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Credit Growth, Current Account and Financial Depth

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Abstract

Exploring the determinants and dynamics of the current account balance is one of the priorities of academic literature and policy circles. Although the effects of structural variables are deeply analyzed, a lesser attention has been paid to the impact of financial variables. Drawing on standard empirical current account models and with a large sample of industrial and developing countries, we report a significant deterioration in the current account balance in case of an increase in the credit growth. Moreover, we find that this link is substantially stronger for the developing ones motivating a closer examination. Therefore, we further advance our analysis and show that credit growth causes a stronger impact on the current account balance for lower levels of financial depth. In other words, at the early stages of financial development, acceleration in the credit growth might cause a larger deterioration in the current account balance; thus, it might be suggested that monetary policy and macro-prudential measures aimed at preventing financial excess might be more effective to reduce the external imbalances at the early stages of financial deepening.

***JEL Classification**:* F31 - Foreign Exchange, F32 - Current Account Adjustment; Short-Term Capital Movements, F37 - International Finance Forecasting and Simulation: Models and Applications, F41 - Open Economy Macroeconomics

***Keywords**:* Credit Growth, Current Account Balance, Developing Countries, Financial Depth, Financial Excess, Global Imbalances, and Panel Data.

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1. Introduction

The global imbalances, persistently widening at the pre-crisis period and suddenly narrowing afterwards, have drawn a lot of attention both within the policy circles and among academicians. Therefore, the efforts aiming to understand the determinants of the current account (CA) balance has been intensified.[1] However, although demographic factors, fiscal positions, growth prospects, net foreign asset positions and level of oil dependency are identified as the main determinants of the CA balance, a lesser attention has been paid to the financial variables.[2]

When we look at the proposed financial variables in the literature, we observe that variables targeting to measure financial excess and financial depth have been used. While financial excess variables aim to capture boom-bust cycles in the financial markets by flow measures, financial depth variables focus on the size of the financial markets via using stock measures. Noting that it is not always trivial to empirically identify financial excess and financial depth, we undertake a challenging task of combining these two. First, by using a rich panel dataset, we show that financial excess has a significant impact on the CA balance. Then, we investigate whether this relationship is conditional on the level of financial depth. We present strong empirical evidence that acceleration in financial excess might cause a larger deterioration in the CA balance for a lower level of financial depth.

Atoyan et al. (2013) and IMF (2013) are the two recent studies that include credit growth (to measure the degree of financial excess) as a determinant of the CA balance.[3] Both studies report a significant relationship between the two, even when controlling for the output gap. This finding is consistent with Borio (2012), which proposes that financial and economic cycles do not necessarily coincide. Regarding the influence of financial excess on the CA balance, IMF (2013) explains the underlying mechanism as follows: If the authorities fail to implement policies to dampen financial excess, there might be a demand boom, which causes a weaker CA balance.

[1] Calderon et al. (2002), Chinn and Prasad (2003), Gruber and Kamin (2007), Medina et al. (2010), Lane and Milesi-Ferretti (2012), Cheung et al. (2013) and IMF (2013) can be listed as the latest studies that examine this issue.
[2] The International Monetary Fund (IMF), for instance, has recently updated its methodology, the External Balance Assessment (EBA), to assess the member countries' exchange rates. Although the previous version of the EBA, discussed in IMF (2012), ignores the financial variables for various reasons, the latest version, described in IMF (2013), finds a significant impact of these on the CA balance dynamics.
[3] IMF (2013) reports results with both credit growth and deviations from the trend of the credit stock.

The influence of financial deepening on the CA balance has been discussed in a relatively more detailed way. The main reason behind this proposal is through the impact of financial deepening on the saving and investment decisions of the agents via economic growth.[4] Moreover, Chinn and Prasad (2003) argue that countries that are in the early stages of financial development run CA deficits by importing capital. As they reach to advanced stages, they export capital to pay their accumulated external liabilities thereby run CA surpluses.

To combine these two different views, we construct a panel dataset, which consists of 49 countries including industrial and developing ones. For our benchmark empirical model, we measure the financial excess by the ratio of new lendings to the private sector to the gross domestic product, i.e. GDP, (credit growth later on). We control for a number of other determinants that are identified as the main determinants of the CA balance in the literature, such as net foreign assets, relative income, average growth rate, oil trade balance, fiscal balance, demographics, and the terms of trade. We report an economically and statistically significant deterioration in the CA balance for the full sample in case of acceleration in the credit growth.

Several studies in the literature, such as Chinn and Prasad (2003), Chinn and Ito (2007), Gruber and Kamin (2009) and Cheung et al. (2013), suggest that country-specific dynamics should be taken into account while investigating the determinants of the CA balance. In this study, we show that the credit growth has a statistically significant impact on the CA balance for both industrial and developing countries; however, it is much more pronounced for the latter group. The diversion in the results regarding the industrial and developing countries points to a heterogeneity within the sample. Building on the growth literature, which suggests non-linearities with the level of financial deepening, we document the variation in the impact of the credit growth on the CA balance due to the degree of financial depth. Using alternative measures of financial excess and financial depth, we observe that the CA balance is more sensitive to the degree of financial excess for those countries with lower levels of financial depth. This finding implies that acceleration in the credit growth might cause a larger deterioration in the CA balance at the early stages of financial development. Therefore, as a policy implication, it can be claimed that monetary policy and macro-prudential measures aimed at preventing financial excess might

[4] Chinn and Ito (2007) discusses the impact of financial development on saving and investment in detail. Moreover, for a recent comprehensive discussion on this point, see Arcand et al. (2012) and the references therein.

be effective in reducing the external imbalances particularly at the early stages of financial deepening.

The next section discusses data and methodology. The third section presents empirical evidence on the impact of the credit growth on the CA balance. In the fourth section we examine the role of financial depth in explaining the variation in the impact of the credit growth on the CA balance. The fifth section provides robustness checks for our results before the last section concluding the paper.

2. Data and Methodology

In this study we document the dynamics of impact of the credit growth on the CA balance, which is measured as the ratio of the CA balance to the GDP. Our panel dataset includes 49 countries including industrial and developing ones. Table 1 gives the list of the countries in the sample. Following the studies that investigate the impact of financial excess, such as IMF (2013), we use annual data and the dataset spans the period from 1991 to 2011. The credit growth is calculated as the ratio of the new lendings to the private sector within a year to GDP. For the control variables, we consider the determinants of the CA balance identified in the literature.[5] Table 2 reports all variables considered in this study (with their sources) and below we briefly discuss how these variables might influence the CA balance.

The ratio of the net foreign assets (NFA) to GDP is introduced to the estimation by two means. First one is the ratio with one-period lag. Lane and Milesi-Ferretti (2012) argues that the sign should be positive due to the fact that the steady-state CA balance is proportional to the equilibrium NFA position. Secondly, we include a dummy variable when a country has an NFA to GDP ratio lower than -60%. According to Catao and Milesi-Ferretti (2013), this level is a threshold after which the crisis probability substantially increases. Therefore, the dummy is expected to have a positive impact on the CA balance.

Relative income is assumed to be a proxy for the marginal product of capital and expected to have a positive impact on the CA balance. It is calculated as the ratio of the country's per capita GDP to the per capita GDP of the United States where GDP is measured with purchasing

[5] For a detailed discussion on the determinants of the CA balance, see Chinn and Prasad (2003) and IMF (2013).

power parity. In addition to this, higher growth rate should lead to a lower CA balance; thus, we include five year average annual growth rate of GDP to the estimation process.

Oil trade balance is a proxy for the impact of oil price and volume changes on the CA balance. For instance, when oil prices increase, the share of oil balance for an oil-exporting country would be higher and so would the CA balance. Similarly, the share would be lower for an oil-importing country. We should also note that the countries where GDP heavily depends on oil exports are excluded while constructing our data set.

Fiscal balance is expected to affect national savings as long as the private sector does not fully offset the changes in public saving. Lane and Milesi-Ferretti (2012) and IMF (2013) find that the Ricardian equivalence does not hold and a positive impact from the fiscal balance is expected.

Following the literature, we mark Belgium, Netherlands and Switzerland as the financial centers. The rationale behind this is to obtain unbiased estimates for the other parameters in the regression. Moreover, we use the reserve currency countries' share in world reserves, which is dubbed as exorbitant privilege.

To capture the dynamics of demographics, we consider three measures. Old-age dependency ratio is measured as the ratio of the population over 65 to the working-age population, where young-age dependency ratio is the ratio of the population under 15 to the working-age population. The third variable is the annual growth rate of the population. A larger dependent population is expected to decrease national savings and hence the CA balance. All the demographic variables are expected to have a negative impact on the CA balance.

Finally, the terms of trade is expected to have a positive sign and aims at capturing the impact of the world prices on exports and imports.

Since the CA data displays strong autocorrelation, it is important to address this issue in the estimation process. Therefore, we use pooled Generalized Least Squares (GLS) with a panel-wide AR(1) correction[6] as it is the case in IMF (2013). We estimate the following equation under alternative specifications:

$$\left(\frac{CA}{GDP}\right)_{it} = \beta_0 + \beta_1 \left(\frac{\Delta Credit}{GDP}\right)_{it} + \beta_2 X_{it} + \varepsilon_{it} \tag{1}$$

[6] Estimations using Newey-West (HAC) standard errors yield similar results.

Here, the dependent variable is the ratio of the CA balance to GDP, $\left(\frac{CA}{GDP}\right)_{it}$. As explanatory variables, we use the change in the credit stock extended to the private sector, $\left(\frac{\Delta Credit}{GDP}\right)_{it}$, as a ratio to GDP, i.e. credit growth, and the control variables (denoted by X_{it}) explained above.

3. Panel Results

We report the results of our benchmark empirical model in table 3 with an emphasis on the impact of the credit growth on the CA balance. We observe that the credit growth negatively affects the CA balance in an economically and statistically significant way. The results without including the control variables suggest that a 10 percentage point increase in the credit growth leads to a 0.3 percentage point decrease the CA balance.[7]

Our findings up to this point are consistent with the literature. Cheung et al. (2013), for instance, finds a strong negative relationship between the private credit to GDP ratio and the CA balance. IMF (2013) also finds a strong negative impact of the demeaned private credit to GDP ratio on the CA balance for a large set of countries.

As discussed above, the country-specific factors should be taken into account while investigating the determinants of the CA balance. In a broad sense, Chinn and Prasad (2003), Lane and Milesi-Ferretti (2012) and Cheung et al. (2013) find that impacts of some of the variables, such as NFA, relative income, expected growth, dependency ratios, fiscal deficit and financial deepening, on the CA balance significantly differ among industrial and developing countries. Atoyan et al. (2013), in the meantime, divides the country set into two groups, i.e. industrial and developing countries, and find significant differences between the parameters estimated for such as real private credit growth and partners' GDP growth among the two. Given these findings, a first natural question to be asked at this point is whether there is a diversion in the relationship between the credit growth and the CA balance among subsamples of our data set.

To be able to test this hypothesis, we re-estimate our model by allowing different slopes for industrial and developing countries and present the results in the third and fourth columns of

[7] We also observe that this result remains intact after the inclusion of the control variables with all having expected signs. Impact of the credit growth on the CA balance is also estimated by using Newey-West standard errors since time dimension of our sample is relatively low. The results of this estimation, which supports our results, are available upon request.

table 3. The empirical results clearly indicate that although the credit growth has a negative impact on the CA balance for both groups of countries, the link between the credit growth and the CA balance is stronger in the developing countries than that in the industrial countries.[8]

To deepen our analysis on parameter heterogeneity and materialize the impact of the credit growth on the CA balance, we extract the country-specific parameters by augmenting equation 1 with country dummies, which is represented by D_i.[9]

$$\left(\frac{CA}{GDP}\right)_{it} = \beta_0 + \beta_1\left(\frac{\Delta Credit}{GDP}\right)_{it} + \alpha_i\left(\frac{\Delta Credit}{GDP}\right)_{it} * D_i + \beta_2 X_{it} + \varepsilon_{it} \qquad (2)$$

In this setup, the slope of the credit growth for country i is given by $\beta_1 + \alpha_i$. Country-specific parameters (α_i) measure the incremental sensitivity of the countries' CA balance to the credit growth relative to the panel average. To provide an example for the influence of the credit growth on the CA balance, we conduct a simple rebalancing exercise[10] for Turkey for the year 2012. The CA balance of Turkey shrank by 3.79 percentage points in that year and according to our results almost 23 percent of this reduction is due to the slowdown in the credit growth, which was around 2.92 percentage points.[11]

4. The Role of Financial Depth

The evidence presented above indicates a significant heterogeneity in the impact of the credit growth on the CA balance. Regarding the underlying reasons behind this heterogeneity, we particularly concentrate on the level of the financial depth in this study. When we consider the direct impact of financial deepening on the CA balance, the mechanism relies on the influence of financial depth on economic growth. However, the literature finds that financial deepening

[8] According to the Wald test, coefficients of the credit growth for the industrial and developing countries are significantly different under both specifications, which exclude and include control variables. P-values of the tests are provided in table 3.

[9] A similar empirical strategy is used by Bruno and Shin (2013) to assess the impact of macro-prudential policies for Asian countries, in particular Korea.

[10] Turkey had the largest decrease in the CA balance within our sample in 2012.

[11] To examine whether the country-specific coefficient for Turkey (β_1+α_i) is significant, we run a Wald test. The coefficient for Turkey is statistically significant in both equations with and without including control variables at 5% significance level. Moreover, the difference between the parameter for Turkey and the panel average is statistically significant. The calculations are available upon request.

contributes to the GDP growth up to a certain threshold[12] and after this point, the positive contribution of financial deepening on growth disappears. Moreover, Easterly, et al. (2000) argue that, further deepening after the threshold increases the volatility of output growth. Therefore, these non-linearities motivate us to develop a different approach and study how the influence of financial excess might change with the level of financial depth.[13] We measure financial depth as the historical average of the ratio of total credit stock to GDP for each country.

To this end, we extract country-specific slopes from the whole sample by using the estimation methodology involving country specific dummies as in equation 2. Instead of providing all results, we depicted them in figure 1, which plots the level of financial depth and the extracted slopes.[14] Panel A of the figure shows the results for the full sample where panel B only considers the developing countries. The figures indicate that there is a significant degree of slope heterogeneity across the sample. Moreover, there is a positive relationship between the depth in the financial markets and influence of the credit growth on the CA balance. The same finding is also valid when only the developing countries are included, where the relationship more pronounced in this case.

To proceed in a more systematic way, we form interaction variables for the credit growth and financial depth. We estimate the following equation, which allows us to examine the impact of the credit growth on the CA balance conditional on the level of financial depth.

$$\left(\frac{CA}{GDP}\right)_{it} = \beta_0 + \beta_1 \left(\frac{\Delta Credit}{GDP}\right)_{it} + \gamma \left(\frac{\Delta Credit}{GDP}\right)_{it} * financialdepth_i + \beta_2 X_{it} + \varepsilon_{it} \qquad (3)$$

The results are presented in table 4, which shows that the impact of the credit growth on the CA balance is getting weaker for higher levels of financial depth. In addition, we run an exercise to examine the implied coefficients[15] for the high 10 percentile and the low 10 percentile financial depth levels. The estimation results (in column 4 where control variables are included) implies

[12] Arcand et al. (2012) suggest that when the credit stock to GDP ratio reaches to 100 percent, additional financial development puts a negative effect on output growth.

[13] The direct impact of financial deepening on the CA balance has been studied extensively starting with Chinn and Prasad (2003). Although theoretically one might expect a negative relationship between financial depth and the CA balance, the literature could not establish a clear finding on this issue. For instance, Gruber and Kamin (2007 and 2009) fail to report a statistically significant association in empirical terms.

[14] The regressions are run separately for each country and the control variables are included in the estimation process.

[15] Details of the calculations are available upon request.

that, a 10 percentage point increase in the credit growth would worsen CA balance by 0.14 percentage points for a country with financial depth level at the high 10 percentile. On the other hand, same level of a credit boom would worsen the CA balance by 0.63 percentage points for a country where financial depth level is at the low 10 percentile.

5. Robustness

To verify our results, we conduct some robustness checks. Our first robustness test is using alternative indicators to measure financial excess and financial depth. Secondly, we employ a dynamic panel data estimation to deal with a potential endogeneity problem.

As for the alternative measures for financial excess and financial depth, we first use the annual growth rate of credit stock (instead of the change in credit stock to GDP ratio). We re-estimate the equation 3 with this new variable and the results are reported in table 5. The results indicate that the annual credit growth rate has a similar impact on the CA balance. Moreover, the impact is weakened for higher levels of financial depth. Secondly, to check the results with respect to the choice of financial depth measure, we generate dummies for alternative levels of financial depth, using stock market and bond market capitalizations (both as ratios to the GDP). Estimation results with different measures of financial depth levels are reported in table 6, which supports our main findings. As the bond or stock market capitalization levels increase, the impact of credit growth on the CA balance becomes weaker.

Regarding the empirical strategy, it might be argued that the causal relationship between the domestic credit growth and foreign borrowing may not be clear since the shocks that are deriving the latter might also affect the former.[16] In other words, shocks that are driving the credit growth can also affect the foreign borrowing. The same concern is addressed by IMF (2013) suggesting that the source of financing, whether it is domestic or foreign, is in the secondary importance compared with proxying the lack of policies that could limit excessive credit growth. Moreover, the financial and economic cycles do not necessarily coincide and the credit growth carries information about the CA balance that is not addressed by the latter one. A similar approach to ours is implemented in Atoyan et al. (2013), which uses the credit growth as a

[16] See IMF (2013) for a detailed discussion.

determinant of the CA balance and identifies it among the most important determinants of the CA balance, which is exacerbated during the post-crisis period.

To control for a potential endogeneity problem, we employ generalized method of moments (GMM) procedure that is developed for dynamic panel data (DPD) models by Arellano and Bond (1991). GMM procedures for DPD models have been widely used in the literature as these models can handle multiple endogenous variables by using first-differencing and lagged values of the endogenous variables as instruments. Similar GMM procedures are also used in the studies identifying dynamics of the CA balance such as Calderon et al. (2002) and Cheung et al. (2013). The results of the DPD models with GMM estimation[17] are reported in table 7. The results of the GMM estimations indicate that when potential endogeneity problem is taken into consideration, the results remain intact. The credit growth has a statistically significant impact on the CA balance and the impact declines with the level of financial development.

6. Conclusion

This study undertakes a challenging task of examining the impact of financial variables on the CA dynamics. When we look at the previous work on the impact of financial variables on the CA balance, we observe that there are two strands of literature focusing on financial excess and financial depth. In this study, we implement a different approach and combine these two views. We first report a significant impact of the degree of financial excess, measured by the ratio of the change in new lendings to the private sector to the GDP, on the CA balance. Then, we show that there is a large dispersion in the country-specific parameters and argue that the level of financial depth can account for this dispersion. We present strong empirical evidence that the credit growth causes a higher deterioration in the CA balance for lower levels of financial depth. In other words, acceleration in the domestic credit causes a larger deterioration in the CA balance, particularly for the countries that are in the early stages of financial development. Our results

[17] In this study, Arellano and Bond's (1991) difference GMM estimation is preferred. To limit the set of instruments, as Roodman (2007) suggests, second order lag of CA balance and first and second order lags of the credit growth are used as GMM type instruments and oil trade balance, young and old dependency ratios are used as IV type instruments. To reduce the number of instruments, other control variables are assumed to be exogenous. In addition, as reported in table 7, Hansen's over-identification test and tests for autocorrelation give expected results. Hansen test statistic indicates that selected instruments are valid and are exogenous as a group. The results for Arellano-Bond's first order and second order serial correlation tests suggest that there is serial correlation for the first order correlation and as expected there is no serial correlation for the second order.

imply that low financial-depth countries should be mindful of their domestic credit growth rate and implement appropriate monetary and macro-prudential policies to avoid possible disruptive impact of the credit growth on the CA balance.

This study can be extended in several directions. First of all, the composition of the credit stock is important for CA dynamics. Buyukkarabacak and Krause (2009) show that lending to the consumers negatively affects the trade balance by increasing the demand for consumption, where the firm loans raise the net exports by increasing the demand for investment goods. Second issue is related with the means by which the credit growth is financed. Credit growth financed by domestic deposits may not alter the CA balance compared with the case where it is financed by foreign borrowing. Future work concerning these issues will enhance our understanding of the CA dynamics and help to implement more effective policies.

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Tables and Figures

Table 1: Countries in the sample[18]

Country	Abbreviation	Industrial = 1, 0 otherwise	Country	Abbreviation	Industrial = 1, 0 otherwise
Argentina	ARG	0	Korea	KOR	1
Australia	AUSL	1	Malaysia	MLY	0
Austria	AUS	1	Mexico	MEX	0
Belgium	BEL	1	Morocco	MOR	0
Brazil	BRA	0	Netherlands	NTL	1
Canada	CAN	1	New Zealand	NZ	1
Chile	CHI	0	Norway	NOR	1
China	CHN	0	Pakistan	PAK	0
Colombia	COL	0	Peru	PER	0
Costa Rica	COSR	0	Philippines	PHL	0
Czech Republic	CZE	1	Poland	POL	0
Denmark	DEN	1	Portugal	POR	1
Egypt	EGY	0	Russia	RUS	0
Finland	FIN	1	South Africa	SAFR	0
France	FRA	1	Spain	SPA	1
Germany	GER	1	Sri Lanka	SRL	0
Greece	GRE	1	Sweden	SWE	1
Guatemala	GUA	0	Switzerland	SWZ	1
Hungary	HUN	0	Thailand	THA	0
India	IND	0	Tunisia	TUN	0
Indonesia	IDN	0	Turkey	TUR	0
Ireland	IRE	1	United Kingdom	UK	1
Israel	ISR	1	United States	US	1
Italy	ITA	1	Uruguay	URU	0
Japan	JAP	1			

[18] The distinction between the industrial and developing countries is made according to the IMF description.

Table 2: Variable description

Variable	Source	Notes
CA to GDP ratio	IMF World Economic Outlook Database (WEO)	
Credit growth	World Bank's World Development Indicators (WDI)	Ratio of new lendings to the private sector within a year to GDP
NFA to GDP ratio	Updated Lane and Milesi-Ferretti (2007) dataset	Lagged one period
Dummy for high debt		Equals 1 if $\frac{NFA}{GDP} < -60\%$
Relative income	WEO	Own per capita GDP/US per capita GDP (PPP)
Average Growth Rate	WDI	5-year average growth rate of GDP at market prices based on constant local currency
Oil trade balance to GDP ratio	WEO	
Fiscal balance	World Bank Global Economic Prospects dataset	
Financial center dummy	IMF (2013)	Equals 1 for Netherlands, Switzerland and Belgium.
Exorbitant privilege	WEO	Own currency share in world reserves
Dependency ratio (old)	WDI	Population over 65/working-age population
Dependency ratio (young)	WDI	Population under 15/working-age population
Population growth	WDI	
Terms of trade	WDI	Net barter terms of trade

Table 3: Panel estimations results: The dependent variable is the ratio of the CA balance to GDP

	(1)	(2)	(3)	(4)
Credit growth	-0.030***	-0.027**		
	(0.005)	(0.006)		
Credit growth*IND			-0.012**	-0.012**
			(0.005)	(0.006)
Credit growth*DEV			-0.060***	-0.056***
			(0.011)	(0.013)
Average Growth		-0.362***		-0.324***
		(0.081)		(0.081)
NFA		0.028***		0.026***
		(0.007)		(0.007)
Dummy for high NFA level		0.001		-0.001
		(0.005)		(0.005)
Relative income		0.005		0.002
		(0.012)		(0.012)
Oil trade balance		0.555***		0.558***
		(0.068)		(0.067)
Fiscal balance		0.067**		0.066***
		(0.032)		(0.032)
Financial center dummy		0.039***		0.041***
		(0.009)		(0.009)
Exorbitant privilege		-0.027**		-0.027*
		(0.014)		(0.014)
Dependency ratio (old)		-0.158***		-0.154***
		(0.058)		(0.058)
Dependency ratio (young)		-0.053*		-0.053*
		(0.026)		(0.026)
Population growth		-0.416		-0.457
		(0.303)		(0.304)
Terms of trade		0.040***		0.040***
		(0.011)		(0.011)
Constant	-0.003	0.031	-0.003	0.030
	(0.003)	(0.022)	(0.003)	(0.022)
# of Observations	1000	967	1000	967
# of Countries	49	49	49	49
R-Squared	0.01	0.353	0.053	0.353
Root MSE	0.048	0.039	0.047	0.039
Wald Test p-values			(0.0001)	(0.0014)

Standard errors in brackets: *** p<0.01, ** p<0.05, * p<0.1

Note1: IND marks the industrial countries and DEV denotes the developing countries.

Note2: According to the Wald test, coefficients of the credit growth for industrial and developing countries, respectively, are significantly different for both of the equations that including and not including control variables at 5% significance level.

Table 4: Credit levels and the impact of the credit growth on the CA balance

	(1)	(2)	(3)	(4)
Credit growth	-0.030***	-0.083***	-0.027**	-0.072***
	(0.005)	(0.012)	(0.006)	(0.014)
Credit growth*financialdepth		0.051***		0.041**
		(0.010)		(0.011)
Controls	NO	NO	YES	YES
# of Observations	1000	1000	967	967
# of Countries	49	49	49	49
R-Squared	0.01	0.02	0.35	0.35
Root MSE	0.048	0.048	0.039	0.039

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1
Note: Credit growth*financialdepth denotes the interaction variable between the credit growth and the level of financial depth.

Table 5: Alternative determinants for the CA balance and credit levels

	(1)	(2)	(3)	(4)
Annual credit growth	-0.016***	-0.014***	-0.029***	-0.025***
	(0.003)	(0.003)	(0.007)	(0.008)
Annual credit growth*financialdepth			0.019***	0.015**
			(0.007)	(0.007)
Controls	NO	YES	NO	YES
# of Observations	1000	967	1000	967
# of Countries	49	49	49	49
R-Squared	0.01	0.41	0.04	0.35
Root MSE	0.048	0.037	0.047	0.039

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1
Note1: Credit growth and credit level are used as alternative financial excess measures.
Note2: Annual Credit growth*financialdepth denotes the interaction variable between annual credit growth of credit stock and level of financial depth.

Table 6: Alternative measures for financial depth

	(1)	(2)	(3)	(4)
Credit Growth	-0.048***	-0.037***	-0.063***	-0.051***
	(0.011)	(0.013)	(0.011)	(0.012)
Credit growth*Stock	0.025	0.013		
	(0.015)	(0.017)		
Credit growth*Bond			0.045***	0.033***
			(0.009)	(0.010)
Controls	NO	YES	NO	YES
# of Observations	916	891	752	728
# of Countries	45	45	37	37
R-Squared	0.02	0.35	0.02	0.30
Root MSE	0.048	0.040	0.049	0.042

Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1
Note: Stock market capitalization ratio to GDP and bond market capitalization ratio to GDP are used as to generate different financial depth levels. Credit growth*Stock and Credit growth*Bond denote the interaction variables between the credit growth and financial depth level as stock market capitalization and bond market capitalization, respectively.

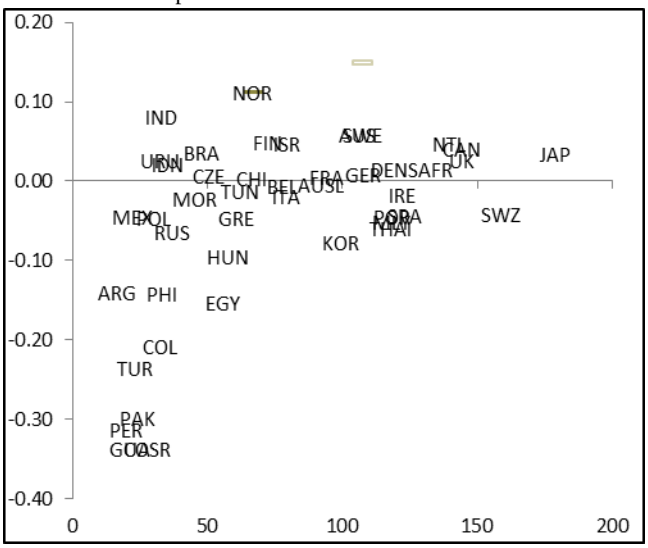
Table 7: Controlling for potential endogeneity problem: Difference GMM estimation

	(1)	(2)
Credit growth	-0.033**	-0.182**
	(0.015)	(0.083)
Credit growth*financialdepth		0.136*
		(0.068)
Controls	YES	YES
# of Observations	868	868
# of Countries	49	49
Specification Tests (p-values)		
Hansen Test for Overidentification	0.788	0.781
1st Order Correlation	0.017	0.044
2nd Order Correlation	0.128	0.100
Number of Instruments	61	61

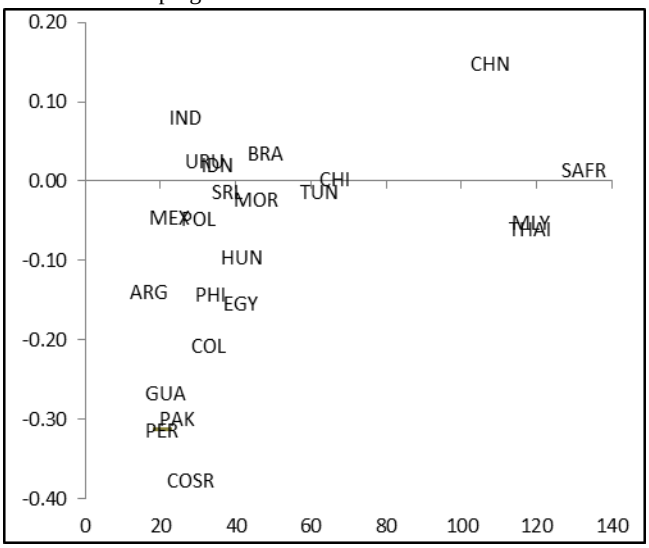
Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1.
Note: Instruments include second order lag of CA balance and first and second order lags of the credit growth as GMM type instruments and oil trade balance, dependency ratios for young and old are used as IV type instruments.

Figure 1: Country-specific parameters and financial depth

Panel A: Full sample with control variables



Panel B: Developing countries with control variables



Note: This figure is derived from the estimaton of the equation 2. It plots the country-specific parameters extracted out of this estimation. The country-specific parameters measure the incremental sensitivity of the countries' CA balance to the credit growth relative to the panel average. Panel A considers the full sample where panel B considers only the developing countries.

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