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Oil Prices, Financial Stability, and the Use of Countercyclical Macroprudential Policies in the GCC

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CONTENTS

EXECUTIVE SUMMARY[1]

Economic and financial developments in the GCC economies are interwoven with oil price movements. GCC economies are highly dependent on oil and gas exports. Oil price upturns lead to higher oil revenues, stronger fiscal and external positions, and higher government spending. This boosts corporate profitability and equity prices and strengthens bank balance sheets, but can also lead to the buildup of systemic vulnerabilities in the financial sector. Banks in the GCC are well-capitalized, liquid, and profitable at present, and well-positioned to manage structural systemic risks. However, oil-macro-financial linkages mean that asset quality and liquidity in the financial system may deteriorate in a low oil price environment and financial sector stress may emerge.

The scope for amplification of oil price shocks through the financial sector suggests a role for a countercyclical approach to macroprudential policies. Countercyclical macroprudential policy can prove useful to reduce the buildup of systemic risks in the financial sector during upswings, and to cushion against disruption to financial services during periods of financial sector stress.

The GCC countries have considerable experience with implementing a wide range of macroprudential policies, but these policies have not generally been adjusted through the cycle. GCC central banks implemented several macroprudential measures before the global financial crisis and have continued to enhance their macroprudential frameworks and toolkits to limit systemic financial sector risks. Although there is some evidence of macroprudential tools being adjusted in a countercyclical way, most of the tools have not been adjusted over the financial cycle.

Further enhancements to the GCC macroprudential framework are needed to support the countercyclical use of these policies. A comprehensive and established framework, supported by strong institutional capacity, is essential for countercyclical macroprudential policies. This framework should provide clear assignment of responsibilities and guidance on how policies will be implemented to maintain financial stability and manage systemic risks over the financial cycle. Addressing data gaps and the further development of reliable early warning indicators in signaling potential systemic stress are needed to help guide the countercyclical use of a broad set of macroprudential policies.

Expanding the countercyclical policy toolkit and its coverage can help address emerging financial sector risks. The implementation of countercyclical capital buffers and dynamic loan loss provisions could boost resilience in line with systemic risks faced in GCC economies. At the same time, using existing macroprudential policies countercyclically would prove useful to address emerging financial sector risks in a more targeted way. Expanding the coverage of macroprudential tools to nonbanks can help boost effectiveness by reducing leakages.

[1] Prepared by Tim Callen, Padamja Khandelwal (lead), Ken Miyajima, and Andre Santos. Research and editorial support was provided by Ben Piven and Diana Kargbo-Sical.

A. Introduction

1. GCC economies are highly dependent on oil and gas exports. During 2011–14, hydrocarbon exports represented about 70 percent of exports of goods and services on average (Table 1). Fiscal dependence on hydrocarbon revenues was even greater, accounting for over 80 percent of total fiscal revenues on average. Over time, the dependence on hydrocarbon fiscal revenues has not declined despite efforts at economic diversification.

Table 1. GCC: Dependence on Oil Revenues

	2000-05	2006-10	2011-14	2015 (proj.)
Oil export revenues as percent of total exports of goods and services				
Bahrain	58.7	60.5	65.1	44.4
Kuwait	82.7	80.5	87.6	80.1
Oman	76.9	69.4	64.3	46.8
Qatar	88.5	85.9	88.9	77.9
Saudi Arabia	83.4	83.1	83.0	73.1
United Arab Emirates	45.0	38.7	32.6	17.7
Fiscal oil revenues as percent of total fiscal revenues				
Bahrain	71.7	82.2	87.2	72.2
Kuwait	72.7	79.2	83.8	70.1
Oman	83.4	83.4	88.7	78.3
Qatar	90.5	88.3	90.5	84.0
Saudi Arabia	82.8	88.3	90.3	80.1
United Arab Emirates	60.2	65.1	69.9	48.7

Source: IMF staff calculations.
Note: Fiscal data is of the general government for UAE and central government in other GCC countries

2. The dependence on oil and the interconnectedness of GCC economies call for structural macroprudential measures to limit systemic risk. The GCC non-oil sectors are dependent on the oil sector either directly or through government spending. This economic structure constrains the ability of banks to truly diversify their credit portfolios (Aljabrin and others, 2014). Further, banks have exposures to connected counterparties that arise from the ownership and control links in the GCC corporate sector. These structural systemic risks can be addressed by macroprudential policies that control structural vulnerabilities within the financial system.

3. In addition, macro-financial linkages in the GCC can amplify the effects of oil price movements over the financial cycle. Oil price movements and government spending policies create feedback loops between asset prices and credit that can lead to the buildup of systemic vulnerabilities in the financial sector. Oil price upturns lead to higher oil revenues, and stronger fiscal and external positions. Equity market returns are larger as investors anticipate the impact of higher oil prices on the corporate sector, and generally stronger government spending growth. In turn, stronger government spending leads to higher non-oil output growth, greater banking sector liquidity and credit growth, higher real estate prices, and stronger bank balance sheets, with the higher asset prices also having positive wealth effects. In the event of an oil price downturn, these developments can reverse. With financial sectors being fairly large in the GCC (Table 2), and oil prices being highly volatile, the unraveling of systemic financial sector vulnerabilities could have significant adverse effects on the real economy.

Table 2. GCC: Size of the Financial System

	Bank Assets (Percent of GDP)	Market Capitalization (Percent of GDP)
Bahrain	259.7	64.2
Kuwait	165.5	72.7
Oman	121.4	28.1
Qatar	148.7	73.2
Saudi Arabia	92.6	71.3
United Arab Emirates	193.4	61.1

Source: GCC authorities, Bloomberg
Note: United Arab Emirates market capitalization is sum of Abu Dhabi and Dubai stock markets; Market capitalization data is as of Sept. 16, 2015.
Banking sector data for Bahrain excludes wholesale banks.

4. Countercyclical macroprudential policies can help mitigate systemic risks to financial stability that result from these strong macro-financial linkages over the financial cycle. By putting in place countercyclical capital and liquidity buffers in good times to increase the resilience of the financial system, and reducing the procyclical feedback between asset prices and credit, countercyclical macroprudential policies can mitigate financial stability risks (Gonzalez and others (2015), IMF (2013), and IMF (2014a)).[2]

5. This paper examines how oil prices affect the real and financial sectors in the GCC and how countercyclical macroprudential policies can be used to mitigate systemic financial sector risks in these circumstances. Section B documents the interactions between oil prices and economic and financial conditions in the GCC. Section C examines the risks to financial stability that may arise from swings in oil prices, although sizable financial sector buffers provide a significant cushion. Section D documents the current use of countercyclical macroprudential policies in the GCC. Section E examines the international use and experience with countercyclical macroprudential policies, while Section F concludes and provides policy recommendations. It should be noted that while the dependence on oil creates structural risks from high concentration and interconnectedness within the GCC financial system and the use of structural macroprudential policies to mitigate these risks is appropriate, this topic is not addressed in this paper.[3] The focus in this paper is on countercyclical policies.

B. Evidence on Oil-Macro-Financial Linkages and Systemic Risks in the GCC

6. Systemic financial sector risks rose in GCC countries with the oil price upswing in the years before the global financial crisis. An expanding deposit base and high liquidity (owing to high oil prices and short-term capital inflows) resulted in credit and asset-price booms before the global financial crisis.[4] Bologna and Prasad (2010) document a sharp increase in household leverage between 2004 and 2008 in Oman. Al-Hassan and others (2010) suggest that the bursting of a domestic real estate bubble and tightening global liquidity conditions played a role in the United Arab Emirates' 2009 financial crisis, while defaults in 2008 by two of the largest investment companies in Kuwait imposed strains on the banking system, with the third-largest bank having to be recapitalized. IMF country report 10/41 discusses Qatar's preemptive recapitalization of banks and other measures to support the banking sector in 2009. As the global financial crisis hit, asset prices and credit declined in several GCC countries, although fiscal stimulus and liquidity support helped cushion the impact.

[2] Gonzalez and others (2015) employ a theoretical model calibrated using data for Colombia, an oil exporter, to suggest that macroprudential policies could help in reducing the buildup of systemic vulnerabilities that arise from oil price movements and their interactions with the financial sector.

[3] The use of macroprudential policies to address structural risks in the GCC financial system is discussed in Aljabrin and others (2014), Arvai et al (2014), and Prasad and others (2015).

[4] Al-Hassan and others (2010) explain the role of short-term capital inflows and high oil prices in fueling financial sector vulnerabilities in the run up to the global financial crisis. Arvai and others (2014) also discuss the near doubling of private sector credit as a share of non-oil GDP in the GCC during 2003-08 which contributed to systemic vulnerabilities.

7. Global oil price movements and GCC business and financial cycles are closely associated. Since 1991 periods of oil price declines have been associated with weaker credit growth (except Oman), equity prices, non-oil growth, and government spending than periods of oil price upturns (Table 3). In the United Arab Emirates, government spending growth has remained strong during downturns and upturns as has non-oil GDP growth.

Table 3. GCC: Average Percent Change in Business and Financial Cycle Variables During Oil Price Upturns and Downturns, 1991-2014[1]

	Real credit to private sector	Real equity price index[2]	Real non-oil GDP	Real government spending
Bahrain				
Downturn	7.1	-7.1	3.6	3.1
Upturn	13.7	0.0	7.0	9.0
Kuwait				
Downturn	11.4	4.5	3.8	-0.9
Upturn	11.6	13.0	6.6	7.9
Oman				
Downturn	10.6	9.2	5.7	1.5
Upturn	10.6	10.6	6.8	10.8
Qatar				
Downturn	9.6	4.1	8.3	3.4
Upturn	16.7	18.0	9.9	14.2
Saudi Arabia				
Downturn	9.7	5.0	3.7	0.9
Upturn	12.8	15.4	6.3	10.5
United Arab Emirates				
Downturn	5.7	24.6	8.0	6.2
Upturn	12.5	29.3	8.1	5.4

Source. IMF staff calculations.
[1] The average annual increase in real oil prices during an upturn is 19.9 percent, while the average annual decline in real oil prices during a downturn is 16 percent. Average real Dubai Fateh oil prices declined in 1991, 1993-94, 1997-98, 2001, 2009, and 2013-14.
[2] Equity price indices are available for Bahrain from 2004, Kuwait from 1995, Oman from 1992, Qatar from 1998, Saudi Arabia from 1994, United Arab Emirates (Dubai) from 2003.

8. Using a methodology similar to Claessens, Kose, and Terrones (2011) to identify the dates of upturns and downturns in GCC business and financial cycles since 1991 yields the following conclusions:[5]

- **GCC business cycles are long, as no country (except Qatar) has experienced two contractions since 1991** (Table 4). The contractions in real non-oil output appear to have occurred around contractions in oil prices and government spending, or global financial crises (e.g. Kuwait in 2009, Oman in 1999-2000, Qatar in 1991 and 1995, the United Arab Emirates in 2009). However, contractions in government spending or oil prices were only infrequently accompanied by a contraction in non-oil output.

Table 4. GCC: Contractions in Business and Financial Variables, 1991-2014[1]

	Real credit to the private sector	Real equity price index[2]	Real non-oil GDP	Real government spending
Bahrain	2009	2009-12	...	1991, 1993, 1995-96, 1998, 2000, 2009, 2013
Kuwait	2010-12	1998-2000, 2009-12, 2014	2009	1992-94, 1996-97, 1999, 2007, 2009, 2013
Oman	1991	1993, 1999-2001, 2009, 2011-12	1999-2000	1991, 1993, 1996-98
Qatar	1993, 1996	1999-2000, 2006-07, 2009, 2012	1991, 1995	1991, 1994-95, 1998, 2001
Saudi Arabia	2009	1995, 1998-99, 2006-09, 2011	...	1991, 1993-95, 1998-99, 2002
United Arab Emirat	2009, 2011	2006-11	2009	1992, 1994-95, 1997, 2002, 2004, 2012

Source: IMF staff calculations.
[1] Contraction is defined as a decline in the level of the corresponding variable. Average real Dubai Fateh oil prices declined in 1991, 1993-94, 1997-98, 2001, 2009, and 2013-14.
[2] Equity price indices are available for Bahrain from 2004, Kuwait from 1995, Oman from 1992, Qatar from 1998, Saudi Arabia from 1994, United Arab Emirates (Dubai) from 2003.

- **Contractions in credit and equity markets have reflected oil price movements, global financial market developments, and the buildup of underlying domestic vulnerabilities.**

[5] Using annual data, cyclical turning points are identified using changes in the levels of the relevant variables i.e. a downturn or a contraction is defined as a decline in the level of that variable, while an upturn or an expansion is defined as an increase. One complete business or financial cycle can be considered to last from peak to trough and to the next peak i.e. from the start of one contraction to the next.

With respect to bank credit to the private sector, data suggest long credit cycles—four of the six GCC countries have experienced only one credit contraction in the entire sample period. In contrast to credit cycles, the duration of equity market cycles is shorter and the frequency of contractions is higher than for non-oil output and credit, with several episodes of GCC equity indices falling after the mid-2000s and in 2015 following the recent oil price decline. The financial contractions (in credit and equity markets) in Kuwait and the United Arab Emirates were accompanied by a non-oil output contraction in 2009, but not in Bahrain and Saudi Arabia.

- **Contractions in real government spending occurred as often as real oil price downturns in the 1990s, but less so since 2000**. This may be a result of the accumulation of fiscal buffers over the past decade which allowed governments the space to cushion economic activity during oil price downturns. Over the entire period, the average size of the annual contraction in real government spending is typically less than half that of an expansion, suggesting that fiscal positions have on balance been expansionary through the cycle. This has likely boosted non-oil output growth and growth in bank balance sheets and asset prices. This effect is likely to be especially pronounced since 2000 as the average length of the fiscal expansion increased over this period.

9. There is strong empirical evidence of feedback loops between oil price movements, bank balance sheets, and asset prices in the GCC. Results from a panel VAR model suggest that:[6]

- **Oil price movements affect bank balance sheets in a significant way.** A drop in the growth rate of oil prices results in a rise in the ratio of nonperforming loans (NPL) to gross loans, and a reduction in the real growth rates of bank credit and deposits (Figure 1).[7] A 1 percent decline in oil prices leads to a 0.2–0.3 percentage point decline in real credit growth and a 0.1-0.2 percentage point decline in real deposit growth—with timing varying from immediate to 2-3 year lags. The NPL ratio would increase by about 0.1 percentage point in the long run. There is also a feedback effect within bank balance sheets, as a higher NPL ratio leads to lower real bank credit and deposit growth—as solvency risk rises, banks reduce lending to boost capital adequacy ratios, while the customers lose confidence in the banks, and vice versa. These results are consistent with other studies on the GCC economies (see, for instance, Espinoza and Prasad, 2010).

- **Equity price developments are a channel for amplification of the bank liquidity feedback loop stemming from an adverse oil price shock.** A one percent reduction in oil price growth leads to a 0.8 percent decline in the rate of equity price inflation, which in turn leads to a reduction of bank credit and deposit growth by 0.1 percentage point, further depressing equity price performance.

[6] A panel VAR routine, accounting for bank fixed effects, is used (Love and Zicchino, 2006). NPL ratios were used without a logit transformation. The variables are ordered as follows: global real oil prices, bank NPL ratio, bank real credit growth, bank real deposit growth, country-level real equity price growth. Data on real estate prices are unavailable. One counter-intuitive result is that a rise in the NPL ratio leads to higher real equity price growth.

[7] All coefficients shown are statistically significant at the 5 percent level.

Figure 1. Linkages Between Oil Prices, Bank Balance Sheets and Equity Prices in GCC

Note: Panel VAR with two lags. Annual data 2000-14. Bank level data for NPL, deposits, and credit. Numbers represent a percent response to a 1 percent adverse shock, except for NPL ratio where shock and response are in percentage point. Using data for a total of 41 banks, representing on average nearly 70 percent of the individual domestic banking system as measured by the stock of credit.

C. Financial Stability and Oil Prices

10. GCC banks are well-capitalized, liquid, and profitable. Although oil prices have declined since mid-2014, government spending is yet to slow down significantly and bank balance sheets remain strong. As oil prices and credit increased rapidly over the past decade, capital buffers and provisioning levels simultaneously increased to levels above those in many other commodity exporting countries (Box 1). This is likely to be, in part, a result of strengthened regulatory frameworks and improved risk management. More generally, GCC banks currently hold high levels of capital to limit structural risks in their credit portfolio stemming from concentration and interconnectedness. NPL ratios are at low levels, and loan loss provisions and profits are strong to enable coverage of NPLs.

Box 1. GCC Banking Systems Characterized by Sizable Buffers

GCC banks have sizable capital and liquidity buffers with high levels of high-quality capital and low loan-to-deposit ratios by international standards.

Capital adequacy ratios (CARs) in GCC banks are 2–3 percentage points higher than in other commodity exporter country banks (Table)—a result of minimum capital requirements and add-ons enforced by GCC regulators as part of the supervisory process— to buttress the banks' ability to meet any unexpected losses. Most of the capital held by GCC banks at end-2014 was high quality, with Tier 1 capital representing more than 80 percent of total capital on average. Loan-to-deposit ratios are low, especially in Kuwait, Saudi Arabia, and the United Arab Emirates.

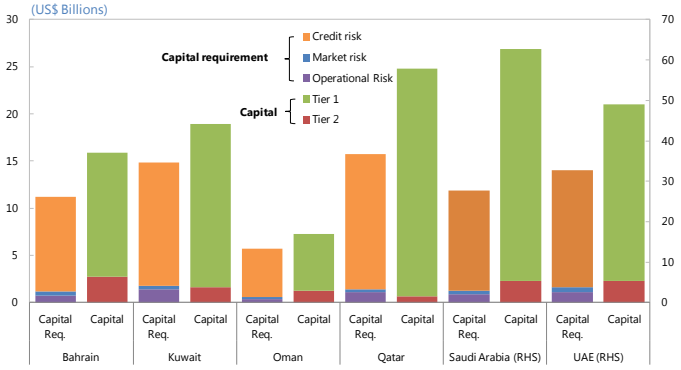
Financial Soundness Indicators for Selected Commodity Exporters

	Capital Adequacy Ratio	NPLs to Gross Loans	Loan to Deposits	Return on Assets
Bahrain	18.3	4.6	-	1.4
Kuwait	18.3	3.5	71.4	1
Oman	15.1	2.0	97.8	1.8
Qatar	16.3	1.7	105.9	2.1
Saudi Arabia	17.9	1.1	79.4	2.5
United Arab Emirates	18.1	6.5	89.9	1.8
GCC average	***17.3***	***3.2***	***88.9***	***1.8***
		Advanced Economies		
Canada	14.2	0.5	122.2	1.1
Norway	16.5	1.3	115.5	0.8
AM average	***15.4***	***0.9***	***118.8***	***1.0***
		Emerging Markets		
Azerbaijan	19.2	12.7	154.9	1.7
Kazakhstan	16.8	23.6	103.5	1.3
Malaysia	15.4	1.6	81.0	3
Mexico	15.8	3.0	-	1.7
Peru	14.4	4.0	-	1.9
Russia	12.5	6.7	97.4	0.9
EM average	***15.7***	***8.6***	***109.2***	***1.8***

Sources: Authorities data; Haver; IMF staff calculations
Note: Data is for 2014 or latest year available

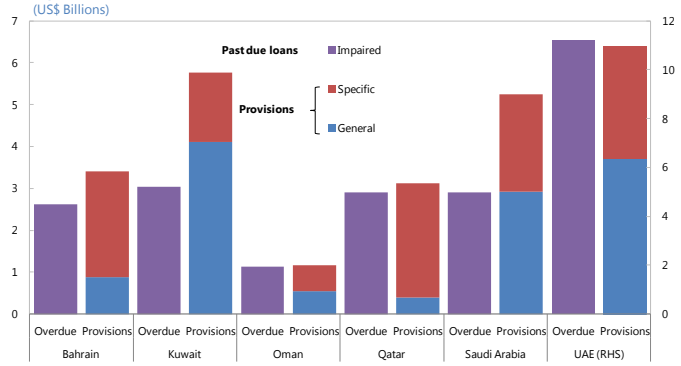
Credit quality in GCC banks is high and similar to banks in other commodity exporting countries. NPL ratios in both the GCC and many other commodity exporters are below 5 percent (except the United Arab Emirates, Azerbaijan, Kazakhstan, and Russia). For United Arab Emirates banks, NPLs rose in the wake of the 2008–09 financial crisis, but have been on a declining trend since.

Top GCC Banks: Capital Requirements and Total Capital, End-2014
(US$ Billions)



Sources: Bank's 2014 annual reports, Pillar III disclosures and staff calculations.

Top GCC Banks: Past Due Loans and Provisions, End-2014
(US$ Billions)



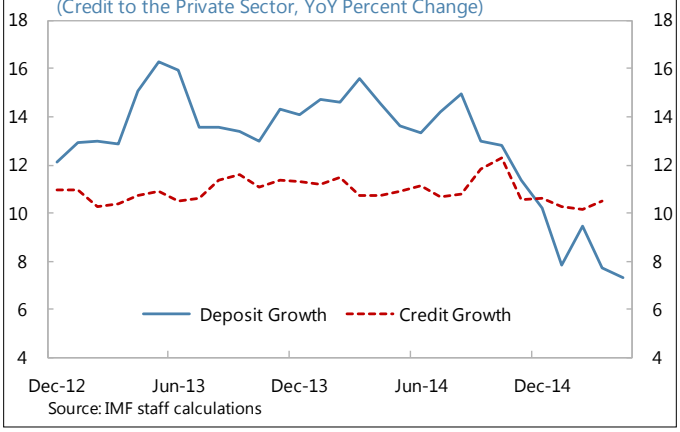
Sources: Banks' 2014 annual reports, Pillar III disclosures, and staff calculations

Profitability and loan loss provisions are strong. Profitability in GCC banks is high and provides the first line of defence against losses. Moreover, the provisioning ratio—measured as the ratio of total provisions (general and specific) to nonperforming loans—is also high, above 100 percent on average at end-2014 (Figure). This would help cover NPL write-offs, although the practice in some GCC countries of applying provisioning rates on net exposures may expose banks to underprovisioning if collateral is not properly assessed.[1]

[1]Despite some differences across GCC countries, loan loss provisioning regulations are broadly in line with international best practices (Aljabrin and others, 2014). However, except in Saudi Arabia, specific provision calculations in the GCC deduct the value of collateral from gross exposures to obtain net exposures on which provisioning rates are applied. As a result, banks could be underprovisioned if the value of collateral such as real estate is overstated or declines in a financial downturn.

11. Liquidity conditions have tightened slightly in recent months. The growth in deposits has slowed, largely as governments and government-related entities have withdrawn deposits from the banking system (Figure 2). Meanwhile credit growth has remained at robust levels. As liquidity has begun to tighten, interbank rates have risen slightly since the beginning of August 2015.

Figure 2. Bank Credit and Deposits
(Credit to the Private Sector, YoY Percent Change)



Source: IMF staff calculations

12. Non-performing loans have declined in recent years. During the early 2000s, the distribution of the NPL ratio was noticeably "fat tailed" on the right – some banks used to have NPL ratios of 40 percent or above. The distribution improved through 2008, with highest ratio falling below 15 percent. The NPL ratio subsequently increased, but its distribution for the banks in the sample improved by 2014 to one that looks to be one of the least vulnerable at the aggregate level over the entire period (2000–14). In 2014, the NPL ratio in the 10th, 50th and 90th percentile was 0.8 percent, 2.5 percent, and 8.5 percent respectively.

13. GCC banks are exposed to swings in global oil prices. Liquidity conditions are likely to worsen over time as oil prices and deposit growth remain low. Sustained lower oil prices over time would also lead to fiscal tightening and reduce the growth rates of non-oil GDP and real credit. This would lead to a decline in equity prices, creating negative wealth effects and further depressing private sector consumption and non-oil GDP. These effects are likely to be mutually reinforcing. In this environment, bank NPLs are likely to rise as borrowers have increasing difficulties servicing their debts. An empirical analysis finds that growth rates of real oil prices and real non-oil GDP are key determinants of NPLs

Table 5. Determinants of Bank NPL Ratios in the GCC

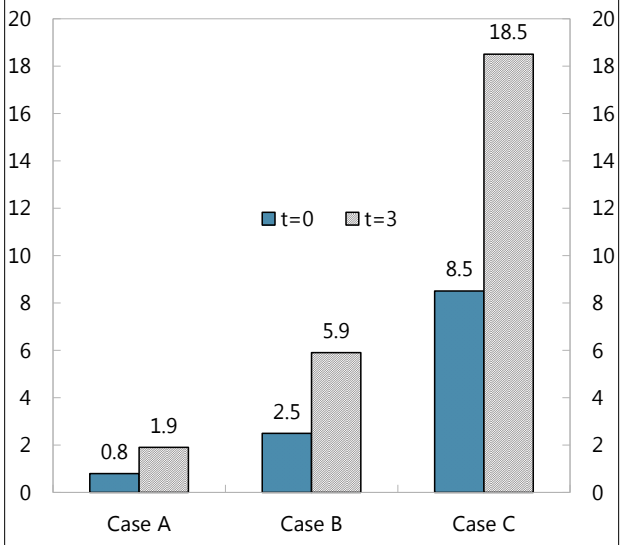
Model number	1	2	3
Logit of NPL ratio (L1)	0.872***	0.842***	0.874***
Real oil price growth (L1)	-0.012*	-0.008*	-0.008***
Nonoil GDP growth (L1)	-0.058	-0.076*	-0.069*
Real equity price growth (L1)	-0.012	-0.001	-0.003
Real credit growth (L1)	-0.004	-0.004	-0.003
Real US fed funds FD (L1)			
Year dummy	Y	Y	Y
Lag depth	1	2	3
p-values			
AR(1)	0.000	0.000	0.000
AR(2)	0.364	0.192	0.251
Hansen	0.546	0.634	0.790
Passes tests?	Y	Y	Y

Note: The dependent variable is bank-by-bank (logit transformed) NPL ratio for selected GCC banks spanning 2000-2014 (annual frequency). Relying on a system GMM approach, with the collapsing method. The coefficients represent non-linear effect that depends on starting levels. ***, **, and * signify statistical significance at the 1%, 5% and 10% levels. L1 signifies one period lag. AR(1) and AR(2) signify p-values associated with the null hypothesis of lack of first and second order serial correlation. Hansen signifies p-value associated with the null hypothesis that the instruments are exogenous. A model is cosidered to pass tests if pvalues of both AR(2) and Hansen tests are 10% or greater.
Sources: Bankscope, Haver, Bloomberg, and staff estimates.

in the GCC (Table 5).[8] The coefficients on real equity prices growth and real credit growth on the other hand have the correct sign but are not statistically significant. Real U.S. interest rates do not directly affect NPL ratios in a systematic way. The NPL ratio exhibits strong persistence.

14. The recent large decline in oil prices could therefore lead to an increase in the NPL ratio in GCC banks, with a larger increase for weaker banks. For illustrative purposes, the NPL ratio in the 10th, 50th, and 90th percentile in 2014 is taken as a starting point and the coefficients obtained from model 2 in Table 5 are applied. Oil prices are assumed to decline by 50 percent (to $48 a barrel) and non-oil GDP growth by 3 percentage points in t = 0 and then remain unchanged for three years (the simulation period). Figure 3 shows that for banks in the 10th percentile (NPL ratio of 0.8 percent), the NPL ratio would rise by 1.1 percentage points to 1.9 percent in three years. Banks with lower asset quality would witness larger increases. Starting from 2.5 (8.5) percent, the NPL ratio would rise by about 3 (10) percentage points to about 6 (18.5) percent. Nevertheless, their strong capital buffers, profitability, and provisions provide an important source of resilience for GCC banks.

Figure 3. Impact of Decline in Oil Prices and Non-oil Growth on NPLs



Source: Bankscope, Haver, and IMF staff calculations.
Note: The three cases illustrate banks in the 10th, 50th, and 90th percentile of NPLS in 2014 and the impact of an adverse oil price and growth shock scenario over a three year horizon.

D. The Use of Countercyclical Macroprudential Policies to Mitigate Systemic Vulnerabilities in the GCC

15. The exposure to oil price volatility and the associated macro-financial feedback loops and systemic risks outlined in the previous two sections suggest the need for countercyclical macroprudential policies. Countercyclical macroprudential policies can help mitigate the buildup of systemic financial sector risks over the financial cycle by putting in place countercyclical capital and liquidity buffers in good times to increase the resilience of the financial system, and reducing

[8] The analysis relies on publicly available bank-level data for the NPL ratio from Bankscope. The sample includes 41 large GCC banks, for which sufficient data are available for 2000-14, representing on average nearly 70 percent of the individual domestic banking system credit. As is commonly done in the literature, the dependent variable, the NPL ratio, is used after a logit transformation to ensure the variable is more normally distributed. This transformation also captures the empirical regularity that the variable tends to vary most for banks with higher starting values. A range of explanatory variables (including oil prices, non-oil GDP, equity prices, bank level credit, U.S. interest rates) is included to capture the effects of these variables on bank credit quality. Domestic bank lending rates are often not available. Time dummy variables for all years are introduced to help control for potential shocks not related to oil price movements. A system GMM approach is employed to control for the endogeneity of explanatory variables.

procyclical feedback between asset prices and credit. A comprehensive and established macroprudential policy framework, buttressed by strong institutional and analytical capacity, is essential to implement macroprudential policies in a countercyclical way, taking into consideration the interactions and feedback loops between economic and financial conditions.

16. Countercyclical macroprudential instruments can be classified according to the financial risks they target and can be adjusted over the cycle to enhance resilience and contain emerging risks. Broad-based macroprudential tools include countercyclical capital buffers (CCBs), dynamic loan loss provision requirements, and the leverage ratio. These measures build resilience in banks by affecting all the credit exposures of the banking system and the cost of capital (IMF, 2014a and b). On the other hand, household sector vulnerabilities can be contained through a range of sectoral tools that target specific credit categories such as sectoral capital requirements (risk weights), loan-to-value (LTV), and debt-service-to-income (DTI) ratios. Financial vulnerabilities arising from increasing corporate leverage are addressed using sectoral capital requirements (risk weights) and exposure caps, in addition to other measures such as LTV limits. Systemic liquidity and currency risks can be contained through liquidity buffer requirements, stable funding requirements (e.g. loan-to-deposit ratios), liquidity charges, reserve requirements, constraints on open FX positions, and constraints on FX funding.

Table 6. Macroprudential Toolkit of GCC Countries[1]

	Capital Tools			Liquidity Tools			Sectoral Tools				Exposure Limits		
	Counter-cyclical Capital Buffers	Leverage Ratio	Dynamic provisions	Reserve require-ments	Loan to Deposit Ratio	Liquidity Require-ments	Concent-ration Limit	Loan to Value Ratio	Debt to Income Ratio	Sectoral Capital Buffers	Foreign Exchange & Currency	Real Estate or Equity Exposures	Interban k
Bahrain	+	√		√	√	√	○		√			√	
Kuwait	+	√			√	√	√	√	√	√	√	√	
Oman				√	√	√	√	√			√	√	
Qatar	+	√		√	√	√	√	√	√		√	√	
Saudi Arabia	+	√	●	●	√	√	√	√	√				
United Arab Emirates				√	√	√	√	√	√			√	√

Sources: IMF Global Macroprudential Instruments Survey 2013, *National Sources*.

+ Planned √ Not used countercyclically ○ Varied over time, but not intended as a countercyclical tool ● Used countercyclically

[1] Categorization of the macroprudential tools used in GCC countries; slight differences in definitions and coverage are not reflected.

17. GCC countries have considerable experience with the use of macroprudential policies, although these have generally not been employed countercyclically (Table 6). GCC central banks implemented several macroprudential measures before the financial crisis to contain risks, especially from retail lending. However, these measures were not able to prevent the credit booms before the global financial crisis (Prasad and others, 2015). Ceilings on credits for banks, such as loan-to-deposit ratios, were introduced relatively early (1980s and 1990s in many countries). These ratios have helped contain liquidity risk and the reliance on wholesale funding. In addition to LTD ratios, Saudi Arabia used reserve requirements countercyclically during the global financial crisis to manage liquidity pressures in banks. Bahrain, Oman, Qatar, and the United Arab Emirates also implement reserve requirements as a macroprudential tool (not just for monetary policy purposes), but this tool has not been used in a time varying way.

18. There is some evidence to suggest that capital buffers and loan loss provisions have moved in a countercyclical way in the GCC (Box 2). General provisioning requirements have been raised in Kuwait, Oman, Qatar, and the United Arab Emirates after the global financial crisis, and minimum capital requirements were raised in Oman and the United Arab Emirates in 2009–10 to boost banking system resilience. In Saudi Arabia, the minimum regulatory capital ratio is 8 percent, but banks have implicitly been required to hold a minimum capital ratio of 12 percent and add-on capital buffers and loan loss provisions are implemented in a countercyclical way (Abusaaq et al 2015). In Kuwait, the minimum capital requirement has been raised from 12 percent in 2014 to 12.5 percent in 2015 and 13 percent in 2016. CCBs in line with Basel requirements are already planned in Bahrain, Kuwait, Saudi Arabia, and Qatar, while Saudi Arabia is also planning a formal dynamic loan loss provisioning framework.

19. Macroprudential tools have also been used in the GCC to limit risks from lending to the household sector, but leakages are a concern. GCC countries have imposed debt-service-to-income (DTI) limits to curb risks from retail lending for some time. Bahrain and Kuwait imposed DTI limits in the early 2000s, while Saudi Arabia imposed these in 2006, and the United Arab Emirates more recently. In Bahrain, there have been concerns over leakages from the DTI to the unregulated financial institutions and the NBFI sector, and in Saudi Arabia over the possibility of high overall DTI ratios as these limits apply only to repayments of personal loans and consumer credits and not to mortgage loans. In Saudi Arabia, an extension of the DTI ratio to all loan repayments (including mortgages) by individual borrowers is under consideration. In Kuwait and the United Arab Emirates, DTI limits are more comprehensive as they extend to banks and non-banks and cover all debt repayments by an individual borrower. LTV ratios are now becoming widespread in the GCC, with Saudi Arabia introducing one in November 2014 (at 70 percent), and differentiated limits introduced recently for nationals and expatriates as well as for first and second properties in the United Arab Emirates. Kuwait, Oman, and Qatar have also previously imposed explicit LTV limits, while business practices in Bahrain have resulted in the ratio being around 80 percent (Arvai et al 2014). The loan-to-value (LTV) ratios in the GCC are largely focused on mortgages and do not include other collateralized lending (e.g. auto loans).

20. The institutional framework for macroprudential policies in GCC countries is being developed.[9] The central bank is responsible for the financial stability mandate in Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia (Prasad and others 2015). In the United Arab Emirates, different agencies are responsible for ensuring different aspects of financial stability, without much formal coordination. Coordination mechanisms are being developed in the region—Qatar and Oman have already established a formal structure for coordination among various regulatory bodies, while Saudi Arabia is also taking steps in this direction. Another prerequisite for countercyclical macroprudential policy is a system of early warning indicators to signal vulnerabilities and guide the use of macroprudential tools. In this regard, early warning systems are under various stages of development, separate financial stability offices have been established in all GCC central banks,

[9] The macroprudential framework should include a clear legal mandate for maintaining financial stability, and provide for information sharing and assign roles and responsibilities for policy action among relevant supervisory agencies.

Box 2. Empirical Evidence on the Countercyclical Use of Loan Loss Provisions and Capital Buffers in the GCC

A simple empirical approach is used to shed light on the countercyclical use of loan loss provisions and capital ratios in the GCC. Developments in loan loss provisioning and capital adequacy ratios (CAR) are compared to movements in key macroeconomic indicators, including the credit-to-GDP gap (estimated as percent deviations from HP trends),[1] real credit growth, and real nonoil GDP growth. Finally, to account for GCC-specific factors, real oil price growth is also considered. The degree of countercyclical movement is assessed using correlation coefficients between provisions to NPLs or CAR with each of the four macroeconomic indicators.[2] Positive correlation coefficients, when statistically significant, signal the potential that provisions to NPLs and CAR are countercyclical – these ratios increase during good times.

Counter-Cyclical Use of Macroprudential Tools

(1) Country level analysis

	Provisions (% of NPLs)				Total capital (% of RWA)			
	Credit to GDP gap	Real credit growth	Nonoil GDP growth	Real oil price growth	Credit to GDP gap	Real credit growth	Nonoil GDP growth	Real oil price growth
Saudi Arabia	x							
United Arab Emirates	x							
Oman	x						x	x
Bahrain		x				x	x	x
Qatar								
Kuwait		x				x		

(2) Bank level analysis (Number of banks with statistically significant correlation)

Saudi Arabia (out of 11 banks)	7	1	1	2	4	2	2	0
UAE (out of 7 banks)	3	3	3	0	0	2	2	0
Significance level	1%	5%	10%					

Sources: Bankscope; IMF staff estimates.

There is tentative evidence to suggest these tools are countercyclical in some GCC countries. Country-level loan loss provisions to NPL ratios are calculated using bank level data from Bankscope.[3] This ratio is countercyclical relative to the credit to GDP gap in Saudi Arabia, the United Arab Emirates, and Oman; and relative to real credit growth in Bahrain and Kuwait (Table). CARs (based on published country-level financial soundness indicators data) are countercyclical in Oman, Bahrain, and Kuwait with respect to real growth of credit, nonoil GDP, or oil prices. No systematic linkage was found for Saudi Arabia, the United Arab Emirates, and Qatar. The results need to be interpreted with caution as the annual data provide a relatively limited number of observations. Additionally, the estimated credit-to-GDP gap may not represent sufficiently the financial cycle.

Similar assessments using bank-level data reveal heterogeneity across individual banks. In Saudi Arabia, provisions to NPLs ratios are countercyclical, in a statistically significant way, with respect to the credit-to-GDP gap for 7 of the 11 banks, consistent with the evidence based on the aggregate data. The CAR is countercyclical with respect to the credit to GDP gap for 4 banks. In the United Arab Emirates, provisions to NPL ratios are countercyclical with respect to most macroeconomic variables including the credit-to-GDP gap for 3 out of 7 banks. The CAR is countercyclical with respect to real growth rates of credit and nonoil GDP for 2 of the 7 banks analyzed.

[1] The "credit to GDP gap", defined here as the deviation in the ratio of credit to non-oil GDP from its long run trend, is a key indicator of the financial cycle, but should be complemented by additional indicators and judgment. The empirical literature finds that, currently, it is the single best early-warning indicator of crises, signaling crises five to three years in advance. To help address the well-known end-point issues with HP filters, the gaps for 2000–14 are calculated with two extra years of data, including forecasts through 2015–16. A two-sided approach is used.

[2] The latter are lagged by one period (i.e. one year) to help reduce the chance of capturing reverse causality stemming from macro variables.

[3] Bankscope-based country aggregates are consistent with IMF desk data and, importantly, available with longer time series. The sampled banks represent 50-96 percent (an average of 67 percent) of domestic banking systems measured in terms of percent of the stock of credit.

and financial stability reports are being published. However, financial information is limited in a number of areas which poses an obstacle toward building an efficient macroprudential framework and identifying systemic risks as most of the tools and models commonly used to identify systemic risk require comprehensive and granular set of data.[10] Moreover, the macroprudential framework and countercyclical policies are yet to be adapted to address the systemic risks associated with Islamic banking (Box 3).

Box 3. Risks and Countercyclical Macroprudential Policies in Islamic Banking

Islamic banking has implications for countercyclical implementation of macroprudential policies in GCC economies. Islamic banking in the GCC has grown rapidly over the past half-decade: annual growth rates from 2009-13 have reached over 10 percent in the United Arab Emirates, 15 percent in Saudi Arabia, and nearly 30 percent in Qatar. The market share of Islamic banking in GCC economies (except Oman) ranges from 20 percent of banking system assets for the United Arab Emirates to nearly 60 percent for Saudi Arabia at end-2013 (Kammer et al, 2015).[1]

The increased penetration of Islamic finance offers scope for risk-sharing. The risk-sharing and asset-based financing nature of IBs can help promote better risk management and discourage credit booms by reducing the incentives for customers to take on excessive leverage. Profit-and-loss sharing customer deposits can be "bailed in" in the event of a crisis. The reduced exposure to derivatives and greater focus on ethical lending can also help mitigate risks.

However, systemic risks from IBs need to be contained. IBs are subject to equity investment risks that can get exacerbated during a downturn because of uncertain returns on profit-sharing investments. The need to provide asset-based financing has been seen to lead to conglomerate structures of banks, with high concentration in consumer financing and in real estate and commodities investments in some countries. Credit risk is also heightened because of the difficulty of recognizing NPLs in the event of default. In addition, profitability of IBs may be low because they often need to hold a higher proportion of assets in cash, owing to a lack of well-developed markets for Shari'ah compliant high quality liquid assets.

GCC supervisors will need to adapt and calibrate countercyclical macroprudential tools for systemic risks in IBs. While most macroprudential instruments that are applied to conventional banks can be applied to IBs, some modifications will be needed.[2] The somewhat different nature of risks facing IBs will need to be assessed and countercyclical macroprudential policies will need to be calibrated accordingly.

[1]Islamic banks (IBs) are funded by non-interest bearing current accounts as well as profit sharing investment accounts, owing to the Shari'ah prohibition on interest. On the asset side, banks do not engage in lending, but in sales, lease, profit- and-loss-sharing financing, and fee-based services. Banks are prohibited from undertaking transactions in certain types of derivatives. However, in practice, Islamic finance often involves complex and layered transactions that mimic conventional finance.

[2] Kammer, A., M. Norat, M. Pinon, A. Prasad, C. Towe, and Z. Zeidane (2015) provide an analysis on the challenges and needed modifications to the macroprudential instruments

[10] Data gaps that need to be filled include: data on commercial and residential real estate prices, household balance sheets (distribution of equity and home ownership, household debt, LTV and DTI ratios), corporate balance sheets (e.g. debt and debt service coverage ratios including for non-listed firms), characteristics of bank loan portfolios (fixed versus variable interest rate loans, secured and unsecured loans etc.), and cross border exposures vis-à-vis non-BIS-reporting banks/countries.

E. Countercyclical Macroprudential Policies—International Experience

21. The countercyclical use of macroprudential policies across commodity exporting countries is becoming more common. This increased usage does not, however, appear to be directed at risks from commodity price volatility, but rather at boosting resilience and addressing specific financial sector risks over the financial cycle. Below the countercyclical macroprudential frameworks and policies in selected emerging and advanced commodity exporting countries are explored using responses of country authorities (for Canada, Malaysia, Norway, and Peru) to the IMF's Global Macroprudential Policy Instruments Survey (2013) and updated from country sources. In these countries (Annex I), the countercyclical use of macroprudential policy instruments (MPIs) is recent—three of the four countries started implementing MPIs in a countercyclical way only after the global financial crisis, while Malaysia started earlier. The differences in the policy frameworks and tools reflect the structure of the financial system and the policy makers' assessment of systemic risks. Some interesting aspects are:

- **The macroprudential framework for use of countercyclical MPIs appears to be well-specified with an important role for policymakers' judgement**. In all four countries, the framework calls for implementation of MPIs to be coordinated among the supervisory authorities, the central bank, and the Ministry of Finance. The roles of the various agencies in some cases differ based on instrument. In each case, the country-specific criteria for the calibration of the selected countercyclical macroprudential policy instruments (MPIs) are clear and provide guidance for action. That said, there is considerable room for policymakers to exercise judgement and discretion in the use of countercyclical MPIs.
- **Two commodity exporters are among the early adopters of the CCB.** In Norway and Peru, a framework for CCBs has been established. Norway's framework is closely aligned with the Basel III guidance and the CCB can range between 0 to 2.5 percent of risk-weighted assets. The framework specifies a role for indicators—related to credit, asset prices, and wholesale funding in banks—and the judgment of policy makers to trigger an increase in the CCB. Market turbulence indicators and loss prospects for the banking sector are used to trigger a decrease in the CCB to ensure a timely policy response to emerging systemic risks. To minimize leakages, all domestic banks and foreign branches are covered.[11] The Ministry of Finance is responsible for making decisions related to the CCB but is required to consult with the central bank.[12] In contrast, Peru's CCB framework uses results from an internal methodology to calibrate the level of the CCB, and the GDP growth rate as an indicator to trigger an increase as well as a decrease in the CCB. The supervisory authority of banks (SBS) is responsible for making decisions related to the CCB.

[11] CCB requirements for foreign branches in Norway have already been recognized by Denmark, Finland, Sweden and the UK. Banks with their head office in these countries thus have to hold a countercyclical capital buffer in accordance with Norwegian requirements for that portion of their activities carried out in Norway. CCB requirements for other foreign branches will be subject to the incorporation of the Capital Requirements Regulation (CRR) and Capital Requirements Directive (IV) into the European Economic Agreement (EEA).

[12] The central bank in turn is required to exchange information and assessments with the Financial Supervisory Authority when making recommendations to the Ministry.

- **The LTV and DTI limits on the household sector are among the most popular MPIs.** Canada, Malaysia, and Norway use these tools to contain financial sector risks from household leverage. In Canada, the two tools are used together and can be mutually reinforcing – as house prices increase, LTV limits become less constraining but DTI limits become more binding. However, LTV and DTI limits are applied only to insured mortgages by both banks and nonbanks and leakages to uninsured mortgages are a concern.[13] In Malaysia, LTV limits on banks and nonbanks are implemented in a targeted way to the purchasers of multiple homes and luxury properties, and are supplemented by higher risk weights on high LTV and long tenor mortgages. In addition, there are caps on the overall exposure of banks to the property sector (excluding low income and owner-occupied housing loans) and for the purchase of equities. Capital gains taxes on the sale of properties have also been increased to curb speculation in the real estate market. In Norway, the LTV limit and a loan-to-income ratio guideline are applied only to residential mortgages from banks, and are supplemented by an affordability test for mortgages that applies a 5 percentage point increase in interest rates. In this regard, the use of sectoral tools to target risks emanating from specific sectors of the economy may have advantages in that it would limit the impact on credit to the wider economy, but may also have disadvantages in terms of leakages.

- **Tools to limit corporate sector risks are relatively uncommon.** None of the four countries have implemented sectoral capital requirements or caps on exposures to the corporate sector. Only one country, Malaysia, has implemented LTV limits on real estate mortgage loans to corporate borrowers.

- **Liquidity tools are being used countercyclically.** In Canada, the calibration of the liquidity requirements incorporates considerations of liquidity, stability of funding, market risk premia, and systemic risks. Peru, which was concerned with foreign currency exposures owing to volatile capital flows, has introduced high reserve requirements on foreign currency liabilities of banks. These reserve requirements have been eased recently with the impending normalization of U.S. monetary policy.

22. More generally, tools targeting risks from the household sector have been used countercyclically in several countries with well-developed financial sectors, and countercyclical macroprudential toolkits are being expanded in line with Basel III requirements. A recent study (Darbar and Wu, 2015) examined macroprudential policies in five countries (Hong Kong SAR, the Netherlands, New Zealand, Singapore, and Sweden). Most of these economies have large financial sectors relative to GDP and well-defined macroprudential policy frameworks. Hong Kong SAR and Singapore are well-developed international financial centers. In all the countries, in the aftermath of the global financial crisis, owing to rising risks associated with real estate lending, LTV limits have been the most popular macroprudential tool and have been tightened successively. In addition, Hong Kong SAR and Singapore have used the DTI ratio and

[13] Western Hemisphere Regional Economic Outlook, October 2015. In Canada, limits on loan repayment periods of insured mortgages are used to supplement LTV and DTI limits.

taxes on real estate transactions.[14] Sweden and Hong Kong SAR also have imposed additional capital requirements for mortgages.[15] More recently, in line with Basel III requirements, CCBs are being introduced to boost bank resilience in Hong Kong SAR, Singapore, and Sweden, and are under consideration in the Netherlands.[16] There is no separate set of countercyclical macroprudential tools geared for the financial institutions operating in their international financial centers with the coverage of several of the macroprudential tools often limited to banks operating in the domestic financial sector.

23. Preliminary evidence points to the effectiveness of macroprudential policies in reducing systemic risks during upswings, less so during downswings. Macroprudential policies have been increasingly used in both advanced economies and emerging markets, especially since the global financial crisis. Based on the experience so far, some operational considerations with respect to the design and implementation of macroprudential policies are summarized in Annex II (see also IMF, 2014a and b). Given that the use of these policies has increased in recent years, the evidence on their use and effectiveness is still evolving. Some studies that have examined the effectiveness of a range of macroprudential tools over the financial cycle have found them effective in reducing the buildup of systemic risks during booms (e.g. Lim and others (2011), Akinci and Olmstead-Rumsey (2015)), but there is less evidence of effectiveness during busts. A recent study by Cerutti et al (2015) finds evidence of asymmetric effects on the effectiveness of macroprudential policies between booms and busts. Similarly, Kuttner and Shim (2013) consider a number of macroprudential tools, and find that a tightening of the DTI ratio is associated with a significant deceleration in housing credit, and housing-related taxes are associated with a decline in house price growth.[17] On the other hand, loosening of the DTI ratio has a comparable (but statistically insignificant) effect in the opposite direction. McDonald (2015) finds somewhat stronger results for the effectiveness of loosening LTV and DTI limits during downturns. As this literature points out, it is challenging to draw conclusions regarding the effectiveness of macroprudential policies during downturns as there are few instances of policy loosening and their effects can be difficult to isolate from those of other policies.

24. An important lesson from the international experience is that multiple early warning indicators can help assess the evolving nature of systemic risk and the need for tightening or relaxation of macroprudential measures. Early warning indicators can help signal when policy adjustments are appropriate, and support clear communication of policy intentions. A gradual policy tightening is often appropriate as there may be uncertainty about the transmission to the real

[14] In the GCC, Dubai has also imposed real estate transaction fees as an MPI to help reduce price pressures in the real estate market.

[15] The successive phases of tightening and other measures being introduced perhaps point not only to the policymakers' desire for a gradual tightening, but also to the difficulty of calibrating macroprudential tools to achieve the desired response in financial market activity.

[16] It is interesting that Hong Kong SAR and Singapore, with a fixed exchange rate regime and stabilized arrangement respectively, do not set macroprudential restrictions on FX loans to unhedged borrowers, although Hong Kong SAR does set limits on the open FX positions of banks.

[17] Darbar and Wu (2015) find similar results for a tightening of LTV and DTI ratios.

economy and it is important not to over-tighten. However, as banking sector stress starts to emerge and the policymakers assess that this could lead to systemic financial sector stress, a faster response on loosening macroprudential tools could be appropriate to mitigate a rapid intensification of a financial downturn, while ensuring financial system resilience to future shocks. When multiple indicators point to a build-up of risks, there is a stronger case for policy action. Over time, efforts to assess the reliability of signals provided by early warning indicators, and address data gaps (where they exist) can help improve the calibration of the policy response.

25. The experience with macroprudential policies also indicates that leakages need to be contained for policy to be effective. Leakages occur when the provision of credit migrates outside of the scope of application of the macroprudential tools. For instance, when MPIs are applied to domestic banks, their effectiveness can be reduced by the migration of credit activities and associated risks to non-banks, off-balance sheet vehicles, and foreign financial institutions. Domestic leakages can be addressed by extending regulations to all financial products, including by non-bank financial institutions, and enforcing these through high standards for consolidated supervision. Cross border leakages may be addressed by reciprocity arrangements (e.g. Norway), or alternatively, greater host control over foreign branches. In this regard, economies with a larger nonbank sector or more open financial sector may find it challenging to implement macroprudential policies effectively. However, expanding the perimeter of macroprudential action can face legal and operational challenges, including the need for greater cooperation among supervisory agencies.

F. Policy Recommendations and Conclusions

26. The exposure of the GCC economies and financial sectors to volatile oil prices suggests an important role for countercyclical macroprudential policies to mitigate systemic risks. Oil price shocks are a cause of feedback loops between asset prices, government spending, credit, and non-oil GDP. In such circumstances, countercyclical macroprudential policies can help reduce the buildup of systemic risks in the financial sector during oil price upswings, and to cushion against disruptions to financial services during oil price downswings.

27. The GCC countries are already implementing a wide range of macroprudential instruments to build resilience in the banking sector. Banks in the GCC have been encouraged to build capital buffers and provision for NPLs in a countercyclical way. As a result, the banking sectors are well-capitalized and liquid compared to many other commodity exporting countries, and NPLs are at low levels. Other instruments have been introduced to limit the build-up of risks such as loan-to-deposit, loan-to-value, and debt service-to-income ratios, but these have been not been adjusted, or adjusted very infrequently, over time. Reserve requirements were adjusted countercyclically in Saudi Arabia during the second half of the 2000s to help manage bank liquidity. The institutional frameworks for macroprudential policies are also being developed.

28. Well-defined macroprudential policy frameworks are needed to guide the countercyclical use of MPIs in the GCC. Where currently absent, formal macroprudential frameworks which clearly assign roles and responsibilities among the central bank, the capital markets regulator, other supervisors, and the Ministry of Finance are needed to help strengthen

macroprudential policy formulation and implementation. The frameworks should provide clear guidance on how macroprudential policies will be implemented to maintain financial stability and manage systemic risks over the financial cycle.[18] The frameworks can then guide decisions on when and how macroprudential policies can be tightened or eased to mitigate adverse feedback loops, while respecting microprudential norms to maintain confidence and an appropriate degree of resilience against future shocks.

29. Policy makers will need to strengthen institutional and analytical capacity and monitor a number of high-frequency and granular indicators closely to assess financial stress. The further development and assessment of early warning indicators in signaling potential systemic stress is needed to help identify reliable triggers that would guide the countercyclical use of a broad set of macroprudential policies (see Annex II for a list of indicators that can be used for each tool). The decision to relax macroprudential policies will need to be based to a considerable extent on judgment drawing on market intelligence, supervisory assessments, and stress tests. Addressing data gaps would strengthen the ability to assess systemic vulnerabilities. The process of data compilation would need to incorporate both macro- and micro-prudential aspects, looking both at the big picture and risks at the micro level. The lack of information about real estate prices and activity measures in a number of countries is one critical data gap to address. The continued development and publication of Financial Stability Reports will benefit both the authorities and market participants by increasing transparency, identifying vulnerabilities, and providing guidance on the use of macroprudential tools.

30. Further enhancements to the macroprudential toolkits could be considered to use some of the tools more countercyclically. Given the evidence of feedback loops from oil prices to equity prices, credit, and non-oil GDP, there may be scope to expand the countercyclical use of existing time-invariant macroprudential instruments. The implementation of countercyclical capital buffers (in line with Basel III requirements) and dynamic loan loss provisions provides an opportunity for GCC countries to establish and calibrate capital tools that could boost resilience in line with systemic risks faced in these economies (although these countercyclical buffers are considered to be more effective in building resilience than in moderating credit cycles (IMF, 2014)). There is also scope to enhance the countercyclical role of LTD, DTI and LTV requirements. A greater usage of LTDs and other countercyclical tools might have contributed more effectively to limiting credit growth in the mid-2000s for example. In some countries, there is scope to use the LTV and DTI ratios together and expand the coverage to nonbanks to contain risks from real estate and consumer lending more effectively.[19] Additionally, sectoral concentration limits (e.g. on margin lending for the purchase of equities, or on the construction sector which may be more exposed to government

[18] For instance, the framework will need to identify the minimum regulatory capital requirements in line with structural risks and set the countercyclical buffers in line with Basel III capital requirements. Regulatory minima will also need to be set for other tools that can be used countercyclically.

[19] The high share of personal loans in total lending and the moral hazard related to the debt-bailout expectations of nationals places extra significance on risks from the household sector. For instance, in Kuwait, debt relief has been provided several times for nationals for personal loans taken from commercial banks, most recently in 2012. The United Arab Emirates set up an AED 10 bn ($2.7 bn) debt settlement fund to clear the defaulted debts of its citizens in 2011, but to date there has only been limited utilization.

spending) may prove useful to address emerging financial sector risks from specific sectors/activities in a more targeted way.

31. Macroprudential tools should only be relaxed where buffers have been built and minimum regulatory levels maintained. The GCC countries' exposure to lower oil prices is likely to lead to fiscal tightening, accompanied by lower growth rates of nonoil GDP and real credit, falling equity and asset prices. With growth risks to the downside, this has the potential to create an adverse feedback loop through bank balance sheets. In such circumstances, a relaxation of macroprudential policy tools could potentially be a powerful instrument to ensure that adverse feedback loops do not develop. However, such a relaxation of macroprudential requirements should not go below minimum regulatory levels that are necessary to maintain resilience to future shocks in light of the structural risks from concentration and interconnectedness. Regulatory minima should be calibrated in accordance with these and other risks. The relaxation of MPIs would have to consider the source of systemic stress—if liquidity pressures are the source of banking sector stress, easing reserve requirements first would be appropriate. If this proves insufficient, the loan-to-deposit ratio can also be relaxed. If the stress is on asset quality leading to loan losses and declines in bank capital, dynamic provisioning ratios may be allowed to decline first. A relaxation of the CCB should be considered only after dynamic provisions have been used, to limit any adverse impact on investor confidence. Strong financial supervision will remain essential to ensure the quality and adequacy of the remaining capital and liquidity buffers.

32. The macroprudential policy framework needs to contain potential leakages. For example, DTI limits are currently applicable only to personal and consumer loans and often exclude debt service on residential mortgages. An expansion in the scope of the DTI limits to include all debt service to be paid by an individual borrower and extending LTV limits to CRE loans or other corporate loans secured by real estate and other collateral could increase the effectiveness of MPIs. In a similar vein, MPIs should be extended to nonbanks and foreign branches, with the latter requiring close collaboration between home and host supervisors. While nonbank financial institutions do not appear to represent a large share of the GCC financial system at present, a lack of data makes it difficult to assess systemic risks from this source.

33. Lastly, macroprudential policies will need to remain adaptable over time as the financial sector deepens to support a growing economy. Many initiatives for financial deepening are likely to have financial stability implications. For instance, promoting SME financing may increase risk taking within the banking sector. Similarly, opening the capital markets for foreign investment would increase vulnerabilities from capital flows. Over time, as the financial sector deepens, the macroprudential framework and toolkit would need to adapt to an evolving set of systemic risks.

Annex I. Countercyclical Use of Macroprudential Tools in Selected Commodity Exporters

		Canada	Malaysia	Norway	Peru
1	**Capital tools**				
1.1	Countercyclical buffers			Adopted in 2013; range is 0-2.5 percent of RWAs; applied to domestic banks and foreign branches; calibrated with 4 indicators for tightening; being phased in from June 2015	Implemented in July 2011; size determined based on stress tests; calibrated using GDP growth rate
1.2	Leverage ratio				
1.3	Dynamic provisioning requirements				Introduced in 2008; trigger based system, using GDP growth rate
2	**Household sector tools**				
2.1	Capital requirements		Higher risk weights for high LTV and long-tenor mortgages		
2.2	Loan-to-value ratio	Introduced in 2008; applies to new insured mortgage loans by banks and nonbanks; calibration based on performance of housing market.	Introduced in 1995; targeted limits for individuals with multiple housing loans; applied to new loans by banks and nonbanks; calibrated based on credit and asset prices.	Introduced as a guideline in 2010 and made a regulation in 2015; applies to new residential mortgages by banks; calibrated based on sectoral credit growth and asset prices.	
2.3	Debt-service-to-income ratio	Introduced in 2008; applies to new insured mortgage loans by banks and nonbanks; calibration based on performance of housing market; supported by limits on amortization periods.		Loan-to-income ratio guideline introduced in 2010; applies to new residential mortgages by banks	

		Canada	Malaysia	Norway	Peru
3	**Corporate Sector Tools**				
3.1	Loan-to-value ratio		Applies to new loans by non-individuals from banks and selected nonbanks, limits on amortization periods since July 2013.		
4	**Liquidity Tools**				
4.1	Liquidity buffers	Three definitions of liquidity buffers are applied to banks; calibration based on assessment of liquidity and market risk indicators			
4.2	Reserve requirements				Applied to outstanding stock and new liabilities; used to limit foreign currency exposures; adjusted based on market indicators and systemic risk
5	**Framework (mandate, responsibility, and coverage)**	Authority and coverage varies by instrument between the Ministry of Finance and the Supervisory Authority, in coordination with the Central Bank and the Deposits Insurance Company.	Mandate for financial stability; authority rests with Central Bank; powers are overseen by Financial Stability Committee comprising the Central Bank, Deposit Insurance Corporation, Securities Commission, and the Treasury; measures are applied to banks and selected nonbanks.	Mandate for financial stability; authority and coverage varies by instrument between Ministry of Finance, Central Bank, and Financial Supervisory Authority.	Mandate for financial stability; responsibility for implementation is shared between Supervisory Authority and Central Bank. Measures are applied to banks and nonbanks except insurance companies and pension funds.

Source: IMF's Global Macroprudential Instruments Survey, includes macroprudential policies as reported by country authorities.

Note: This excludes macroprudential tools that are not used countercylically to manage systemic risk.

Annex II. Issues in the Implementation of Macroprudential Policies

This Annex draws on the IMF's Staff Guidance Note on Macroprudential Policy—Detailed Guidance on Instruments, November 2014. It summarizes the main issues and operational considerations in implementing specific macroprudential tools.

Broad-Based (Capital) Tools

1. Countercyclical buffer (CCB): Basel III has introduced a framework for a time-varying capital buffer on top of the minimum capital requirement and another time-invariant buffer (the conservation buffer). The countercyclical buffer is expected to be phased in gradually from 2016 to 2019. The CCB aims to make banks more resilient against imbalances in credit markets and thereby enhances medium-term prospects of the economy—in good times when system-wide risks are growing, the regulators could impose the CCB which would help the banks to withstand losses in bad times.

Operational considerations:

- The Basel committee recommends that the CCB be set at a maximum of 2.5 percent of risk-weighted assets, although it can be set higher based on broader macroprudential considerations. Stress tests can help calibrate the appropriate size of the CCB to reflect both a capital shortfall in a stress scenario and extra capital needed to maintain investor confidence in a downturn.
- For foreign banks in host jurisdictions, the reciprocity principle under the Basel II framework requires home country supervisors to ensure that the banks they supervise apply the CCB on exposures in the host jurisdiction that has imposed the CCB. This reciprocity arrangement will apply as long as the buffer does not exceed 2.5 percent, above which reciprocity is voluntary or based on further bilateral or regional agreements between home and host country authorities.
- It may take time for banks to raise capital so the process of increasing the CCB should begin early in the financial cycle. Increases in the buffers should be preannounced for 12 months to give banks time to meet the additional requirements. At times of financial stress, reductions in the buffer could take effect immediately to help reduce the risk of a credit crunch.
- The BCBS suggests that triggers to tighten CCBs can be based on estimates of the credit gap (derived as the deviation of credit-to-GDP ratio from trend). Other early warning indicators (e.g. credit growth, deviation of real estate and equity prices from long term trends, measures of market volatility and spreads, debt service and leverage ratios, reliance on wholesale funding, current account balances) that reflect country-specific systemic risk can also be incorporated. Over time, performance of these indicators in identifying systemic risk will need to be monitored.

- Triggers to ease CCBs could be based on high-frequency market-based indicators of banking sector distress such as asset prices, credit spreads, and measures of market volatility in equity and foreign exchange markets.[1] Additional indicators could include growth rate and leverage on new loans, credit conditions, and increases in nonperforming loans. *To ensure that banks use the released capital to absorb losses, dividend payments should be restricted when the CCB is released.*

2. Dynamic loan loss provisioning requirements (DPR): help smooth provisioning costs over the financial cycle and insulate bank income and lending in bad times. This pool of provisions, set aside in good times, can be used to cover realized losses in bad times when specific provisions for impaired loans exceed the average specific provisions over the economic cycle.

Operational considerations:

- There are four main approaches to the DPR (i) through the cycle accumulation (formula-based approach) builds up general provisions in line with expected losses on new and existing loans, net of specific provisions on losses incurred during the period, (ii) trigger-based systems use thresholds of indicators to increase or release DPR buffers, (iii) loan by loan provisioning based on expected losses and probability of default data, and (iv) a hybrid approach combining (i) and (ii) with a trigger for allowing banks to access DPR reserves.
- The formula-based approach is the least data intensive DPR framework (e.g. Spain, Uruguay) and accumulates and releases DPR buffers automatically and gradually as actual loan losses vary over the cycle. On the other hand, trigger based systems require estimation of thresholds of indicators that would signal the release of the DPR, but can allow reserves to be saved for rapid deployment during periods of stress.
- A hybrid approach can be based on an accumulation formula but would add a trigger rule for release based on the same indicators identified for the release of the CCB. A bank would not be allowed to access its dynamic loan loss reserves unless indicators signal a downturn. *As in the release of CCB, dividend payments should be restricted when DPRs are released.*

Sectoral Tools

3. Household sector: vulnerabilities from excessive credit to the household sector and procyclical feedback between credit and asset prices can be addressed through sectoral capital requirements, loan-to-value (LTV) and debt-service-to-income (DTI) limits.[2],[3]

[1] Credit usually lags the business cycle, so the credit/GDP gap does not work well as an indicator for releasing the CCB.

[2] LTV limits cap the size of the loan relative to the appraised value of a property, while DTI limits cap the debt service as a share of borrower income.

[3] Where supply constraints are an important driver of real estate price increases, macroprudential measures are likely to be of limited effectiveness. In such situations, measures to alleviate supply constraints are appropriate.

4. Corporate sector: vulnerabilities from increases in corporate leverage, lending to commercial real estate (CRE) or from forex lending to the corporate sector can be addressed through sectoral capital requirements and exposure caps (e.g. higher risk weights for foreign currency credit, caps on growth of corporate credit and in foreign currency). To deal with risks from CRE lending, LTV limits can also be used.

Operational considerations:

- Capital requirements and risk weights build resilience by forcing lenders to hold extra capital against their exposures to a specific sector and can be calibrated using results of stress tests. Caps on credit growth slow the supply of credit, while LTV and DTI limits reduce demand. LTV and DTI limits reinforce each other and can be used in an interlocking way— as asset prices rise relative to income, LTV limits become less constraining but DTI limits become more binding.
- These tools can be differentiated between types of borrowers, across regions, and by currency and type of loans.[4] There are no fixed thresholds for early warning indicators to suggest a tightening or relaxation. Tools can be calibrated to reflect country specific risks.
- Sectoral capital requirements are less distortionary and can be applied first on either the entire stock of loans or to new lending. If sectoral capital requirements are tightened on the entire stock of loans, they may require significant adjustment and will need to be announced well ahead of the planned enforcement date. LTV and DTI limits can be subsequently imposed on the flow of new loans, if capital requirements fail to slow the growth of credit.[5] A cap on sectoral credit growth has little direct effect on the resilience of the banking system and is more distortive and could be implemented if other measures prove inadequate. Decisions to ease sectoral macroprudential policies can be sequenced in the same way as a tightening.[6]
- When several indicators signal elevated systemic risk, policy tightening should be gradual to overcome uncertainty over strength of economic transmission.[7] Stepped up communication and supervisory guidance prior to introducing measures can reduce the burden on borrowers and lenders while strengthening the expectations channel. *Loosening decisions may need to be taken more rapidly than tightening decisions.*
- For the household sector, indicators that could be used to assess a need for tightening include household loan growth and house price growth (jointly), to help prevent feedback

[4] For example, they may be applied only to mortgages that are interest-only, in foreign currency, or on luxury and investment properties.

[5] LTV limits are often applied in commercial and residential real estate markets, but can also be applied to other secured loans, such as car loans.

[6] Defining minimum capital buffers and maximum LTV and DSTI ratios that are considered safe in a downturn is critical to ensure that microprudential norms are respected and financial stability is maintained.

[7] Mixed signals from multiple indicators are not sufficient for action.

loops between asset prices and credit.[8] Other indicators could include mortgage loan growth, house price to income and house price to rent ratios, and the share of households in total credit in local and foreign currency. Further indicators may help a targeted policy response (e.g. house prices in different regions, average risk-weights on household loans and capital buffers above minimum, the average and distribution of LTV and DSTI ratios across various income groups, share of foreign currency denominated or interest-only loans).[9]

- *Easing macroprudential policies on the household sector can also rely on similar indicators as used for tightening decisions.* In addition, fast-moving indicators could include transaction volumes, spreads on household loans, and CDS spreads of financial institutions to help policy makers respond in a timely fashion.
- Corporate credit indicators that could be used to assess a need for tightening include the growth rate of corporate credit and the share of corporate credit in total credit in local and foreign currency (both stocks and flows). A range of additional indicators such as leverage on new and old loans, debt service ratio (debt service as a share of operating surplus), corporate credit/operating surplus (share and growth rate), corporate credit gap, and lending standards could also be considered.
- *In addition to indicators used for tightening decisions, fast-moving indicators such as spikes in corporate CDS spreads can help policy makers respond to corporate sector stress in a timely fashion.*

Liquidity Tools

5. A variety of liquidity tools are available to promote a more sound funding profile in banks. Liquidity buffer requirements (e.g. a liquid asset ratio) oblige banks to hold a certain amount of liquid assets as a share of all short-term funding. A liquidity coverage ratio (LCR) can help ensure that banks hold sufficient high quality liquid assets to fund net cash outflows over a 30 day period. A stable funding requirement ratio (e.g. Net Stable Funding Ratio (NSFR), loan-to-deposit (LTD) ratio, core funding ratio (CFR)) can help ensure that banks hold stable liabilities (e.g. deposits) to fund their relatively illiquid assets.[10] Liquidity charges impose a levy on non-core funding and can be differentiated by currency and can be accumulated for the budget or a dedicated fund that is used to provide liquidity during times of stress. Reserve requirements can be applied on short-term liabilities and adjusted for financial stability purposes. In addition, constraints on open FX positions and on FX funding may be used as well as tools to manage risks in nonbank financial institutions. Liquidity tools can be designed to target risks by currency and maturity and tailored to reflect country circumstances.

[8] LTV limits are often applied in mortgage markets, but can also be applied to other secured loans, such as car loans.

[9] Where supply constraints are an important driver of real estate price increases, macroprudential measures are likely to be of limited effectiveness. In such situations, measures to alleviate supply constraints are appropriate.

[10] International discussions on liquidity tools are ongoing as minimum standards for the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR) are being negotiated under Basel III.

Operational considerations:

- Tightening liquidity tools is not only likely to boost resilience to liquidity shocks, but is also likely to slow the growth of credit by making funding more costly during a financial cycle upswing. Given the limited experience with countercyclical use of liquidity tools, a gradual tightening is recommended. When tightening reserve requirements, the volume of open market operations may need to be adjusted to sterilize the impact on banking system liquidity and keep interbank rates close to the policy target.
- Indicators that can be used to assess a need for tightening include the LTD ratio and the CFR. In addition, indicators of general credit conditions (based on surveys, movements in interest rates, short-term capital inflows, gross open FX positions) are also useful to guide the use of liquidity tools to moderate (liquidity-driven) credit cycles. There are no fixed thresholds for the indicators to assess a need for tightening, and stress testing can be used to assess specific risks and calibrate the policy response. Sharp movements in the indicators could also signal a need for policy action.
- *During times of liquidity stress, a relaxation of liquidity tools is appropriate and liquidity buffers should be released promptly. Authorities can allow temporary declines in liquidity buffers (reserve requirements, liquid asset ratio) without changing the formal requirements. If this proves insufficient, the stable funding ratio can be relaxed temporarily to prevent fire-sales of assets and abrupt deleveraging. In the event of extreme funding stress, central bank liquidity support should also be provided.*
- *Indicators that can be used to assess liquidity stress include increased usage of the central bank's overnight or emergency facilities, increases in unsecured interbank rate spreads, margins and haircuts on repo collateral, FX swap rates, bid-ask spreads in FX, and CDS-bond spreads*.

Tools for the Nonbank Sector

6. Nonbanks are also a significant source of systemic liquidity risks. Data collection and basic oversight of nonbank institutions and markets are important first steps in addressing risks in this sector. Macroprudential measures can be extended to nonbank intermediaries. Leverage ratios, liquidity buffers and stable funding requirements, sectoral concentration limits, regulations on margin lending are some of the tools that can help manage systemic risks in the nonbank financial sector and ensure a level playing field.

References

Abusaaq, H., A. Alfi, P. Khandelwal, K. Miyajima, and B. Piven, 2015, "Countercyclical Macroprudential Policies in Saudi Arabia," International Monetary Fund, Washington DC.

Akinci, O. and J., Olmstead-Rumsey, 2015, "How Effective are Macroprudential Policies? An Empirical Investigation," FRB International Finance Discussion Paper 1136.

Aljabrin, S., M. Colacelli, P. Grippa, A. Prasad, A. Santos, and I. Song, 2014, "Assessing Concentration Risks in GCC Banks," *Background Paper prepared for Annual Meetings of GCC Ministers of Finance and Central Bank Governors*, International Monetary Fund.

Al-Darwish, A., N. Alghaith, P. Deb, and P. Khandelwal, 2015, "Monetary and Macroprudential Policies in Saudi Arabia," in Saudi Arabia: Tackling Emerging Economic Challenges to Sustain Growth, International Monetary Fund, Washington, DC.

Al-Hassan, A., M. Khamis, and N. Oulidi, 2010, "The GCC Banking Sector: Topography and Analysis," IMF Working Paper 10/87.

Arvai, Z., A. Prasad, and K. Ketayama, 2014, "Macroprudential Policy in the GCC Countries," IMF Staff Discussion Note 14/01.

Bologna, P. and A. Prasad, 2010, "Oman: Banking Sector Resilience" IMF Working Paper 10/61.

Claessens, S., M. A. Kose, and M. Terrones, 2011, "Financial Cycles: What? How? When?" IMF Working Paper 11/76.

Cerutti, E., S. Claessens, and L. Laeven, 2015, "The Use and Effectiveness of Macroprudential Policies: New Evidence," IMF Working Paper 15/61.

Darbar, S. and X. Wu, 2015, "Experiences with Macroprudential Policy— Five Case Studies,"IMF Working Paper 15/123.

Espinoza, R., and A. Prasad, 2010, "Nonperforming Loans in the GCC Banking Systems and their Macroeconomic Effects," IMF Working Paper 10/224.

Gonzalez, A, Hamann, F., and D. Rodriguez, 2015, "Macroprudential policies in a commodity exporting economy," BIS Working Paper No. 506.

IMF, 2013, Key Aspects of Macroprudential Policy.

IMF, 2014a, Staff Guidance Note on Macroprudential Policy.

IMF, 2014b, Staff Guidance Note on Macroprudential Policy—Detailed Guidance on Instruments.

Kammer, A., M. Norat, M. Pinon, A. Prasad, C. Towe, Z. Zeidane, and an IMF staff team, 2015, "Islamic Finance: Opportunities, Challenges, and Policy Options," IMF Staff Discussion Note 15/05.

Kuttner, K. and I. Shim, 2013, "Can Non-Interest Rate Policies Stabilize Housing Markets? Evidence From a Panel of 57 Economies," BIS Working Paper 433.

Love, I., and L. Zicchino, 2006, "Financial development and dynamic investment behavior: evidence from panel vector autoregression," The Quarterly Review of Economics and Finance, 46, pp 190-210.

McDonald, C., 2015, "When is Macroprudential Policy Effective?" BIS Working Paper 496.

Prasad, A., H. Abdel Monem, and P.Garcia Martinez, 2015, "Macroprudential Policy and Financial Stability in the Arab Region", *Joint Paper of the Staffs of the Arab Monetary Fund and International Monetary Fund*, presented to The Council of Arab Central Banks and Monetary Agencies Governors, September.