IN SEARCH OF A REASONABLE CREDIT GROWTH RATE FOR TURKEY

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ABSTRACT We present a cross country analysis of credit growth and draw implications for Turkey. Similar credit deepening phases in many countries suggest a stable ratio of net credit use (change in credit stock) with respect to national income. To this end, we calculate an interval for this ratio in a sample of selected countries and assess the implications of this interval for Turkey's medium to long term credit stock projections. *JEL* E51, E58, G20

Keywords Credit growth, Net credit use, Financial stability

öz Bu çalışma, kredi büyümesine dair ülkelerarası bir analiz sunarak Türkiye için çıkarımlarda bulunmaktadır. Benzer kredi derinleşmesi aşamasından geçen birçok ülkenin verileri, milli gelire oranla net kredi kullanımının (kredi stokundaki değişimin) istikrarlı bir oranda seyrettiğini ortaya koymaktadır. Bu doğrultuda, seçilmiş ülkelerden oluşan bir örneklemde söz konusu oran için bir aralık hesaplanmakta ve bu aralığın Türkiye'nin orta ve uzun vadeli kredi stoku projeksiyonları açısından nasıl bir görünüm ima ettiği değerlendirilmektedir.

TÜRKİYE İÇİN MAKUL KREDİ BÜYÜME ORANI NE OLMALI? JEL E51, E58, G20 Anahtar Kelimeler Kredi büyümesi, Net kredi kullanımı, Finansal istikrar

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1. Introduction

The global crisis has increased the weight that 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.¹ In this respect, special emphasis has been placed on 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. Accordingly, the CBRT has 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 reasonable for Turkey in the forthcoming period.

2. 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

¹ See Başçı and Kara (2011), Kara (2012) for an assessment of the policy framework implemented by the CBRT in the post crisis period.

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. Correspondingly Jordà 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 ($\Delta C/C$) are already frequently used in the economic literature. The CBRT, furthermore, attributes special emphasis to the change in credit stock as a ratio of GDP ($\Delta C/Y$), which is a combination of these two variables. The $\Delta C/Y$ 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 an economy's indebtedness 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.



Sample includes all countries in the World Bank database. Horizontal axis shows ratio of net credit use to GDP ($\Delta C/Y$) averaged between 2005 and 2007; vertical axis shows difference of GDP growth rates between 2009 and 2007. Source: World Bank.

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.² Overall, keeping credit growth at reasonable rates is crucial for stabilizing fluctuations in indebtedness ratios and limiting macro-financial risks.

² 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 2011-2012 period, credit expansion is likely to remain 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.

3. 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.





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.³

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 consistently exceeded 55 percent.⁴ 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.

³ 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.
⁴ We exclude those countries whose credit/GDP ratios have exceeded the 55 percent threshold but afterwards

⁴ We exclude those countries whose credit/GDP ratios have exceeded the 55 percent threshold but afterwards plunged to much lower levels, mainly due to breakout of a war, civil war, military coups, or other political transformations. We also excluded countries that had exceeded the threshold level of 55 percent before the start date of that country's available time series. See Appendix for the list of countries included in Figures 4a and 4b.







Figures 4a and 4b plot the mean and median values of C/Y and $\Delta C/Y$ 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 52 in our sample (See Appendix). 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.

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 ($\Delta C/Y$) are two different ways of displaying the same variable, one can base credit projections on either one of these two trends. As mentioned above, $\Delta C/Y$ provides a more straightforward and intuitive perspective regarding financial stability. As depicted in the figures, $\Delta C/Y$ does not show an upward or downward trend but oscillates around a constant average.⁵ 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 $\Delta C/Y$ 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 follows a broadly stable course.⁶ Accordingly, in the rest of this note, we take $\Delta C/Y$ ratio as a reference and assume a constant horizontal trend for this variable when making projections.⁷

We adopt a long term perspective when making credit projections. In this respect, when determining the reference values of $\Delta C/Y$, we take average $\Delta C/Y$ values for each country having C/Y ratio higher than 55 percent for at least 20 years. Table 1 provides details about the countries included in our sample. We include the name of the country, the income group it currently belongs to, as well as the year in which the country entered our sample according to our C/Y criteria of 55 percent. Out of the 25 countries in our sample, 17 of them belong to "high income" group, while 8 of them belong to "upper-middle income" group, which is the group that includes Turkey according to World Bank classification. Countries included in the sample are quite heterogeneous, differing with respect to size, economic structure and the date their C/Y ratio exceeded 55 percent.

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 $\Delta C/Y$ across countries. Accordingly, we rank average $\Delta C/Y$ values for 25 selected countries and take $\Delta C/Y$ values corresponding to the 25th and 75th percentiles, which yields a range between 6.7 and 10.6 percent (Table 1).

Although we arrange the dataset so that each country starts from a comparable level of financial deepening, i.e. C/Y ratio of 55 percent, there is still considerable heterogeneity, possibly reflecting a wide range of other factors which determine the evolution of credit in those countries. Therefore, we think that the countries listed in Table 1 are heterogeneous enough to nest some characteristics of the Turkish economy, hence to provide a range of reference values for net credit use in Turkey.

⁵ Figure 4b shows $\Delta C/Y$ only for countries whose C/Y ratio exceeded 55 percent. However, a similar pattern is also observed for most of the other countries regardless of their C/Y ratios.

⁶ It is also observed that $\Delta C/Y$ ratio for individual countries oscillate around a constant average.

⁷ Taking $\Delta C/Y$ ratio constant implies decreasing growth rates for C/Y and credit. To check the validity of this assumption we test whether credit growth rates at various C/Y ratios differ significantly. For example we find that credit growth rate when C/Y ratio is between 55-65 percent is higher than the credit growth observed when C/Y is in 75-90 percent range, and the difference is statistically significant.

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 $\Delta C/Y$ ratio ranging between 6.7 and 10.6 percent. Given a constant value for $\Delta C/Y$, 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.

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Country	Income Group	Year entered	Number of years in	C/Y by	$\Delta C/Y$ avg.	$\Delta C/C$ avg.
·	-	the sample	the sample	2011	U	U
Australia	High income: OECD	1989	23	128	8.8	10.0
Austria	High income: OECD	1976	36	120	6.1	7.2
Canada	High income: OECD	1977	32	128	8.4	8.0
Chile	Upper middle income	1981	31	71	9.5	14.8
China	Upper middle income	1980	32	127	15.0	16.1
Finland	High income: OECD	1983	29	96	4.7	6.8
France	High income: OECD	1966	46	116	7.0	5.8
Israel	High income: OECD	1978	34	95	17.1	24.6
Jordan	Upper middle income	1983	29	74	6.6	9.3
Korea, Rep.	High income: OECD	1990	22	100	8.4	11.5
Luxembourg	High income: OECD	1978	34	170	12.3	11.1
Malaysia	Upper middle income	1981	31	116	10.8	10.4
Malta	High income: non-OECD	1987	25	134	8.7	9.3
Netherlands	High income: OECD	1972	40	198	8.1	7.8
New Zealand	High income: OECD	1988	24	146	9.8	10.1
Norway	High income: OECD	1986	21	86	6.1	9.1
Panama	Upper middle income	1972	40	92	6.8	9.3
Portugal	High income: OECD	1969	43	192	11.0	13.9
Singapore	High income: non-OECD	1973	39	113	8.5	10.5
Spain	High income: OECD	1970	42	204	11.3	12.3
St. Kitts and Nevis	High income: non-OECD	1989	23	69	5.3	8.3
St. Lucia	Upper middle income	1988	24	112	7.2	9.5
Sweden	High income: OECD	1964	48	136	7.9	7.7
Thailand	Upper middle income	1983	29	132	10.4	11.0
Tunisia	Upper middle income	1982	30	76	6.0	9.6
	Average	1979	32	121	8.9	10.6
	Std. dev.	7.6	7.8	38	2.9	3.8
	25th percentile	1973	25	93	6.7	8.2
	Upper middle income 1982 30 76 6.0 9.6 Average 1979 32 121 8.9 10.6 Std. dev. 7.6 7.8 38 2.9 3.8 25th percentile 1973 25 93 6.7 8.2 75th percentile 1985 40 135 10.6 11.3 data point for all countries except Norway and Canada is 2011. Data for these countries end at 2011. Data for these countries end at					
Note: The last data point for all countries except Norway and Canada is 2011. Data for these countries end at						

Table 1. Detail	s of the	Countries 1	Includ	ed in t	the Sam	ble
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Note: The last data point for all countries except Norway and Canada is 2011. Data for these countries end at 2006 and 2008, respectively.

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Source: World Bank, authors' calculations.

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

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

$$\frac{C_t}{Y_t} = \frac{C_{t-1}}{Y_{t-1}} \frac{1}{(1+q^Y)} + \frac{\Delta C_t}{Y_t}.$$
(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 $\Delta C/Y$ 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 $\Delta C/Y$ ratios plotted in Figure 5a. Accordingly, assuming that $\Delta C/Y$ 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.

Figure 5. Projections for Credit/GDP and Credit Growth Based on Different Values of Change in Credit / GDP



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In order to have a better view of reasonable credit growth rates in the short to medium term, Table 2 presents credit projections for 2013-2015 period using the results of the analysis above. The table presents net credit use to GDP for the 25th, 50th (median) and 75th percentiles as well as annual credit growth rate and credit to GDP ratio. For 2013, these projections point out a credit growth rate that lies between 13.5 and 21.3 percent.

 Table 2. Credit Projections for 2013-2015 Based on Different Values of Change in Credit / GDP

1 Lower cound	2013	2014	2015
Change in Credit / GDP (percent)	6.7	6.7	6.7
Credit / GDP (percent)	56.5	58.0	59.5
Credit Growth (percent)	13.5	13.0	12.7
2. Median			
	2013	2014	2015
Change in Credit / GDP (percent)	8.4	8.4	8.4
Credit / GDP (percent)	58.2	61.3	64.1
Credit Growth (percent)	16.9	15.9	15.1
3. Upper bound			
**	2013	2014	2015
Change in Credit / GDP (percent)	10.6	10.6	10.6
Credit / GDP (percent)	60.4	65.5	70.1
Credit Growth (percent)	21.3	19.3	17.8

Following up from this point, as a final exercise, we make projections based on the reference value mentioned by the CBRT, which implies a $\Delta C/Y$ ratio of 7.5 percent. As shown by Figure 6, C/Y reaches 78 percent in 2032 provided that net credit use to GDP ratio stays constant at 7.5 percent. 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.





4. Concluding 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 coupled with the strong relationship between current account balance and the change in credit stock (net credit use) 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. We aggregated net credit use data for countries with credit-to-GDP ratios exceeding 55 percent, and showed for countries at comparable levels of financial deepening that net credit use relative to GDP fluctuates around a constant ratio when all countries in the sample are aggregated. Analysis of country-level data for net credit use also reveals that countries at comparable levels of financial deepening have experienced broadly stable net credit use at average ratios ranging from 6.7 percent to 10.6 percent of GDP. Using this interval for net credit use, we produced medium and long term projections for Turkey's credit-to-GDP ratio and credit growth rate. We also showed that a stable ratio of net credit use relative to GDP implies gradually decreasing credit growth rate over the longer term.

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.

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Appendix

We try to cover as many countries as possible in the analysis. However there is a tradeoff between including all countries to increase the number of observations and facing unnecessary noise caused by apparent outliers. Still we try to exploit the heterogeneity in the sample as much as possible. We exclude those countries whose credit to GDP ratios have exceeded the 55 percent threshold but afterwards plunged to much lower levels, mainly due to breakout of a war, civil war, military coups, or other political transformations. These countries are Algeria, Brazil, Bulgaria, Czech Republic, Hungary, Slovak Republic, Uruguay, and Venezuela.

There is also another set of countries that are excluded from the sample. These countries had exceeded the threshold level of 55 percent before the start date of that country's available time series. Countries that are excluded from the sample because of this filter are as follows: Cyprus, Bosnia and Herzegovina, Brunei, Djibouti, Germany, Hong Kong, Japan, Lebanon, Macao, Macedonia, Poland, South Africa, Switzerland, and the US. Finally, we also exclude the UK despite it does not fit into any of the filters mentioned above. This is because of the fact that the UK has established a special role as a financial center over the years, and hence it may have acted quite differently from the rest of the sample.

Countries included in Figure 4a and 4b and the years their credit to GDP ratio has exceeded 55 percent level (written in parenthesis) are as follows: Antigua and Barbuda (1996), Australia (1989), Austria (1976), The Bahamas (1993), Bahrain (2007), Barbados (1998), Belgium (1992), Belize (2004), Canada (1977), Cape Verde (2008), Chile (1981), China (1980), Croatia (2006), Czech Republic (2010), Dominica (1993), Estonia (2004), Fiji (2002), Finland (1983), France (1966), Greece (2001), Grenada (1993), Hungary (2006), Iceland (1997), Ireland (1995), Israel (1978), Jordan (1984), Korea (1990), Latvia (2005), Lithuania (2007), Luxembourg (1978), Malaysia (1981), Maldives (2007), Malta (1987), Mauritius (1998), Morocco (2007), Netherlands (1972), New Zealand (1988), Norway (1986), Panama (1972), Portugal (1969), Singapore (1973), Slovenia (2005), Spain (1970), St. Kitts and Nevis (1989), St. Lucia (1988), Sweden (1964), Thailand (1983), Tunisia (1982), Ukraine (2007), United Arab Emirates (2007), Vanuatu (2008), Vietnam (2004).