta c_{N,t} + \xi \quad (2)$$

$$D = 1 \forall \Delta c_{N,t} > 0$$

Where β_d and β_u are the slopes when per capita consumption is falling and rising respectively. In the case of Pakistan we have small number of data points which affects the reliability of results.

The annual data on per capita private consumption is limited to 1984-2008. The survey data is obtained from multiple waves of Household Income and Expenditure Surveys (HIES) from Federal Bureau of Statistics and the aggregate

data comes from International Financial Statistics. The conversion into real value is done through a common deflator from national accounts.

3. Results

First, we briefly present levels analysis by considering the ratio of two per capita consumption data sets.

The mean over time of the ratios of $c_{S,t}/c_{N,t}$ is 0.63 (with t-stat -15.28 and s.e. 0.09). This implies that on average per capita consumption data from surveys is overstated in national accounts by the order of 37 percent. This ratio lies in the range 0.51 to 0.76. Figure 1 presents a mapping of real per capita consumption from the two data sources against the ideal scenario which would be the 45 degree line. The mapping from the two sources of data set persistently lies above the 45-degree line. Moreover, we also observe in Figure 1 that with the passage of time the mapping moves vertically from the 45-degree line. This indicates that data mapping is worsening with time. The same is observed in ratio terms in Figure 2 where the latest ratio of real consumption per capita data appears to be moving away from unity and hence worsening. This is bad news as one would expect the levels and growth data to converge over time as data collection technology improves. Likewise tendency is indirectly observed in Ahmad and Asad (2011) for their analysis of growth and consumption inequality.

Second, we turn to the growth analysis. The results of regressions of (1) and (2) are reported in the Table 1 below.

Table 1. Dependent variable: $\Delta c_{S,t}$

	Coeff	S.E.	t-stat	P-value
Eq. (1)				
α	-0.47	1.97	-0.24	0.82
β	0.52	0.26	1.98	0.08
Eq. (2)				
α	-0.21	3.66	-0.06	0.96
β_d	0.63	1.35	0.47	0.65
β_u	0.50	0.41	1.20	0.26

For (1) we find that the intercept is zero but slope is significantly different from 1 (t-statistic=1.82) implying that on average two growth rates are unequal. Because we only have 12 data points we also discuss first two moments: the average of $\Delta c_{S,t}$ is 1.12 and the standard deviation is 6.91 and the same statistics for $\Delta c_{N,t}$ are 3.03 and 7.02 respectively. It clearly shows that means are different but standard

deviations are almost the same. In Figure 3 we plot the growth rates in real consumption per capita from the two sources of data. Only half of the variation in $\Delta c_{N,t}$ is revealed in $\Delta c_{S,t}$ according to the regression of (1).

The results for (2) which control for business cycles movements indicate that one can reject the null hypothesis that the growth rate in consumption from national accounts is unbiased for expansions and contractions. These findings are in contrast from Ravallion (2003) who does not reject the null for expansions at least.

4. Conclusion

We establish a mismatch between survey and national accounts data for real consumption per capita in level and growth terms. For this result to hold it is important to assume that national survey data and aggregate accounts on household consumption are equivalent. A key caveat for our results is that we only have access to 12 data points mainly due to paucity of national survey data available in Pakistan – a problem other developing countries also face. These results, if taken seriously, cast doubt on the usefulness of consumption data for macroeconomic forecasting, growth and business cycle research.

References

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Figure 1. Mapping against the 45-degree line

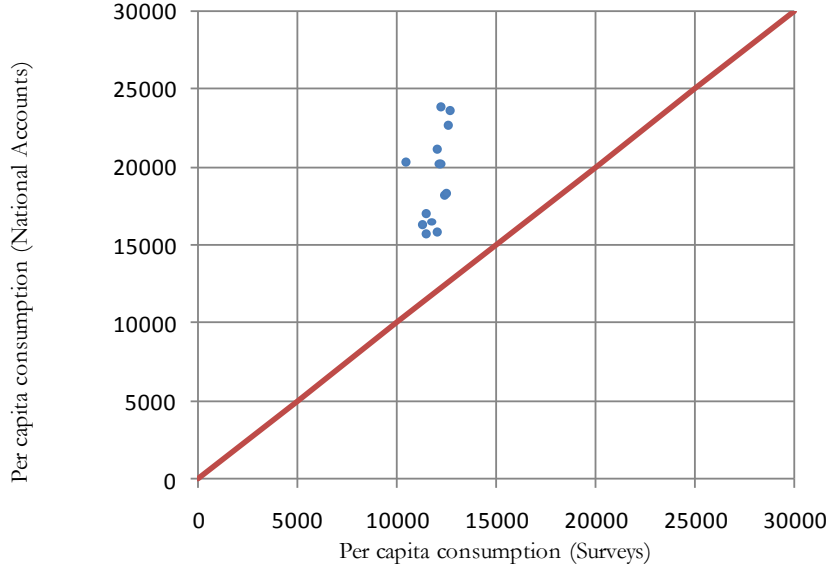


Figure 2. The ratio of per capita consumption from Surveys and National Accounts

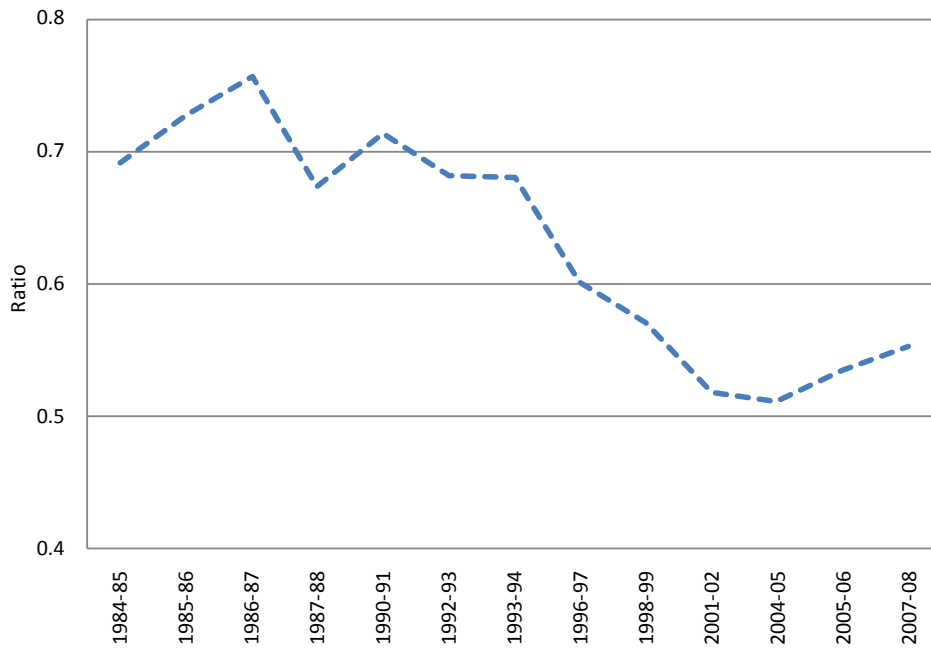


Figure 3. Growth in per capita Consumption from Two Sources