Economic Growth in Turkey:  
A Note

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June 22, 2013

This note presents some figures and a very brief discussion of the economic growth experience of the Turkish economy after 2002. This is the year at which the rule of the Justice and Development Party (AKP) begins. The AKP rule is currently in its third successive term.

The issue at hand has very recently gained popularity after The Economist published the following correction regarding the growth of GDP per person in Turkey for its June 8th piece:

This article originally said that Turkey’s GDP per person had tripled in the past ten years. This was true only in nominal terms. In real terms, GDP per person has risen by just 43%. Sorry. This was corrected on June 14th 2013.

This simple correction—which is just about the distinction between the real and the nominal value—would not lead to a debate between the AKP government’s Minister of Finance Mehmet Şimşek and Professor Dani Rodrik of the Institute for Advanced Study if Mehmet Şimşek did not argue for GDP comparisons being made in terms of current US dollars. The following remark by Professor Dani Rodrik is illuminating:

2. See Professor Aykut Kibritçioğlu’s excellent summary of the debate with web-based references at http://goo.gl/Vjp1Z.  
3. See http://goo.gl/2AU1b for his entire post titled “How well did the Turkish economy do over the last decade?”
The Turkish government likes to claim that the GDP expanded by more than three-fold between 2002 and 2012. This is a misleading number, as it is based on the dollar valuation of Turkish GDP at current prices, and hence lumps both dollar inflation and the real appreciation of the Turkish lira on top of real growth. Calculated properly, real GDP (or GDP at constant prices) rose by 64 percent during 2002-2012, and real GDP per capita by 43 percent.

As every serious student of economic growth knows by heart, when it comes to associate the growth of GDP per capita to the rise of average material welfare in a country, what really matters is the growth of purchasing power parity (PPP) converted GDP per capita in constant international currency units.

The Question

The question to be asked here is thus whether there exists an upward trend break in the long-run time series of PPP converted GDP per capita in constant international dollars at around the year 2002. If such a break exists, then one can seriously approach the issue from the perspective of what the AKP governments since 2002 really achieved to create such an upward deviation in the rate of economic growth. Yet, if there does not exist such a break in the trend, this means that the AKP governments could not be able to move the Turkish economy to a new path of development with a higher growth rate.

Answering this question requires the estimation of some univariate time-series models and the execution of some structural break tests. Surely, such an important and popularized question deserves to be handled in great seriousness and such state-of-the-art techniques. However, I restrict the scope of this note by the estimation of the pre-2002 growth trends and leave a rigorous analysis of the issue for future research.

The Long-Run Growth Trend

Let time, denoted by $t$, be discrete and start from some initial period $t = 0$. Denote by $y_t$ the level of PPP converted GDP per capita in constant international dollars. Suppose that the stochastic growth process for $y_t$ satisfies

$$y_t = Ae^{\mu t}e^{-(1/2)\sigma^2} \epsilon_t$$

where $A > 0$ is some arbitrary constant, $\mu > 0$ is the constant rate of trend growth in $y_t$, and $\ln(\epsilon_t)$ is a normally distributed random variable with mean 0 and variance.
Table 1: The Data Sources for PPP converted GDP per capita in Turkey

<table>
<thead>
<tr>
<th>Source</th>
<th>Coverage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angus Maddison</td>
<td>1923-2008</td>
<td>Annual</td>
</tr>
<tr>
<td>PENN World Tables</td>
<td>1950-2010</td>
<td>Annual</td>
</tr>
<tr>
<td>The World Bank</td>
<td>1980-2011</td>
<td>Annual</td>
</tr>
</tbody>
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$\sigma^2 > 0.4$ Taking the natural logarithm of both sides yields

$$\ln(y_t) = \ln(Ae^{-\frac{1}{2}\sigma^2}}) + \mu t + \ln(\epsilon_t)$$

where an estimate of $\mu$ can be obtained via Ordinary Least Squares estimation.\(^5\)

The Data

I exploit three different time series for PPP converted GDP per capita to estimate the growth rate $\mu$; see Table 1.

- The first estimation uses Angus Maddison’s annual data in 1990 Geary-Khamis international dollars to estimate $\mu$ for the period 1923-2002.\(^6\)
- The second estimation uses the annual data from the PENN World Table Version 7.1 in 2005 constant prices as a chained series to estimate $\mu$ for the period 1950-2002.\(^7\)
- The third estimation uses the annual data from the World Bank in 2005 international dollars to estimate $\mu$ for the period 1980-2002.\(^8\)

A Picture is Worth a Thousand Words

I actually have three figures—each for one of the estimations described above. Below, I first present each figure and give some very brief information on the associated estimation. I discuss the implications of these estimations—which, not surprisingly, show extensive overlap—in the concluding section.

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4. This is the setup formulated for the aggregate consumption by Professor Robert Lucas in his 2003 presidential address to the American Economic Association. The paper is accessible at http://goo.gl/XXm6F. Within this setup, we have $E[e^{-\frac{1}{2}\sigma^2} \epsilon_t] = 1$ and the mean of $y_t$ reads $Ae^{\mu t}$.

5. Note that no part of the following discussion would be altered if the exponential growth form in levels, i.e. the first equation above, is estimated via Nonlinear Least Squares.

6. The data is accessible at http://goo.gl/cfDFZx.

7. The data is accessible at http://goo.gl/90KNn.

8. The data is accessible at http://goo.gl/EEA9U.
Figure 1: GDP per capita (1923-2008) and its Growth Trend (1923-2002)

Data Source: Angus Maddison

Figure 1 pictures the growth trend estimated for the period 1923-2002 using Maddison’s data.

The estimated growth rate $\mu$ is approximately equal to 0.0254 with a 95% confidence interval of [0.0244, 0.0264]. The adjusted $R^2$ is around 0.97 for this estimation.

Figure 2 pictures the growth trend estimated for the period 1950-2002 using the PENN World Table data.

The estimated growth rate $\mu$ is approximately equal to 0.0226 with a 95% confidence interval of [0.0215, 0.0237]. The adjusted $R^2$ is again around 0.97.

Finally, Figure 3 pictures the growth trend estimated for the period 1980-2002 using the World Bank data.

The estimated growth rate $\mu$ is approximately equal to 0.0236 with a 95% confidence interval of [0.0208, 0.0263]. The adjusted $R^2$ is around 0.93 due to the small sample size.

What do we learn from these figures about the economic growth in Turkey? Is there really a trend break in the long-run evolution of GDP per capita in Turkey around the year 2002 once it is appropriately measured in constant international currency units? What is, so to speak, the punchline?
The Long-Run Growth with Booms and Busts

All of the figures presented above indicate that Turkish economy \textit{does} enjoy long-run growth with an annual rate that is certainly above 2% but apparently less than 3%. This is the type of economic growth that truly reflects the sustained increase in average material welfare in Turkey. If a government attempts to derive some legitimacy for its policies by putting forward arguments involving economic growth from one period to another, this is the rate of economic growth a responsible citizen should be evaluating in response.

Regarding the mysterious trend break at around the year 2002, first observe that Turkish economy \textit{did} attain an annual rate of economic growth that is remarkably higher than 2% from 2002 to 2008. Call this episode of uninterrupted growth the 2001-07 episode. Now—and this is the really interesting part—notice the similar episodes of uninterrupted growth from the figures:

- the 1994-98 episode
- the 1991-93 episode
- the 1974-77 episode
- the 1956-58 episode

\textbf{Figure 2:} GDP per capita (1950-2010) and its Growth Trend (1950-2002)

\textit{Data Source: PENN World Table 7.1}
Three things that we can catch with our naked eyes are common for all of these episodes: First, the economy grows at a rate that is higher than its trend growth rate during these episodes. This comes with no surprise because it is simply this faster growth that allows us to locate these episodes as expansions or booms.

Second, these boom episodes always come to an end. When this happens, the economy faces a serious decline in GDP per capita, i.e. the bust. It is the Great Depression, or it is the World War II, or it is one of the oil shocks, or it is one of Turkey’s very own 1994 Currency and 2001 Banking crises, or it is the Global Financial Crisis of 2008. What really matters is that Turkey, as a typical emerging market economy, experiences this type of short-run growth characterized by booms and busts for some time now.

The third feature is the key for the main question we asked: Also apparent to the naked eye, the average rate of growth in all of these boom episodes is very close to the average rate of growth associated with the 2001-07 episode. Hence, we have every reason to ask what the AKP governments really did to end the long history of
boom-bust type growth in Turkey. What we see from Figure 2 and Figure 3 is that, as of 2010, GDP per capita is very close to its growing long-run mean after the Global Financial Crisis. This implies that the 2001-07 boom, as in the case of other episodes of short-run growth, was basically unsustainable. What I strongly believe—upon observing some figures of the balance of payments for Turkey in the past decade—is that nothing really fundamental has been altered in Turkey by the AKP governments. This is not only because a serious research policy to increase the rate of technological progress is still missing or because the low quality of education remains alarming. Economic growth in Turkey is still dependent on external borrowing in the short run given the low rates of domestic saving, and the economy is still prone to some degree of financial instability if a sudden stop of capital inflows to occur for some reason.

The major caveat here, certainly in favor of the AKP governments, follows from the timing of the Global Financial Crisis of 2008. The AKP rule might really have managed to create an upward trend break in the long-run evolution of GDP per capita at around 2002, and we are yet to observe this break simply because the adverse effects of the Global Financial Crisis of 2008 do not allow us to do so. In other words, there is a hope. But hopes are of two types, and some hopes are false hopes.