Relationship between Financial Intermediation and the Current Account in Egypt

Ossama Elhadary*

ABSTRACT

In this paper, the author studied the relationship between financial intermediation and the Current Account fluctuations in Egypt. The author was able to show that in Egypt, financial intermediation has both long and short run causal effects on the Current Account. On the other hand, the Current account has no long or short run causal effects on two of the financial intermediation variables (M2Y and Private) but had both long run and short run causal effect on the remaining financial intermediation variable (Privy). This latest finding comes as a surprise and will require additional research to explain it.

INTRODUCTION

In this paper, the author examined the relationship between financial intermediation and the Current Account in Egypt. The literature suggests that a lack of financial development prohibits emerging markets from successfully engaging in consumption-smoothing and thus affects the current account. Underdeveloped financial sectors are seen as an impediment for emerging economies to convert domestic savings and capital inflows into high-quality assets and thus investment, creating a shortage of assets (Caballero 2006). Thus, emerging markets with underdeveloped financial markets will—in principle—invest less than predicted by standard theory and hence will show a tendency towards current account surpluses (Hermann and Winkler, 2009).

Hermann and Winkler (2009) list three approaches that link underdeveloped financial markets with current account developments in emerging markets:

1. Financial intermediation and financial sector quality: Recent literature seems to suggest that the underdeveloped and weak financial markets hamper the ability of emerging markets to transform domestic savings into domestic investment and to engage in substantial foreign borrowing.
2. Build-up of foreign exchange reserves. Aizenman and Lee (2007) and Aizenman (2008) believe that foreign exchange reserve accumulation by emerging market economies acts as a substitute for developed financial markets in absorbing terms of trade shocks. Hermann and Winkler (2009) point out that for emerging markets to get credibility, they have to accumulate foreign assets (mainly foreign exchange reserves). This is especially true as consecutive financial crisis reveal financial sector weaknesses in emerging economies and reinforce the need to build-up foreign reserves.

* Department of Computer Systems Technology, New York City College of Technology, 300 Jay St, Brooklyn, NY

3. Financial integration. Underdeveloped financial sectors are regarded as a major obstacle for financial integration which hampers borrowing abroad and thus weakens the link between income convergence and the current account (Hermann and Winkler, 2009).

DATA

All time-series data was downloaded from the International Monetary Fund International Financial Statistics database. For all the variables (except Current Account), the data covers the period from 1960 to 2011. The Current Account data on the other hand is only available from 1977 to 2010.

The following data was downloaded:

1. Current Account (% of GDP)
2. M2 as a % of GDP
3. Domestic Credit to Private Sector (% of GDP)
4. Total Credit by Domestic Banks (% of GDP)

To calculate "private" (the ratio of credit issued to non- financial private firms to total domestic credit (excluding credit to banks), I divided the Domestic Credit to Private Sector by the Total Credit by Domestic Banks:

private= Domestic Credit to Private Sector/ Total Credit by Domestic Banks

FINANCIAL INTERMEDIATION AND THE RESEARCH VARIABLES

Hermann and Winkler (2009) believe that a higher degree of financial intermediation and a better quality of the domestic financial sector (less crisis-prone) should be associated with higher current account deficits (lower surpluses), as the financial sector is assumed to take a more active and facilitating role in fostering domestic investment.

According to Caprio and Klingebiel (2003), the ratio of private credit to GDP (Privy), and the ratio of M2 to GDP (M2Y) are variables directly capturing quantity and quality of financial intermediation in emerging Asia and emerging Europe. Besides these two variables, the author will also use "private" which is the ratio of credit issued to non- financial private firms to total domestic credit -excluding credit to banks as this variable is also believed to be a good measure of financial intermediation.

Accordingly, in this research, I will use the following variables:

- CA: is the ratio of Current Account to GDP
- M2Y: is the ratio of M2 to GDP
- Private: the ratio of credit issued to non- financial private firms to total domestic credit (excluding credit to banks)
- Privy: is the ratio of Domestic Credit to Private Sector as a percentage of GDP

The diagram below (Figure 1.) shows the variables used. Figure 2 on the other hand, shows the first difference of the variables used.

Figure 1: *Research Variables*

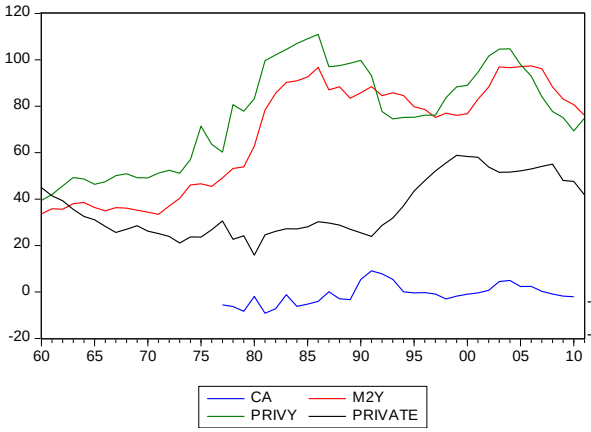
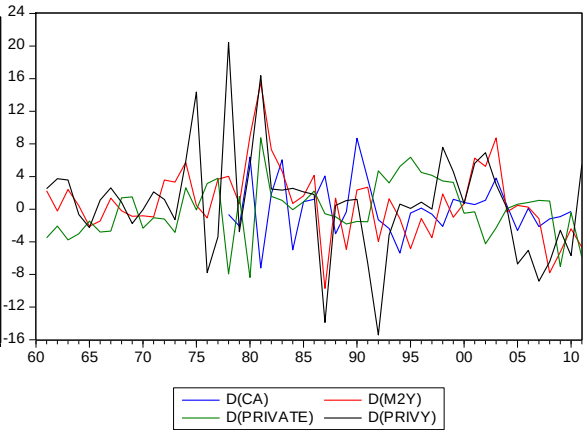


Figure 2: *First Difference of the Research Variables*



METHODOLOGY

The author will first establish the stationarity or lack of stationarity of the variables and then test for cointegration between the Current Account (CA) and the 3 financial intermediation variables (Private, M2Y, and Privy). Based on the results of the cointegration tests, the author will then construct separate VECM models with CA and the financial intermediation variables that are cointegrated with it.

To test for long run causality, the author will estimate the VECM equations using OLS and then examine the significance of the coefficient in front of the cointegrating equation. This will allow us to confirm if there is long run causality from financial integration to CA and from CA to financial integration or not.

For short run causality of financial intermediation on CA, the author will use the Wald test to confirm that the joint effect of the lags of the financial intermediation variables is significant. And to test for short term causality of CA on financial intermediation, the author will again use the Wald test to confirm that the joint effect of the lags of the CA is significant.

UNIT ROOT TEST

To confirm that the variables are I(1), the author performed the Phillips Perron unit root test which showed that all the variables have a unit root. The author then performed the same test for the difference of the variables, and the results showed that the differences do not have a unit root. This implied that the original variables (CA, M2Y, Privy, and Private) are all I(1) .

VECM SPECIFICATION

COINTEGRATION BETWEEN CURRENT ACCOUNT AND THE FINANCIAL INTERMEDIATION VARIABLES

Using Johansen's Cointegration test, the author tested for cointegration between the Current Account variable and the three financial intermediation variables (M2Y, Private, and Privy). One Cointegration relationship was found between the Current Account and each of the other variables.

LONG TERM CAUSALITY BETWEEN CA AND M2Y

To test for long term causality between CA and M2Y, we construct an Error Correction Model with CA and M2Y (Table 1.).

Table 1: VECM Model for CA and M2Y

Error Correction	D(CA)	D(M2Y)
CointEq1	-0.412	0.353
	(0.126)	(0.217)
D(CA(-1))	0.209	0.172
	(0.151)	(0.260)
D(CA(-2))	-0.156	-0.323
	(0.150)	(0.258)
D(CA(-3))	0.176	0.35
	(0.131)	(0.225)
D(CA(-4))	-0.145	-0.401
	(0.143)	(0.245)
D(M2Y(-1))	0.24	0.443
	(0.109)	(0.188)
D(M2Y(-2))	0.022	0.127
	(0.107)	(0.184)
D(M2Y(-3))	-0.368	0.077
	(0.105)	(0.180)
D(M2Y(-4))	-0.232	0.133
	(0.132)	(0.226)
c	1.02	-0.6
	(0.475)	(0.816)

The above implies the following system of equations:

- D(CA) = C(1)*(CA(-1) - 0.611991191449*M2Y(-1) + 53.256477768) + C(2)*D(CA(-1)) + C(3)*D(CA(-2)) + C(4)*D(CA(-3)) + C(5)*D(CA(-4)) + C(6)*D(M2Y(-1)) + C(7)*D(M2Y(-2)) + C(8)*D(M2Y(-3)) + C(9)*D(M2Y(-4)) + C(10)
- D(M2Y) = C(11)*(CA(-1) - 0.611991191449*M2Y(-1) + 53.256477768) + C(12)*D(CA(-1)) + C(13)*D(CA(-2)) + C(14)*D(CA(-3)) + C(15)*D(CA(-4)) + C(16)*D(M2Y(-1)) + C(17)*D(M2Y(-2)) + C(18)*D(M2Y(-3)) + C(19)*D(M2Y(-4)) + C(20)

To test for long term causality between CA and M2Y, we are especially interested in C(1) and C(11). Note that:

- C(1) is the coefficient in front of the cointegrating equation and represents the causality from M2Y to CA.
- C(11) is the coefficient in front of the cointegrating equation and represents the causality from CA to M2Y.

By estimating the above 2 equations using OLS (see table 2.), it is clear the C(1) is significant and negative at the 5% level, while C(11) is not. We can thus conclude that there is causality from M2Y to CA, but not vice versa (i.e.: there is no long run causality from CA to M2Y).

Table 2: *OLS Estimation of VECM model with CA and M2Y*

	Coefficient	Std. Error	t-statistic	Prob
C(1)	-0.412	0.126	-3.275	0.002
C(2)	0.209	0.151	1.38	0.175
C(3)	-0.156	0.15	-1.045	0.303
C(4)	0.176	0.131	1.346	0.186
C(5)	-0.145	0.143	-1.018	0.315
C(6)	0.24	0.109	2.198	0.034
C(7)	0.022	0.107	0.202	0.841
C(8)	-0.368	0.105	-3.524	0.001
C(9)	-0.231	0.131	-1.762	0.086
C(10)	1.02	0.475	2.149	0.038
C(11)	0.377	0.213	1.72	0.093
C(12)	0.154	0.255	0.602	0.551
C(13)	-0.314	0.254	-1.237	0.224
C(14)	0.352	0.222	1.583	0.122
C(15)	-0.377	0.24	-1.574	0.124
C(16)	0.432	0.185	2.337	0.025
C(17)	0.147	0.179	0.824	0.415
C(18)	0.111	0.171	0.649	0.52
C(19)	0.13	0.223	0.584	0.562
C(20)	-0.753	0.775	-0.971	0.338

SHORT TERM CAUSALITY FROM M2Y TO CA

To test for short run causality from M2Y to CA, we need to test if the joint effect of the 4 lags of M2Y are significant or not. We can do this by setting C(6)=C(7)=C(8)=C(9)=0 using the Wald Test. The results of the test are shown in table 3.

Table 3: *Wald Test for 4 Lags of M2Y*

Test Statistic	Value	df	Probability
Chi-square	23.21	4	0.0001

Because the probability is smaller than .05, it is evident that we can reject the null that C(6)=C(7)=C(8)=C(9)=0, which implies that there is a short run causality from M2Y to CA.

SHORT TERM CAUSALITY FROM CA TO M2Y

To test for short run causality from CA to M2Y, we need to test if the joint effect of the 4 lags of CA are significant or not. We can do this by setting C(12)=C(13)=C(14)=C(15)=0 using the Wald Test. The results of the test are shown in table 4.

Table 4. *Wald Test for 4 Lags of CA*

Test Statistic	Value	df	Probability
Chi-square	6.422	4	0.17

Because the probability is greater than .05, it is evident that we can not reject the null that C(12)=C(13)=C(14)=C(15)=0, which implies that there is no short run causality from CA to M2Y.

LONG TERM CAUSALITY BETWEEN CA AND PRIVATE

Similarly, to test for long run causality between CA and Private, we construct an Error Correction Model with these two variables. The results of the model imply the following system of equations:

- D(CA) = C(1)*(CA(-1) - 0.0213036413436*PRIVATE(-1) + 1.09720529618) + C(2)*D(CA(-1)) + C(3)*D(CA(-2)) + C(4)*D(CA(-3)) + C(5)*D(CA(-4)) + C(6)*D(PRIVATE(-1)) + C(7)*D(PRIVATE(-2)) + C(8)*D(PRIVATE(-3)) + C(9)*D(PRIVATE(-4)) + C(10)
- D(PRIVATE) = C(11)*(CA(-1) - 0.0213036413436*PRIVATE(-1) + 1.09720529618) + C(12)*D(CA(-1)) + C(13)*D(CA(-2)) + C(14)*D(CA(-3)) + C(15)*D(CA(-4)) + C(16)*D(PRIVATE(-1)) + C(17)*D(PRIVATE(-2)) + C(18)*D(PRIVATE(-3)) + C(19)*D(PRIVATE(-4)) + C(20)

To test for long term causality between CA and Private, we are especially interested in C(1) and C(11). Note that:

- C(1) is the coefficient in front of the cointegrating equation and represents the causality relation of Private on CA.
- C(11) is the coefficient in front of the cointegrating equation and represents the causality relation of CA on Private.

By estimating the above 2 equations using OLS, we realize that C(1) is significant at the 5% level, while C11 is not. This implies that on the long run, Private causes CA but not vice versa.

SHORT TERM CAUSALITY FROM PRIVATE TO CA

To test for short run causality from Private to CA, we need to test if the joint effect of the 4 lags of Private are significant or not. We can do this by setting C(6)=C(7)=C(8)=C(9)=0 using the Wald Test.

Because the probability is smaller than .05, it is evident that we can reject the null that C(6)=C(7)=C(8)=C(9)=0, which implies that there is a short run causality from Private to CA.

SHORT TERM CAUSALITY FROM CA TO PRIVATE

To test for short run causality from CA to Private, we need to test if the joint effect of the 4 lags of CA are significant or not. We can do this by setting C(12)=C(13)=C(14)=C(15)=0 using the Wald Test. Because the probability is greater than .05, we fail to reject the null that C(12)=C(13)=C(14)=C(15)=0, and this implies that on the short run, there is no causality from CA to Private.

LONG TERM CAUSALITY BETWEEN CA AND PRIVY

Now, to test for long run causality between CA and Privy, we construct an Error Correction Model with these two variables. The results of the model imply the following system of equations:

- D(CA) = C(1)*(CA(-1) - 1.28894606143*PRIVY(-1) + 118.838447074) + C(2)*D(CA(-1)) + C(3)*D(CA(-2)) + C(4)*D(CA(-3)) + C(5)*D(CA(-4)) + C(6)*D(PRIVY(-1)) + C(7)*D(PRIVY(-2)) + C(8)*D(PRIVY(-3)) + C(9)*D(PRIVY(-4)) + C(10)
- D(PRIVY) = C(11)*(CA(-1) - 1.28894606143*PRIVY(-1) + 118.838447074) + C(12)*D(CA(-1)) + C(13)*D(CA(-2)) + C(14)*D(CA(-3)) + C(15)*D(CA(-4)) + C(16)*D(PRIVY(-1)) + C(17)*D(PRIVY(-2)) + C(18)*D(PRIVY(-3)) + C(19)*D(PRIVY(-4)) + C(20)

To test for long term causality between CA and Private, we are especially interested in C(1) and C(11). Note that:

- C(1) is the coefficient in front of the cointegrating equation and represents the causality relation of Privy on CA.
- C(11) is the coefficient in front of the cointegrating equation and represents the causality relation of CA on Privy.

By estimating the above 2 equations using OLS we realize that that both C(1) and C(11) are significant at the 5% level. This implies that there is causality from Privy to CA and also from CA to Privy.

SHORT TERM CAUSALITY FROM PRIVATE TO CA

To test for short run causality from Privy to CA, we need to test if the joint effect of the 4 lags of Privy is significant or not. We can do this by setting C(6)=C(7)=C(8)=C(9)=0 using the Wald Test. Because the probability is smaller than .05, it is evident that we can reject the null that C(6)=C(7)=C(8)=C(9)=0, which implies that there is a short run causality from Privy to CA.

SHORT TERM CAUSALITY FROM CA TO PRIVY

To test for short run causality from CA to Privy, we need to test if the joint effect of the 4 lags of CA is significant or not. We can do this by setting C(12)=C(13)=C(14)=C(15)=0 using the Wald Test. Because

the probability is smaller than .05, it is evident that we can reject the null that C(12)=C(13)=C(14)=C(15)=0, which implies that there is a short run causality from CA to Privy.

CONCLUSION

In this paper, the author studied the relationship between financial intermediation and the Current Account fluctuations in Egypt. Three measures from the literature were used as proxies of financial intermediation: 1) the ratio of M2 to GDP (M2Y), 2) the ratio of credit issued to non- financial private firms to total domestic credit excluding credit to banks (Private), and 3) the ratio of Domestic Credit to Private Sector as a percentage of GDP (Privy).

Previous research suggests that the lack of financial development prohibits markets from successfully engaging in consumption-smoothing and thus affects the current account. In terms of financial intermediation (which is the focus of this paper), the underdeveloped and weak financial markets hamper the ability of emerging markets to transform domestic savings into domestic investment and to engage in substantial foreign borrowing (Hermann and Winkler, 2009) thus again affecting the Current Account. The author was able to show that in Egypt, financial intermediation has both long and short run causal effect on Current Account.

It is worth noting that in this paper, the long run causality from financial intermediation to the Current Account was always negative which confirms Hermann and Winkler's (2009) assertion that a higher degree of financial intermediation is associated with higher current account deficits. This implies that a weak financial sector will prohibit emerging markets from successfully engaging in consumption-smoothing and thus affects the current account.

On the short run, the above three variables also had a direct causal effect on Current Account. It is interesting to note here that Current Account had no long or short run causal effect on two of the three financial intermediation variables (M2Y and Private), but it had both long and short term causal effect on the third variable (Privy). This latest finding comes as a surprise and will require additional research to explain it.

REFERENCES

Aizenman, Joshua, 2008."Large hoarding of international reserves and the emerging global economic architecture." *The Manchester School* 765(5), 487-503.

Aizenman, Joshua, and Jaewoo Lee, 2007. "International reserves: precautionary versus mercantilist views, theory and evidence." *Open Economies Review* 18(2), 191-214.

Caballero, Ricardo J., 2006. "On the macroeconomics of asset shortages". No. w12753. National Bureau of Economic Research.

Gaprio, Gernard, and Daniela Klingebiel, January 2003. "Episodes of Systemic and Borderline Financial Crisis." *World Bank Mimeo.*

Herrmann, Sabine, and Adalbert Winkler, 2009. "Financial markets and the current account: emerging Europe versus emerging Asia." *Review of World Economics* 145(3), 531-550