In Search of a Reasonable Credit Growth Rate for Turkey\textsuperscript{1}

Hakan Kara \quad Hande Küçükk \quad S. Tolga Tiryaki \quad Canan Yüksel

Abstract: This study presents a cross-country analysis of credit growth and draws implications for Turkey. Similar credit deepening phases in other countries suggest that an average of 15 percent annual credit growth would be reasonable and healthy in the medium-term.

Introduction

The global crisis has increased the weight central banks attach to financial stability in their objective functions. Central Bank of the Republic of Turkey (CBRT) has also designed and implemented a new policy framework since end-2010, adopting financial stability as a supplementary objective to price stability.\textsuperscript{2} In this respect, special emphasis has been put to credit variables as an indicator of financial stability. The new policy framework seeks to alleviate adverse effects of the volatility in cross-border financial flows on the domestic economy. In this set-up, credit gained even more importance as it can be used as an additional instrument to cope with capital flow volatility. Especially, during the acceleration of capital inflows short term interest rate loses its effectiveness as a policy tool, increasing the importance of controlling broad credit aggregates. Unlike interest rate policy, restraining credit growth does not lead to a trade-off between financial stability and price stability during capital inflows. Accordingly, the CBRT has

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\textsuperscript{2} See Başçı and Kara (2011), Kara (2012) for an assessment of the policy framework implemented by the CBRT in the post crisis period.
frequently highlighted the importance of keeping a sustainable and balanced credit growth in its recent communication policy.

The central role of credit in the new policy framework begs for an important question: Which level of credit growth rate is reasonable for Turkey? This study approaches the question from a historical perspective. We analyze historical data for similar credit deepening phases across countries, and use this information to suggest a reasonable credit growth path in the medium- to long-run for Turkey. In particular, we take Turkey’s credit to GDP ratio (C/Y) as of the end-2012 (55 percent) as a benchmark, and find the year each country reached (if they ever did) this level. Next, we aggregate the information embedded in the credit path of each country after having reached 55 percent of C/Y ratio. Finally, using some additional assumptions, we compute the credit path that can be deemed as normal for Turkey in the forthcoming period. Using these results and also considering the lessons learnt from the crisis, we assess that 15 percent annual credit growth rate looks reasonable and healthy for Turkey.

1. Credit Growth and Financial Stability

In recent years, an increasing number of studies highlight that rapid credit growth hampers financial stability and also raises the probability of a crisis. Mendoza and Terrones (2008) identify excessive credit expansion episodes in advanced and developing countries, and examine bank- and firm-related indicators, as well as main macroeconomic indicators during these episodes. Accordingly, they find that excessive credit expansion raises banking sector’s vulnerabilities and also that excessive credit expansion is associated with financial crises particularly in developing countries. Using 140 years of data for advanced economies, Schularick and Taylor (2012) find that rapid credit growth is historically a leading indicator for financial crises. On the other hand, Jorda et al. (2011), using the same database, show that the relationship between credit growth and external imbalances has strengthened in recent years. They also emphasize the importance of the interaction between these two variables for financial stability. Dell’Ariccia et al. (2012) document that balance sheet adjustments at the end of rapid credit growth episodes have negative and much prolonged consequences for the real economy. To this end, they also provide an overview of policy alternatives to contain credit growth.

Credit-to-GDP ratio (C/Y) and credit growth rate (ΔC/C) are already frequently used in the economic literature. CBRT, on the other hand, attributes special emphasis to the change in credit stock as a ratio of GDP (ΔC/Y), which is a combination of these two variables. The ΔC/Y variable, which shows net credit use in the economy relative to GDP, can be considered as a composite indicator reflecting information not only on credit growth but also on the size of credit stock relative to GDP. This variable contains essential information on financial stability, as it shows how
rapidly indebtedness in an economy is rising relative to national income. Indeed, as will also be discussed in the next section, this variable is also closely related to current account balance.

In Figure 1, for each country, we plot 3-year average of net credit use prior to the global crisis against economic growth performance at the height of the crisis. It is clear that economic activity is more depressed in countries where the change in credit grew faster than income prior to the crisis. This observation supports the view that credit indicators contain important information on financial and macroeconomic stability.

In the case of Turkey, the importance of credit is even greater due to high structural current account deficit. Any additional deficit arising from cyclical conditions, especially during periods of volatile cross-border capital flows, bears the potential to impair macroeconomic stability by raising the risk of a "sudden stop". Therefore, it is important that the cyclical component of current account deficits is contained. The strong relationship between net credit use and current account deficit (Figure 2a) indicates that credit could be an instrument for stabilizing cyclical fluctuations in the current account. Overall, keeping credit growth at reasonable rates is crucial for stabilizing fluctuations in indebtedness ratios and limiting macro-financial risks.

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3 The relationship between \( \Delta C/Y \) and current account is not particular to Turkey. Akdoğan and Tiryaki (2012) report significant co-movement between the two variables in other countries.
Turkey experienced rapid credit growth over the past few years (Figure 2b). There have been several factors feeding into the credit expansion, including low global interest rates, increased supply of credit backed with the strong balance sheets of the domestic banking sector, as well as vigorous growth in output and employment. The credit expansion episode that started in 2010 is worth particular attention as it implies significantly higher net credit use compared to previous episodes. As evident in Figure 2b, credit growth rates at the end of 2010 are lower than the growth rates reached in years 2006 and 2008. At the end of 2010, the main factor driving the CBRT to take measures was the historically high net credit use and current account deficit relative to income (Figure 2a). Even though credit growth has lost pace during the past two years, credit expansion will continue to be central to financial stability in the forthcoming period. Therefore, the question of which rate of credit growth could be taken as reference for Turkey over the coming years is of crucial importance.

2. Data and Methodology

We use data from World Bank’s World Development Indicators. This dataset includes credit indicators for the period between 1960 and 2011 for more than 200 countries. The credit variable we use is domestic credit to private sector which comprises loans extended to private sector by banks and non-bank financial institutions.
To introduce data and provide a historical perspective, Figure 3 plots the ratio of credit to national income for Turkey and for different income groups between 1960 and 2011. Throughout the whole sample, credit to GDP ratio has been higher on average in the high income group compared to the middle income group as would be expected. An interesting point to note is that this ratio, which followed a stable upward trend between 1980 and 2000, has accelerated significantly in the 2000s. In particular, the period just before the global financial crisis saw a remarkable rise in the ratio of credit to GDP. This acceleration trend, which resulted in crisis, has recently come to a halt.

![Figure 3. Average Credit/GDP Ratio by Income Groups* (Percent)](image)

*Countries are grouped according to World Bank’s most recent (July 2012) income group classification. Source: World Bank.

Although the ratio of credit to GDP stayed at relatively low levels in lower-middle and upper-middle income countries (the latter including Turkey), there has been notable credit expansion in these countries after 2004. In Turkey, the ratio of credit to GDP has been quite low for a long period, but has increased significantly since 2003, catching up with the average ratio in upper-middle income countries.4

The question that follows is how to use other countries’ experiences to infer a reasonable credit path for Turkey. Starting from Turkey’s current level of credit deepening, that is, from a C/Y ratio of around 55 percent, we take as reference the trend followed by other countries after reaching the same level of credit deepening. First we select the countries whose C/Y ratio has

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4 The data is quite heterogeneous. To control for the effects of outliers in the calculated average in Figure 3, we also calculate average of the sub-sample that excludes observations in the highest and lowest 10th percentiles for each year. There is no significant difference between the averages of the whole and the trimmed sample.
consistently exceeded 55 percent. Then we aggregate the credit paths that each country followed after reaching C/Y ratio of 55 percent. Finally, we use this statistical information to arrive at a reasonable credit path for Turkey.

Figures 4a and 4b plot the mean and median values of C/Y and ΔC/Y ratios of the countries whose C/Y ratio exceeded 55 percent. The horizontal axis shows the number of years passed after each country’s C/Y ratio reached 55 percent for the first time. Columns indicate the number of countries in the sample at each point starting from the year the country’s C/Y ratio exceed 55 percent (t=0). The number of countries whose C/Y ratio has reached 55 percent is 57 in our sample. As t increases, more years pass after reaching 55 percent and thus fewer countries remain in the sample. Therefore, the mean and median values reflect the trend of less number of countries. For example, only two countries had a C/Y ratio higher than 55 percent for as long as 45 years. Therefore, the extent to which these credit paths represent a reference value for Turkey weakens as the number of years after having reached 55 percent increases.

**Figure 4. Credit/GDP and Net Credit Use/GDP Ratios in the Countries with Credit/GDP Higher than 55%** *(Percent)*

<table>
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<th>(a) Credit/GDP</th>
<th>(b) Net Credit Use/GDP</th>
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<tr>
<td>Number of years after reaching Credit/GDP ≈ 55%</td>
<td>Number of years after reaching Credit/GDP ≈ 55%</td>
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<td>Number of Countries</td>
<td>Number of Countries</td>
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<td>Mean</td>
<td>Mean</td>
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<td>Median</td>
<td>Median</td>
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*All countries are included in the analysis irrespective of their income group. Horizontal axis indicates the number of years passed after having reached a C/Y ratio of 55%. Left vertical axis shows the evolution of C/Y and ΔC/Y variables while the right vertical axis shows the number of countries.


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*Countries that had credit/GDP ratio higher than 55 percent for 4-5 years are considered as having consistently exceeded 55 percent.*
In the remainder of the paper, we make projections on possible future paths of credit in Turkey based on the trends presented in Figure 4. Since Figures 4a (C/Y) and 4b (ΔC/Y) are two different ways of displaying the same variable, one can base credit projections on either one of these two trends. As mentioned above, ΔC/Y provides a more straightforward and intuitive perspective regarding financial stability. As depicted in the figures, after C/Y reaches 55 percent, ΔC/Y follows a broadly stable course. We have argued above that a stable level of net borrowing relative to income is important to mitigate macro-financial risks. That is why the CBRT prefers to communicate through this variable, emphasizing that a stable ΔC/Y path (which does not show an upward or downward trend) is desirable for a healthier financial system. Figure 4 shows that the historical path of this variable is in line with the CBRT’s view as it does not show an upward or downward trend but oscillates around a constant average. Accordingly, in the rest of this note, we take ΔC/Y ratio as a reference and assume a constant horizontal trend for this variable when making projections.

We adopt a long term perspective when making credit projections. In this respect, when determining the reference values of ΔC/Y, we take 20-year averages of ΔC/Y values of countries having C/Y ratio higher than 55 percent for at least 20 years. We prefer not to include observations after 20 years, since the number of surviving countries fall considerably as the number of years exceed 20 (Figure 4, right axis).

Given that credit paths show considerable heterogeneity across countries, it might be misleading to base the analysis solely on mean and median values. Therefore, we base our projections on a range that takes into account the distribution of ΔC/Y across countries. Accordingly, we rank average ΔC/Y values for 25 selected countries and take ΔC/Y values corresponding to the 25th and 75th percentiles, which yields a range between 6.7 and 10.6 percent.

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6 It is also observed that ΔK/Y ratio for individual countries oscillate around a constant average.
7 Taking ΔK/Y ratio constant implies decreasing growth rates for K/Y and credit. To check the validity of this assumption we test whether credit growth rates at various K/Y ratios differ significantly. For example we find that credit growth rate when K/Y ratio is between 55-65 percent is higher than the credit growth observed when K/Y is in 75-90 percent range, and the difference is statistically significant.
8 For robustness we repeat the calculations using 10 and 25 years of observations. The results do not change significantly.
To summarize, the experiences of other countries indicate that, after reaching Turkey’s current level of credit deepening, it is reasonable to expect a constant ΔC/Y ratio ranging between 6.7 and 10.6 percent. Given a constant value for ΔC/Y, one can arrive at implied credit growth by making an assumption regarding nominal GDP growth. In this respect, we assume that the annual growth rate of nominal GDP will be around 10 percent for the next 20 years.

First we calculate a path for C/Y that is consistent with a constant ΔC/Y ratio, then we use these values to arrive at ΔC/C (credit growth). To illustrate, we can write the dynamics of C/Y as follows:

\[
\frac{C_t}{Y_t} = \frac{C_{t-1}(1 + g_t^C)}{Y_{t-1}(1 + g^Y)}. \tag{1}
\]

In this equation, \(g_t^C\) denotes the growth rate of the credit stock (\(\Delta C_t/C_{t-1}\)) between period \(t\) and \(t-1\), while \(g^Y\) denotes nominal GDP growth, which is assumed to be constant throughout the period. Rearranging equation (1) yields:

\[
\frac{C_t}{Y_t} = \frac{C_{t-1}}{Y_{t-1}} \frac{1}{(1 + g^Y)} + \frac{\Delta C_t}{Y_t}, \tag{2}
\]

For each period \(t\), \(C_t/Y_t\) is a function of its previous value as well as nominal GDP growth and \(\Delta C_t/Y_t\). Accordingly, given an initial point for \(C_t/Y_t\) (55 percent in our case), \(\Delta C_t/Y_t\) (a constant value between 6.7 and 10.6 percent) and \(g^Y\) (assumed to be 10 percent per annum for 20 years) we can calculate the future path of \(C_t/Y_t\) in a recursive manner. Finally, combining this with a constant ΔC/Y ratio we can arrive at the credit growth path.

Figures 5b and 5c show projections on credit deepening and credit growth for the next 20 years based on the ΔC/Y ratios plotted in Figure 5a. Accordingly, assuming that ΔC/Y stays constant between 6.7 and 10.6 percent, C/Y reaches a level between 71 and 107 percent at the end of 20 years. A stable path for net credit use to GDP is consistent with a gradually declining credit growth rate as shown in Figure 5c.
In order to have a better view of what would be reasonable credit growth rates in the short to medium term, Table 1 presents credit projections for 2013-2015 period using the results of the analysis above. The table presents net credit use to GDP for the 25\(^{th}\), 50\(^{th}\) (median) and 75\(^{th}\) percentiles as well as annual credit growth rate and credit to GDP ratio. For 2013, these projections point out to a credit growth rate that lies between 13.5 and 21.3 percent.

**Table 1. Credit Projections for 2013-2015 Based on Different Values of Change in Credit / GDP**

<table>
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<tr>
<th>1. Lower bound</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<tr>
<td>Change in Credit / GDP (percent)</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
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<tr>
<td>Credit / GDP (percent)</td>
<td>56.5</td>
<td>58.0</td>
<td>59.5</td>
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<tr>
<td>Credit Growth (percent)</td>
<td>13.5</td>
<td>13.0</td>
<td>12.7</td>
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<tr>
<td>Change in Credit / GDP (percent)</td>
<td>8.4</td>
<td>8.4</td>
<td>8.4</td>
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<tr>
<td>Credit / GDP (percent)</td>
<td>58.2</td>
<td>61.3</td>
<td>64.1</td>
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<tr>
<td>Credit Growth (percent)</td>
<td>16.9</td>
<td>15.9</td>
<td>15.1</td>
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<tr>
<td>Change in Credit / GDP (percent)</td>
<td>10.6</td>
<td>10.6</td>
<td>10.6</td>
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<tr>
<td>Credit / GDP (percent)</td>
<td>60.4</td>
<td>65.5</td>
<td>70.1</td>
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<tr>
<td>Credit Growth (percent)</td>
<td>21.3</td>
<td>19.3</td>
<td>17.8</td>
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Given the range of values for the credit growth rate in 2013 presented in Table 1, the 15 percent credit growth rate mentioned by the CBRT for 2013 seems to be on the cautious side. However, risks regarding the global economy still persist and current account still hovers around relatively high levels. These observations alongside the lessons learnt from the crisis require a cautious stance in credit policy. Consequently, an annual credit growth rate of 15 percent is deemed reasonable for Turkey.

Following up from this point, as a final exercise, we make projections based on the assumption that total credit growth in 2013 will be 15 percent and the ΔC/Y ratio implied by this growth rate will be constant for the rest of the period (Table 2). The ΔC/Y ratio that is consistent with a credit growth rate of 15 percent in 2013 is 7.5 percent, which yields a C/Y ratio of 57.2 percent by the end of the year. In order to have ΔC/Y ratio constant at 7.5 percent, credit growth rate needs to be 14.3 in 2014 and 13.8 percent in 2015.9

| Table 2. Credit Projections for 2013-2015 under the Assumption That Credit Growth Will be 15% in 2013 and Corresponding Net Credit to GDP Ratio Will Remain Constant |
|-------------------------------------------------|-------|-------|-------|
| Change in Credit / GDP (percent)                | 2013  | 2014  | 2015  |
| Credit / GDP (percent)                          | 7.5   | 7.5   | 7.5   |
| Credit Growth / GDP (percent)                   | 57.2  | 59.5  | 61.6  |
| Credit Growth / GDP (percent)                   | 15.0  | 14.3  | 13.8  |

Figure 6 extends these projections to a longer horizon. Consequently, C/Y reaches 78 percent in 2032 provided that net credit use to GDP ratio stays constant at 7.5 percent which is the level implied by a 15 percent credit growth rate in 2013. This path is broadly in line with the path followed by high income countries between 1980 and 2000 (Figure 3). According to this projection, the growth rate of credit will gradually slow down, and reach 10 percent—the growth rate of nominal GDP—in 20 years.

9 It is assumed that nominal GDP will grow by 10 percent.
3. Conclusion and Final Remarks

Strengthened emphasis on financial stability after the global crisis has increased the role of credit in the design of economic policy. For the Turkish case, ongoing current account deficit, the strong relationship between current account balance and the change in credit stock further enhance the role of credit as a policy variable. In fact, the CBRT highlights the importance of maintaining healthy and sustainable credit growth to promote financial stability. But what rate of credit growth would be healthy for Turkey?

In light of other country experiences, this study tries to make assessments for a credit path that can be taken as a benchmark for the Turkish economy in the medium and long term. Aggregated data point to an annual credit growth rate between 14-21 percent after reaching 55 percent credit to GDP ratio. However, it should be noted that the sample used in the study includes the crisis period to some extent. The experiences of the crisis have taught us that rapid credit growth creates important risks for financial stability. Moreover, the existing high level of current account deficit warrants a cautious approach to credit growth. Taken together, these factors suggest that benchmark levels for credit growth rate in Turkey should be close to the lower bound of the range provided above.

All these assessments suggest that 15 percent credit growth rate, which is taken as reference by the CBRT for 2013, looks reasonable and healthy in terms of historical norms. This rate of credit growth corresponds to a change in credit stock to GDP ratio ($\Delta C/Y$) of 7.5 percent. In order to keep this ratio constant for the forthcoming years, the credit growth rate has to decelerate gradually.
Needless to say, it would be useful to enrich the results of this study with model-based techniques. However, we believe that this study is still helpful in terms of complementing empirical and structural methods with a historical perspective, and provides important information regarding the benchmark levels of credit growth that may be deemed as healthy in the forthcoming period.

References