



Implications of Capital Inflows on Financial Stability in Arab Countries

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Abstract

This paper investigates the impact of net capital inflows on credit to the private sector as a share of gross domestic product. It tries to assess to what extent net capital inflows could lead to excessive credit growth and, hence, undermine financial stability. The pooled mean group for the cointegration method is employed in this paper. The results show that net capital inflows may have a negative long run impact on financial stability in the Arab countries through increasing credit growth. With different types of capital inflows, the implications on financial stability differ. The results show that direct and portfolio investments have both insignificant impact on credit to the private sector in the long run, while other investments¹ show a potential long run positive impact on credit to the private sector in the Arab countries.

Introduction:

Capital flows are cross-border transactions involving financial assets. Financial assets include for example, bank deposits, equity and debt securities, loans, etc. Capital flows that include changes in international reserves, foreign currency exchange, and special withdrawal agreements with the International Monetary Fund (IMF) are called official capital flows. At the same time, private capital flows are the direct portfolio and other investments made by residents and non-residents.

Countries seek to attract foreign capital to finance the savings gap and promote economic growth and development (Dornbusch, 1998) by enhancing productivity and management efficiency, smoothing consumption, and promoting financial competitiveness and development (IMF, 2012) and (IMF, 2016). On the other hand, capital flows may expose the economic and financial systems to external risks and shocks (Kim & Singal, 2000), (IMF, 2016), (Baum, Pundit, & Ramayandi, 2017). More precisely, a significant increase in capital inflows can make the financial system more vulnerable and overheat the economy. Regarding financial system risks, an increase in capital inflows will lead to a lending boom, and thus increasing financial system vulnerability by exacerbating maturity and currency mismatches on one hand and by creating asset price bubbles on the other (Combes, Kinda, & Plane, 2011).

Therefore, the impact of capital flows on economic and financial stability remains an open question that depends on empirical evidence. In emerging markets, studies show that the effect of capital flows on the macroeconomic is ambiguous and may depend upon many factors, such as the level of financial development, the nature of the flows, the country's characteristics, and others (Baum, Pundit, & Ramayandi, 2017).

The main objective of this paper is to assess the impact of capital inflows on credit to the private sector of 10 Arab countries, specifically Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Palestine, Saudi Arabia, Sudan, and Tunisia. The selection of Arab countries depends on the availability of data. The analysis examines three types of private capital inflows, direct

¹ Classifications of other investments will be provided in subsequent sections.

investment (DI), portfolio investment (PI), and other investments (OI) for the selected Arab countries. Given episodes of financial instability in emerging countries associated with high credit growth, credit to the private sector as a share of GDP is utilized as an indication for potential risks and vulnerabilities that may have undesirable impact on financial stability.

Review of literature

The interaction between the volatility of capital inflows and financial stability has given rise to rich theoretical and empirical literature.

Lopez-Mejía (1999), notes that massive capital inflows can cause an excessive increase in aggregate demand² and an appreciation of the real exchange rate and worsening current account deficits. They could also have negative repercussions on the financial system through an excessive increase in bank credit, macroeconomic instability, etc. He points out that not all countries that experienced a credit boom saw their financial system weaken, and the amplitude of the boom-and-bust cycle varied from country to country.

Burton et al. (2006) show that the volatility of capital flows triggers financial instability, especially in a weak financial system. Massive withdrawals of capital ensued; hence the causality is bidirectional.

Kose et al. (2007), theoretically demonstrate the feedback loop between capital flow volatility and financial stability. For these authors, the more financial system is developed, the more capital inflows boost growth and the less the country is vulnerable to crises, either directly or indirectly. The development of the financial system also has a beneficial effect on macroeconomic stability, which in turn affects the volume and composition of capital flows. However, in the developing countries whose financial system is not dense enough, sudden outflows of capital tend to generate cycles alternating between expansion and contraction or amplify volatility. This contributes to triggering financial instability (i.e., a financial crisis).

Bernanke (2011), to review the impact of capital flows on financial stability, theoretically analyzes the behavior of the savings and investments balance with a reduction of investment ($S - I$). According to his analysis, capital flows have helped to finance the booms in financial assets and thus prepared the ground for the phase of financial instability in countries where the financial system is shallow and less regulated. He shows that the interaction between the volatility of capital flows and the weakness of the financial system produces destructive effects on the economy.

Kaminsky & Reinhart (1999) study the relationship between financial crises (banking, monetary, etc.) and capital flows in a liberalized economy. Using a panel probit model, they identify excessive credit growth as the major factor in generating a financial crisis. Indeed, show that among the 26 cases of banking crises they studied, 18 took place 5 years after the liberalization of the financial market. Similarly, according to Kaminsky (2008), a high level of financial integration increases the risk of a sudden stop in capital flows, even in the absence of

² Which would result in macroeconomic overheating (inflationary pressure).

proven macroeconomic imbalance in the domestic country. This relationship can be explained by the adverse effects of deregulation of capital movements following financial liberalization. Such lifting of restrictions leads to free entry and exit of capital without control or hindrance. Hence, it could be deduced that financial liberalization stimulates capital inflows which result in excess liquidity and can thus lead to an increase in bank credit and money in circulation. When these massive capital inflows into the economy are mediated through an underdeveloped and inadequately regulated financial system, they lead to volatility in consumption and, consequently, in imports. While the investment remains weak, the economy becomes more vulnerable to exogenous shocks.

Sa (2006) finds no causal link between capital flows and bank credit to the private sector. It is therefore difficult to draw general conclusions about financial stability. However, he observes that in some countries, the massive inflows of foreign capital and credit expansion can be linked to a healthier movement in the process of financial deepening. In other countries, the co-existence of strong capital inflows and credit booms can generate risks of instability when this external financing leads to deep macroeconomic and financial imbalances.

Diev and Pouvelle (2008) estimate an econometric model that shows a significant and negative relationship between credit growth and capital flows. They find that a one percentage point increase in the credit to GDP ratio would deteriorate the current account to GDP ratio by 0.5 percentage points. They show that excessive credit growth would deteriorate the current account and/or the financial account beyond a level deemed sustainable and would increase the likelihood of a currency crisis. Then they implement causality tests to assess the nature of credit growth. They conclude that when the detected causality is in the direction of credit growth towards domestic demand and not vice versa, this could be interpreted as a potential risk for financial stability to that extent as strong credit growth leads to overheating going beyond developments related to simple catch-up (financial development process).

Furceri et al. (2011) studied the relationship between international capital inflows and the probability of triggering financial crises. To do this, the authors estimate a panel data logistic regression model on a sample of 112 developed and emerging countries between 1970 and 2007. They find that an episode of international capital inflows significantly increases the probability of financial crises in the following two years. They also show that the likelihood of triggering crises is greater if capital inflows consist mainly of short-term debt flows.

For Reinhart and Reinhart (2008), the probability of financial instability conditional on a capital bonanza is higher than the unconditional probability. Their study shows that financial instability is much more caused by a capital bonanza. Furthermore, Reinhart & Rogoff (2010), have calculated the correlation between capital mobility and financial instability between 1800 and 2000, showed that periods of high capital mobility repeatedly caused financial crises.

Janus and Riera-Crichton (2016), study the relationship between financial crises and capital flows. They show that banking crises associated with the reversal of capital increase the exchange rate risk and the sudden stop. Magud et al. (2014) found that in a flexible exchange

rate regime, the macroprudential policy allows countries to mitigate and smooth capital flow volatility.

Lambert et al. (2011), estimate a Panel VAR model to capture the spillover effects of taxes on capital. They conclude that the tax imposed by Brazil on capital flows has led to an increase in capital flows to the other countries. This cost a loss of capital for Brazil and a significant gain for other neighboring countries.

Glockert and Towbin (2012) analyze the impact of monetary policy on capital flows while pursuing two objectives, namely price stability and financial stability. Through the VAR model, they find that the effects of the policy rate on capital flows is significant if the objective pursued is price stability, and less important in the case of the objective of financial stability. Unlike the policy rate, they find that a shock or a reserve requirement policy influences capital flows if the objective pursued is financial stability.

Bussiere et al. (2015), estimate in the panel the relationship between the level of foreign exchange reserves and capital controls. The results indicate that the level of reserves plays an important role: countries with a high level of reserves (as a proportion of their short-term debt) suffered relatively less from the crisis, mainly when their capital account is less open. This suggests a certain complementarity between reserve accumulation and capital controls.

Clerk et al. (2010) suggest that implementing a macroprudential policy, in the form of a prudential tax on capital flows or capital controls, is of limited interest relative to an ex-post public intervention in times of crisis.

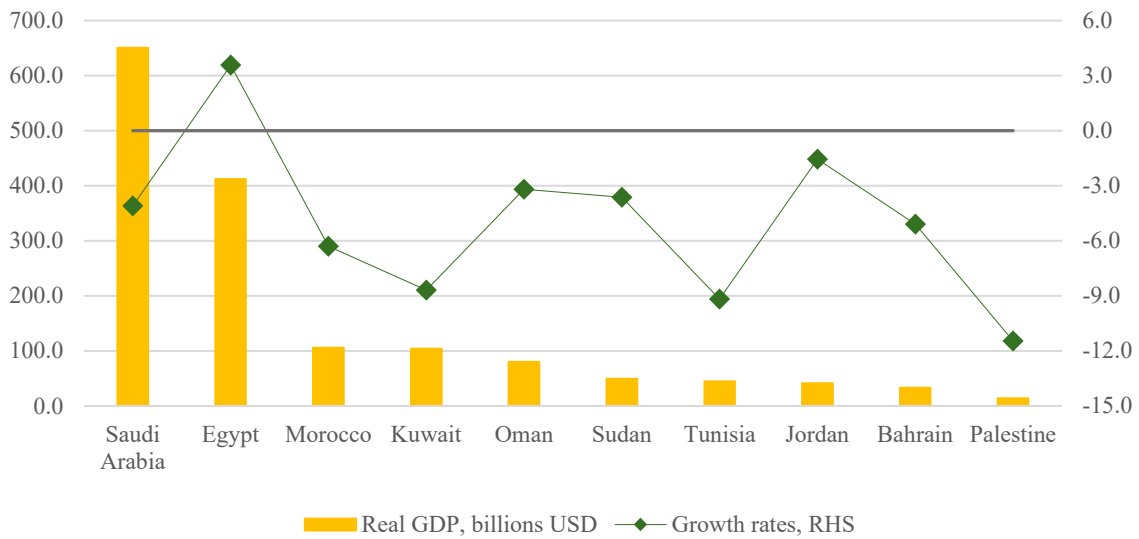
A general review of the literature discussed above reveals that some authors advocate that the volatility of capital flows undermines financial stability and has destructive effects on the real economy. However, many have also shown that a weaker, underdeveloped, and inadequately regulated financial system can cause capital flow volatility. It follows that the causal effect is essentially not univocal but retroactive, i.e., the influence is in both directions.

Economic and financial developments

Output and prices developments

Figure 1 below shows the real GDP growth for the selected Arab countries in 2020. As shown in the figure, all Arab countries' economies declined, except for Egypt, due to the health pandemic, which harmed all economies worldwide.

Figure 1: Real GDP (USD billion) and growth rates of the selected Arab countries, 2020



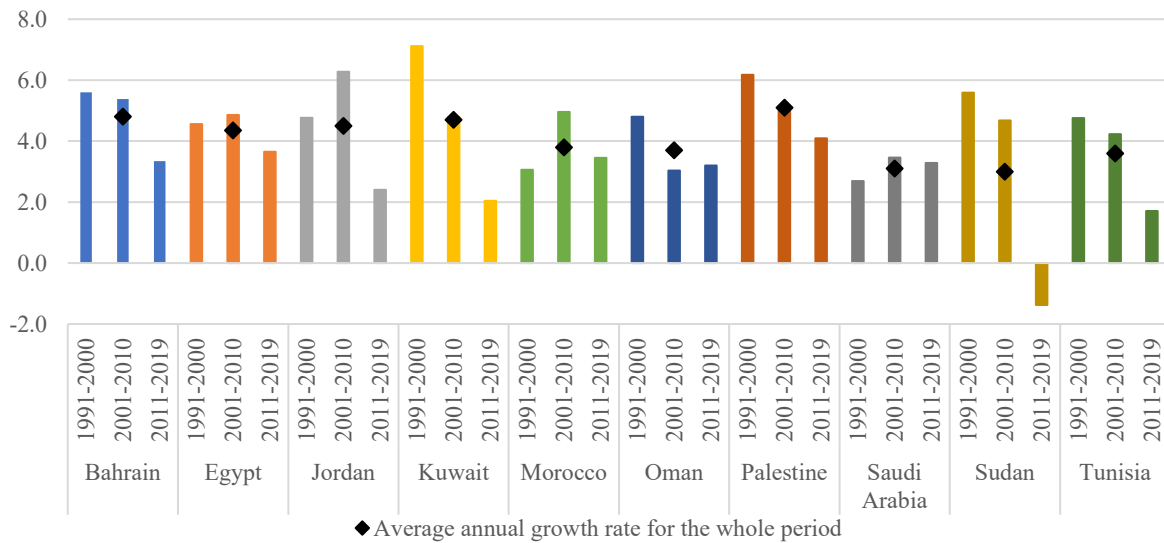
Source: World Bank, World Bank national accounts data.

Figure 2 shows the annual growth rates in selected Arab countries' economies between the period 1991 – 2019. Growth rates of 2020 were excluded from neutralizing the effect of the Pandemic from the average annual growth rates during the period. Arab countries showed different patterns of growth during the sample period. Five out of the ten selected countries showed a continued slowdown in GDP growth rates during 1990s, 2000s, and 2010s. All the selected countries showed a decline in its economic performance during the last decade except for Oman, which performed slightly better than in the 2000s period. The selected Arab countries grew by only 2.6 percent during the 2010s (excluding 2020) compared to a growth rate of 4.7 percent during the 2000s and 4.8 percent during the 1990s.

Sudan's economy declined during the 2010s (-1.4 percent average annual growth rates)³. Among possible reasons stand behind this decline are the secession of South Sudan and the hyperinflation that hit Sudan during that period.

³ It is worth noting that the source of Sudan's data is the World Bank's database and it is adjusted to reflect the secession of South Sudan.

Figure 2: Average annual growth rates of the selected Arab countries

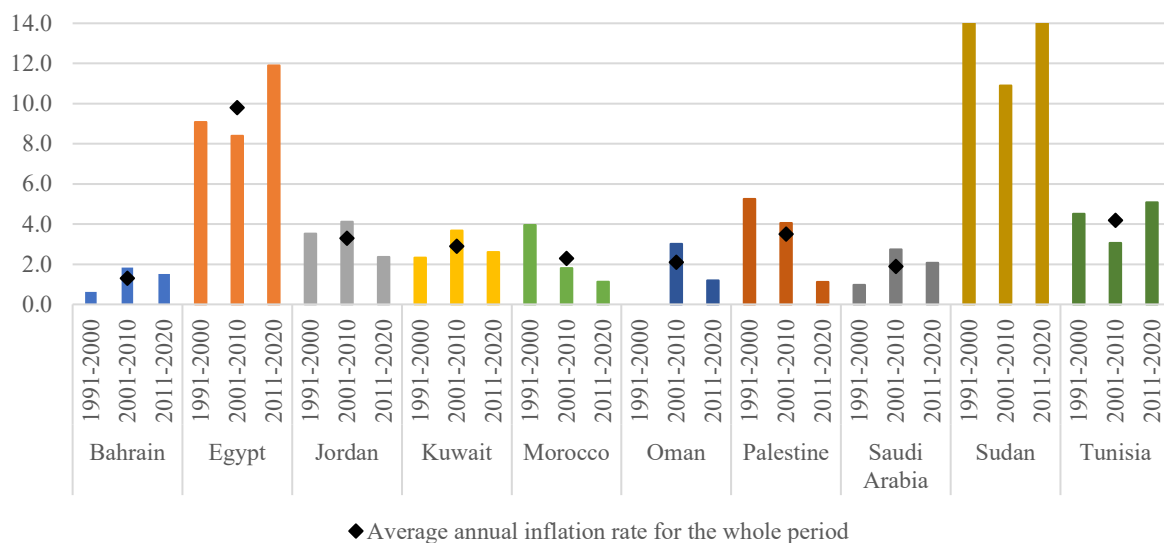


Source: World Bank, World Bank national accounts data.

Figure 3 shows the evolution of inflation rates in the selected Arab countries between 1991 and 2020. The average annual inflation rate in the selected Arab countries vary between 1.3 percent in Bahrain to 44.1 percent in Sudan during 1991-2020. Excluding Egypt and Sudan, the rest Arab countries in the sample showed low inflation rates in the last decade, around 2.1 percent on average.

Sudan suffered from very high inflation rates (hyperinflation) during the 1990s and 2010s, where the average annual inflation rate reached 75.5 percent during the 1990s and 45.9 percent during the 2010s. The data also shows that the inflation rates in Egypt are high compared to the other countries excluding Sudan, with average annual inflation rates reaching around 9.8 percent during the whole period. It is worth noting that Egypt has left the fixed exchange rate regime against the USD and adopted a managed floating exchange rate regime since 2016.

Figure 3: Average annual inflation rates in the selected Arab countries



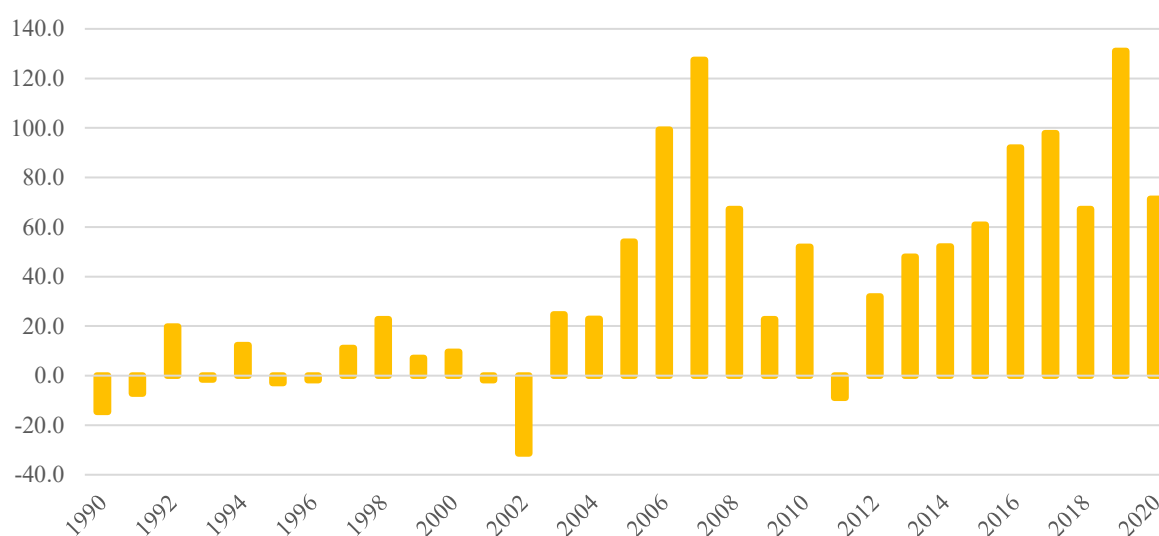
Source: IMF, International Financial Statistics.

Net capital inflows developments

Before analyzing the developments of net capital inflows in the selected Arab countries, it is helpful first to clarify what is meant by net capital inflows. According to the Six Edition of the Balance of Payments Manual (BOPM6, 2009), “capital flows” refers to *cross-border financial transactions recorded in economies’ external financial accounts*. Now capital inflows arise when the economy incurs more external liabilities (in this case, capital inflows come with a positive sign) or the economy reduces its external liabilities (in this case, capital inflows come with a negative sign). Thus, net capital inflows are the difference between the incurs and the reduction of external liabilities. When net capital inflow is positive, means that the economy is incurring external liabilities more than reducing them and vice versa.

The following figure shows the total net capital inflows to the selected Arab countries between 1990 and 2020. The figure shows that net capital inflows before 2005 was small and volatile. Still, after that, net capital inflows increased heavily until 2007 (the starting of the global financial crisis), when they started to decline and then resumed their increasing pattern after 2011. In 2020, net capital flows declined from about 131 USD billion to around 71 USD billion. This is mainly due to the COVID-19 pandemic.

Figure 4: Total Net capital inflows to the selected Arab countries, USD billion



Source: IMF, International Financial Statistics.

There are three types of capital flows:

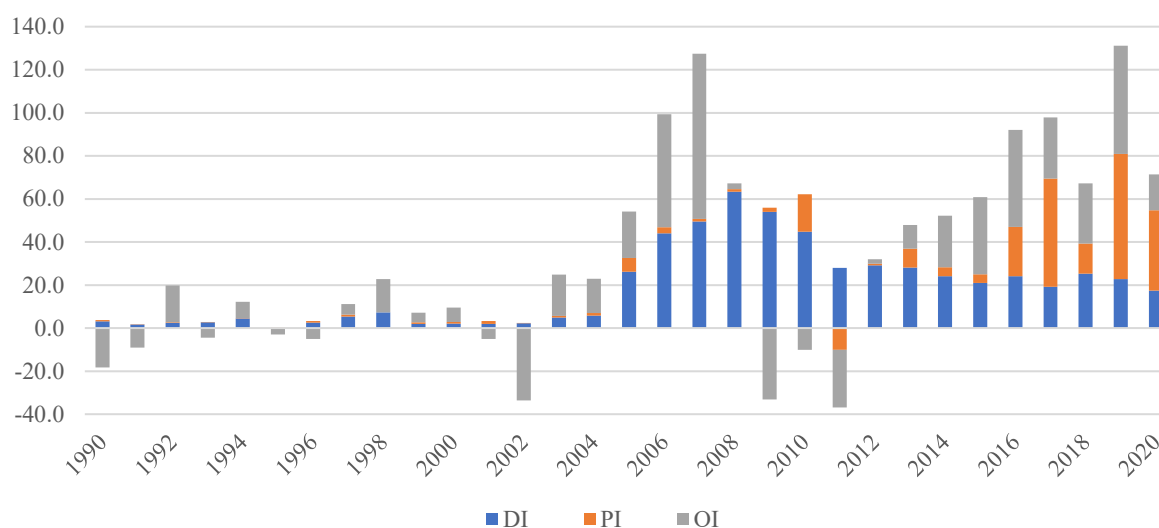
- 1- **Direct investment (DI):** “is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise resident in another economy.” (BOPM6, 2009)
- 2- **Portfolio investment (PI):** “is defined as cross-border transactions and positions involving debt or equity securities other than those included in direct investment or reserve assets.” (BOPM6, 2009)
- 3- **Other investments (OI):** “is a residual category that includes positions and transactions other than those included in direct investment, portfolio investment,

financial derivatives and employee stock options, and reserve assets.” (BOPM6, 2009).

Among the items included in other investments are other equities not in the form of securities, financial lease, repurchase agreements, loans from the International Monetary Fund (IMF), loans to finance trade, special drawing rights.

Like net capital inflows, net inflows of *DI*, *PI*, and *OI* may take a positive or negative sign. Figure 5 shows the distribution of net capital inflows in selected Arab countries among its components. As shown in the figure, the net inflows of *DI* started to have a significant share of net capital inflows after 2004 and constantly have a positive sign, which means that the selected Arab countries are attracting foreign direct investment. On the other hand, net inflows of *OI* oscillate between increase and decrease. When *OI* is positive, most probably, Arab countries are acquiring more foreign debt, and when it is negative, it means that countries are repaying their foreign debt. Net inflows of *PI* started to increase recently, which means that non-residents are now investing more in financial securities and debt instruments in the selected Arab countries.

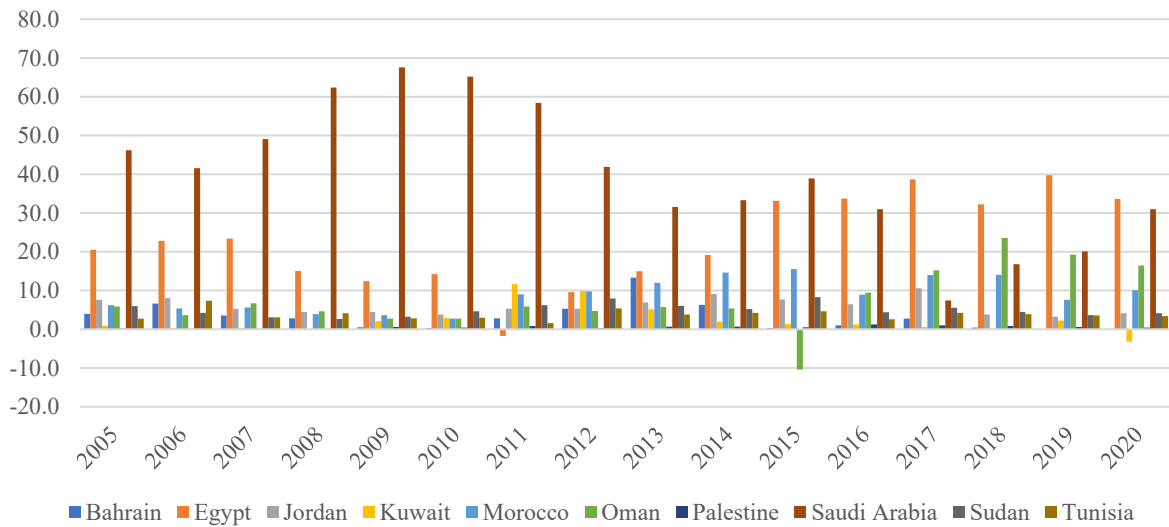
Figure 5: Net inflows of DI, PI, and OI to the selected Arab countries, USD billion



Source: IMF, International Financial Statistics.

Figure 6 shows the evolution of net inflows of *DI* country shares out of total net inflows of *DI* to selected Arab countries. As shown in figure 6, Saudi Arabia had the largest share of *DI* among the rest of countries until 2015. Later, Egypt had the largest share of *DI* net inflows. In 2020, Egypt’s share of *DI* net inflows reached 33.6 percent, while Saudi Arabia’s share reached 31.0 percent. Oman’s share was 16.4 percent, then Morocco with 10.1 percent. The rest of countries (Bahrain, Jordan, Kuwait, Palestine, Sudan, and Tunisia) share stated at only 8.9 percent.

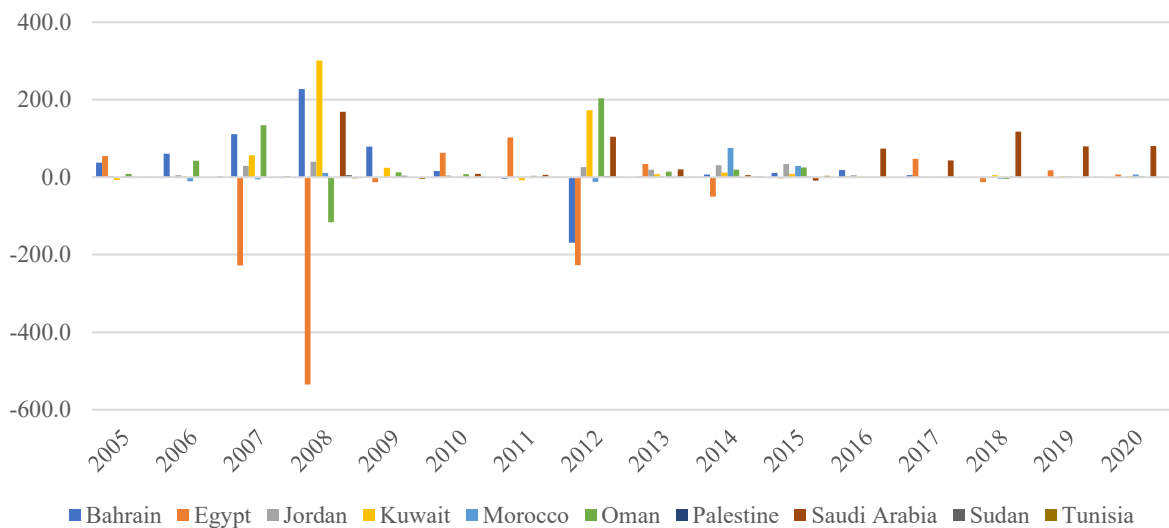
Figure 6: The share of net inflows of DI by country



Source: IMF, International Financial Statistics.

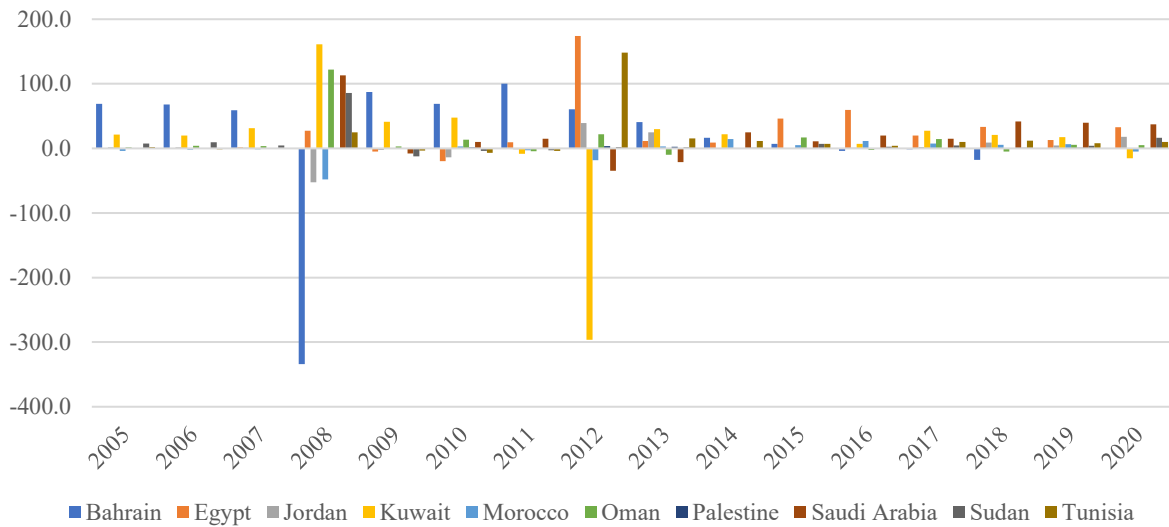
As shown in the following two figures, the shares of PI and OI are highly volatile, and most of these investments are built on debt-based instruments (foreign loans and debt securities). The shares of the selected Arab countries of PI in 2007 and 2008 and OI in 2008 have changed significantly due to the global financial crisis. While in 2012 PI and OI changed with remarkable trend due to social and economic developments in some countries, such as Egypt and Tunisia.

Figure 7: The share of net inflows of PI by country



Source: IMF, International Financial Statistics.

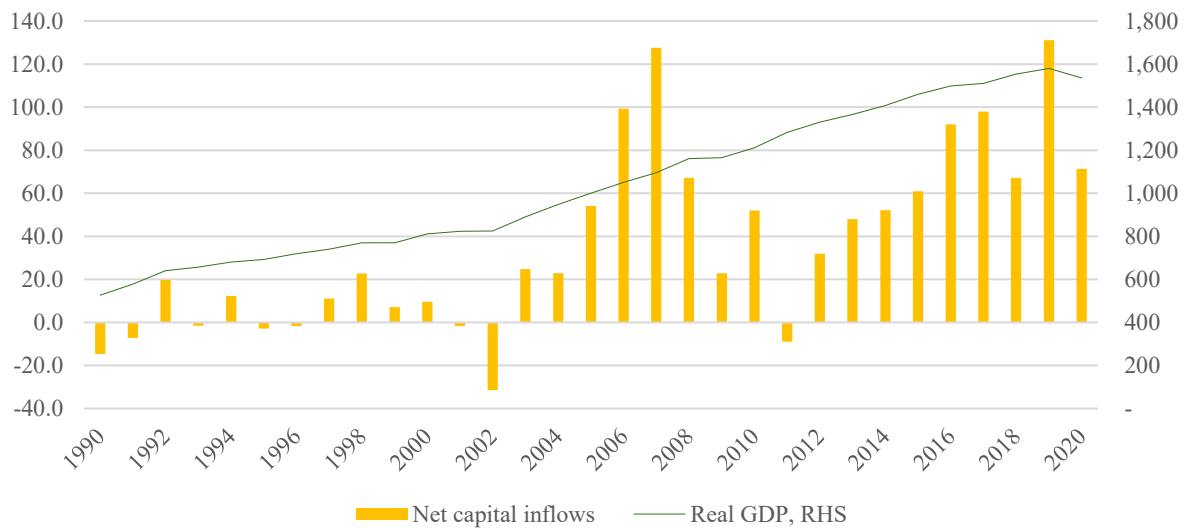
Figure 8: The share of net capital inflows of OI by country



Source: IMF, International Financial Statistics.

In general, PI and OI are short run foreign investments and are highly sensitive to economic, political, and social pressures, while DI is long run foreign investment and, in this regard, is less volatile as demonstrated in the above figures 5 to 8. The following figure shows the evolution of net capital inflows and real GDP in selected Arab countries. The figure reveals the relationship between economic performance and attracting extra capital inflows.

Figure 9: Net capital inflows and real GDP for the selected Arab countries, USD billion



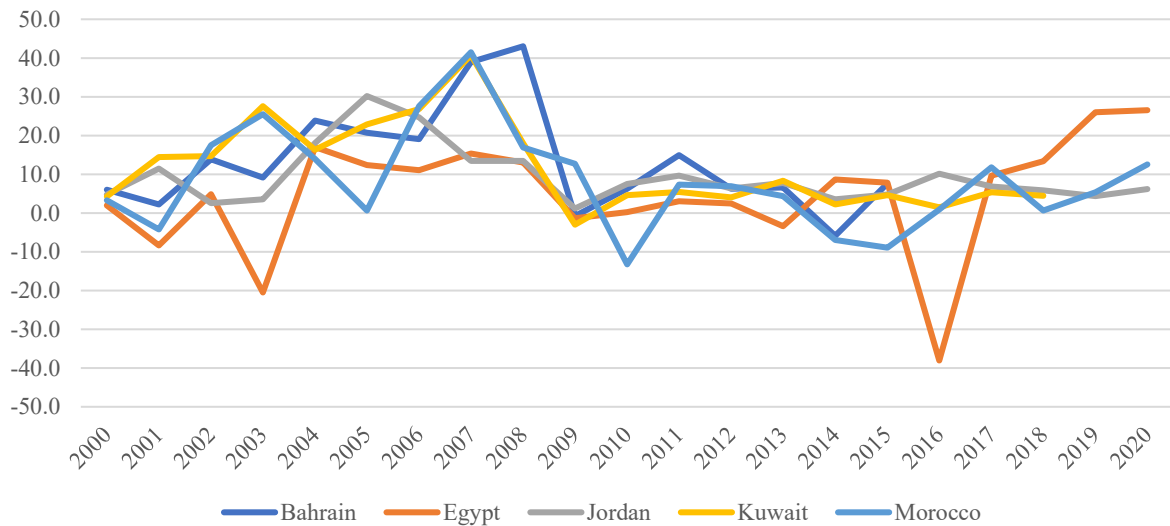
Sources: World Bank, national accounts data
IMF, International Financial Statistics.

Credit to the private sector developments

In this subsection, the paper analyzes the evolution of credit to the private sector. Figures 10a and 10b indicate the evolution of the growth rate of the credit to the private sector in the selected Arab countries. Indeed, the figures show an upward trend in credit up to 2007. After that, credit to the private sector declined substantially due to the global financial crisis (except for

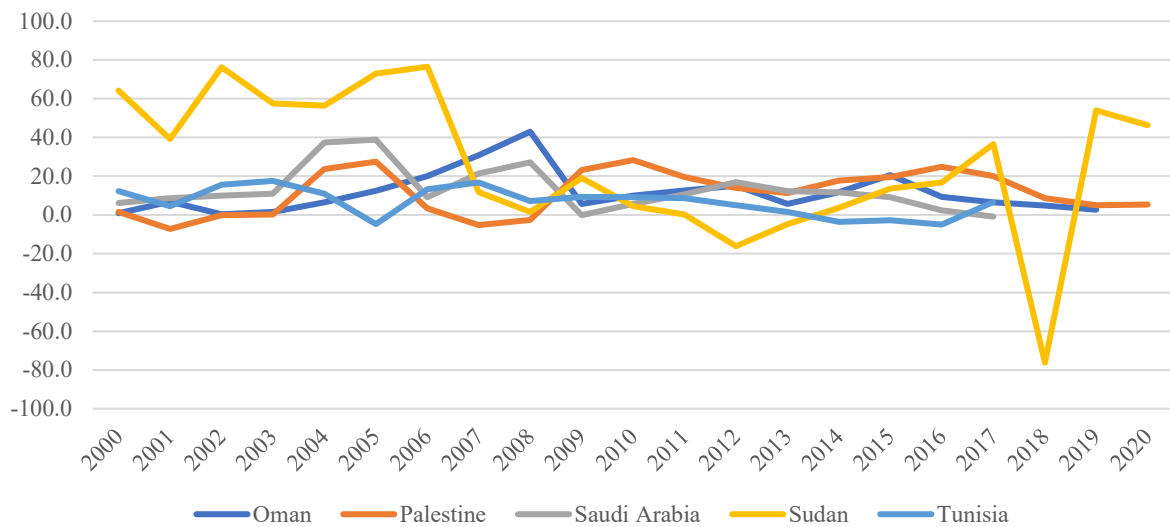
Palestine, which witnessed an increase in credit during the global financial crisis⁴). It is worth noting that credit to the private sector in Egypt has experienced sizable decline in 2016, mainly due to the depreciation in the value of the Egyptian pound, which was followed by increase in both inflation and interest rates, reaching respectively more than 29 percent in 2017, and more than 18 percent in 2017. In Sudan, credit to the private sector declined in 2018, when inflation rate hits more than 60 percent in 2018.

Figure 10a: The growth rates of the credit to the private sector



Source: IMF, International Financial Statistics.

Figure 10b: The growth rates of the credit to the private sector



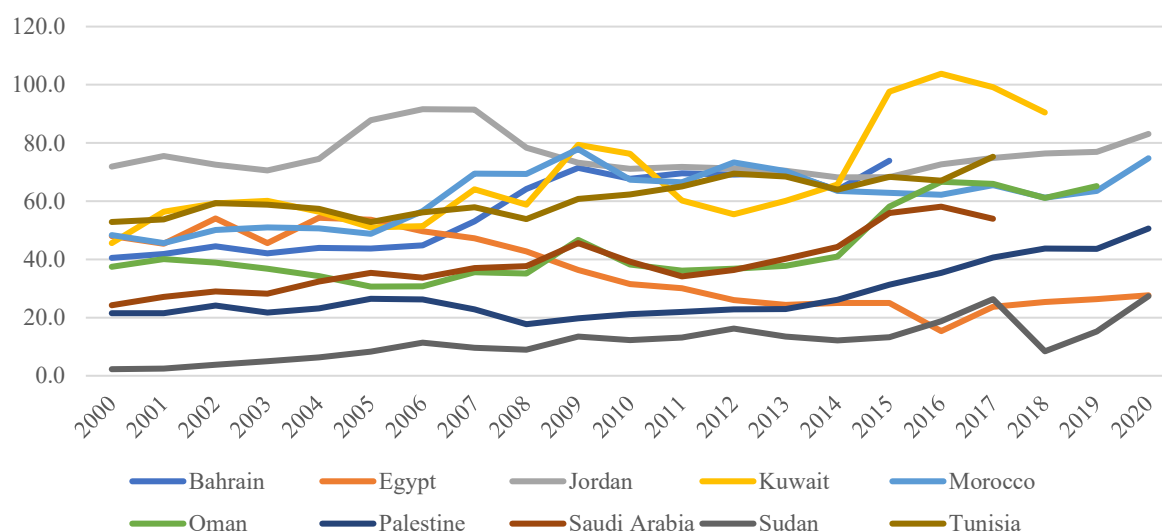
Source: IMF, International Financial Statistics.

Figure 11 shows credit to the private sector as a share of GDP. It is easy to notice here that the ratio increased moderately between 2000 and 2020 except for Egypt, which witnessed a decline

⁴ In that period Palestine Monetary Authority instructed the banks operating in Palestine to decrease their foreign financial assets, which led to a jump in liquidity in the Palestinian banking sector and resulted in an increase in lending.

during that period. The increase in the ratio of credit to GDP reflects what so-called financial deepening is, which is the case in most emerging and developing countries around the world.

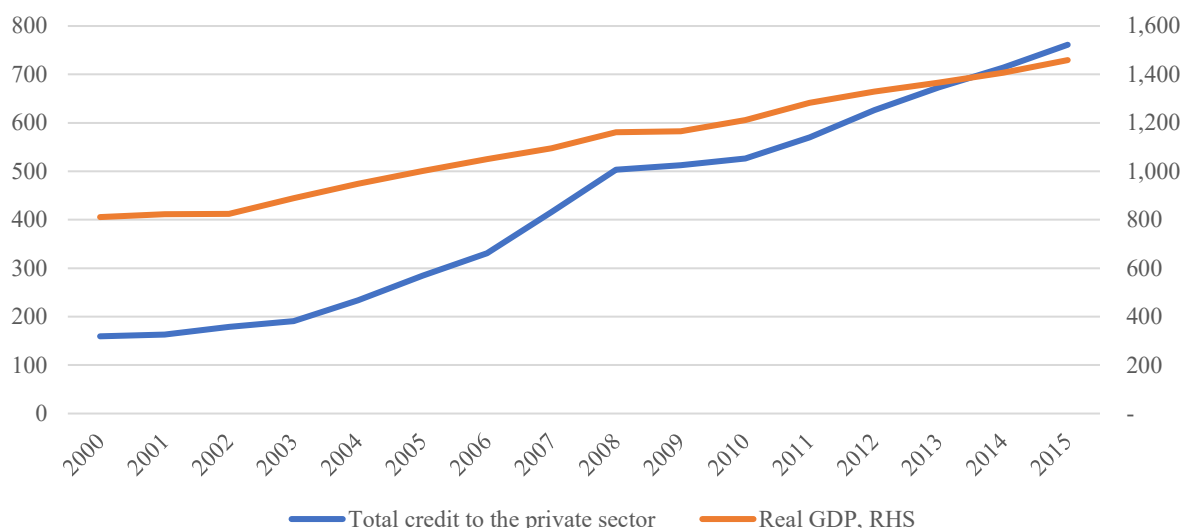
Figure 11: Credit to the private sector as a share of GDP



Source: Authors calculations.

Figure 12 shows a long-run positive relationship between credit to the private sector and real GDP in selected Arab countries. The growing pace of credit is steeper than that for credit to the private sector, which reflects either financial deepening or excessive increase in credit in the selected Arab countries.

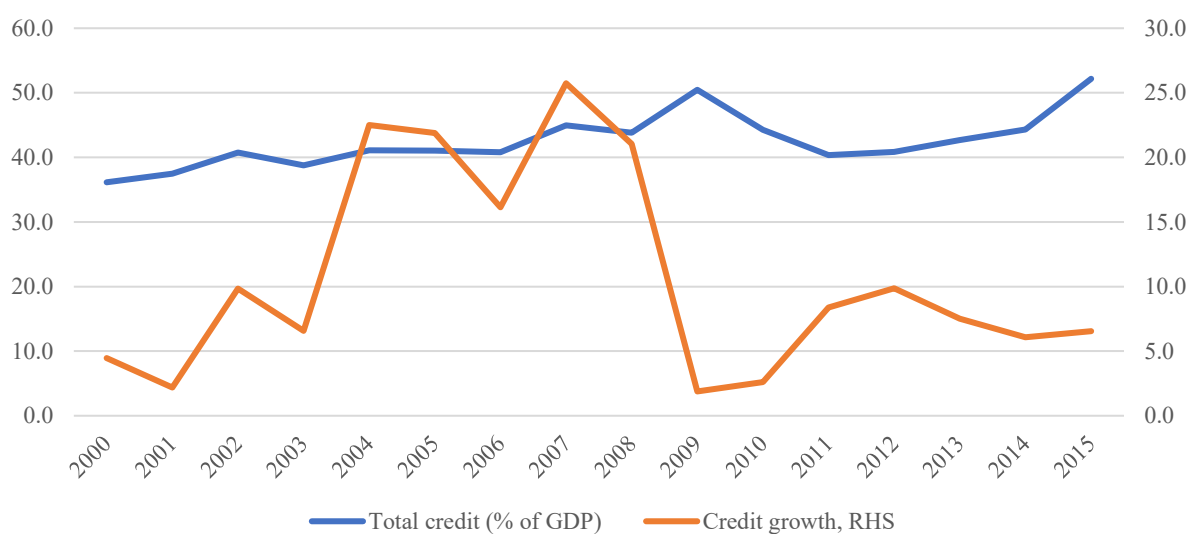
Figure 12: The evolution of credit to the private sector and real GDP (2010=100) in the selected Arab countries (USD billions)



Sources: World Bank, national accounts data
IMF, International Financial Statistics.

Figure 13 shows the evolution of credit growth versus credit to the private sector as a share of the total GDP in selected Arab countries. Credit as a share of GDP reveals a growing trend which implies a potential risk on financial stability. The figure also shows the remarkable decline in credit to the private sector during the global financial crisis of 2008 – 2009.

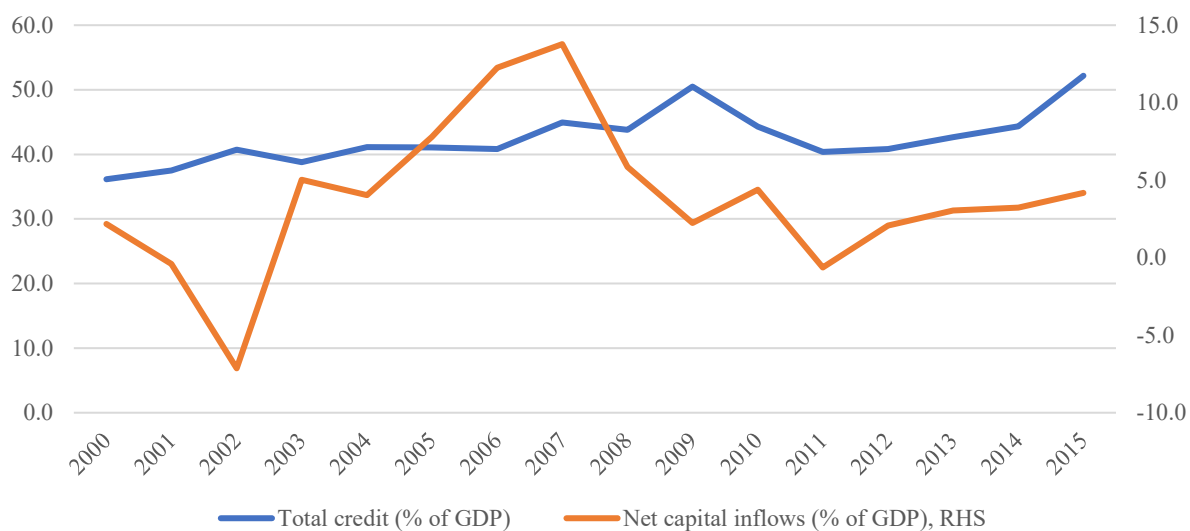
Figure 13: Credit growth vs credit as a percent of GDP and in selected Arab countries



Source: Authors calculations.

Finally, figure 14 shows the evolution of credit to the private sector versus net capital inflows as a share of GDP. The figure shows a long run upward trend for both series, but with a short run countercyclical behavior until 2010 and procyclical behavior since 2011. This short-run relationship could be made possible since capital flows are considered as a substitute source of funds from one hand, and this relationship depends upon the type of the capital flow on the other hand. The potential relationship will be examined in an econometric model thereafter.

Figure 14: The evolution of credit to the private sector vs net capital inflows as a share of GDP



Source: Authors calculations.

Methodology

Model specification

The paper employs the pooled mean group (PMG) for the cointegration method, according to Pesaran et al. (1999). The pooled mean group (PMG) is superior to the traditional estimators like pooled, fixed effects, and random effects models and the dynamic models or the generalized method of moments (GMM). These methods produce biased estimates of the slope parameters especially when time dimension is large (Pesaran and Smith, 1995). Although the mean group (MG) estimator allows for heterogeneity and produces consistent estimates, however, it does not consider the possible homogeneity across countries (Pesaran et al., 1998). Therefore, the PMG is more appropriate given the characteristics of Arab economies.

In this context, the PMG lets each country to have its coefficient in the short run, but all countries have equal slopes in the long run. The ARDL (p, q, q, q, q) model can be specified as:

$$CP_{it} = \sum_{j=1}^p \lambda_{ij} CP_{i,t-j} + \sum_{j=1}^q \phi_{ij} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (1)$$

Where CP is credit to the private sector as a share of GDP (a proxy for financial stability), X is a vector of explanatory variables, where $i = 1, 2, \dots, N$, and $t = 1, 2, \dots, T$, μ_i denotes the fixed effects, and ε refers to the error terms. It is suitable to reparametrize Eq. (1) in the following way:

$$\Delta CP_{it} = \theta_i CP_{i,t-1} + \delta'_i X_{i,t-1} + \sum_{j=1}^{p-1} \alpha_{ij} \Delta CP_{i,t-1} + \sum_{j=0}^{q-1} \beta_{ij} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (2)$$

where $\theta_i = -(1 - \sum_{j=1}^p \lambda_{ij})$, $\lambda_i = \sum_{j=0}^q \phi_{ij}$, $\alpha_i = -\sum_{m=j+1}^p \lambda_{im}$, $j = 1, 2, \dots, p-1$, and $\beta_i = -\sum_{m=j+1}^q \phi_{im}$.

The set of explanatory variables, X , contains net capital inflows (CI) which consist of direct investment (DI), portfolio investment (PI), and other investment (OI); real GDP (RGDP); trade openness (TO) measured as the ratio of exports plus imports to GDP; and inflation rate measured as the percentage change in the consumer price index. The paper includes trade openness as an explanatory variable to capture the current account developments in the balance of payments. On the other hand, world integration in form of exports and imports is an important factor that affects financial stability. Regarding inflation, it was used as an indicator for macroeconomic stability.

All the variables are transferred into a natural logarithm. The data for all series are collected from the International Monetary Fund and World Bank databases. Note that the four models will be estimated. The baseline model (1) includes the net capital inflows together with the rest of the independent variables, model (2) is like model (1) but control for important events such

as the global financial crisis (GFC) 2008-2009⁵, while model (3), model (4), and model (5) include net inflows of DI, PI, and OI, respectively.

Estimation method

To examine the impact of capital inflows on credit to the private sector in selected Arab countries, the paper uses data from 1990 to 2019 covering only ten countries. As the characteristics of the data match macro panels or time-series panel data (relatively long time series), an appropriate estimating procedure will be applied. As time-series data, macro panels are subject to spurious regression; therefore, panel unit root and panel cointegration tests are essential for opening analyses. According to Im et al. (2003), the IPS⁶ panel unit root test will be used to identify the order of variables of integration. Consider the series y_{it} for N countries observed for T periods.

$$\Delta y_{it} = \gamma_i + \alpha_i y_{i,t-1} + u_{it}$$

The null hypothesis of the IPS unit root test is as follows:

$$H_0: \alpha_i = 0$$

Against the alternatives,

$$H_1: \alpha_i < 0, \quad i = 1, 2, \dots, N_1, \quad \alpha_i = 0, \quad i = N_1 + 1, N_1 + 2, \dots, N.$$

The alternative hypothesis allows for α_i vary across some countries.

After the panel unit root test, the paper build on Pedroni (1999 and 2004) research, who suggests seven test statistics that allow for heterogeneity in the panel and to test the null hypothesis of no cointegration. These tests are categorised into within-dimension (pooled) and between-dimension or group-mean (average individual test statistics). The rho-statistic, PP-statistic, and ADF-statistic are within both groups. There is a possibility of obtaining contradictory results between the seven test statistics. Pedroni (2004) argues that the ADF statistics in each test categorises (within-dimension and between-dimension) would have higher power properties, especially when $T < 100$.

Empirical findings

To examine the relationship between capital inflows and the financial sector's stability proxied by CP in selected Arab countries, the paper uses panel data analysis, namely, the PMG. Before the primary analysis, the paper runs some preliminary tests. Table 1 demonstrates the results of the correlation among different variables. A closer inspection of the table shows a moderate level of correlation for most variables. The highest correlation is between capital inflows and other investments, followed by the correlation between capital inflows and direct investment with coefficients of about 0.76 and 0.61, respectively. This is not surprising since the other

⁵ The dummy variable that takes the value of zero before 2008 and 1 afterwards.

⁶ IPS stans for the paper published by Im, Pesaran, and Shin (2003).

investment and foreign direct investment are the main components of net capital inflows. Also, none of the previously mentioned variables are included in estimation models.

Table 1. Correlation Matrix

	CP	CI	RGDP	TO	INF	FDI	PI	OI
CP	1							
CI	0.1530	1						
RGDP	0.0516	0.5429	1					
TO	0.5333	0.0557	-0.2689	1				
INF	-0.4379	0.1923	0.2105	-0.4567	1			
DI	0.0607	0.6114	0.5492	-0.0659	0.2620	1		
PI	0.3511	0.50364	0.4490	0.2666	-0.1253	0.3350	1	
OI	0.1730	0.76280	0.3520	0.1063	0.0699	0.3075	0.4145	1

It is essential to test for the stationarity of the series and the cointegration among the variables, as shown in Table 2 and Table 3. The IPS panel unit root test results reveal that the variables are stationary at level or $I(0)$, except CP, RGDP, TO, and INF are stationary after first-difference ($I(1)$). These findings suggest the absence of an $I(2)$ variable. The next step is to verify the long-run relationship among the variables. Table 3 provides the results obtained from the Pedroni (1999 and 2004) cointegration analysis. What stands out in the table is the clear evidence of a long-run relationship for the four specified models since the PP-Statistic and ADF-Statistic are statistically significant. Once the presence of cointegration is confirmed, the fear of spurious estimation fades away, and one may proceed to the panel-ARDL/PMG analysis.

Table 2. IPS Panel Unit Root Test

variables	level		1 st Difference	
	C	C&T	C	C&T
CP	-1.3362	-2.5379**	-4.7308***	-4.7632***
CI	-2.5991***	-4.0599***	-7.676***	-7.5459***
RGDP	-2.0418**	-1.1632	-4.062***	-4.5606***
TO	-1.4523	-1.6897	-5.4296***	-5.7189***
INF	-2.5308	-3.415***	-7.8372***	-7.6877***
DI	-3.5911***	-2.8451***	-7.7563***	-8.138***
PI	-2.9814***	-4.339***	-6.7582***	-6.5996***
OI	-3.3475***	-4.1614***	-8.5658***	-7.8012***

Note: ***, **, and * refer to 1, 5, and 10 percent, respectively. C and C&T refer to intercept, intercept, and trend, respectively. The critical values for equation with intercept only are -2.18, -1.99, and -1.88 for 1, 5, and 10 percent, respectively. The critical values for equation with intercept and trend are -2.79, -2.60, and -2.51 for 1, 5, and 10 percent, respectively.

Table 3. Pedroni Panel Cointegration Test

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Within-dimension</i>					
Panel v-Statistic	-1.0052	-0.2087	1.1465	-0.4755	-0.9551
Panel rho-Statistic	0.1270	0.1346	0.2845	1.1431	0.6959
Panel PP-Statistic	-5.5335***	-4.3055***	-3.0308***	-2.4869***	-4.1002***
Panel ADF-Statistic	-5.6639***	-4.3215***	-3.3041***	-1.6896**	-4.1827***
<i>Between-dimension</i>					
Group rho-Statistic	1.9175	1.8705	2.0424	2.6122	2.3830
Group PP-Statistic	-2.0731**	-1.5938*	-0.8360	-2.7174***	-1.1347
Group ADF-Statistic	-2.6462***	-1.7822**	-1.5413*	-0.8308	-2.2502**

Note: ***, **, and * refer to 1, 5, and 10 percent, respectively.

Table 4 shows the PMG/panel-ARDL results for the baseline model (1) that regresses CI and the other independent variables on CP and model (2) that mirrors model (1) and controls for the GFC effect. Regarding model's (1) results, it is apparent from this table that most of the variables are statistically significantly related to CP. What stands out is that CI is positively associated with CP in the long run. An increase in CI by 10 percent, for instance, results in 0.9 percent increase in credit to the private sector as a percentage of GDP (CP). In addition, a positive association between RGDP and CP was observed. Indeed, when RGDP rises by 10 percent, the CP measure goes up by approximately 2.6 percent. However, it is found that there is a negative association between TO and CP. Note that the coefficient of TO is weakly significant at the 10 percent level. The INF harms CP with an increase of 10 percent in INF; the CP measure decreases by about 0.8 percent on average.

The results of model (2) that shown in table 6 reveal that CI is positive and significantly related to CP in the long-run. It is shown that an increase in CI by 10 percent leads to approximately 0.5 percent increase in the dependent variables. Also, the RGDP is positive and statistically significant in its relation to CP. A 10 percent rise in RGDP results in about 5 percent in CP. However, the long-run coefficient of TO and INF are negative, but only the latter is statistically significant. Indeed, 10 percent increase in INF results in roughly 1 reduction in CP in the long-run. Overall, the PMG results after controlling for GFC is to large extent like those of the main model (1).

At the bottom of Table 4, the paper reports the short-run relationship results. None of the explanatory variables is statistically significant except RGDP in model (1) and INF in model (2), which are negative and significant and positive significant, respectively. Contrary to the long-run, the short-run association between RGDP and CP is negative, suggesting that higher output may reduce the credit to the private sector. Also, INF in the short-run is positive unlike the long-run, this implies that inflation stimulates the credit to private sector. Importantly, the paper finds the error correction term (ECT) that explains the speed of adjustment toward equilibrium in a model of cointegrated variables, negative and statistically significant as the theory of Engle and Granger (1987) implies. The correction speed is about 20.4 percent annually.

Table 4. PMG Results (Overall Capital Inflows)

Variable	Model 1	Model 2
<i>Long-run</i>		
CI	0.085535 (0.0022)	0.0478 (0.0044)
RGDP	0.257484 (0.0301)	0.5134 (0.0003)
TO	-0.246870 (0.0880)	-0.0272 (0.7729)
INF	-0.082982 (0.0010)	-0.0969 (0.0000)
<i>Short-run</i>		
ECT	-0.204210 (0.0000)	-0.2799 (0.0000)
D(CI)	-0.004536 (0.5358)	0.0012 (0.8987)
D(RGDP)	-0.487420 (0.0699)	-0.0254 (0.9497)
D(TO)	-0.020214 (0.8945)	-0.0818 (0.4143)
D(INF)	0.009573 (0.3746)	0.0193 (0.0408)
DU		0.0058 (0.9316)
C	-0.753983 (0.0000)	-2.6774 (0.0000)
No. Groups	10	10
No. Obs.	236	261
Log likelihood	221.9491	263.5937

Note: the values in () are the p-values. The optimal lags are selected according to Akaike information criterion (AIC).

Table 5 presents further analysis to examine the effects of the individual components of capital inflows on credit to the private sector as a share of GDP. In model (3), The paper uses net DI inflows instead of the aggregate measure of net capital inflows (CI). The results show that DI has a positive but insignificant effect on CP (probability value = 0.44), indicating that changes in the inflows of DI do not explain the variation in CP in the long run. The table shows a positive and statistically significant relationship between RGDP and CP. A 10 percent increase in RGDP leads to a 1.5 percent increase, on average, in the dependent variable (CP).

Nevertheless, the paper discovers no statistically significant relation between TO and the CP since the probability value is 0.45. INF is negative and statistically significant, which is consistent with that of the models (1) and (2). Indeed, if inflation rises by 10 percent, the CP declines roughly 0.6 percent. When inflation increases, real lending rate declines which negatively affects the profitability of banks and thus the supply of credit declines. Regarding the short-run results, it is evident that all the estimated coefficients are not statistically significant. However, the ECT coefficient is the only exception since it has a negative sign, and the probability value is 0.00. The speed of adjustment indicates a correction of about 22 percent annually.

In model (4), the paper uses portfolio investment (PI) inflows as a replacement for capital inflows (CI). The outcomes reveal that PI has a negative but statistically insignificant relationship with CP, with a probability value of 0.31. This finding signifies that those variations in the PI do not influence the difference in CP. Moreover, it is noticed that RGDP is insignificantly related to the dependent variable (CP). However, there is a positive and significant relationship between TO and CP. This indicates that an increase in trade-to-GDP by 10 percent results in an average rise of 6.8 percent in the CP measure. The findings show that

INF is negatively and significantly related to CP, consistent with earlier results. If inflation rises by 10 percent, CP will drop by approximately 2.2 percent.

On the other hand, the short-run results show that PI is negatively and significantly associated with CP. However, it was found that the remaining regressors have no significant impact on CP in the short run. The results reveal a negative and significant ECT coefficient indicating 21.4 percent as a correction speed.

Model (5) includes net other investment (OI) inflows as an alternative measure of capital inflows (CI). Unlike DI and PI results in models (3) and (4), the paper discovers that OI has a positive and significant impact on CP measure. Indeed, a 10 percent increase in OI indicates an increase in CP measure by nearly 0.7 percent, on average. The significant result of CI in the models (1) and (2) could be attributed to the importance of other investment inflows to the region. Also, the paper finds that RGDP has a positive and significant effect on CP in the long run. A 10 percent rise in RGDP results in an increase of 2.6 percent⁷, on average, in the dependent variable (CP). But there is no long-run relationship between TO and CP (probability value = 0.32). Like the previous results, the INF is significantly and negatively associated with CP. This shows that the CP measure declines by 1 percent, on average, due to an increase in INF by 10 percent. In the short run, however, none of the variables can explain the variations in the CP. However, the speed of adjustment coefficient is negative and significant. It reveals that the disequilibrium is corrected by approximately 20 percent annually.

Table 5. PMG Results (Components of Capital Inflows)

Variable	Model 2	Model 3	Model 4
<i>Long-run</i>			
DI	0.005013 (0.4493)		
PI		-0.005255 (0.3122)	
OI			0.067359 (0.0022)
RGDP	0.151546 (0.0086)	-0.148033 (0.1325)	0.257793 (0.0360)
TO	0.099919 (0.4517)	0.676621 (0.0000)	-0.124291 (0.3205)
INF	-0.060332 (0.0003)	-0.218556 (0.0000)	-0.101797 (0.0002)
<i>Short-run</i>			
ECT	-0.219550 (0.0003)	-0.213647 (0.0017)	-0.198019 (0.0000)
D(CP(-1))	0.051062 (0.6075)		
D(DI)	-0.002772 (0.5343)		
D(DI(-1))	-0.007949 (0.2594)		
D(PI)		-0.006006 (0.0035)	
D(OI)			-0.004167 (0.5305)
D(RGDP)	-0.304613 (0.3980)	-0.267956 (0.5841)	-0.290989 (0.6191)
D(RGDP(-1))	0.445942 (0.2487)		
D(TO)	-0.033588 (0.8629)	-0.166789 (0.3724)	-0.031239 (0.8088)
D(TO(-1))	-0.084502 (0.5685)		

⁷ The variables are in logarithmic form.

D(INF)	-0.002814 (0.8085)	0.009110 (0.6017)	0.009949 (0.3180)
D(INF(-1))	-0.004408 (0.6239)		
C	0.077688 (0.1676)	1.827665 (0.0018)	-0.683674 (0.0000)
No. Groups	10	10	10
No. Obs.	248	196	266
Log likelihood	280.0351	239.3447	239.1294

Note: the values with () are the p-values. The optimal lags are selected according to AIC.

Conclusion

This paper investigated the relationship between net capital inflows and credit to the private sector as a proxy for financial stability in selected Arab countries, namely Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Palestine, Saudi Arabia, Sudan, and Tunisia. The results reveal that capital inflows have a positive relationship with credit to the private sector in the long run, after controlling for a set of macroeconomic factors, specifically real GDP, trade openness, and inflation. This result is consistent with a wide range of empirical research and literature, especially those carried out on emerging and developing countries. A test for spurious estimation is implemented, and the results show that the variables are stationary at I(0) and I(1), and cointegrated. The paper has employed the pooled mean group for the cointegration method.

This result points out that capital inflows may have a negative impact on financial stability in the long run, especially if credit to the private sector grow at significantly higher pace than GDP growth. But, on the other hand, the analysis shows that credit to GDP ratio is growing moderately in the selected countries, which reflects financial deepening more than excessive credit to the private sector.

A further analysis was made to examine the impact of each type of capital inflow on credit to the private sector in the selected countries. The results revealed that direct investment and portfolio investment have insignificant effect on credit to the private sector in the long-run, and therefore there are no fears of accumulating risks on the financial sector and, consequently, financial stability. Regarding other investments, the results showed a long-run positive effect on credit to the private sector in the selected countries. These results suggest that the evolution of other investments may have a negative long run impact on the financial stability in the selected countries.

The analysis shows a discrepancy between the selected countries in attracting foreign capital inflows. Several reasons could stand behind this result; among those is whether the country is an oil exporter or oil importer; the level of economic stability; and economic policies. To gain a better understanding of the determinants of capital inflows in the selected countries, further studies and research are needed.

Finally, the paper recommends the selected countries to focus more on direct investment and portfolio “equity” investment, as they do not have negative consequences on financial stability.

Such investments do not have debt burden, and do not have adverse economic and financial effects such as speculative investments (hot money).

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