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What Influences Bank Lending in Saudi Arabia?

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Abstract

Determinants of bank-level credit growth in Saudi Arabia are investigated by applying a panel approach to data spanning 2000–15. Strong bank balance sheet conditions, economic activity, and oil prices support bank lending. Reduced bank concentration appears to have helped. Lending remained robust in 2015 despite oil prices having declined, helped by strong bank balance sheets and a reduction in bank holdings of “excess liquidity”. To support bank lending in the period ahead, bank balance sheets need to remain strong. Fiscal adjustment and a reduced reliance on banks to finance the budget deficit would support credit provision to the private sector.

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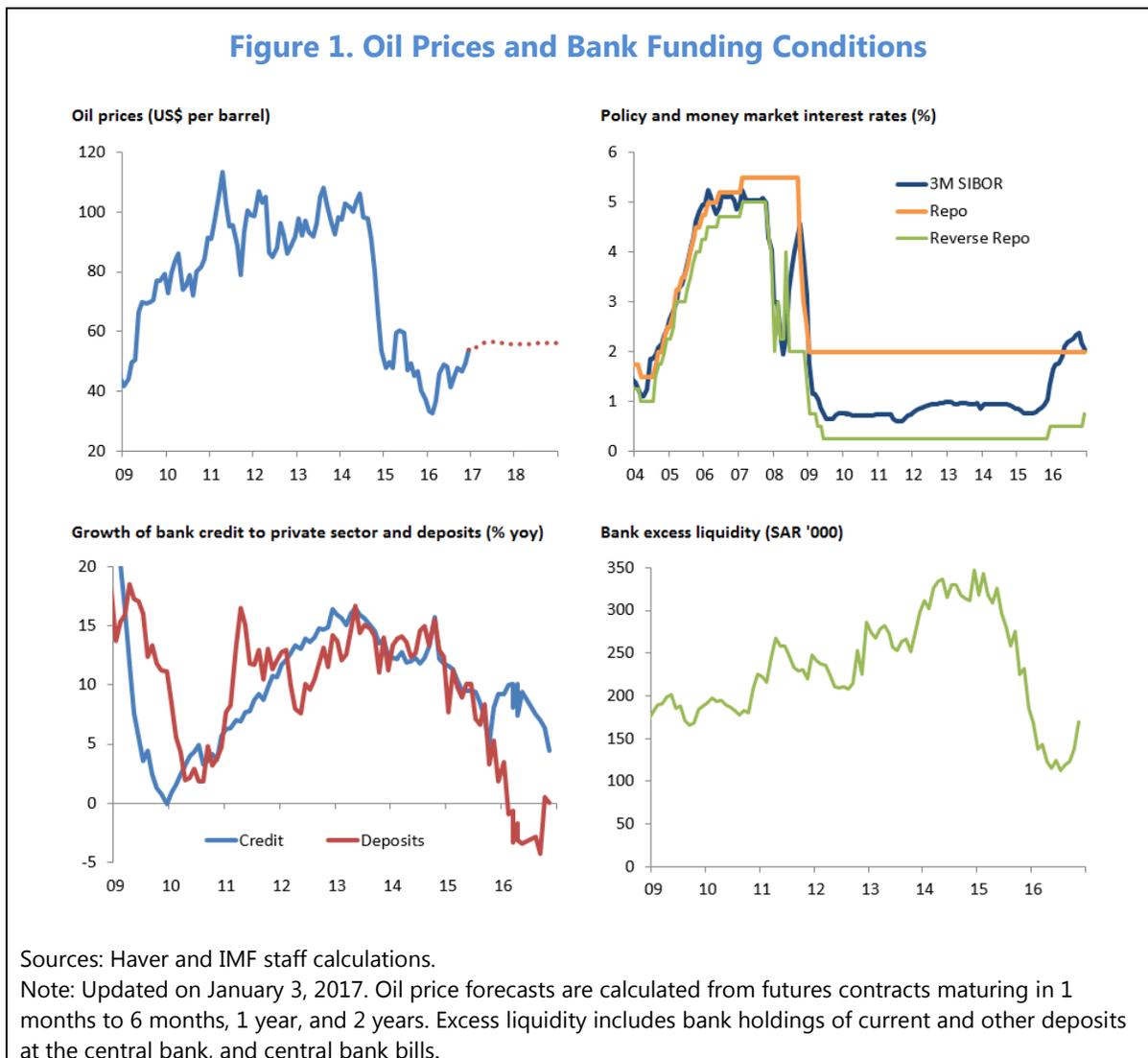
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I. INTRODUCTION

As oil prices have fallen since mid-2014, inflows of oil receipts have declined and fiscal spending has been scaled back, weakening economic activity. Funding conditions in the banking system have tightened, evidenced by the increase in the 3-month Interbank Offered Rate (SIBOR) to the highest level in many years (Figure 1, upper right panel). Lower oil prices have also dampened confidence (Husain et al, 2015). Deposit growth has fallen and remained mostly in negative territory on a year-on-year basis during 2016 but growth of credit to the private sector has remained robust, particularly to the construction sector, partly reflecting efforts by businesses to manage their cash positions as government payments were delayed (Figure 1, lower left panel). Banks have been reducing their holdings of both excess reserves at the Saudi Arabian Monetary Agency (SAMA) and SAMA bills to help fund private sector credit and purchases of bonds which the government re-started issuing in 2015 (Figure 1, lower right panel).



In response, SAMA has recently undertaken measures to help ease funding conditions. The central bank placed more than SAR 20 billion (\$5.3 billion) of government entity deposits with the domestic commercial banks in September. It also announced the introduction of 7, 28, and 90-day repos, which had only been overnight previously. As bank funding conditions eased, the 3-month SIBOR declined to the lowest level in six months in mid-December.² Deposit growth rebounded to marginally above zero percent and bank holdings of excess liquidity rose in November. The issuance of \$17.5 billion international bonds by the government in October, which was the largest by an emerging market and heavily oversubscribed has also helped ease funding conditions. Earlier, SAMA also relaxed the loan to deposit ratio, allowing the ratio to exceed the 85 percent limit.

As banks face funding pressure, one key question is prospects for bank lending in Saudi Arabia. Bank credit represents a key channel of transmission from oil prices to the real economy in Saudi Arabia and an important driver of economic growth more generally (see the next paragraph). Cross-country data for the past several years presented in Figure A1 in the Appendix suggest that the nation's credit deepening (bank credit to the nonfinancial private sector relative to GDP) was broadly consistent with the stage of economic development (GDP per capita in US dollars during 2010–15). However, low oil prices could adversely affect bank credit extension and economic activity. Indeed, weak bank balance sheet conditions (eg higher NPL ratios and lower deposit growth) can spillback to further weaken macroeconomic conditions (Miyajima, 2016).

Bank credit is one important element of financial development, which enhances economic growth. A vast literature finds that greater financial development helps spur economic growth (see, for example, Levine (1997, 2005) and Demirguc-Kunt and Levine (2008), for an extensive survey of the literature). However, more recent studies provide nuanced messages. Sahay et al (2015) argue that many benefits in terms of growth and stability can be reaped from further financial development in most emerging market economies, but that the effect of financial development on economic growth is bell-shaped and weakens at higher levels of financial development.

Some studies, however, have suggested the effects of financial development on growth are weak in oil exporting countries. For example, Naceur and Ghazouani (2007) analyze MENA countries, including Bahrain, Kuwait, Oman, and Saudi Arabia, and find no significant relationship between the development of the banking sector or the stock market and economic growth.³ Barajas et al (2013) argue that the beneficial effect of financial deepening (including private credit) on economic growth is generally smaller in oil exporting countries and lower-income countries due to weaker regulatory and supervisory characteristics and more limited access to financial services. Hakura (2004) argues that, in the Middle East and

² The 3-month SIBOR ended 2016 at 2.035 percent, marginally up from its low registered in mid-December.

³ The authors argue that underdeveloped financial systems in the MENA region hamper economic growth and that more needs to be done to improve the institutional environment and functioning of the banking sector.

North Africa (MENA), where oil revenues are significant (including the GCC countries), large governments have likely limited private sector growth and diversification. However, such cross-country, panel-data analyses may fail to capture Saudi Arabia's country-specific characteristics and can be usefully complemented by single-country estimations. Indeed, Miyajima (2016) finds that higher bank lending strengthens real GDP growth in Saudi Arabia.

A large volume of literature focuses on determinants of bank credit. One strand of literature studies the issue in the context of monetary policy transmission, or the bank lending channel, which has attracted particular attention after the global financial crisis. These studies find that bank-specific characteristics, such as size, liquidity, capitalization, and lenders' default probabilities, have a large impact on the provision of credit (for instance, Altunbasa et al, 2010; Gambacorta and Marques-Ibanez, 2011; Gambacorta and Shin, 2016). For emerging markets, global factors increased in importance in affecting the bank lending channel as capital flows became larger and more volatile against the backdrop of very easy global monetary conditions (Kohlscheen and Miyajima (2015)).

Another strand of literature more directly focuses on determinants of bank credit in emerging markets, including the GCC countries. Focusing on a sample of emerging economies, Chen and Wu (2014) confirm the importance of strong balance sheet conditions and banking regulation in supporting robust credit growth. Moreover, state-owned banks played a counter cyclical role during the global financial crisis in 2008–09, particularly in Latin America and emerging Europe. That is, credit by state-owned banks grew faster than credit by private banks. Guo and Stepanyan (2011) examine a large number of emerging economies for a decade and identify several key determinants of bank credit: domestic economic activity, bank balance sheet conditions, domestic and external monetary conditions, and foreign funding. Amidu (2014) analyses determinants of bank lending in 24 countries in Sub-Saharan Africa using both bank and country-level data and finds linkages between bank balance sheet health and lending. Barajas et al (2010) find that bank characteristics (capitalization and loan quality) help explain bank credit slowdown among MENA countries in the aftermath of the global financial crisis in 2008. Studies zooming in on the GCC banks identify a range of determinants affecting bank credit (Ghosh, 2013; Ganil and AlMuharramil, 2016): bank capital, concentration, financial deepening (credit/GDP), economic growth, and institutional quality (enforcement, regulatory quality, and rule of law).

Building on the literature, this paper analyses determinants of bank credit in Saudi Arabia. It complements the literature which primarily relies on cross-country panel-data by single-country estimations that account for country-specific characteristics. The paper applies a panel econometric approach to bank-level balance sheet and macro-level data for Saudi Arabia spanning 2000–15.

The paper does not consider the differences between Islamic and conventional finance in Saudi Arabia. Shariah-compliant assets and liabilities account for a significant part of banks'

balance sheets. However, a breakdown by Shariah-compliant and conventional exposures is not available. Analyses whereby banks are separated into Islamic and non-Islamic following the classification presented by data provider Bankscope did not yield meaningful results due probably to the relatively small number of observations used in this paper. However, results based on a larger sample of GCC banks and the classification of banks by type provided by Bankscope suggests that Islamic banks tend to increase credit more rapidly than non-Islamic banks. Barajas et al (2010) conjecture that Islamic banks' business models are geared more towards investments and lending in high growth areas such as real estate.

The rest of the paper is organized as follows. Section II describes the methodology and data. Section III discusses results. Section IV extends the baseline model to address several questions key to Saudi Arabia. Section V concludes.

II. METHODOLOGY AND DATA

A. Methodology

As commonly done in the literature, determinants of real growth of bank-level credit are modeled using the following multivariate panel data specification for bank i in year t .

$$rcg_{i,t} = \sum_j \alpha_{1,j} Bank_{j,i,t-1} + \sum_k \alpha_{2,k} Macro_{k,t} + \sum_l \alpha_{3,l} time_l + \theta_i + \varepsilon_{i,t} \quad (1)$$

where $rcg_{i,t}$ is real growth of bank credit to the private sector and $Bank_{j,i,t-1}$ is bank level variables ($j = 1, 2, \dots$) lagged by one period to reduce potential endogeneity issues. That is, banks may adjust balance sheet composition in response to lending activity. $Macro_{k,t}$ represents macro level variables ($k = 1, 2, \dots$) which are contemporaneous on the premise that these variables are exogenous to balance sheet conditions of individual banks. Time dummies for 2008 and 2009, $time_l$ ($l = 1, 2$), help capture the potential effects of defaults of two large family-owned domestic conglomerates on loans.⁴ Finally, θ_i is bank fixed effects and $\varepsilon_{i,t}$ is random errors.

B. Data

A range of bank- and macro-level explanatory variables are considered to explain bank-by-bank real credit growth guided by the literature. All data are annual and span 2000–15. Bank-level balance sheet data from Bankscope are available for longer history, back to 1987, but with limited data availability. There are 12 domestic Saudi banks but the analysis focuses on 10 of them dictated by data availability (Table 1). The 10 banks together represent more than 90 percent of the size of the banking system. All variables are expressed in real terms except

⁴ Data on the international investment position and the BIS banking statistics suggest that the Saudi banking system' cross-border exposures are small.

for ratios. Figure 2 visually summarizes the data while Table 2 presents summary statistics. Table A1 in the Appendix reports detailed description of the data.

Four bank level balance sheet variables, standard in the literature, capture bank characteristics (which perhaps represent supply factors): the capital ratio, growth of NPL provisions, deposit growth, and net income growth.⁵ A lagged dependent variable, bank-level credit growth, is often included in the literature, but not in this paper's analysis because its coefficient is generally statistically insignificant. Therefore, the rest of the paper considers a standard panel fixed-effects model but not GMM approaches.⁶

Table 1. Saudi Arabian Domestic Banks Analyzed

Name	Percent share of total banking system assets, 2015
1. National Commercial Bank	20.7
2. Al Rajhi Bank	14.5
3. Samba	10.8
4. Riyadh Bank	10.3
5. Banque Saudi Fransi	8.5
6. Saudi British Bank	8.7
7. Arab National Bank	7.9
8. Saudi Hollandi Bank	5.0
9. Saudi Investment Bank	4.3
10. Bank AlJazira	2.9
Sum of above	93.6

Sources: Bankscope and author's calculations.

Five macro-level variables control for key global and domestic developments (which could perhaps represent a combination of supply and demand factors). Oil price growth captures an important external shock given the nation's large reliance on oil exports. Oil revenues affect the nonoil sector through government spending on domestic goods and services and payment of government wages. The US Fed funds rate aims at controlling for changes in global monetary conditions which, given the Saudi riyal's peg to the US dollar, are expected to impact domestic monetary conditions. Non-oil private sector GDP growth captures domestic economic activity not directly affected by oil price movements. Domestic money market

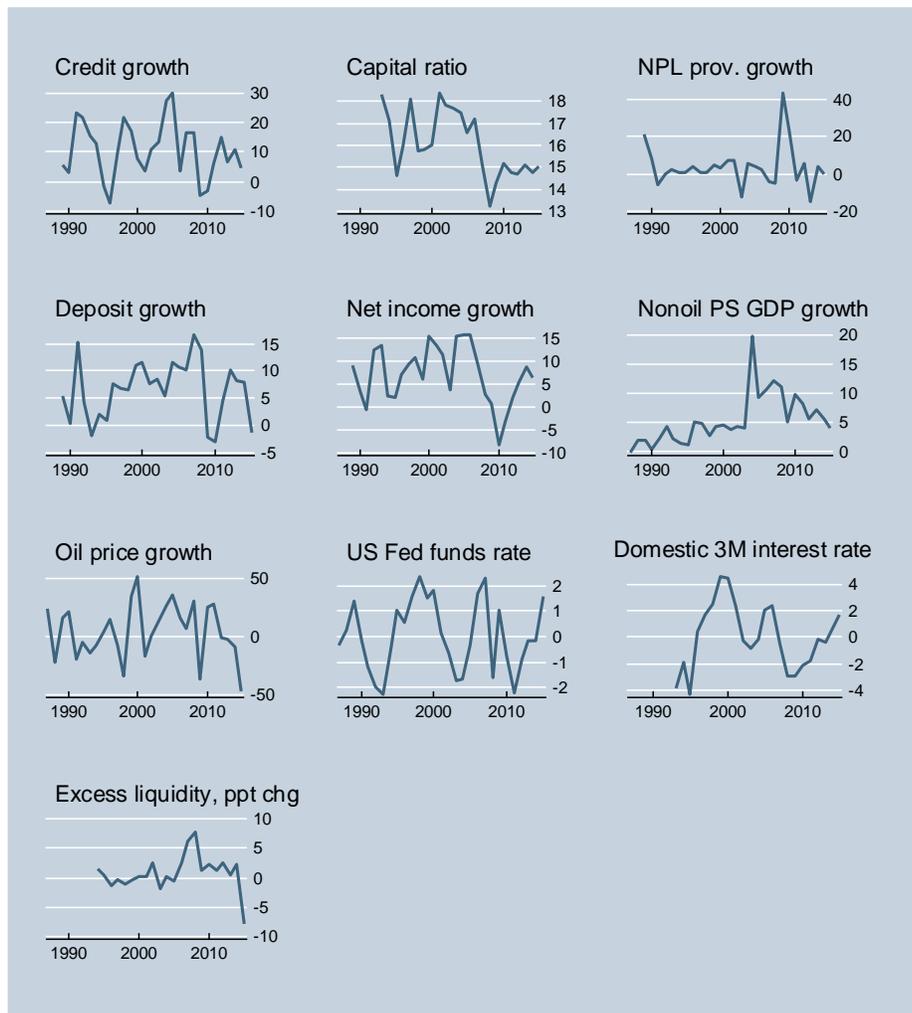
⁵ Growth of NPL provisions is a more direct and likely a better measure of banks' capacity to extend credit than NPLs in Saudi Arabia. This is because in Saudi Arabia, banks have been provisioning for NPLs counter-cyclically, weakening the linkage between NPL ratios and credit growth. Indeed, the author did not find plausible results using NPL ratios instead of growth of NPL provisions.

⁶ A panel fixed-effects approach suffers from a downward Nickell bias when a lagged dependent variable is included in the right-hand side of the regression equation. In such circumstances, a system Generalized Method of Moments (GMM) approach proposed by Arellano and Bover (1995) and Blundell and Bond (1998) is used commonly.

(continued...)

interest rates (3-month SIBOR) are expected to capture domestic monetary conditions and bank profitability.⁷ Bank holdings of excess liquidity (sum of bank holdings of excess reserves at the central bank and those of central bank bills) represents banks' liquidity conditions.

Figure 2. Saudi Arabia: Macroeconomic and Bank Level Variables



Note: Regressions rely on data spanning 2000–15. See Annex Table 1 for data description. The US Fed funds rate and 3-month SIBOR are detrended.

Source: IMF staff calculations.

Figure 2 summarizes the behavior of the explanatory variables. As far as bank-level variables, real growth of bank credit rose in early-2000 but declined to negative territory in

⁷ Given the Saudi riyal's peg to the US dollar, we do not include the US Fed funds rate and the 3-month SIBOR together in regression models. Some of the deposit base in Saudi Arabia is interest free.

the late-2000s, due primarily to defaults of two large domestic conglomerates, rather than spillovers of international financial shocks. Saudi banks have been very well capitalized, with the Tier 1 ratio remaining at around 15 percent. NPLs have been very well provisioned, by about 1.6 times in Q4 2015. Banks increased the pace of NPL provisioning as NPLs rose in the late-2000s. It fell as NPLs have fallen and remained very low. Deposit growth has behaved broadly in line with credit growth, as banks rely primarily on customer deposits to fund their assets (the size of balance sheets has grown in line with deposits). Saudi banks are profitable, but net income growth has started to moderate on low oil prices, tightening funding conditions, and weaker economic activity.

Turning to macro-level variables, oil prices registered the worst performance in at least three decades, which in turn dampened non-oil private sector GDP growth. It fell to the lowest level since the early 2000s. As the US Federal Reserve started to gradually normalize its policy rate from very low levels, and as domestic liquidity conditions have tightened, the 3-month money market rate has surged. Bank holdings of excess liquidity (in percentage point change of bank assets) declined notably. The US and domestic interest rates are both detrended using linear time trend to help reduce issues of spurious coefficients.

Table 2. Data Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
Bank level data					
Credit growth	244	10.4	12.2	-10.8	35.3
Capital ratio	163	16.2	3.2	11.8	23.6
NPL provision growth	225	3.7	17.3	-26.6	43.3
Deposit growth	245	8.2	8.8	-5.7	27.8
Net income growth	237	7.3	10.2	-10.4	28.3
Macro level data					
Oil price growth	29	7.5	42.2	-61.8	130.3
Nonoil private sector GDP growth	29	5.2	4.2	-0.4	19.6
US Fed funds rate, detrended	29	0.0	1.4	-2.3	2.3
Saudi 3M interest rate, detrended	23	0.0	2.4	-4.4	4.6
Excess liquidity, ppt chg.	22	0.9	2.9	-7.7	7.6

Note: Data for 2000–15. See Appendix Table 1 for data description.
Source: Author's calculation.

Results from a correlation analysis suggest both bank- and macro-level variables affect bank credit growth. Table 3 reports correlation coefficients which are statistically significant at the 5 percent level. Credit growth increases when bank funding (deposit growth) and profitability (net income growth) improve. It also strengthens with economic activity (nonoil private sector GDP growth). Bank profitability improves as short-term interest rates increase.

Deposit growth is positively correlated with economy activity, bank profitability, and liquidity conditions (bank holdings of excess liquidity). Domestic money market rates rise with the US Fed funds rate and as liquidity conditions tighten (lower excess liquidity and oil prices).

Table 3. Correlation Coefficient
(Significant at the 5 percent level)

	1 Credit growth	2 Capital ratio	3 NPL provisions growth	4 Deposit growth	5 Net income growth	6 Oil price growth	7 Nonoil private sector GDP growth	8 US Fed funds rate, detrended	9 Saudi 3M interest rate, detrended	10 Excess liquidity, change
1 Credit growth	1.00	...	...	...	...	...	...	...	...	...
2 Capital ratio	...	1.00	...	...	...	...	...	...	...	...
3 NPL provisions growth	...	...	1.00	...	...	...	...	...	...	...
4 Deposit growth	0.65	...	...	1.00	...	...	...	...	...	...
5 Net income growth	0.39	...	...	0.43	1.00	...	...	...	...	...
6 Oil price growth	...	...	0.28	...	...	1.00	...	...	...	...
7 Nonoil private sector GDP growth	0.37	...	...	0.28	...	...	1.00	...	...	...
8 US Fed funds rate, detrended	...	...	...	...	0.28	...	...	1.00	...	...
9 Saudi 3M interest rate, detrended	...	...	...	...	0.54	-0.28	...	0.51	1.00	...
10 Excess liquidity, change	...	...	...	0.27	...	...	0.37	...	-0.41	1.00

Note: "... " when estimated correlation coefficients are not statistically significant at the 5 percent level. See Appendix Table 1 for data description.
Source: IMF staff calculations.

III. RESULTS

A. Bivariate regressions

To start the analysis, bivariate panel fixed-effects regressions of bank credit growth are estimated on each one of the independent variables. Bank-level data are lagged by one period to reduce issues of reverse causality. Macro-level data are introduced contemporaneously. All models control for time effects for 2008 and 2009.

Results confirm the importance of bank balance sheet and macroeconomic conditions. A rise in the capital ratio increases the bank's capacity to lend. A higher growth rate of NPL provisioning reduces resources for additional lending and leads to a decline in credit growth. Higher deposit growth increases resources to fund bank lending. Higher growth of oil prices

and non-oil private sector GDP creates tailwinds for lending. Interest rates, net income growth, and bank holdings of excess liquidity do not systematically affect lending growth.⁸

Model number	1	2	3	4	5	6	7	8	9	Lagged
<i>Bank characteristics</i>										
Capital ratio	0.881**	...	...	...	...	...	...	...	...	Y
NPL provisions, real growth	...	-0.162***	...	...	...	...	...	...	...	Y
Deposits, real growth	...	...	0.271*	...	...	...	...	...	...	Y
Net income, real growth	...	...	...	0.092	...	...	...	...	...	Y
<i>Macro variables</i>										
Oil prices, real growth	...	...	...	...	0.128***	...	...	...	...	N
Nonoil PS GDP, real growth	...	...	...	...	...	0.863***	...	...	...	N
Domestic mm rate, real, detrended	...	...	...	...	...	...	-0.332	...	...	N
Fed funds effective, real, detrended	...	...	...	...	...	...	...	-0.829	...	N
Excess liquidity, ppt change	...	...	...	...	...	...	...	...	0.14	N
_cons	-2.56	12.242***	9.006***	10.993***	10.471***	4.656**	11.390***	11.328***	11.138***	N
Bank fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
2008, 09 dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
N	142	145	145	142	155	155	155	155	155	...
r2_a	0.171	0.202	0.167	0.143	0.219	0.211	0.125	0.131	0.124	...

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.
Source: Author's calculation.

B. Multivariate regressions

We subsequently proceed to the multivariate panel fixed effects models of bank credit growth by combining all variables.⁹

Empirical evidence confirms that bank credit is affected by bank characteristics and macroeconomic conditions (Table 5). Starting from bank characteristics, the supply of bank credit improves as the capital ratio increases and deposit growth strengthens. An increase in Tier 1 capital by 1 percentage point of risk-weighted assets leads to 0.5–1.0 percent increase in credit growth. Around 0.2–0.4 of a rise in deposit growth in real terms is transmitted to credit growth.¹⁰ Credit supply weakens as banks provision for NPLs. Every one percent growth in NPL provisions in real terms reduces credit growth by 0.1–0.2 percent. Net income growth does not systematically affect credit growth.

⁸ The 3-month SIBOR spread to US dollar 3-month LIBOR is not significant in bivariate nor multivariate specifications.

⁹ Key messages in sections III and IV were generally unchanged when a dummy variable for 2006 was introduced to capture a large decline in domestic stock prices.

¹⁰ The estimated coefficient appears low despite bank credit in Saudi Arabia being primarily funded by deposits. However, the value of the estimated coefficient (i) doubles when real credit growth is regressed on contemporaneous real deposit growth and (ii) increases to around unity when median values of bank-level data (as shown in Figure 3) are used to regress real credit growth on contemporaneous real deposit growth.

Turning to macro-level variables, bank lending increases as oil price growth accelerates and activity in the non-oil private sector strengthens (Table 5). A ten percent increase in oil price growth leads to 0.9–1.4 percent increase in credit growth. A one percent rise in non-oil private sector economic growth leads to 0.5–0.8 percent increase in credit growth. Lower bank holdings of excess liquidity support credit extension. In some specifications, a one percentage point reduction in the variable accelerates credit growth by 0.4 percent. Interest rates do not systematically affect credit growth either probably as the variables are capturing a combination of both profitability and cost of capital.

Table 5. Determinants of Bank Credit Growth

Model number	10	11	12	13	14	15	16	17	18	Lagged
<i>Bank characteristics</i>										
Capital ratio	0.969**	0.947***	0.834***	0.931**	0.911**	0.795**	0.703**	0.696**	0.498*	Y
NPL provisions, real growth	-0.126***	-0.131***	-0.161***	-0.111***	-0.116***	-0.145***	-0.138***	-0.139***	-0.161***	Y
Deposits, real growth	0.382***	0.395***	0.287**	0.366***	0.378***	0.266*	0.345***	0.340***	0.184	Y
Net income, real growth	-0.082	-0.052	...	-0.064	-0.036	...	-0.093	-0.103	...	Y
<i>Macro variables</i>										
Excess liquidity, ppt chg.	0.129	0.072	-0.011	-0.213	-0.265	-0.277	-0.491*	-0.492*	-0.500**	N
Nonoil PS GDP, real growth	...	...	...	0.768***	0.764***	0.708**	0.528*	0.515**	0.424	N
Oil prices, real growth	...	...	...	...	...	...	0.094**	0.100***	0.140***	N
Domestic mm rate, real, det.	...	...	-0.771	...	...	-0.465	...	...	0.802	N
Fed funds, real, det.	...	-0.812	...	...	-0.759	...	...	0.235	...	N
	-6.097	-6.054	-3.497	-11.334	-11.266*	-8.245	-5.75	-5.435	-1.423	N
Bank fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
2008, 09 dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
N	138	138	141	138	138	141	138	138	141	...
r2_a	0.302	0.303	0.266	0.362	0.362	0.311	0.389	0.384	0.358	...

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.
Source: Author's calculation.

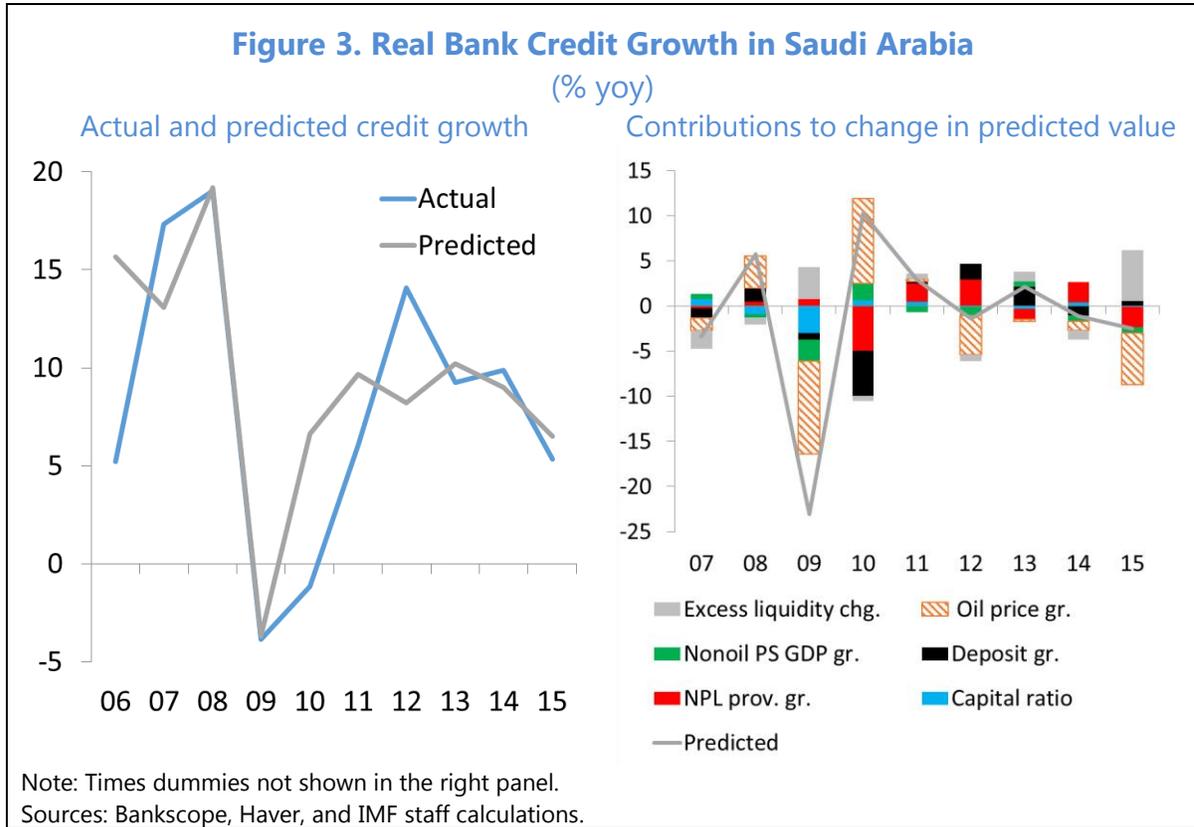
C. Model predictions

Model predictions help understand why credit growth remained robust through 2015 despite oil prices having fallen. Figure 3 plots the actual average credit growth and the model prediction (using Model 16). It also shows contributions to the change in the predicted credit growth.

The result plotted in Figure 3 suggests that the sharp decline in credit growth around the global financial crisis was due to a combination of bank specific factors (a lower capital ratio, weaker deposit growth) and macroeconomic factors (lower growth of oil prices and non-oil private sector GDP). In addition, time dummy variables are required to fully capture the magnitude of the fall in credit growth, consistent with the view that defaults of two large domestic conglomerates dented market confidence around the global financial crisis.¹¹ Credit growth held up well in 2015 despite a large fall in oil prices, supported by resilient bank balance sheet conditions and economic activity but also by a reduction in bank holdings of

¹¹ Predicted credit growth using regression results without 2008 and 2009 time dummies is not shown.

excess liquidity. Looking ahead, credit growth could slow further, reflecting lagged effects of slower deposit growth, and if the capital ratio declines, provisioning for NPLs accelerates, and economic activity slows further.



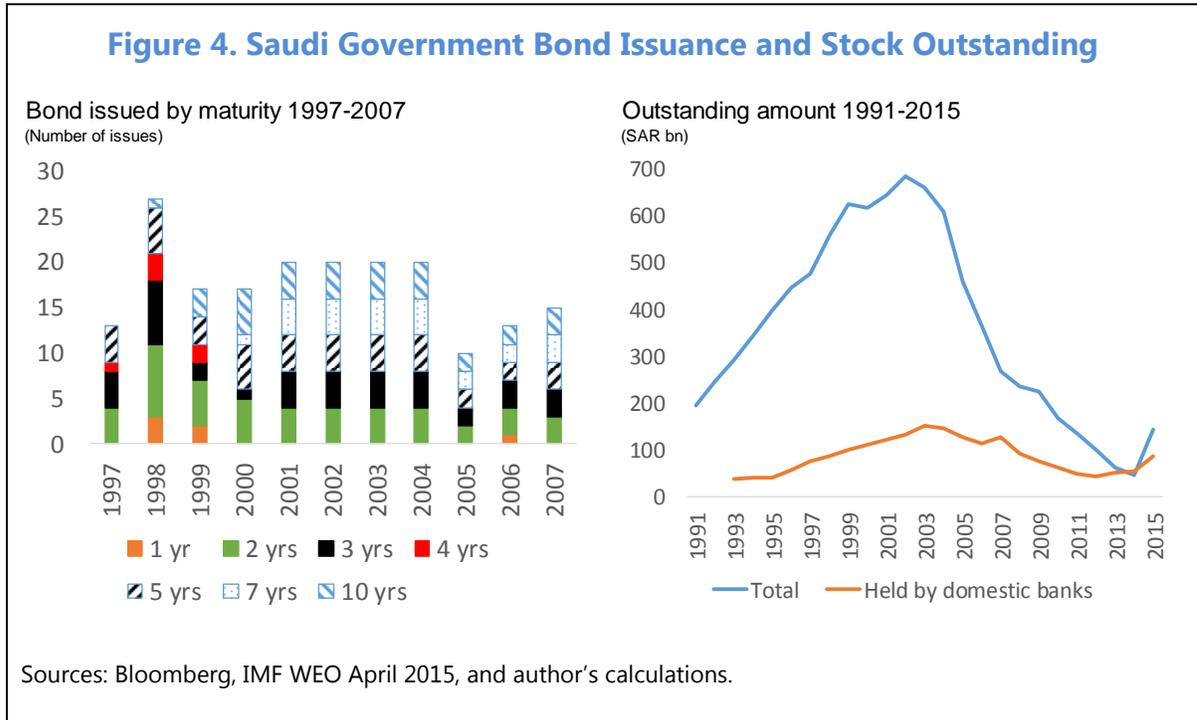
IV. CONSIDERING ADDITIONAL FACTORS

Additional factors are considered to account for country-specific characteristics. These are bank holdings of government bonds, lending by Specialized Credit Institutions (SCIs), banking system concentration, and state ownership.

First, bank lending can slow as domestic banks continue absorbing bonds after the Saudi government re-started issuing debt securities. The government used to issue domestic bonds actively during previous periods of low oil prices. For instance, Bloomberg reports that during 1997–2007, the Saudi government issued 17–18 bonds per year on average. The maturity ranged from one year to 10 years.¹² As a result, the amount outstanding of Saudi government bonds peaked at close to SAR 700 billion in the early 2000s. Domestic banks held 10–20 percent of the total amount outstanding during the 1990s and early 2000s. Bank holdings of government bonds as a share of total bank assets peaked at close to 30 percent.

¹² Information from Bloomberg on the amounts issued is scant. In 2007, the Saudi government issued two 10 year bonds for SAR 200 million each and one 10-year bond for SAR 2 billion.

From the early 2000s, the share continued to decline until the Saudi government re-started domestic bond issuance in mid-2015 (Figure 5, first panel).

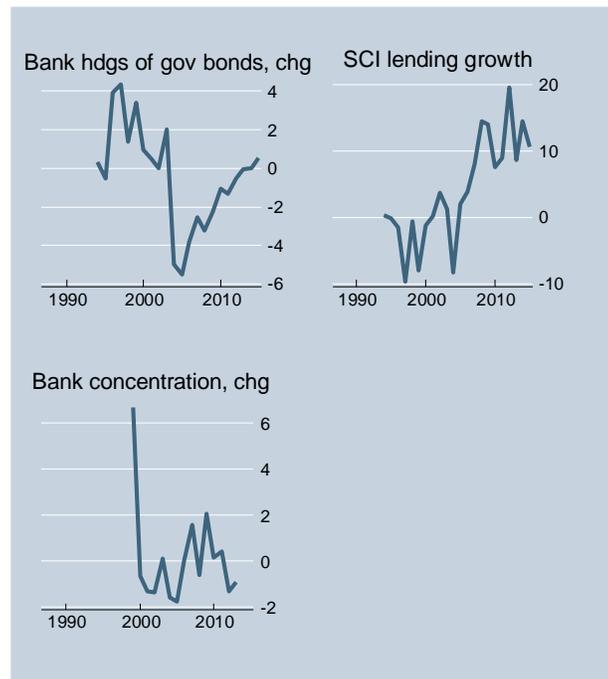


Second, lending by specialized credit institutions (SCIs) may affect bank lending.¹³ SCIs lend to some of the same sectors as banks do, which may increase or reduce bank lending. SCI lending growth accelerated during the 2000s and has remained relatively high (Figure 5, second panel). The stock of lending by SCIs represents some ¼ of that of by banks.¹⁴

¹³ SCIs are unlevered non-deposit taking entities that rely mainly on budgetary support by the MoF. They target lending to, for instance, housing, critical industrial projects, and SMEs, some of which do not have access to bank lending. The Saudi Industrial Development Fund (SIDF) finances industrial projects, the Public Investment Fund (PIF) large scale government and private industrial projects, the Real Estate Development Fund (REDF) individual/corporate residential and commercial real estate, and the Saudi Agricultural Development Fund (SADF) farmers and agricultural projects. The Saudi Credit and Saving Bank (SCSB) provides interest-free loans to small and emerging businesses and professions. Al-sadig (2013) finds that private domestic investment is positively associated with SCI lending.

¹⁴ Banks offer bridge financing to construction projects financed by SCIs. One SCI provides SME credit guarantees in collaboration with banks (kafala). Another SCI offers top-up financing for mortgage borrowers to meet the recent 70 percent LTV limit.

Figure. 5 Saudi Arabia: Additional Factors
(Percent)



Note: See Appendix Table 1 for data description. Regressions rely on date for 2000–15.
Source: IMF staff calculations.

Third, greater banking system concentration may limit competition and reduce credit growth. An indicator of banking system concentration suggests that, among the GCC banking systems, Saudi Arabia's is the least concentrated (Figure A2). Moreover, concentration has been declining in recent years in Saudi Arabia (Figure 5, third panel).

Fourth, greater state ownership can affect bank lending behavior. One view is that banks with greater state ownership may lend more counter-cyclically to fill the gaps left by other commercial banks as the latter reduce lending in response to a negative macroeconomic shock (Chan and Wu, 2014). Another view is that, if state ownership comes with greater prudence or reduced risk taking, lending behavior may appear pro-cyclical. State ownership in 2015 is estimated based on two definitions (Table 6). Under the "wide" definition, which accounts for ownership by the Saudi government, the Public Investment Fund (PIF), and two domestic pension funds (GOSI and PPA), state ownership is considered to be high when it is 50 percent or above.¹⁵ Under the "narrow" definition, which accounts only for the ownership by the Saudi government and PIF, the threshold above which state ownership is considered to be high is lowered to 30 percent. Econometrically, a dummy variable representing high state ownership is interacted with several variables.

¹⁵ Bankscope's classification of state ownership include "General Investment Funds" and "Government of Saudi Arabia via various funds" which are interpreted as the PIF and remaining ownership by the government.

Table 6. State Ownership of Domestic Banks, 2015
(Percent of total)

	Wide	Narrow
National Commercial Bank	74	54
Samba	65	38
Riyad Bank	57	31
Saudi Investment Bank	52	17
Banque Saudi Fransi	15	15
Arab National Bank	11	0
Saudi Hollandi Bank	11	0
Al Rajhi Bank	10	0
Saudi British Bank	10	0
Bank AlJazira	0	0

Note: "Narrow" accounts for ownership by the Saudi government and Public Investment Fund. "Wide" additionally accounts for ownership by two domestic pension funds (GOSI and PPA).

Source: Bankscope, and IMF staff calculations.

Results from econometric models including those variables indicate that bank characteristics and most of macro variables remain key determinants of bank credit growth (Tables 7 and 8). A higher capital ratio, lower provisioning growth, and higher deposit growth all lead to higher bank credit growth. Similarly, higher oil price growth, which can represent higher demand, supply, or confidence, support bank credit growth. A reduction in bank holdings of excess liquidity also helps. Non-oil private sector GDP growth, however, does not systematically affect credit growth any more.

Results also show that most of the additional macroeconomic factors affect bank credit growth. First, bank credit growth declines as banks increase their holdings of government bonds (suggesting "crowding out"). As shown in Table 7, a one percentage point of bank balance sheet increase in the holdings of government bonds reduces credit growth by 1–1.5 percent. However, the coefficient loses statistical significance when combined with nonoil private sector GDP growth.¹⁶

¹⁶ This is consistent with the result from Alhumaidah et al (2016). The chapter uses an asset-liability management framework to discuss the benefits and risks as well as the macroeconomic implications of different financing strategies for the fiscal deficit, and illustrates some of these aspects through a simulation analysis. It also reviews a number of policies that will help expand the investor base and reduce financing costs, while having broader positive implications for the economy.

Table 7. Determinants of Bank Credit Growth - Additional Factors

Model number	Government bond holdings				SCI lending				Lagged
	19	20	21	22	23	24	25	26	
Bank characteristics									
Capital ratio	1.145**	0.839**	0.831**	0.819**	0.708**	0.554**	0.655*	0.719**	Y
Provisions growth	-0.128***	-0.151***	-0.142***	-0.144***	-0.124***	-0.148***	-0.137***	-0.138***	Y
Deposit growth	0.379***	0.363***	0.363***	0.346***	0.353***	0.348***	0.355***	0.346***	Y
Net income growth	-0.041	-0.08	-0.078	-0.072	-0.135	-0.143	-0.114	-0.088	Y
Macro variables									
Bank holdings of gov. bonds, ppt chg.	-1.532**	-1.180*	-0.878	-0.962	...	...	...	...	N
SCI credit growth	...	...	...	...	-0.402**	-0.25	-0.128	0.032	N
Oil prices growth	...	0.091**	0.074**	0.097**	...	0.087**	0.069*	0.096**	N
Nonoil PS GDP growth	...	...	0.288	0.325	...	...	0.379	0.555*	N
Excess liquidity, ppt chg.	...	...	...	-0.533**	...	...	...	-0.521**	N
Dummy variables									
Bank	Y	Y	Y	Y	Y	Y	Y	Y	N
2008	Y	Y	Y	Y	Y	Y	Y	Y	N
2009	Y	Y	Y	Y	Y	Y	Y	Y	N
Constant	-8.695	-4.02	-6.168	-5.883	1.502	2.525	-3.088	-6.459	N
N	138	138	138	138	138	138	138	138	...
r2_a	0.348	0.386	0.387	0.398	0.343	0.373	0.379	0.384	...

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.

Source: Author's calculation.

Second, lending by SCIs does not appear to systematically complement commercial bank lending (Table 7). The estimated coefficients are mostly not statistically significant. In one specification, a negative coefficient alludes to the existence of competition rather than complementarity between these institutions and banks in the segments of the market they work in. More research is needed to understand the role of SCI lending.

Third, higher banking system concentration leads to lower bank lending growth (Table 8). The recent decline in concentration in domestic banking system should have helped improve credit growth. The estimated coefficient becomes statistically insignificant when included with bank holdings of excess liquidity. One interpretation is that as concentration rises and the degree of competition declines, banks tend to accumulate excess liquidity.

Table 8. Determinants of Bank Credit Growth - Additional Factors

Model number	Concentration				State ownership						Lagged
	27	28	29	30	31	32	33	34	35	36	
Bank characteristics											
Capital ratio	0.910***	0.706***	0.790**	0.681***	0.990**	0.924**	1.140**	1.053**	1.074**	1.009**	Y
Provisions growth	-0.107**	-0.112***	-0.091**	-0.094**	-0.114**	-0.142***	-0.096*	-0.124**	-0.101**	-0.129**	Y
Deposit growth	0.344***	0.342***	0.341***	0.326***	0.471***	0.402***	0.480***	0.407***	0.454***	0.386***	Y
Net income growth	-0.054	-0.124	-0.102	-0.097	-0.141	-0.152	-0.121	-0.131	-0.12	-0.128	Y
Macro variables											
Concentration index, ppt chg.	-2.831**	-2.974**	-3.148**	-1.761	...	...	...	...	...	...	N
Oil prices growth	...	0.137**	0.098*	0.153***	0.085**	0.093***	0.048	0.056	0.069*	0.076*	N
Nonoil PS GDP growth	...	...	0.517*	0.530**	...	...	0.367	0.358	0.341	0.36	N
Excess liquidity, ppt chg.	...	...	...	-1.385**	...	...	...	...	-0.243	-0.32	N
Interaction with state ownership											
Capital ratio * SO_broad	...	...	...	...	-0.743	...	-1.097*	...	-0.982	...	Y
Provisions growth * SO_broad	...	...	...	...	-0.117	...	-0.124	...	-0.119	...	Y
Deposit growth * SO_broad	...	...	...	...	-0.17	...	-0.186	...	-0.15	...	Y
Oil prices growth * SO_broad	...	...	...	...	0.062*	...	0.058*	...	0.059*	...	N
Nonoil PS GDP growth * SO_broad	...	...	...	...	...	...	0.426	...	0.568	...	N
Excess liquidity, ppt chg. * SO_broad	...	...	...	...	...	...	...	...	-0.485	...	N
Capital ratio * SO_narrow	...	...	...	...	...	-0.865	...	-1.275*	...	-1.199*	Y
Provisions growth * SO_narrow	...	...	...	...	...	-0.052	...	-0.066	...	-0.059	Y
Deposit growth * SO_narrow	...	...	...	...	...	-0.096	...	-0.204	...	-0.103	Y
Oil prices growth * SO_narrow	...	...	...	...	...	0.045	...	0.041	...	0.041	N
Nonoil PS GDP growth * SO_narrow	...	...	...	...	...	...	...	0.59	...	0.691	N
Excess liquidity, ppt chg. * SO_narrow	...	...	...	...	...	...	...	...	...	-0.438	N
Dummy variables											
Bank	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
2008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
2009	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Constant	-5.533	-4.197	-9.671*	-6.057	-6.495	-4.254	-12.052	-9.371	-10.508	-8.421	N
N	118	118	118	118	138	138	138	138	138	138	...
r ² _a	0.362	0.405	0.426	0.448	0.348	0.332	0.373	0.36	0.379	0.364	...

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level.

Source: Author's calculation.

Finally, state ownership does not appear to systematically affect bank lending growth (Table 8). However, tentative evidence, which is statistically significant at the 10 percent level, suggests that lending by banks with greater state ownership appears pro-cyclical with respect to oil price performance. As oil prices increase, lending by banks with high state ownerships tend to rise more than lending by other banks. One interpretation is that, when oil prices decline and the fiscal balance becomes strained, banks with high state ownership tend to purchase government bonds and reduce lending more than other banks do.

Another tentative finding relates to the capital ratio (Table 8). For banks with high state ownership, credit growth is little affected by the capital ratio. The coefficient on the interaction term between the capital ratio and the high state ownership dummy broadly cancels the coefficient on the capital ratio. One interpretation is that banks with larger state ownership are less constrained by capital. For instance, in 2015, banks with high state ownership had a higher average capital ratio compared to other banks by 1–1.5 percentage points.

V. CONCLUDING DISCUSSION

This paper investigated determinants of bank credit growth in Saudi Arabia. The results, relying on bank level balance sheet data, suggest that, consistent with the literature, bank lending is influenced importantly by bank balance sheet conditions and macroeconomic developments. In other words, both supply and demand factors. A rise in the capital ratio and deposit growth, and a reduction in bank holdings of “excess liquidity” all lead to higher credit growth. But greater NPL provisioning reduces it. Bank lending growth rises with stronger oil prices and domestic economic activity. Interest rates, either domestic or foreign, do not systematically affect bank lending. In 2015, bank credit growth remained robust despite oil prices having declined as banks maintained strong balance sheet conditions and reduced holdings of excess liquidity.

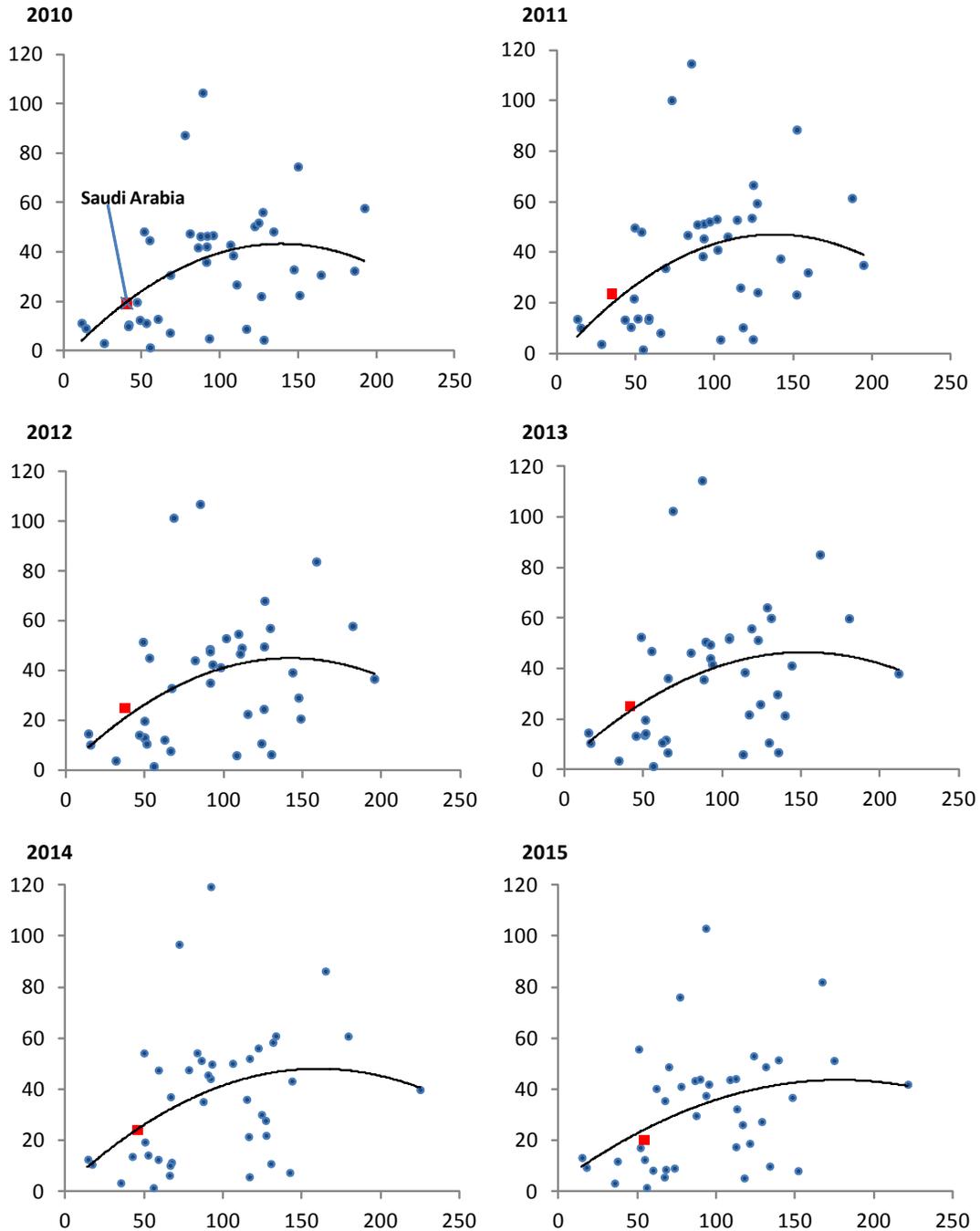
The benchmark model was extended to assess the impacts of Saudi Arabia-specific characteristics on bank lending. A rise in bank holdings of government bonds diversifies bank asset portfolios, but also seems to crowd out bank lending. Lending by SCIs does not lead to higher bank lending. The recent decline in bank concentration should have helped strengthen bank lending. Tentative results suggested that banks with relatively large state ownership may have been lending pro-cyclically with respect to oil price performance (the higher is oil price growth, the higher is lending growth) and that their lending is less sensitive to the capital ratio. When oil prices are low, those banks may be buying government bonds than other banks do. Lending by banks with higher state ownership may be less constrained by the capital ratio which is on average higher than that of other banks.

These results suggest that to support bank credit provision in the period ahead, bank balance sheets need to remain strong. This is particularly the case as the commitment to increase the role of the private sector in the economy under the National Transformation Program and

Vision 2030 would present many opportunities for lenders. Generally, banks in Saudi Arabia are profitable, liquid, and well-capitalized. SAMA's regulation and supervision of the banking system has continued to strengthen in recent years, including through the early adoption of Basel III capital and liquidity standards. Looking ahead, banks need to maintain sufficient capital even as low oil prices start putting bank balance sheets under pressure. Provisioning for NPLs reduces credit extension but is essential for safeguarding financial stability. Greater confidence in the banking system also helps attract customer deposits and support credit supply. A reduced reliance on the banking system to finance the budget deficit would also support credit provision to the private sector.

VI. APPENDIX: FIGURES AND TABLES

Figure A1. Financial Deepening and Economic Development

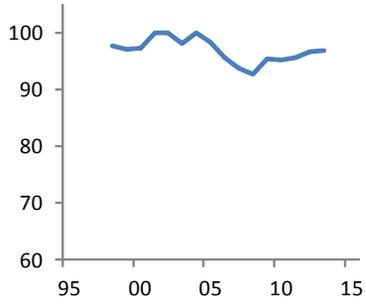


Sources: BIS Table F2.4, IMF WEO, and IMF staff calculations.

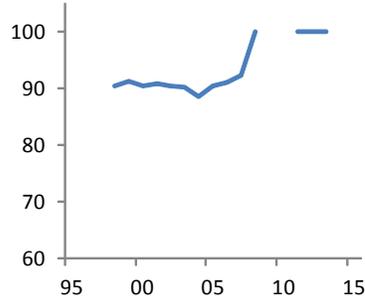
Note: x-axis represents bank credit to nonfinancial private sector as a share of GDP, y-axis represents GDP per capita in current US\$ thousand.

Figure A2. GCC: Indicator of Banking System Concentration

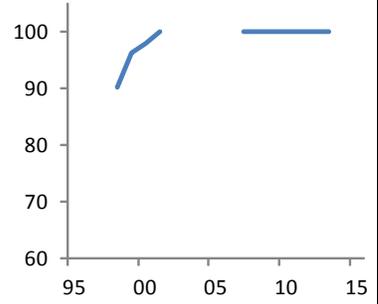
Bahrain



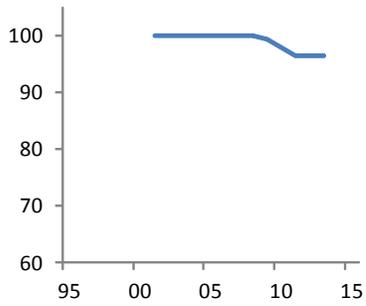
Kuwait



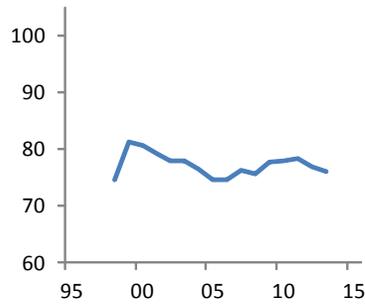
Oman



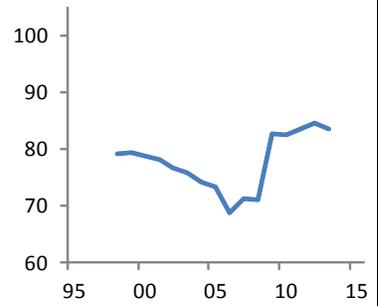
Qatar



Saudi Arabia



United Arab Emirates



Source: IMF staff calculations.

Table A1. Data Description

Variable name	Description	Unit	Sources				Aggregation level	
			Bank scope	Haver	SAMA	World Bank	Bank level	Macro level
Credit growth	Year on year growth of gross loans deflated by Saudi CPI index.	Percent	x	x			x	
Capital ratio, Tier1	Tier 1 capital to risk weighted assets.	Percent	x				x	
NPL provisions growth	Year on year growth of NPL provisions deflated by Saudi CPI index.	Percent	x	x			x	
Deposit growth	Year on year growth of total customer deposits deflated by Saudi CPI index.	Percent	x	x			x	
Net income growth	Year on year growth of net interest income deflated by Saudi CPI index.	Percent	x	x			x	
Nonoil private sector GDP growth	Year on year growth of non oil private sector real GDP.	Percent		x				x
Oil price growth	Year on year growth of Brent oil prices deflated by US CPI index.	Percent		x				x
US Fed funds rate	US Fed funds interest rate effective minus US CPI inflation detrended by linear trend.	Percent		x				x
Domestic 3 month interest rate	Saudi 3 month SIBOR minus Saudi CPI inflation detrended by linear trend.	Percent		x				x
Excess liquidity	Sum of bank holdings of (i) current and other deposits at SAMA and (ii) SAMA bills. Year on year differences divided by bank assets in the base year.	Percent		x				x
Bank holdings of government bonds, change	Year on year difference in bank holdings of government bonds scaled by bank total assets.	Percent		x	x			x
SCI lending growth	Year on year growth of lending by Specialized Credit Institutions deflated by Saudi CPI index.	Percent		x				x
Bank concentration index, change	Assets of five largest banks as a share of total commercial banking assets, year on year percentage point change.	Percent				x		x

Note: SAMA=Saudi Arabian Monetary Agency.
Source: Author.

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