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Bank Competition, Financial Dependence, and Economic Growth in the Gulf Cooperation Council

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Abstract

The relationship between bank competition, firm access to finance, and economic growth is a much debated topic in the economic literature and in policy circles. This paper uses a panel of 23 manufacturing sectors over 2002–10 to investigate the impact of bank competition on industry growth in the Gulf Cooperation Council economies. The results show that greater competition allows financially dependent firms to grow faster. In addition, the results show that lower restrictions on banks' permissible activities, better credit information, and greater institutional effectiveness mitigate the damaging impact of low competition. These results are robust to a variety of checks. The findings suggest that improving bank competition should be an important aspect of the financial sector development agenda in the Gulf Cooperation Council.

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Bank Competition, Financial Dependence, and Economic Growth in the Gulf Cooperation Council[*]

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1. Introduction

There is ample evidence that financial sector development plays an important role in the explanation of inclusive economic growth (see Levine, 2005, for a review of the literature). Well-developed financial markets make it easier for firms to attract financing for their investment needs, therefore stimulating economic development (Rajan and Zingales, 1998), whereas the lack of credit reduces economic growth (Pagano, 1993; Guzman, 2000). However, the literature is far from having a consensus on the impact of banking sector competition on firms' access to external finance and, in turn, growth.

Theory makes ambiguous predictions regarding the direction of this relationship. The traditional view (*market power hypothesis*) argues that market power is detrimental in banking as well as in other industries, and that fiercer competition leads to lower cost of finance, better access and ultimately stronger economic growth (Besanko and Thakor, 1992; Pagano, 1993; Guzman, 2000; Carbo-Valverde et al., 2009). As a consequence, firms that are more reliant on external sources of finance should grow faster in more competitive banking systems.

The alternative view (*information hypothesis*) maintains that in the presence of information asymmetries and agency costs, stronger rivalry may reduce the incentives of banks to invest in lending relationships (Petersen and Rajan, 1995). Moreover, the quality of screening (Marquez, 2002) and the banks' incentives to invest in information acquisition technologies (Hauswald and Marquez, 2006) are lower in more competitive markets. In competitive markets, firms are not "locked-in" and can easily move to another bank, making the investment in relationship lending unprofitable (Boot, 2000). For all these reasons, access to external finance by potential borrowers is lower in competitive banking markets; hence firms and sectors that are heavily dependent on external financing should grow more slowly in the presence of higher bank competition.

The extant empirical evidence on the link between bank competition and firm financing constraints does not clarify the ambiguity of the theory, though more recent evidence points to a beneficial impact of bank competition on firm access to finance and growth. A first wave of research adheres to the Structure-Conduct-Performance (SCP) paradigm, which posits that measures of market structure such as the five- or three-firm concentration ratio, or the Herfindahl Index are strong predictors of firms' competitive behavior. Adopting this approach, several authors find support for the *market power hypothesis*. For example, Beck et al. (2004) show that banking market concentration increases the probability that firms will report access to finance as a major obstacle to growth in a sample of 74 economies. This finding is corroborated by Chong et al. (2013) for a sample of Chinese small and medium-sized enterprises (SMEs). In contrast, Cetorelli and Gambera (2001) provide evidence that bank concentration promotes the growth of those firms that are more in need of external finance by facilitating credit access of young firms in a sample of 41 countries, in line with the *information hypothesis*. The latter is confirmed by Gonzalez and Gonzalez (2008) in a cross-country setting as well as by Mirzaei and Moore (2015) for Qatar.

A second wave of research is in line with the New Empirical Industrial Organization (NEIO), which contests the usefulness of market structure indicators to gauge the degree of competition of an

industry and employ alternative measures based on the observation of the conduct of firms in the market such as the Lerner index, the Boone indicator or the Panzar-Rosse H-statistic. There is some evidence that market concentration is not a good proxy of bank competition (Claessens and Laeven, 2004; Carbo-Valverde et al., 2009), and therefore policy implications may be sensitive to the measure of competition employed. Along these lines, Claessens and Laeven (2005) find support for the *market power hypothesis* in a sample of 16 economies, showing that sectors heavily reliant on external financing grow faster where there is fierce competition. Liu et al. (2014) confirm this finding for a sample of 48 countries. Love and Martinez-Peria (2014) also find that bank market power reduces access to finance for a cross-section of firms across 53 countries, mainly developing economies. Leon (2015) and Ryan et al. (2014) reach similar conclusions in favor of the *market power hypothesis*, for a sample of developing countries and 20 European countries, respectively. Fernandez de Guevara and Maudos (2011) find opposing evidence that the exercise of market power enhances the growth of financially dependent firms in for a sample 53 sectors in 21 countries, in line with the *information hypothesis*. Hoxha (2013) provides similar findings.

This paper investigates the impact of bank competition on external financing constraints in the countries of the Gulf Cooperation Council (GCC). While displaying some significant differences in terms of size and population, the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) all share high dependence on the hydrocarbon sectors and a long-term policy objective to diversify their economic structures. Financial sector development is as important for economic growth for resource-based economies as for other countries (Beck, 2011). The financial sector in the GCC is dominated by banks and is as deep as that of many advanced economies. Yet it falls short of providing access to finance for the large majority of its firms, especially SMEs. Available credit tends to be heavily concentrated, favoring a few large and well-established firms (Rocha et al., 2011). The share of SME lending is about 2 percent and has hardly improved in recent years.

There is evidence that the GCC banking sectors operate under monopolistic competition. Both structural indicators and direct measures of bank market power indicate that GCC banking systems are among the least competitive in the world (Al-Muharrami et al., 2006; Anzoategui et al., 2010), with a large presence of domestic players and state-owned banks (Al-Hassan et al., 2010). This is largely explained by stringent licensing requirements, weak credit information environment, low presence of non-bank financial institutions and relatively shallow capital markets (Anzoategui et al., 2010). The lack of foreign bank competition and the inability of banks to engage in non-traditional banking activities due to activity restrictions also contribute to explain the low degree of competition in the GCC banking systems (Al-Muharrami et al., 2006).

A competitive banking sector may, therefore, play a pivotal role in the GCC strategy of economic diversification and increased firm access to finance. The development of the non-oil industrial sector is key to economic diversification and it can be expected that those sectors that are more reliant on external finance will benefit more if the degree of bank competition in the region is increased. This paper tests this hypothesis thus contributing to the ongoing academic and policy debate on the effect of bank competition on firm access to finance and growth.

Using a sample of 23 manufacturing sectors during the period 2002-2010, we provide evidence on the extent to which competition in the GCC banking systems affects economic growth of financially dependent industries. We do so by using a panel data specification of the empirical setup developed by Rajan and Zingales (1998) to study the effects of financial development on growth, and adapted by Cetorelli and Gambera (2001), Claessens and Laeven (2005), Fernandez de Guevara and Maudos (2011) and Liu et al. (2014), among others, to assess the relationship between banking system competition and value added growth of financially dependent industries. The use of panel data follows Dell'Ariccia et al. (2008), who study the effect of banking crises on financially dependent industrial sectors. In our context, panel data are preferred to cross-section regressions as in, e.g., Rajan and Zingales (1998), because of the limited number of observations in our sample, i.e. industry-country data for GCC economies, as well as by the need to account for time-variation in bank competition.

We then generalize our baseline framework in several directions to address a number of potential criticisms, which would apply to ours as well as to any similar study. First, to avoid a possible bias in our policy conclusions originating from the measure of bank competition employed, we use both structural indicators (five- and three—bank concentration ratio) and direct measures of market power (Lerner index and Boone indicator). Second, to avoid potential misspecification bias due to a potential nonlinear relationship between the degree of competition in the banking sector and real activity, as highlighted in the theoretical and the empirical literature on banking crises (see Martinez-Miera and Repullo, 2010, and Beck et al., 2013, respectively), we test for the presence of nonlinearities by adding squared terms of our measures of bank market power. Third, since the baseline results can be driven by the way we measure financial dependence, we use alternative indicators developed in the literature, i.e., Rajan and Zingales (1998), Klapper, Laeven and Rajan (2006) and Fernandez de Guevara and Maudos (2008), and we control for the average size of firms. Finally, we address the question of what effects different competition-related public policies might have on industry growth.

Our main findings can be summarized as follows. First, industries that are more dependent on external finance experience higher growth performance if competition in the banking sector is higher. This result holds true when both structural and direct indicators of market power are employed. Second, the impact of bank competition on growth is unambiguous, i.e., it does not depend on the degree of competition: the relationship is linear. Third, we find that our results are robust to alternative measures of financial dependence and that sectors dominated by small-scale firms suffer more when the banking sector is less competitive, which we interpret as further evidence in support of the baseline result. Fourth, we find that relaxing restrictions on banks' activities, improving the credit information environment and implementing an effective competition law play an important role in fostering growth in sectors that depend on external finance.

The paper is organized as follows. Section 2 describes the data used in the empirical analysis. In Section 3 the empirical methodology is discussed. Section 4 presents the results. Section 5 examines the role played by different competition policies and institutional arrangements. Section 6 concludes and draws some policy implications.

2. Data and descriptive statistics

Our empirical analysis rests on industry-specific and country-specific data, spreading over 2002-2010 and including 23 manufacturing sectors in five GCC countries. These are: Bahrain, Kuwait, Oman, Qatar and Saudi Arabia. The United Arab Emirates are left out because of the lack of industry-specific data. Data on our dependent variable (annual growth in value added) come from the Industrial Statistics Database of the United Nations Industrial Development Organization (UNIDO). The manufacturing sectors are classified as two-digit ISIC codes, which is the only available for our sample of countries. Value added data are deflated using the CPI indexes from the World Bank World Development Indicators. The variable *share in value added* represents the value added of each sector as a percentage of the total valued added of the manufacturing sector in an economy in each year.

As a measure of external finance dependence for each industry, we use data from Rajan and Zingales (1998), in line with similar studies (Cetorelli and Gambera, 2001; Claessens and Laeven, 2005; Dell'Ariccia et al., 2008; Liu et al., 2014). Rajan and Zingales (1998) define external finance dependence as the fraction of capital expenditures not financed by cash flows from operations. The figures are based on US manufacturing firm-level data during the 1980s. An important assumption underlying our approach is therefore that external finance dependence reflects technological features of an industry that are stable across time and space. Capital markets in the US are among the most advanced in the world, and firms face the least frictions in accessing finance. This suggests a valid and exogenous way to identify the extent of an industry's external dependence elsewhere in the world. Thus, the degree of US firms' dependence on external finance is good proxy for the demand of external funds on other countries (see Rajan and Zingales, 1998).[1] One potential criticism to this as well as to similar studies is that our results are driven by the way we measure dependence on external finance. We address this potential criticism in two ways. As a robustness check, we also consider alternative measures of external finance dependence as calculated by Klapper et al. (2006) for the US during 1980-99, and by Fernandez de Guevara and Maudos (2011) for the UK during 1993-03. Also in line with similar studies (Cetorelli and Gambera, 2001; Claessens and Laeven, 2005; Fernandez de Guevara and Maudos, 2011; Liu et al., 2014), we include a proxy of financial depth, i.e. domestic credit to GDP, taken from the World Development Indicators.

As for our measures of market power, we employ both structural and more direct indicators of bank market power. The former include the widely used five- and three-bank concentration ratio, estimated as the share of total assets held by the five and three largest banks, respectively. These measures help us test the validity of the structure-conduct-performance paradigm (SCP), which assumes a causal relationship among the structure of the banking industry, firm conduct and performance. This paradigm suggests that fewer and larger firms are more likely to engage in anti-competitive behavior, and therefore higher values of concentration signal greater market power.

[1] For a critique of this approach see Von Fustenberg and Von Kalckreuth, 2006.

Direct measures of market power in line with the New Empirical Industrial Organization (NEIO) include the Lerner index (Lerner, 1934) and the Boone indicator (Boone, 2008). The Lerner index is defined as the difference between output prices and marginal costs (relative to prices). Prices are calculated as total bank revenue over assets, whereas marginal costs are obtained from an estimated translog cost function with respect to output (see Demirgüç-Kunt and Martínez Pería, 2010). Higher values of the Lerner index indicate less bank competition. The Boone indicator is estimated as the elasticity of profits to marginal costs. To obtain the elasticity, the log of profits (measured by return on assets) is regressed on the log of marginal costs. The estimated coefficient, computed from the first derivative of a trans-log cost function, is the elasticity. The rationale behind the indicator is that higher profits are achieved by more-efficient banks. Hence, the more negative the Boone indicator, the higher the degree of competition is because the effect of reallocation is stronger (see Schaeck and Cihák, 2012). Bank concentration ratios, the Lerner index and the Boone indicator all are from World Bank Global Financial Development Database. Finally, we employ a set of proxies for bank competition policy in order to test their effect on economic growth of financially dependent firms (see section 5 for a description and sources).

Table 1 reports some descriptive statistics (number of observations, average value, standard deviation, minimum and maximum observed values) for all the variables included in our baseline empirical specification. The variables included are: value added (valaddw1), the share of value added (valadd_share), financial dependence as measured by Rajan and Zingales (extdepRZ1), Klapper et al. (extdepKLR), Fernandez de Guevara and Maudos (extdepGM), credit-to-GDP (credit_GDP), the 5-bank concentration ratio (conc5), the 3-bank concentration ratio (conc3), the Boone indicator (boone) and the Lerner index (lerner). Table 2 reports the correlation matrix for these variables and for all measures of bank competition included in our data set.

3. Empirical methodology

To study the real effects of bank competition in the GCC economies, we test whether industries that are more dependent on external finance experience lower growth performance when the degree of competition in the banking sector is relatively low. In the baseline specification, we use as dependent variable the growth rate of real value added of industry *j* in country *i* at time *t*, denoted by $y_{i,j,t}$. Such measure of sectoral growth is regressed against the explanatory variable whose effect we are interested in isolating, i.e. an interaction term equal to the product of external finance dependence of sector *j* in country *i* (as measured by Rajan and Zingales, 1998) and country *i*'s level of bank competition at time *t*. We also include as regressor an interaction term equal to sector *j*'s external finance dependence and the level of financial development of country *i* at time *t* (as measured by the credit-to-GDP ratio), in order to capture the potential effects that the country's financial development might have on growth at industry level, conditional on the level of external dependence. In addition to the two interaction terms, following, among others, Rajan and Zingales (1998) and Dell'Ariccia et al. (2008), we also include the share of value added of sector *j* in country *i* at time *t-1* to keep into account convergence effects, in line with theoretical predictions from standard growth models. To account for the presence of cross-sectional and time-varying unobservables, three sets of fixed effects (industry-

year, country-year and industry-country) are included. The baseline specification reads as follows:

$$y_{i,j,t} = \sum_{ij} \alpha_{i,j} d_{i,j} + \sum_{it} \beta_{i,t} d_{i,t} + \sum_{jt} \gamma_{j,t} d_{j,t} + \delta\left(EXTDEP_j \times FINDEV_{i,t}\right) + \varphi\left(EXTDEP_j \times BANK\_COMP_{i,t}\right) + \rho\left(SHARE_{i,j,t-1}\right) + \varepsilon_{i,j,t},$$

where *d* denotes dummy variables. The null hypothesis we want to test, i.e. whether industries that are more dependent on external finance suffer more from a low degree of competition in the banking sector, amounts to testing whether $\varphi < 0$.

By using a panel data specification, we depart from most of the related literature (see, among others, Rajan and Zingales, 1998; Cetorelli and Gambera, 2001; Claessens and Laeven, 2005; Liu et al., 2014) that uses cross-section regressions to study the effects of banking sector competition on industry growth. A panel data model specification offers two main advantages in our context. First, unlike most of the previous reported studies, we focus on a dataset including a limited number of countries, each endowed with a relatively low number of industry sectors. This implies that the size of the sample at hand is relatively small, with a relatively low number of cross-sectional observations and, consequently, degrees of freedom. A panel data specification allows us to overcome this limitation. Second, the countries we examine are characterized over the period under analysis by important changes in the degree of concentration and market power in the banking sector, as shown by, for example, the time behavior of the k-bank concentration ratio and the Lerner index. By using a panel data specification, we can exploit time variation in the measures of bank competition and test their effects on industry growth.

4. Baseline results

The results of our baseline specification are reported in Table 3. The dependent variable for all different specifications is the annual growth rate of real value added of industry *j* in country *i* between year *t-1* and year *t*. Each column refers to the measure of bank market power we include in the model. In particular, the first two columns report results for the two structural measures of market power we adopt, i.e. the 5- and 3-bank concentration ratio, respectively. Columns 3 and 4 report results for the two direct measures of market power we use, the Boone and the Lerner index respectively. The last four columns report results obtained when two measures of market power are jointly included, one structural and one direct. Each of these measures market power enters the regression model interacted with the RZ index of external finance dependence.

Results reported in columns 1 to 4 show that the interaction terms, included one by one, are always significant and with the expected sign. More precisely, Columns 1 and 2 show that the interaction terms equal to the k-bank concentration ratio and the RZ measure of external dependence are negative, and statistically significant at conventional levels. This means that industries that depend more on external finance experience better growth performance when

the degree of concentration in the banking sector decreases. Columns 3 and 4 report the same results for the two additional measures of bank competition we consider, i.e. the Boone indicator and the Lerner index. Also in this case, the interaction terms enter significantly and with the expected sign. A negative sign here indicates that externally-dependent sectors experience better growth performance when the degree of market power decreases, and hence when more competition is introduced in the banking sector. Columns 5 to 8 show results relative to the joint use of two indicators, one measure of concentration and one measure of market power. The reason for including both measures simultaneously is to check whether the effects of market structure in the banking sector on industry growth, highlighted by the four baseline regressions, are due to one type of measure only. Results show that negative and statistically significant coefficients are attached to both measures of concentration and market power.

Results also show that, for each specification, there is a sizeable and significant convergence effect: the coefficient of the lagged share of value added is negative and significant at any conventional level. This result is not surprising and is in line with the extant empirical literature. Moreover, we find that the degree of financial development also matters, as shown by the positive and statistically significant coefficient of the interaction term including the industry-specific external dependence index and the country's ratio of credit-to-GDP: the more industries depend on external finance, the more they will benefit from developed financial sectors, as proxied by the ratio of credit-to-GDP.

Results in Table 3 can also be given a quantitative interpretation. Looking at the Lerner index estimated coefficient in Column 4, for example, our estimates suggest that reducing the value of the index by 0.1 in a sector which depends fully on external finance (e.g. it is characterized by a fictitious value of 1 of the RZ index) would improve annual growth by about 1.2 percent. Hence, taking as an example the textile sector, which has a value of the RZ index equal to 0.4, our results suggest that reducing the value of the Lerner index in the banking sector by 0.1 would foster growth in the textile sector, on average, by about 0.48 percent. Similar interpretation can be given to the estimated coefficients for the other measures of market power and contestability we use. By looking at the coefficient for the 5-bank concentration ratio in Column 1, for example, we can conclude that reducing by 10 percent the ratio in the banking sector would increase annual growth in the textile sector by about 1.1 percent.

5. Robustness checks

The results shown in Table 3 convey one unambiguous conclusion: sectors that depend more on external finance benefit more from higher competition in the banking sector. However, this conclusion rests on several specification assumptions, which deserve more discussion. One potential drawback of our analysis is the assumption of linearity: more competition leads to higher growth regardless of the initial level of market power in the banking sector. The literature on the relationship between banking sector competition and systemic instability has highlighted that there might be important nonlinearities because two opposing effects, a *margin* and a *risk-shifting* effect, might be at work simultaneously, with relative strength that depends on the level of competition itself (see, for example, Martinez-Miera and Repullo, 2010, for a theoretical

discussion; and Berger et al., 2009, Beck et al., 2013, and Caggiano et al., 2015, for empirical findings). In our context, given the close link between systemic instability and growth (see, e.g., Dell'Ariccia et al., 2008), such nonlinearities, if omitted, might lead to misleading conclusions about the link between bank competition and growth in financially dependent sector.

To investigate whether nonlinearities might be at work in our case, we augment the baseline specification with an interaction term equal to the measure of external dependence and the squared value of the competition measure we employ. Evidence of a nonlinear relationship would arise if the interaction term involving the squared term would enter the regression with coefficient with opposite sign compared to the interaction term in levels (as included in the baseline specification). Results are shown in Table 4. Columns 1-4 report for each of the four indicators of market structure the results of the baseline regression augmented with the relevant squared interaction term.

Results from the augmented regression show that the squared interaction terms are not significant. Moreover, the interaction term in level remains significant, with the expected sign, and with similar magnitude compared to the results from the baseline specification reported in Table 2. Hence, a linear specification seems to be appropriate to examine the issue at stake. The same results holds also if the interaction term includes external dependence and the proxy of bank competition both squared (evidence not shown here for the sake of brevity but available upon request).

Another potential criticism to ours as well as to similar studies refers to the way we measure dependence on external finance. We address this potential criticism in two ways. First, we remain close in spirit to the Rajan and Zingales (1998) approach, who measure dependence on external finance as the fraction of investment not financed through retained earnings, and consider alternative measures as calculated by Klapper, Laeven and Rajan (2006), denoted by KLR, for the US during 1980-99, and by Fernandez de Guevara and Maudos (2011), denoted by GM, for the UK during 1993-03. Second, following Dell'Ariccia et al. (2008), we control for the average size of firms in each sector (proxied by the number of employees divided by the number of establishments). The underlying idea is that sectors dominated by small-scale firms are more likely to depend more on external finance. Results based on the KLR and the GM measures are shown in Tables 5 and 6, respectively, while results obtained by including the average size of firms are shown in Tables 7, 8 and 9.

The main conclusion we can draw from Tables 5 and 6 is that the use of alternative measures of dependence of external finance leads to virtually unaltered results: whatever the measure of banking sector competition we use, we find a negative and significant relationship between them.

To control for the role played by the average size of firms within each sector, we proceed in two steps. First, we replace the interaction term used in the baseline analysis with one equal to the product of bank competition and the average size of firms with the aim of studying whether the average size captures a similar effect as the RZ measure of financial dependence. Then, we augment the baseline specification with the latter interaction term, to check whether the effect

captured by the RZ measure of financial dependence is robust to the inclusion of the average size of firms. For the sake of comparison with the interaction term included in the baseline specification, we pre-multiply the average size of firms by -1, so that higher values of the variable would indicate sectors with lower average size firms, which can in turn be interpreted as signal of a more financially dependent sector. Therefore, results from this exercise would be in line with our baseline specification if the coefficient attached to the interaction term is negative.

Table 7 shows the result of the first empirical exercise: the new interaction term is negative and statistically significant. In line with the baseline results, Table 7 shows that sectors with average small-size firms, which are expected to depend more on external finance compared to sectors with relatively larger average size, experience worse growth performance in low competitive environments. This result holds true for all proxies of concentration and market power we use.

Next we test whether the effect previously identified by using the RZ measure of financial dependence is robust to the introduction of the average size of firms as an extra measure of financial dependence. Table 8 shows the results of the estimated augmented regression models. The baseline result, i.e., sectors that rely more in external finance as measured by Rajan and Zingales (1998) have poorer growth performances if the banking sector is characterized by low competition, is confirmed also when the average size of firms is used as a control.

Next, we examine whether there is a magnifying effect by adding to the baseline specification an extra interaction term equal to the measure of bank competition multiplied jointly by the measure of external dependence and by the average size of firms. We find no evidence of an extra effect due to the inclusion of the average size of firms on top of the effect of external financial dependence (Table 9).

Two further issues deserve to be mentioned. First, the two direct measures of market power, i.e. the Lerner index and the Boone indicator, are generated regressors. This would require that correct inference should take into account their estimated variance. While we are well aware of this problem and acknowledge it, lack of data prevents us to account for it. Second, there might be concerns of endogeneity of regressors concerning our measures of market power. No clear instruments, however, are available for the sample at hand. To account for potential endogeneity, we re-estimate the baseline specification by using as instruments, alternatively, either the initial value of the market power measure included in the model, or its average value in the sample at hand (see Beck et al. 2013). In both cases, results, which are not reported for the sake of brevity, fully confirm our baseline specification.

6. Competition policy and economic growth

Bank competition, and its effect on the growth of financially dependent firms, can be influenced by the institutional and regulatory environment in which banks operate. In particular, the degree of bank competition can be influenced by policies and institutions for the conduct of competition policy that affect both market structure and contestability (see Claessens, 2009, for a discussion). Approaches to competition policy include leveling the playing field across financial services providers and products, ensuring that entry/exit rules allow for contestable markets, and that

the institutional environment is contestable. Institutional arrangements for an effective competition policy in the banking sector call for a clear separation from prudential oversight to avoid potential conflicts of interest, and for better coordination of competition policy functions. In this section, we present results in which we add to the baseline specification an interaction between a proxy for competition policy and institutional effectiveness, and external finance dependence. Results are shown in Tables 10 – 13. Each table reports results obtained by adding a series of policy variables to the baseline specification with the 5-bank concentration ratio, 3-bank concentration ratio, the Boone indicator and the Lerner index, respectively.

We first test whether direct government intervention in credit markets via state-owned banks exacerbates the negative impact of low bank competition on economic growth of financially dependent firms. The academic literature supports the negative view of public ownership, indicating that the presence of state-owned banks leads to an unleveled playing field and hence less competition (See Barth et al., 2004; and La Porta et al., 2002). State-owned banks enjoy privileges and immunities that are not available to their privately-owned competitors, giving them an unfair competitive advantage over their rivals. Moreover, firms borrowing from state-owned banks may pay less than firms borrowing from privately-owned banks but tend also to be less profitable and riskier on average (Sapienza, 2004). In our analysis, government ownership is the share of the banking system's total assets held by banks that are 50 percent or more state-owned, based on information collected from regulatory agencies (see Barth et al., 2013). The interaction between government ownership and external finance dependence should enter our baseline specification with a negative sign. Results are reported in the first column in each table (labeled "Public assets"). In all specifications, we do not find a significant effect of direct government intervention in the banking sector.

Next, we assess whether increased foreign bank penetration is associated with higher growth of industries whose firms depend heavily on external sources of finance. Foreign bank entry may enhance competition in domestic banking markets, improve the efficiency of domestic bank operations, provide financial services at lower costs, and ultimately promote economic growth (Claessens et al., 2001; Claessens and Laeven, 2004; Martinez-Peria and Mody, 2004; Levy-Yeyati and Micco, 2007; Mirzaei and Moore, 2014). On the other hand, foreign banks may cherry-pick high quality (low default risk) borrowers (Dell'Ariccia and Marquez, 2004 and Sengupta, 2007) and adversely affect both domestic banks and the firms that rely upon them (Detragiache et al., 2008). The sign of the interaction of our measure of foreign bank penetration, i.e. share of total bank assets in foreign-owned banks (Barth et al., 2013), with our index of external finance dependency is therefore unclear. Results are reported in column 2 (labeled "FX assets"). The estimated coefficient is always negative, but statistically significant only in the specification with the 5-bank ratio. Though evidence is only suggestive, the negative sign favors the latter channel, with foreign bank penetration affecting negatively growth in financially dependent sectors.

The degree of competition in banking depends crucially on entry barriers. Regulators in most countries do not allow just anyone to enter the banking system, but rather screen entrants to better assure they are "fit and proper." By imposing certain basic requirements before a banking license is accepted or rejected, those allowed to enter may be of higher quality and thereby

enhance the overall performance of the banking industry. We test whether the presence of entry barriers amplifies the negative effect of bank market power on access to finance for financially constrained firms by interacting an index of entry into banking with our external finance dependence measure. Our entry into banking index is taken from Barth et al. (2013) and measures a country's requirements of entering into banking based on the amount of information required to apply for a banking license. The values of the index of entry into banking range from 0 to 8, with higher values indicating greater stringency. Accordingly, we should expect a negative sign for our interaction variable, i.e. lower stringency is associated with higher value added of financial constrained firms. Results are reported in column 3 (labeled "Bank entry"). While the estimated coefficient is always positive, we do not find a statistically significant impact of entry barriers in the banking sector on growth.

National regulators not only license banks but also specify permissible activities. Countries may restrict banks to a narrow range of activities, or allow them to engage in a broad array. The scope of activities helps define what is meant by a "bank" in a country. The possibility for a bank to diversify its business model and offer a wide array of products and services to firms, especially SMEs, may be beneficial for economic growth. We test this hypothesis by interacting an index of activity restrictions with the external finance dependence index. The index of activity restrictions is from Barth et al. (2013) and measures the degree to which national regulations restrict banks from engaging in securities activities, insurance activities, and real estate activities. The index ranges from 1 to 4, where larger values indicate more restrictions on banks' activities. Results are reported in column 4 (labeled "Act restr"). For all measures of market power in the banking sector, we find that the degree of restrictions on banks' activities enter the model with a statistically significant negative sign. This finding clearly indicates that sectors that depend more on external finance are hurt by restrictions imposed on banks' activities.

The quality and scope of credit information in a country can affect the impact of bank competition on access to finance. The presence of credit information sharing mechanisms such as credit registry or credit bureaus can help overcome adverse selection and moral hazard problems in credit markets (Padilla and Pagano, 2000; Jappelli and Pagano, 2002). Several empirical studies have found that information sharing results in more lending and better access to finance (see Love and Martinez-Peria, 2014 for a review of the literature). This means that in an environment of reduced information asymmetry bank will have fewer incentives to invest in private information acquisition and therefore less to lose in the presence of higher competition. We test this hypothesis by interacting our measure of external financial dependence with a variable measuring the depth of credit information. The depth of credit information index, taken from the World Bank Doing Business Database, measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 8, with higher values indicating the availability of more credit information to facilitate lending decisions. Results, which are reported in column 6 (labeled "Depth credit"), show that the estimated coefficient is positive and significant in all but one specification (the one with 3-bank concentration ratio), indicating that there is strong evidence that availability of credit information has positive effects on the growth performance of more financially dependent sectors.

Finally, we test whether the institutional framework for competition policy amplifies the effect of bank competition on financially dependent firms. There is now a general consensus that a well-functioning competition law system, including an independent competition authority, is essential to the protection and promotion of healthy competition, including in the banking sector (see International Competition Network, 2005, and OECD, 2011). Competition law is an important determinant of economic growth yet it crucially depends on the law enforcement efficiency of the government (Ma, 2011). To analyze the impact of the institutional setting for competition policy on economic growth we interact a measure of government effectiveness with our indicator of external finance dependence. We use the World Bank government effectiveness index, which captures perceptions of the quality of public services; the quality of the civil service and the degree of its independence from political pressures; the quality of policy formulation and implementation; and the credibility of the government's commitment to such policies. The indicator ranges from approximately -2.5 to 2.5, with higher values signaling stronger government effectiveness. Results are reported in column 7 (labeled "Govt effect"). We find for all specifications a statistically significant and positive coefficient, indicating that more government effectiveness exerts positive effects on growth in sectors that depend on external finance.

This set of regressions conveys one main message: some competition policies might play an effective role in enhancing growth in financially-dependent sectors. In particular, our findings show that relaxing restrictions on banks' activities, reducing informational asymmetries by facilitating the availability of credit information, and improving quality and effectiveness of public services all have a positive effect on industry growth performance.

7. Conclusions and policy implications

Using a panel of 23 manufacturing sectors over 2002-2010, this paper analyzes the effect of bank competition on economic growth of financially dependent industries in the GCC economies. Our results indicate that financially dependent industries grow faster in the presence of higher competition. Therefore, our findings support the *market power hypothesis*. These results are robust to both structural and more direct measures of bank market power, hence providing support for both the SCP and the NEIO approaches to bank competition. Our findings are also robust to alternative indicators of firm external finance dependence. Additionally, we find that the impact of market power on firm growth is linear, i.e. it does not depend upon the initial degree of bank competition. We also find evidence that sectors dominated by small scale firms grow less when the banking market is less competitive. Finally, we find that smaller restrictions on banks' permissible activities, greater access to credit information and more effective institutions are all significant in reducing the negative impact of low competition on firm growth and access to finance.

Our results have important implications for policy makers in the GCC as they advance the economic diversification agenda and seek options to improve financial access for firms, especially SMEs. Overall, our findings indicate that bank competition is an important aspect of financial sector development and, in turn, non-oil economic growth in the GCC economies, and that there

are benefits to promoting bank competition for firms' access to finance. We leave to further research an investigation of the specific policies that policy makers in the GCC can implement to increase competition in the banking sector as well as an analysis of any potential trade-off between increased financial access and systemic stability. Our results suggest, however, that relaxing bank activity restrictions, improving the credit information environment through wider coverage of public registries and private credit bureaus, and strengthening the institutional framework for bank competition policy are important in supporting firm access to finance and reducing the negative impact of low bank competition.

References

Al-Hassan, A., M. Khamis, N. Oulidi. 2010. The GCC banking sector: topography and analysis. IMF Working Paper 10/87

Al-Muharrami, S., K. Matthews, Y. Khabari. 2006. Market structure and competitive conditions in the Arab GCC banking system. Journal of Banking and Finance 30: 3487-3501

Anzoategui, D., M. S. Martinez Peria, R. Rocha. 2010. Bank competition in the Middle East and North Africa region. Review of Middle East Economics and Finance 6 (2).

Barth, J.R., G. Caprio, R. Levine. 2013. Bank regulation and supervision in 180 countries from 1999 to 2011. Journal of Financial Intermediation, 13 (2): 111-219

Barth, J.R., G. Caprio, R. Levine. 2004. Bank regulation and supervision: what works best? Journal of Financial Economic Policy, 5 (2): 205-248

Beck, T. 2011. Finance and oil: is there a resource curse in financial development? European Banking Center Discussion Paper No. 2011-004

Beck, T., A. Demirgüç-Kunt, V. Maksimovic. 2004. Bank competition and access to finance: international evidence. Journal of Money, Credit, and Banking, 36 (3): 627–648

Beck, T., A. Demirgüç-Kunt. 2006. Small and medium-size enterprises: access to finance as a growth constraint. Journal of Banking & Finance, 30 (11): 2931–2943

Beck, T., O. De Jonghe, G. Schepens. 2013. Bank competition and stability: cross-country heterogeneity. Journal of Financial Intermediation, 22 (2): 218-244

Berger, A. N., L. F. Klapper, R. Turk-Ariss. 2009. Bank competition and financial Stability. Journal of Financial Services Research, 35: 99-118

Besanko, D., A. V. Thakor. 1992. Banking deregulation: Allocational consequences of relaxing entry barriers. Journal of Banking and Finance, 16 (5): 909-932

Boone, J. 2008. A new way to measure competition. The Economic Journal, 118 (531): 1245–1261

Boot, A. 2000. Relationship banking: What do we know? Journal of Financial Intermediation, 9:7-25.

Boot, A., A. Thakor. 2000. Can relationship banking survive competition? The Journal of Finance, 55 (2): 679–713

Caggiano, G., P. Calice, L. Leonida. 2015. Bank concentration, competition and crises: A tale of two tails. Unpublished manuscript.

Carbó-Valverde, S., F. Rodriguez-Fernandez, G.F. Udell. Bank market power and SME financing constraints. Review of Finance, 13 (2): 309–340

Cetorelli, N., M. Gambera. 2001. Banking market structure, financial dependence and growth: international evidence from industry data. Journal of Finance, 56: 617–648

Chong, T. T., L. Lu, S. Ongena. 2013. Does Banking Competition Alleviate or Worsen Credit Constraints Faced by Small- and Medium-Sized Enterprises? Evidence from China. Journal of Banking and Finance, 37: 3412-3424

Claessens, S. 2009. Competition in the financial sector: overview of competition policies. IMF Working Paper, WP/09/45

Claessens, S., L. Laeven. 2004. What drives bank competition? Some international evidence. Journal of Money, Credit and Banking, 36 (3): 563–583

Claessens, S., L. Laeven. 2005. Financial dependence, banking sector competition, and economic growth. Journal of the European Economic Association, 3 (1): 179–207

Claessens, S., A. Demirgüç-Kunt, H. Huizinga. 2001. How does foreign entry affects domestic banking markets? Journal of Banking and Finance, 25: 891–911

Dell'Ariccia, G., E. Detragiache, R. Rajan. 2008. The real effect of banking crises. Journal of Financial Intermediation, 17 (1): 89-112

Dell'Ariccia, G., R. Marquez. 2004. Information and bank credit allocation. Journal of Financial Economics, 72: 185–214.

Detragiache, E., T. Tressel, P. Gupta. 2008. Foreign banks in poor countries: theory and evidence. Journal of Finance, 63 (5): 2123–21260.

Demirgüç-Kunt, A., M. S. Martinez Peria. 2010. A framework for analyzing competition in the banking sector: an application to the case of Jordan. World Bank Policy Research Working Paper No. 5499

Fernández de Guevara, J., J. Maudos. 2011. Banking competition and economic growth: cross-country evidence. The European Journal of Finance, 17 (8): 739–764

González, V. M., F. González. 2008. Influence of bank concentration and institutions on capital structure: new international evidence. Journal of Corporate Finance, 14 (4): 363–375

Guzman, M. G. 2000. Bank structure, capital accumulation and growth: a simple macroeconomic model. Economic theory, 16 (2): 421-455

Hauswald R., R. Marquez. 2006. Competition and Strategic Information Acquisition in Credit Markets. Review of Financial Studies, 19 (3): 967-1000

Hoxha, I. 2013. The market structure of the banking sector and financially dependent manufacturing sectors. International Review of Economics & Finance, 27: 432–444

International Competition Network. 2005. An increasing role for competition in the regulation of banks. Bonn, June 2005

Jappelli, T., M. Pagano. 2002. Information sharing, lending and defaults: cross-country evidence. Journal of Banking and Finance, 26: 2017–45.

Padilla, A. J., M. Pagano. 2000. Sharing default information as a borrower discipline device. European Economic Review, 44: 1951–80.

Kaufmann, D., A. Kraay, M. Mastruzzi. 2010. The Worldwide Governance Indicators: Methodology and Analytical Issues. World Bank Policy Research Working Paper 10/5430

Klapper, L., L. Laeven, R. Rajan. 2006. Entry regulation as a barrier to entrepreneurship. Journal of Financial Economics, 82: 591–629

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, R. Vishny. 2002. Investor protection and corporate valuation. Journal of Finance, 57: 1147–1170.

Leon, F. 2015. Does bank competition alleviate credit constraints in developing countries? Journal of Banking and Finance, 57: 130-142

Lerner, A. P. 1934. The concept of monopoly and the measurement of monopoly power. The Review of Economic Studies, 1 (3): 157-175

Levine, R. 2005. Finance and growth: theory and evidence. Handbook of economic growth, 1: 865-934.

Levy Yeyati, E., A. Micco. 2007. Concentration and foreign penetration in Latin American banking sectors: impact on competition and risk. Journal of Banking and Finance, 31 (6): 1633–1647

Liu, G., A. Mirzaei, S. Vandoros. 2014. The impact of bank competition and concentration on industrial growth. Economics Letters, 124 (1): 60–63

Liu, G., A. Mirzaei. 2013. Industrial Growth: Does Bank Competition, Concentration and Stability Constraints Matter? Evidence from Developed and Developing Countries. Brunel University Working Paper 23

Love, I., M. S. Martínez Pería. How bank competition affects firms' access to finance. World Bank Economic Review, 29(3): 413-448

Ma, T. C. 2011. The effect of competition law enforcement on economic growth. Journal of Competition Law & Economics, 2011

Marquez, R. 2002. Competition, adverse selection, and information dispersion in the banking industry. Review of Financial Studies, 15 (3): 901-926

Martinez-Miera D., R. Repullo. 2010. Does competition reduce the risk of bank failure? Review of Financial Studies, 23: 3638-3664.

Martínez Pería, M. S., A. Mody. 2004. How Foreign Participation and Market Concentration Impact Bank Spreads: Evidence from Latin America. World Bank Policy Research Working Paper WPS3210

Mirzaei, A., T. Moore. 2015. Banking performance and industry growth in an oil-rich economy: Evidence from Qatar. The Quarterly Review of Economics and Finance, in press

Mirzaei, A., T. Moore. 2014. What are the driving forces of bank competition across different income groups of countries? Journal of International Financial Markets, Institutions and Money, 32: 38–71

OECD, 2011. Competition and regulation in retail banking. OECD Journal of Competition Law and Policy, 2 (3): 101–165.

Pagano, M. 1993. Financial markets and growth: An overview. European Economic Review, 37: 613–622

Petersen, M.A., R. Rajan. 1995. The effect of credit market competition on lending relationships. The Quarterly Journal of Economics, 110 (2): 407–443

Rajan, R., L. Zingales. 1998. Financial dependence and growth. American Economic Review, 88: 559–587

Rocha, R., Z. Arvai, S. Farazi. 2011. Financial access and stability: a roadmap for the Middle East and North Africa. The World Bank: Washington, D.C.

Ryan, R. M., C.M. O'Toole, F. McCann. 2014. Does bank market power affect SME financing constraints? Journal of Banking and Finance, 49: 495–505

Sapienza, P. 2004. The effects of government ownership on bank lending. Journal of Financial Economics, 72: 357-384

Schaeck, K., M. Cihák. 2012. Banking competition and capital ratios. European Financial Management, 18 (5): 836–866

Sengupta, R. 2007. Foreign entry and bank competition. Journal of Financial Economics, 84: 502–528.

Von Furstenberg, G. M., U. Von Kalckreuth. 2006. Dependence on external finance: an inherent industry characteristic? Open economies review, 17(4-5): 541-559

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
valaddw1	922	.2029683	.8555191	-.8559638	6.917526
valadd_share	926	.0492754	.0959419	-.0168253	.6232337
extdepRZ1	1035	.3097826	.3504254	-.45	1.06
extdepKLR	1035	.270813	.2490618	-.1205	.9445
extdepGM	1035	.4656522	.2002016	.23	1.31
credit_gdp	1035	44.75038	13.09025	28.3958	79.07193
conc5	1035	.9327738	.0902841	.7461277	1
conc3	1035	.7516325	.1244656	.5180085	.9313483
boone	1035	-.0326252	.0259417	-.0965298	.0108706
lerner	1035	.4739148	.0655871	.3143038	.6153406

Table 2: Correlation matrix

	valaddw1	valadd~e	extdep~1	extdep~R	extdepGM	credit~p	conc5
valaddw1	1.0000						
valadd_share	-0.0745	1.0000					
extdepRZ1	0.0218	-0.1761	1.0000				
extdepKLR	0.0219	-0.1223	0.2868	1.0000			
extdepGM	0.0060	0.0390	0.2709	-0.0465	1.0000		
credit_gdp	-0.0246	0.0106	0.0021	-0.0329	0.0115	1.0000	
conc5	0.0963	0.0306	-0.0364	-0.0859	-0.0708	0.1991	1.0000
conc3	0.0882	0.0315	-0.0516	-0.0872	-0.0502	0.1914	0.9193
boone	0.1631	0.0113	-0.0240	-0.0367	-0.0121	-0.1657	0.4940
lerner	-0.0501	-0.0078	-0.0294	0.0172	-0.0109	0.1777	-0.3975

	conc3	boone	lerner
conc3	1.0000		
boone	0.5507	1.0000	
lerner	-0.3241	-0.2918	1.0000

Table 3: Baseline Results

	conc5	conc3	boone	lerner	conc5 and lerner	conc3 and lerner	conc5 and boone	conc3 and boone
valadd_share	-6.784	-6.812	-6.831	-6.833	-6.789	-6.817	-6.794	-6.815
	(3.64)***	(3.62)***	(3.66)***	(3.66)***	(3.64)***	(3.62)***	(3.64)***	(3.63)***
credgdpXextdep	0.016	0.018	0.025	0.016	0.017	0.018	0.023	0.024
	(1.89)*	(1.99)**	(2.42)**	(1.88)*	(1.93)*	(2.02)**	(2.29)**	(2.39)**
conc5Xextdep	-4.483				-4.490		-3.712	
	(2.76)***				(2.78)***		(2.29)**	
conc3Xextdep		-3.712				-3.687		-3.500
		(2.92)***				(2.92)***		(2.78)***
booneXextdep			-8.529				-6.627	-5.933
			(1.94)*				(1.50)	(1.39)
lernerXextdep				-1.193	-1.199	-1.088		
				(1.99)**	(1.98)**	(2.47)***		
constant	1.530	1.101	0.136	0.494	1.691	1.241	1.170	0.919
	(3.57)***	(4.53)***	(0.74)	(3.05)***	(3.89)***	(4.27)***	(2.56)**	(3.57)***
R^2	0.32	0.32	0.32	0.33	0.33	0.33	0.32	0.32
N	922	922	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 4: Nonlinearities

	conc5	conc3	boone	lerner
valadd_share	-6.834	-6.803	-6.810	-6.780
	(3.66)***	(3.62)***	(3.62)***	(3.63)***
credgdpXextdep	0.016	0.017	0.018	0.017
	(1.89)*	(1.67)*	(1.93)*	(1.95)*
conc5Xextdep	-3.021			
	(1.90)*			
conc5squaredXextdep	7.910			
	(0.89)			
conc3Xextdep		-7.106		
		(1.85)*		
conc3squaredXextdep		2.194		
		(0.16)		
booneXextdep			-5.516	
			(1.99)**	
boonesquaredXextdep			6.579	
			(1.06)	
lernerXextdep				-2.468
				(1.99)**
lernersquaredXextdep				2.910
				(0.88)
constant	6.035	1.472	0.352	0.577
	(1.16)	(0.65)	(1.79)*	(1.86)*
R^2	0.32	0.32	0.32	0.32
N	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 5: Robustness to KLR

	conc5	conc3	boone	lerner	conc5 and lerner	conc3 and lerner	conc5 and boone	conc3 and boone
valadd_share	-6.702	-6.995	-6.826	-6.834	-6.720	-7.007	-6.720	-6.994
	(3.63)***	(3.78)***	(3.67)**	(3.66)***	(3.64)***	(3.78)***	(3.64)***	(3.78)***
credgdpXextdep	0.023	0.025	0.029	0.021	0.023	0.025	0.029	0.029
	(1.90)*	(2.00)**	(2.16)**	(1.75)*	(1.91)*	(2.00)**	(2.10)**	(2.14)**
conc5Xextdep	-5.836				-5.909		-5.255	
	(1.92)*				(1.93)*		(1.70)*	
conc3Xextdep		-5.114				-5.097		-4.964
		(2.74)***				(2.75)***		(2.64)***
booneXextdep			-8.061				-5.675	-3.917
			(1.52)				(1.06)	(0.75)
lernerXextdep				-0.821	-0.943	-0.641		
				(1.90)*	(2.05)**	(2.29)**		
constant	1.549	1.169	0.174	0.413	1.669	1.237	1.323	1.073
	(2.34)**	(3.61)***	(0.92)	(1.93)	(2.30)**	(3.15)***	(1.91)	(3.10)***
R^2	0.32	0.32	0.32	0.32	0.32	0.33	0.32	0.33
N	922	922	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 6: Robustness to GM

	conc5	conc3	boone	lerner	conc5 and lerner	conc3 and lerner	conc5 and boone	conc3 and boone
valadd_share	-6.725	-6.785	-6.763	-6.763	-6.726	-6.786	-6.732	-6.785
	(3.58)***	(3.55)***	(3.61)***	(3.59)***	(3.58)***	(3.55)***	(3.59)***	(3.56)***
credgdpXextdep	0.016	0.018	0.023	0.016	0.017	0.018	0.022	0.022
	(2.08)**	(2.19)**	(2.47)**	(2.07)**	(2.08)**	(2.19)**	(2.35)**	(2.45)**
conc5Xextdep	-3.076				-3.076		-2.544	
	(2.20)**				(2.19)**		(1.82)	
conc3Xextdep		-3.442				-3.425		-3.300
		(2.71)***				(2.71)***		(2.59)***
booneXextdep			-6.406				-5.173	-3.832
			(1.76)				(1.41)	(1.08)
lernerXextdep				-0.644	-0.643	-0.508		
				(1.81)*	(1.81)*	(2.25)**		
constant	1.483	1.323	-0.009	0.348	1.617	1.424	1.084	1.145
	(2.49)**	(3.57)***	(0.04)	(1.69)	(2.61)***	(3.28)***	(1.72)*	(2.91)***
R^2	0.32	0.33	0.32	0.32	0.32	0.33	0.32	0.33
N	922	922	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 7: Average firm size

	conc5	conc3	boone	lerner
valadd_share	-6.868	-6.875	-6.864	-6.843
	(3.63)***	(3.63)***	(3.62)***	(3.63)***
credgdpXextdep	0.020	0.020	0.019	0.019
	(1.39)	(1.40)	(1.36)	(1.35)
conc5Xfirmsize	-0.001			
	(2.22)**			
conc3Xfirmsize		-0.000		
		(1.87)*		
booneXfirmsize			-0.001	
			(1.89)*	
lernerXfirmsize				-0.000
				(1.92)*
constant	0.446	0.388	0.345	0.325
	(2.40)**	(2.06)**	(1.80)*	(1.71)*
R^2	0.32	0.32	0.32	0.32
N	794	794	794	794

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 8: Firm size and financial dependence

	conc5	conc3	boone	lerner
valadd_share	-6.796	-6.836	-6.853	-6.846
	(3.59)***	(3.58)***	(3.61)***	(3.63)***
credgdpXextdep	0.027	0.026	0.028	0.019
	(1.63)*	(1.64)*	(1.75)*	(1.85)*
conc5Xextdep	-6.015			
	(2.05)**			
conc5Xfirmsize	-0.000			
	(1.11)			
conc3Xextdep		-3.868		
		(2.51)**		
conc3Xfirmsize		-0.000		
		(0.65)		
booneXextdep			-8.800	
			(1.69)*	
booneXfirmsize			-0.000	
			(0.29)	
lernerXextdep				-0.543**
				(2.01)
lernerXfirmsize				-0.000
				(1.59)
constant	1.756	1.020	0.156	0.392
	(3.06)***	(4.71)***	(0.65)	(1.81)*
R^2	0.33	0.33	0.32	0.32
N	794	794	794	794

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 9: Firm size and financial dependence interacted

	conc5	conc3	boone	lerner
valadd_share	-6.843	-6.850	-6.817	-6.784
	(3.63)***	(3.62)***	(3.58)***	(3.58)***
credgdpXextdep	0.019	0.028	0.025	0.027
	(1.35)	(1.74)*	(1.58)	(1.63)
conc5Xextdep	-6.156			
	(1.97)**			
conc5XextdepXfirmsize	-0.000			
	(0.12)			
conc3Xextdep		-4.096		
		(2.54)***		
conc3XextdepXfirmsize		0.001		
		(0.66)		
booneXextdep			-8.713*	
			(1.68)	
booneXextdepXfirmsize			-0.001	
			(0.20)	
lernerXextdep				-0.659
				(1.76)*
lernerXextdepXfirmsize				0.002
				(1.22)
constant	0.403	0.157	1.042	1.754
	(1.85)*	(0.65)	(4.58)***	(2.89)***
R^2	0.32	0.32	0.33	0.33
N	794	794	794	794

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 10: Policy variables (5-bank concentration ratio)

	Public assets	FX assets	Bank entry	Act restr	Depth credit	Govt effect
valadd_share	-6.784	-6.799	-6.783	-6.802	-6.819	-6.862
	(3.63)***	(3.63)***	(3.66)***	(3.61)***	(3.65)***	(3.63)***
credgdpXextdep	0.016	0.020	0.021	0.023	0.013	0.009
	(1.84)*	(2.06)**	(2.87)***	(2.32)**	(1.29)	(1.34)
conc5Xextdep	-4.459	-6.104	-3.004	-0.096	-4.802	-5.229
	(2.75)***	(3.16)***	(1.00)	(0.04)	(3.00)***	(2.81)***
publicassetsXextdep	0.001					
	(0.19)					
foreignassetsXextdep		-0.010				
		(2.06)**				
entrbankXextdep			0.136			
			(0.71)			
actrestrictXextdep				-0.262		
				(2.83)***		
depthcreditXextdep					0.048	
					(1.94)*	
goveffectXextdep						1.454
						(1.67)*
constant	1.520	1.984	1.375	0.825	1.636	1.725
	(3.61)***	(4.04)***	(2.72)***	(1.61)	(3.81)***	(3.63)***
R^2	0.32	0.32	0.32	0.33	0.32	0.32
N	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 11: Policy variables (3-bank concentration ratio)

	Public assets	FX assets	Bank entry	Act restr	Depth credit	Govt effect
valadd_share	-6.811	-6.816	-6.800	-6.802	-6.827	-6.881
	(3.62)***	(3.62)***	(3.65)***	(3.61)***	(3.63)***	(3.63)***
credgdpXextdep	0.018	0.019	0.022	0.022	0.017	0.012
	(1.94)*	(1.91)*	(2.98)***	(2.34)**	(1.54)	(1.64)
conc3Xextdep	-3.732	-3.683	-3.353	-1.705	-3.620	-3.430
	(2.86)***	(2.97)***	(2.08)**	(1.05)	(2.70)***	(2.87)***
publicassetsXextdep	-0.002					
	(0.28)					
foreignassetsXextdep		-0.001				
		(0.35)				
entrbankXextdep			0.119			
			(0.67)			
actrestrictXextdep				-0.194		
				(1.95)*		
depthcreditXextdep					0.018	
					(0.64)	
goveffectXextdep						1.143
						(1.38)
constant	1.110	1.098	1.237	1.030	1.090	1.040
	(4.42)***	(4.57)***	(4.36)***	(4.22)***	(4.44)***	(4.36)***
R^2	0.32	0.32	0.33	0.33	0.32	0.33
N	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 12: Policy variables (Boone indicator)

	Public assets	FX assets	Bank entry	Act restr	Depth credit	Govt effect
valadd_share	-6.832	-6.848	-6.810	-6.806	-6.860	-6.929
	(3.66)***	(3.66)***	(3.70)***	(3.62)***	(3.67)***	(3.67)***
credgdpXextdep	0.025	0.028	0.032	0.032	0.022	0.020
	(2.36)**	(2.41)**	(3.63)***	(2.80)***	(1.90)*	(2.29)**
booneXextdep	-8.457	-9.201	-9.800	-8.710	-8.287	-12.268
	(1.95)*	(2.03)**	(2.23)**	(2.06)**	(1.89)*	(2.38)**
publicassetsXextdep	0.002					
	(0.39)					
foreignassetsXextdep		-0.006				
		(1.28)				
entrbankXextdep			0.189			
			(1.15)			
actrestrictXextdep				-0.265		
				(3.56)***		
depthcreditXextdep					0.037	
					(1.69)*	
goveffectXextdep						1.627
						(1.79)*
constant	0.132	0.133	0.440	0.602	0.158	0.046
	(0.72)	(0.72)	(1.14)	(3.37)***	(0.83)	(0.22)
R^2	0.32	0.32	0.32	0.33	0.32	0.32
N	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$

Table 13: Policy variables (Lerner index)

	Public assets	FX assets	Bank entry	Act restr	Depth credit	Govt effect
valadd_share	-6.836	-6.843	-6.813	-6.810	-6.862	-6.919
	(3.66)***	(3.66)***	(3.69)***	(3.61)***	(3.67)***	(3.66)***
credgdpXextdep	0.016	0.017	0.023	0.024	0.013	0.009
	(1.80)*	(1.85)*	(3.23)***	(2.45)**	(1.34)	(1.38)
lernerXextdep	-1.364	-1.121	-1.990	-2.199	-1.095	-1.626
	(2.42)**	(2.53)**	(2.17)**	(2.14)**	(1.85)*	(1.71)*
publicassetsXextdep	0.009					
	(1.28)					
foreignassetsXextdep		-0.003				
		(0.78)				
entrbankXextdep			0.206			
			(1.24)			
actrestrictXextdep				-0.288		
				(3.66)***		
depthcreditXextdep					0.037	
					(1.70)*	
goveffectXextdep						1.418
						(1.69)*
constant	0.495	0.491	0.962	1.139	0.497	0.548
	(3.05)***	(3.02)***	(2.22)**	(5.09)***	(3.05)***	(3.50)***
R^2	0.32	0.32	0.32	0.33	0.32	0.32
N	922	922	922	922	922	922

* $p<0.10$;** $p<0.05$; *** $p<0.01$