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These economic studies are the product of the staff of the Economic Department at the AMF. The AMF publishes these studies which survey issues pertinent to monetary, fiscal, banking, trade and capital market policies and their impact on Arab economies.

All correspondence should be addressed to:
Economic Department
Arab Monetary Fund
P.O. Box 2818
United Arab Emirates
Telephone No.: +9712-6171552
E-Mail: economic@amfad.org.ae
Website: www.amf.org.ae

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Abstract

This paper examines the potential impact of the macroprudential policy instruments related to assets (Asset-side instruments), specifically the loan-to-value (LTV) and debt-to-income (DTI) ratios, on controlling the systemic risks arising from the household sector, by measuring the impact of activating or tightening these two tools on the growth of household lending (personal loans and housing loans) for a panel of 10 Arab countries based on quarterly data covering the (2014-2020) period. The impact of liquidity, the main rate of the monetary policy tools and economic variables on the growth of household credit risks were also analyzed. The results showed a clear effectiveness of the macroprudential policy tools in influencing the growth of household credit, as the results of activating or tightening the LTV ratio and DTI ratio appear after one quarter, which indicates the clear efforts made by Arab central banks in assessing the systemic risks arising from the household sector. The results also showed that the liquidity in the banking sector increases the banks' appetite to lend, while the impact of changing interest rates on monetary policy tools appears after three quarters, as there is a negative statistically significant relationship between interest rates on the main monetary policy tools and household credit, while the effect of tightening the required reserve ratio appears after one quarter. The

results also did not show any effect of macroeconomic variables on household credit.

Introduction

Since the beginning of 2004, the factors that led to the global financial crisis in 2008 have accumulated. A real estate bubble arose in the United States of America because of banks' lending exorbitant sums to low-income people in order to buy houses, and then investment banks relied on wholesale funding, and purchase of these real estate loans and their securitization to make them tradable securities. These bonds were marketed as high-quality liquid assets with a high credit rating. Banks, investment funds, and insurance companies invested in them, deepening the interconnectedness between the components of the financial sector on the one hand, and between the financial sector and the real estate sector on the other hand. With mortgage loans defaulting, and banks acquiring houses and reselling them to repay debts, real estate prices plummeted. Bankruptcies began in banking institutions in the United States and stock exchanges deteriorated in the world with the spread of the mortgage crisis due to the interdependence among the financial sector institutions, which called for the intervention of central banks to support financial institutions.

The global financial crisis has highlighted the importance of macro-prudential supervision and the adoption of their instruments to control the financial cycle and maintain financial stability. The Basel Committee on Banking Supervision (BCBS) amended the Core

Principles for Effective Banking Supervision, emphasizing the importance of monitoring risks at the financial sector level and at the level of each financial institution separately. Recent studies (such as Ampudia et al., 2021) have shown that prudential policy tools contribute to controlling the financial cycle by affecting credit growth and limiting the occurrence of a rise in asset prices that exceeds the long-term equilibrium price.

The types of macro-prudential tools to mitigating the households credit risk, according to the Bank for International Settlements (BIS), include the following:

Capital-Based Instruments: These include, among others, the capital Countercyclical Capital Buffer to hedge against the fluctuations of the financial cycle, dynamic provisions, and capital requirements by sectors (Sectoral Capital Requirements).

Liquidity-Based Instruments: These include, among others, liquidity ratios (Liquidity coverage and net stable funding ratios) to counter fluctuations in the financial cycle (Countercyclical Liquidity Requirements), margin ratios and margins and haircuts in Financial Markets.

Asset-Side Instruments: These include, but not limited to LTV, DTI, and Debt Burden Ratio (DBR).

This paper will focus on the macro-prudential tools based on assets, and the role of these instruments to mitigate the credit risk arising from the household sector. It is worth mentioning that the capping on the LTV and DTI ratios are the most important prudential tools that are used to reduce the accumulation of risks arising from the individual and real estate sectors (Arregui et al. 2013). LTV and DTI are the most common tools to face the risks of the individual and real estate sectors, followed by capital and liquidity measures. These two tools can be used as sectoral tools to target risks arising from specific sectors of the economy without affecting the broader economy. For example, the DTI tool targets the individual sector (consumption sector) and not the corporate sector (productive sector).

The study is designed as follows. Section 1 introduces some related empirical studies on the role of LTV and DTI in mitigating the household credit risk. Section 2 provides an overview of the evolution of LTV and DTI ratios in some Arab countries. Section 3 introduces the data and the econometric model. Section 4 presents the econometric methodology used in the study to explore the determinants of the household credit growth, and we will focus on the effects of LTV and DTI in reducing credit risk of the banking sector in the Arab region. Section 5 discusses the empirical results including the policy recommendations for central banks.

1. Literature review

Several empirical studies have examined the effects of LTV and DTI in reducing the credit risk arising from the household sector in order to maintain financial stability. In this context, Jacome and Mitra (2015) explore the effectiveness of LTV and DTI in six economies. A sample was used in the study includes six countries (Romania, Hong Kong, Poland, Malaysia, South Korea, and Brazil). The proportion of LTV and DTI in these countries ranged around (60-85 percent for LTV) and (30-40 percent for DTI). The study have found that the countries included in the study sample changed the rates more than once because they did not achieve the desired effect about the targeted percentages of credit growth. The study also indicated that although Poland and Romania consulted with the banks in their countries before adopting the limits of LTV and DTI, and Korea gave the banks a period of 15 days before applying limits for the two mentioned rates, the study indicated that it is preferable to adopt the limits of the two rates without prior consultation with the banks, to avoid the last-minute rush to buy real estate or cars that can cause an acceleration in asset prices or a credit boom.

McDonald (2015) explores whether the effectiveness of loosening versus tightening macroprudential instruments depends on where in the housing cycle they are implemented. This study indicated that the

tightening of restrictions on LTV and DTI ratios in 17 countries has significant effects when credit expands at an accelerating pace and when real estate prices rise relative to income, as these tools limit the occurrence of heavy losses for banks during periods of economic recession as well as limit the accumulation of imbalances. The study showed that the effect of tightening restrictions on these two ratios reduces the level of housing loans by (2-3) percent, while easing them leads to a rise in these loans by (0-3) percent, meaning that the effect of tightening the two tools is greater than the effect of releasing. The study indicated that, given the impact of policy adjustment across the economies of 17 countries, the impact of setting limits on LTV and DTI has greater effects when credit expands at an accelerating pace and when real estate prices are expensive, as setting limits on these ratios during booms reduces the level of loans a year after applying the 4-8 percent limit and house price level of 6-12 percent, on the contrary during recessions they reduce housing loans by 2-3 percent and the price level by 2-4 percent. Akinci et al. (2015) construct an index of macroprudential policies in 57 emerging and advanced economies covering the (2000-2013) period on quarterly basis, with tightening and easing recorded separately. They found that Macroprudential policies have been used in emerging and advanced economies. These policies targeted the real estate sector in the first place, especially in advanced economies. The tightening of macroprudential policy is associated with lowering the credit growth

of banks and lowering the rise in real estate prices. Arregui and others (2013) found that, after examining cross-sectional time series for 38 countries, LTV and DTI are effective tools in containing high credit growth and increasing home prices. The study of Kuttner and Shim (2013) included the impact of placing limits on LTV and DTI rates in 57 countries. They found that placing caps on DTI reduces home loans by 4-7 percent, while limiting LTV reduces home loans by 1 percent. Wong et al. (2011) found that the LTV ratio reduces the sensitivity of the risk of non-payment of mortgages resulting from real estate price shocks and restricting the maximum of this ratio generally leads to a decrease in household debt.

2. Insights on the Arab banking sector

There is an interest and awareness of Arab central banks and monetary institutions in enhancing the ability of the banking system to absorb shocks, through the application of Basel III requirements and IFRS 9, and central banks constantly assess systemic risks, including credit risks arising from the individual sectors and real estate, and among the tools to that end is to put a cap or change LTV and DTI ratios. These tools aim to control systemic risks arising from the retail and real estate sectors. Table No. 1 shows the value of each of these two instruments in several Arab countries whose central banks have activated one or both instruments, or one of them. As for the rest of the Arab countries, their central banks did not place caps

on either of these two instruments, as we mentioned earlier, the application of the two tools depends on the assessment of systemic risks in the financial system.

Regarding the DTI ratio, the highest ratio (less tightening) was in Oman, reaching 60%, followed by Bahrain, Palestine and Egypt with 50%, and the lowest ratio was in Iraq (more tightening), reaching 12.5%. While the lowest ratio (less tightening) of the LTV ratio was in Palestine and Kuwait, reaching 30-80% and 50-80%, respectively, considering that the ratio in Palestine based on the customer's risk, while the highest ratio (more tightening) was in Libya, reaching 120%. For the UAE, the LTV value ratio for citizens is 80% and 85% for residents (for the first housing loan of less than 5 million dirhams).

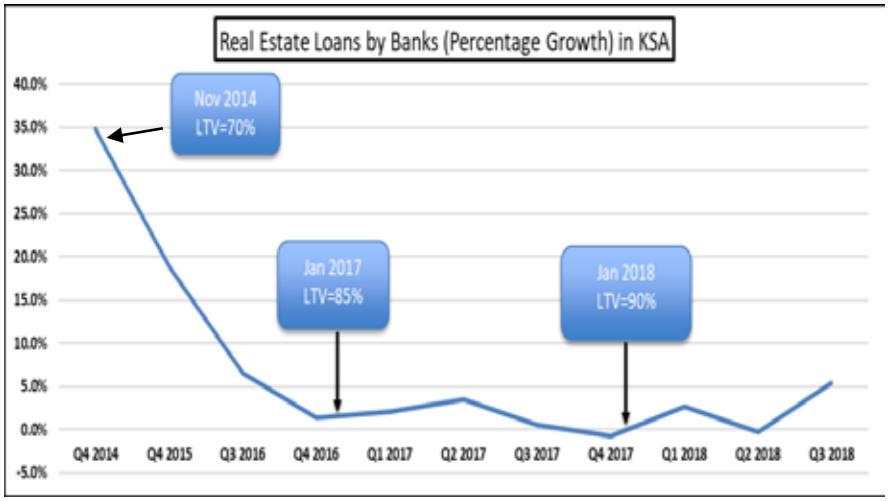
Table 1. The value of each of the LTV and DTI ratios in a number of Arab countries

Country	DTI	LTV
UAE	30%-50%	85-80%
Bahrain	50%	-
Tunisia	40%	-
KSA	-	90%
Iraq	12.5%	-
Oman	60%	80%
Palestine	50%	30%-85%
Kuwait	30%-40%	50%-80%
Egypt	50%	-
Libya	-	120%

Source: Financial Stability Report (2021), the Arab Monetary Fund.

The impact of the LTV and DTI ratios in controlling credit growth according to desired levels can be analyzed if we take the behavior of the real estate credit in Saudi Arabia as an example. It has been noted that the growth of real estate credit decreased when the LTV ratio was tightened in November 2014, due to the requirement that the bank's customer must provide a 30% down payment from the value of the property to obtain the loan, while the real estate credit began to grow when the ratio was 85% (less tightened) in January 2017, the demand for mortgage loans was also stimulated in January 2018 when the ratio reach 90% (the down payment become 10%) (Figure 1) .

figure 1. The impact of LTV ratio on real estate loans in KSA



Source: Financial Stability Report (2021), the Arab Monetary Fund.

3. Model and data

This paper examined the cumulative effect of the LTV and DTI ratios on controlling the systemic risks arising from lending to the real estate and household sectors for a panel of 10 Arab countries (Tunisia, Libya, Egypt, Saudi Arabia, Kuwait, Palestine, Iraq, Oman, Bahrain, and the United Arab Emirates (UAE), based on quarterly data covering the (2014-2020) period. Practically, to ascertain the effects of tighter LTV and DTI limits (lower ratios) on household credit growth, which divided into two main components personal and mortgage loans, we consider the following model which was used by previous literature (see Neagu et al. 2015):

$$\begin{cases} \Delta C_{it} = \alpha \Delta C_{it-1} + \beta_{MP} \sum_{s=1}^{4} \Delta\, r_{MP,t-s} + \beta_{MRR} \Delta r_{MRR,t-1} + \beta_y y_{t-1} \\ \quad + \beta_{inf} \pi_{t-1} + \delta X_{i,t-1} * r_{MP,t-s} + \mu D_{t-1} + \mathcal{E}_{i,t} \\ \quad i = 1, 2, \dots, N, \qquad t = 1, 2, \dots, T \end{cases} \tag{1}$$

where i stands for country for the time t , ΔC is the quarterly growth in the household loan (we take the log of the household loan), r_{MP}: The main monetary policy rate, r_{MRR}: the required reserve ratio, $\boldsymbol{\pi}$: the inflation, y: the real GDP growth, X: the liquidity ratios, D: dummy variable which measure the prudential measures, it take

1 when DTI and/or LTV are activated and/or modified, and zero otherwise, $\mathcal{E}_{i,t}$ is the error term.

Some literatures used other way to estimate the impact of LTV and DTI on the growth of household credit and assets price. For instance, Kuttner and Shim (2013) summarize the impacts of macroprudential policy changes on credit throw assessing the four-quarter effect. They tried to capture the impact of policy changes on housing prices or credit over the next four quarters, accounting for the persistence in credit growth. As shown below:

$$4Q\ effect = \frac{1}{4}[\gamma_{t+1}(1+\rho+\rho^2+\rho^3) + \gamma_{t+2}(1+\rho+\rho^2) + \gamma_{t+3}(1+\rho) + \gamma_{t+4}] \quad (2)$$

ρ is the coefficient on the lagged dependent variable, where $\gamma_i$is the coefficient on the macroprudential policy variable lagged *i* quarters. Based on this methodology, if we have a positive sign for the four quarters effect implies a policy change increases the growth of credit, whereas a negative sign implies a policy change reduces it. The effect of the four-quarter from Kuttner and Shim (2013) provides the lower bound.

McDonald (2015) uses the following method to capture the policy changes on the credit growth, which are allowed to have different effects over the cycle by interacting the various cyclical measures with the policy change variable:

$$\Delta credit_{j,t} = A_J + B(controls_{J,t-i}) + C(policy\ changes_{J,t-i}) + D(policy\ changes_{J,t-i} * cycle_{J,t-i}) + residual_{J,t-i} \qquad (3)$$

Where *C* is the effect of macroprudential policy changes when the cyclical indicator become zero value, and *D* accounts for how this effect interacts with the cycle.

4. Econometric methodology

The study will assess the dynamics of the household credit response to the micro factors specific to the Arab banking sector, as well as the macroeconomic factors, and the role of monetary and macroprudential policies in controlling credit risk. The difference GMM (generalized method of Moments) will be used. This approach was used by Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), as shown below:

$$C_{i,t} = \propto + \gamma C_{i,t-1} + \beta` X_{i,t} + \Psi_i + \varepsilon_{i,t} \qquad (4)$$
$$i = 1, 2, \dots, N, \qquad t = 2, \dots, T$$

Where *C* (dependent variable) refers to credit household growth, and X represents a set of explanatory variables: liquidity ratio, the monetary policy rates, required reserve ratio, inflation real *GDP* growth, dummy variable which measure the prudential measures, and

$\mathcal{E}_{i,t}$ is the error term. Regarding the Ψ_i term, it indicates a country-specific effect that is not captured by the random error term $\mathcal{E}_{i,t}$, given that the value of the term $\Psi_i + \varepsilon_{i,t}$ has a compound standard deviation, where $E(\Psi_i) = 0$, $E(\varepsilon_{i,t})=0$ and also $E(\Psi_i + \varepsilon_{i,t}) = 0$ for each: i=1,…,N and t=2,…,T. Now we will take the first difference to remove the country-specific effects. Equation (1) becomes:

$$C_{i,t} - C_{i,t-1} = \gamma(C_{i,t-1} - C_{i,t-2}) + \beta`(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (5)$$

For the term $C_{i,t} - C_{i,t-1}$, according to equation (5) it is related to the random term $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$, This indicates that the variables may become endogenous. This requires the use of tools to deal with equation (5), since there is no autocorrelation in the error term and the regression variables are not exogenous, then dynamic models (GMM estimator) can be used based on the first estimated difference:

$$E[C_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \quad \textit{for } t=3,\ldots,T,\ s\geq 2 \quad (6)$$

$$E[X_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \quad \textit{for } t=3,\ldots,T,\ s\geq 2 \quad (7)$$

Equations (6) and (7) can be represented by a matrix as follows:

$$M=\begin{pmatrix} y_{i1} & 0 & 0 & \cdots & 0 & \cdots & 0 \\ 0 & y_{i1} & y_{i2} & \cdots & 0 & \cdots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & y_{i1} & \cdots & y_{i,T-1} \end{pmatrix}$$

Where M is the matrix instruments corresponding to the endogenous variables, $y_{i,t-s}$ represents the dependent variable $C_{i,t-s}$ in equation (6). On the other hand, some literature criticized the first difference estimator in terms of bias and inaccuracy. The same tool mentioned in equation (6) is used, but the difference in the new method is assuming that there is no correlation between the regression factors and the country-specific effect so that:

$$E[C_{i,t+p}\Psi_i] = E[C_{i,t+q}\Psi_i]$$

and

$$E[X_{i,t+p}\Psi_i] = E[X_{i,t+q}\Psi_i] \quad \forall \quad p\&q$$

The new additional condition is the momentary application of the level, so that the following is achieved:

$$E[\Delta C_{i,t-s}(\Psi_i + \varepsilon_{i,t})] = 0 \quad \textit{for s=1 and t=2, 3,...,T} \qquad (8)$$

$$E[\Delta X_{i,t-s}(\Psi_i + \varepsilon_{i,t})] = 0 \quad \textit{for s=1 and t=2, 3,...,T} \qquad (9)$$

In light of the foregoing, the GMM technique for both models for parameter estimation is now consistent and efficient, by using the instantaneous conditions given in equations (6), (7), (8) and (9). On the other hand, to verify the validity of the tools in the system GMM estimator, some tests will be conducted that measure the reliability of the methodology used in the study, which were suggested by: Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). Where the " "Hansen J" test will be conducted to assess the validity of the tools used in the estimation, as well as the "Diff-in Hansen" test to verify the validity of the additional instantaneous application condition needed to build the GMM system, and the "Wald" test to assess the extent of the estimation. Validity of the tools used (not weak tools), and finally the "Arellano-Bond" test will be used to verify the hypothesis that the error is not sequentially related.

5. Analysis of the results

5.1. Descriptive analysis

The summary statistics reported in Table 2 show that Libya ranked the highest growth (the average of the ratio of the whole period) in the study sample in terms of loans granted to the household sector (8.312) followed by Saudi Arabia (6.823) and Kuwait (6.321), which reflect the interest of the banking sector in supporting the liquidity needs of the family sector. As for the average growth in the

household sector lending for all sample countries, it amounted to 5.361 percent, which indicates that the household sector receives clear attention from the banking sector in the Arab countries, but at the same time the risks of lending to this sector should continue to be evaluated continuously by financial stability and banking supervision departments, and the use of appropriate micro and macro prudential instruments to control these risks and maintain the strength of the financial sector.

5.2. Discussion of the results

The GMM results of the effects of the considered determinants on the household credit growth from the full panel of 10 Arab economies over the (2014-2020) period is displayed in Table 3. The results revealed the existence of a statistically significant negative relationship between the activation of the macroprudential policy tools and the growth of household credit, and the effectiveness of the LTV ratio and DTI ratio tools in controlling the systemic risks arising from the household sector, as the activation or tightening of any of these two tools by 1 percent leads to a decline the growth of household credit in the next quarter by 2.168 percent, taking into account that the size of the effect depends on the amount of increase or tightening of these two tools or any of them, this result is consistent with (Akinci et al. 2015). On the other hand, the results showed a

significant and positive linkages between the one-period lagged household credit growth and the dependent variable.

With regard to the impact of monetary policy on the risks of the household sector, the results showed that there is a negative statistically significant relationship between the main interest rates of monetary policy tools and household credit, as the impact of adjusting monetary policy tools appears after three quarters, the increase in interest rates on monetary policy tools by 1 percent, household credit would decrease by 2.143 percent, and this result is consistent with economic theory, as higher interest rates on monetary policy tools reduce the liquidity of the banking sector, thus raising the cost of lending, which leads to a decline in demand for loans.

The results also showed that there is a negative statistically significant relationship between the required reserve ratio (RRR) and household credit, as the central bank's raising the RRR, the market liquidity will be reduced, and thus raise costs on banks, which may lead to commercial banks passing these costs within Net interest margin ratio, which leads to a decline in the demand for loans. These results reflect the importance of coordination between prudential and monetary policies, in order to achieve the desired balance between controlling systemic risks and protecting the financial sector on the one hand and stimulating economic activities on the other hand (Obeid and Adeinat, 2017; Obeid 2021).

As for the legal liquidity ratio, the results showed that this variable has a positive statistically significant relationship, as the high percentage of liquidity and its availability encourage banks to lend at low interest rates and increase the banks' desire to employ liquidity and achieve more profits. Finally, the results showed the absence of a statistically significant relationship between economic variables (GDP growth and inflation) on the one hand, and household credit on the other hand, and these results are consistent with (Akinci et al. 2015).

5.3. Diagnostic analysis

In this section, we check the consistency of the two-step system GMM estimators (the validity of the model) using Wald test and the second-order serial correlation test. Moreover, we will use Hansen test for the over-identifying restrictions' validity. Table 3 shows that the Wald test rejects the null hypothesis which indicating the overall significance of the model. On the other hand, the results reported that there is no autocorrelation in the first-differenced errors, as the test does accept the null hypothesis. Finally, the Hansen test showed the over-identifying restrictions` validity (as the tests does not reject the null hypothesis), thus suggesting overall instruments` validity. The results show that all the diagnostic tests support the two-step system GMM estimators of the relationship between the household credit and the independent variables, namely the bank specific variables,

the monetary variables, the macroprudential variables and the economic variables.

Conclusion and policy recommendations

The study examines the potential impact of the macroprudential policy tools related to assets, specifically the LTV and DTI ratios, on controlling the systemic risks arising from the household sector, by measuring the impact of activating or tightening these two tools on the growth of household lending (personal loans and housing loans). The impact of liquidity, the main rate of the monetary policy tools and economic variables on the growth of household credit risks were also studied, and the results showed a clear effectiveness of the macroprudential policy tools in influencing the growth of household credit, as the results of activating or tightening the LTV ratio and DTI ratio appear after one quarter, which indicates the clear efforts made by Arab central banks in assessing the systemic risks arising from the household sector. The results also showed that the liquidity in the banking sector increases the banks' appetite to lend, while the impact of changing interest rates on monetary policy tools appears after three quarters, as there is a negative statistically significant relationship between interest rates on the main monetary policy tools and household credit, its results appear after three quarters, as we mentioned previously, while the effect of tightening the required reserve ratio after one quarter. The results also did not show any

effect of macroeconomic variables on household credit. The analysis provides the following policy recommendations for the Arab central banks:

1. To coordinate between the macroprudential policy and monetary policy in achieving their objectives, in order to achieve the required balance between supporting economic activities and enhancing the strength of the banking system.
2. Continuous assessment of the systemic risks arising from the household sector, and the use of the LTV and DTI ratio tools in a timely manner, that is, when there is an excessive rise in the risks of the household sector, in order to prevent the occurrence of price bubbles or burdening the family sector with high indebtedness.
3. To develop stress tests to measure all risks of the family sector, and to take appropriate recommendations in light of those results.
4. To assess the risks of concentration and credit exposures and develop the credit information database for that purpose.

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Table 1. Summary statistics of the variables (%)

Country	HCG	MoP	LIQ	RRR	RGDP	INF
Bahrain						
Mean	2.986	1.900	121.120	1.231	3.386	1.526
Std. Dev.	6.096	1.660	2.562	3.251	1.399	0.215
Egypt						
Mean	4.156	3.714	142.312	2.453	4.125	4.253
Std. Dev.	7.099	4.386	2.321	1.253	1.211	3.215
Iraq						
Mean	1.346	2.714	214.516	3.256	2.905	6.254
Std. Dev.	3.657	3.946	5.658	7.115	5.986	8.258
Kuwait						
Mean	6.321	2.271	190.612	5.210	0.304	2.365
Std. Dev.	7.914	2.521	6.545	1.023	2.373	3.352
Libya						
Mean	8.312	7.167	223.5	8.235	-0.701	9.521
Std. Dev.	2.202	2.546	4.201	12.352	17.278	6.354
Oman						
Mean	4.823	5.729	135.6	5.623	3.240	3.521
Std. Dev.	1.641	3.431	3.256	5.352	1.293	1.523
Palestine						
Mean	4.823	0.000	194.5	4.502	3.240	3.542
Std. Dev.	5.641	0.000	2.354	6.254	1.293	3.254
KSA						
Mean	6.823	4.729	153.6	3.654	3.240	4.325
Std. Dev.	5.641	2.431	3.654	2.354	1.293	1.235
Tunisia						
Mean	5.823	6.729	122.6	6.521	3.240	6.121
Std. Dev.	6.641	3.431	6.325	4.351	1.293	8.953
UAE						
Mean	5.823	4.729	163.2	6.258	3.240	2.581
Std. Dev.	4.641	3.431	7.852	5.245	1.293	1.354
Full panel						
Mean	5.361	4.198	171.2	5.079	2.537	4.720
Std. Dev.	5.009	2.903	4.685	5.033	3.701	4.166

Table 2. Difference dynamic panel estimation results (Arellando and Bond 1991 difference GMM approach)

Variable	*Coefficients*	*Prob.*
Growth rate of household credit (personal and mortgage loans) (t-1)	*0.11253***	*0.02140*
Change in Monetary Policy (t-1)	*0.82535*	*0.51426*
Change in Monetary Policy (t-2)	*0.52573*	*0.47921*
Change in Monetary Policy (t-3)	*-2.14253***	*0.03156*
Change in Monetary Policy (t-4)	*-0.25843*	*0.74954*
Macroprudential Instruments (t-1)	*-2.16814****	*0.00051*
Liquidity Ratio	*0.35022****	*0.00552*
Required Reserve Rate (t-1)	*-0.05157**	*0.06212*
Real GDP	*1.71691*	*0.23541*
Inflation (t-1)	*-0.22917*	*0.46729*
Wald Test		*4582.52**** *(0.0000)*
Hansen J TEST (p value)		*0.4562*
A-B test AR(1) (p value)		*0.011*
A-B test AR (2) (p value)		*0.482*
Observations		*280*
Number of countries		*10*

Dependent Variable: Growth rate of household credit (personal and mortgage loans).

*The estimation method is Arellano and Bover (1995). I use the Windmeijer (2005) correction. The small number of groups limits the number of instrumental variables (Hansen probability increases to very high values). The endogenous variables used are the lagged dependent variable and the real economic growth. The instrumental variables are entered into the regression with two to six lags. The p-values are displayed in parentheses, where * p<. 0.10, ** p<0.05 and *** p<0.01*

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