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Institutional Environment and Bank Capital Ratios: Empirical Evidence from SAARC Countries

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Abstract: *The purpose of this study is to investigate the impact of the institutional environment on the capital ratios of banks operating in the South Asian Association for Regional Cooperation (SAARC) area. We apply the Hausman-Taylor methodology to unbalanced panel data of 145 banks (109 conventional and 36 Islamic banks) for the period 2010 to 2019. The findings demonstrate that banks with greater creditors' rights have a low regulatory capital ratio. Similarly, banks are reluctant to hold a high regulatory capital ratio as a result of greater corruption perception. However, countries with more financial openness hold higher regulatory capital ratios to present greater financial strength. We also provide evidence that the impact of creditors' rights is more distinct in conventional banks than in Islamic banks. Finally, we demonstrate that with more financial openness, small banks hold a higher regulatory capital ratio than large banks.*

Keywords Institutional environment, capital ratios, capital regulations, banks, SAARC countries.

JEL Classification: G21, G28, G32.

Institutional Environment and Bank Capital Ratios: Empirical Evidence from SAARC Countries

1. Introduction

Banks play a significant role in the economic development of a country. They are involved in capital formation and the efficient utilization of resources to encourage firms (Zeb & Ali, 2019). Therefore, banks' capital structure remains an area of interest for researchers and policymakers, especially after the 2007/08 credit crisis. The flaws in capital regulations at that time were deemed to have created panic in the financial sector. To prevent a collapse, governments around the world stepped in with emergency support for their banks. Various stakeholders agreed to formulate new capital standards (Basel III). These standards made capital needs more stringent and rigorous (Demirgüç-Kunt et al., 2013) so that banks could protect themselves against different types of risk (Abbas et al., 2020).

Previous studies have focused on various market fundamentals and bank-level characteristics in determining banks' capital structure (Diamond & Rajan, 2000; Gropp & Heider, 2010; Harding et al., 2013). However, a significant part of capital structure may also be determined by countries' institutional and legal environment (Alraheb et al., 2019; Demirgüç-Kunt et al., 2020). Our study builds on institutional theory, which concerns how different organizations adhere to the rules and norms defined in institutional environments (Bruton et al., 2010; Burdon & Sorour, 2020). Institutional theory highlights the significant role of the external environment in regard to the daily operations and technical problems of an organization (Tran et al., 2021). Indeed, institutional pressure is considered an effective way to achieve sustainable financial performance in the banking sector (Weber, 2016).

Given the significance of institutional theory, it is important to note that developed economies are characterized by strong institutions. These institutions ensure the effective flow of capital, goods and services in the real economy by resolving potential conflicts of interest between transaction parties (Gao et al., 2017). In contrast, emerging economies comprise weak institutions (Adegbite, 2015). Institutional voids prevail whenever market-supporting institutions are underdeveloped or absent. These institutional voids not only restrict the effective functioning of economic markets but also hamper operational capability (Peprah et al., 2022). In addition, systemic banking crises may be more intense in weak institutional settings. Weak investor protection and imperfect contractual arrangements make economic transactions prone to higher uncertainty and shocks (Öztekin, 2022).

This study focuses on emerging markets where institutional voids may hinder financial and economic progress—in this case, the countries comprising the South Asian Association for Regional Cooperation (SAARC). We contribute to the literature by investigating whether institutional environments affect bank capital structures. We also analyze the impact of the institutional environment on Islamic and conventional banks and on large and small banks. In particular, this study investigates how different types of capital – the regulatory capital ratio and market-based traditional capital ratio – are influenced by the institutional environment in emerging markets. This is important since both of these capital ratios may behave differently in explaining banks' capital structure (Distinguin et al., 2013).

Market participants look at market-based capital ratios, as they are less prone to manipulation. Therefore, we consider two capital ratios in this study: (i) the total capital adequacy ratio (TCR) as defined by the Basel Committee on Banking Supervision (BCBS) and (ii) the equity-to-total-assets ratio (EQTA), set internally by bank managers. South Asia is viewed as a region that struggles to move forward with institutional and regulatory governance reforms (Asadullah et al., 2020). The SAARC countries include Afghanistan, Bangladesh, Bhutan, India, Nepal, the Maldives, Pakistan, and Sri Lanka. The banking sector in these countries contributes almost 57 percent of their GDP. While the level of economic development differs, these countries have a common history, culture and heritage and, more importantly, are contiguous regions (Pandey et al., 2019).

Given the significance of the topic, our primary objective is to analyze how different institutional environments affect the capital ratios of banks in SAARC for the period 2010 to 2019. We use unbalanced panel data for 145 SAARC banks (109 conventional and 36 Islamic banks). We analyze these data using the Hausman-Taylor methodology. Our findings reveal that banks with greater creditors' rights hold lower levels of capital. Likewise, banks are reluctant to hold high levels of capital as a result of increased corruption levels. Furthermore, the results demonstrate that small banks hold more regulatory-influenced capital than large banks. Finally, we provide evidence that the impact of creditors' rights is more distinct in conventional banks than in Islamic banks.

2. Literature Review and Hypotheses Development

Institutional theory is concerned with how different organizations adhere to the rules and norms defined in institutional environments (Bruton

et al., 2010). In addition, it emphasizes the significance of the external environment on a company's daily activities and technical issues (Tran, 2021). It also suggests that institutional pressure can be a useful tool for achieving long-term financial success in the banking industry (Weber, 2016).

Capital structure decisions are supported by trade-off theory (TOT) and pecking-order theory (POT) (Agyei et al., 2020; Silva et al., 2020). TOT suggests that the firm has a maximum value when the benefits of debt are equal to its marginal cost. These benefits include tax shields, fewer cash flow problems and a preference for debt over equity due to information costs. The marginal cost is the agency and bankruptcy cost. Information asymmetries may escalate the firm's cost of financing. Information asymmetry (POT) and agency cost (TOT) vary across countries depending on their institutional and legal systems. Thus, these theories have different applications across countries. We argue that capital ratios may vary in different institutional environments.

Very few studies have analysed the impact of institutional environments on capital structure specifically in the financial sector. For instance, in the case of the Middle East and North Africa (MENA) region, Awdeh and El-Moussawi (2021) analyze the role of capital regulations, institutional quality and credit crunch using annual data for 210 banks from 14 MENA countries. The findings indicate that banks in MENA tend to extend their credit supply in better institutional environments. Furthermore, strict capital regulations may slow down the credit supply, but this can be prevented through increased governance mechanisms and higher political stability.

Muhtar and Baki (2021) investigate the role of market structure and institutional quality in determining bank capital ratios for 79 commercial banks in different African countries. Their primary results show that increased competition and regulation decrease bank capital ratios. This implies that African banks work in less competitive environments and thus do not engage in risky activities that prevent them from holding higher capital ratios.

Adusei and Sarpong-Danquah (2021) investigate the impact of institutional quality on the capital structure of different microfinance institutions. The results of the study indicate that institutional quality is negatively associated with the capital structure of microfinance institutions in both the short and long runs. This suggests that microfinance institutions do not rely on debt funding amid improved levels of institutional quality.

Brewer et al. (2008) conclude that bank capital structure is significantly influenced by a country's capital regulations and policies. Other findings demonstrate that capital ratios may decrease the likelihood of systemic risk (Anginer et al., 2018). In addition, institutional voids may be replaced by higher compliance with capital ratios.

Banks with deposit insurance are exposed to moral hazard. This leads them to opt for high leverage and consequently low capital ratios while observing capital regulations (Keeley, 1990). In the case of the USA, banks maintain capital buffers well above the regulatory minimum requirement (Sorokina et al., 2017). Many studies stress that capital regulations are not obligatory (Flannery, 1994; Diamond & Rajan, 2000). High capital ratios may be justified by the fear of shock pushing a bank below its required capital level. The process of adjusting back to the required level is costly and can lead to regulatory intervention and even damage a bank's reputation (Milne & Whalley, 2001). Moreover, in a strong institutional environment, authorities may dissolve a bank that falls below the minimum capital requirement. Therefore, banks in many countries maintain high capital ratios due to such strict regulations.

Another line of research highlights the importance of institutions in shaping the capital structure of the firm. However, there are mixed results regarding the influence of institutional and legal frameworks on capital structure choice. According to Fan et al. (2012), firms can more easily access external financing when operating in better institutional environments. In fact, in such circumstances, the problems of information asymmetry and agency conflict are likely to be reduced. Agency problems are mitigated by a strong legal system that keeps investors well informed. Ultimately, this increases the supply of external financing. Thus, firms start relying more on external debt and hold less capital in countries with developed institutions. On the demand side, countries with more creditor rights protection discourage the use of leverage because firms do not want to give control to creditors if there is any financial turmoil (Öztekin & Flannery, 2012).

Fonseca and González (2010) analyze the effect of institutional environments using six different parameters for capital buffers in a sample of 170 countries. The results reveal that better institutions reduce market discipline, giving banks less incentive to hold capital buffers. Another strand of the literature, especially in the case of the MENA region, shows that bank regulations do not affect risk and capital ratios due to weak institutional and regulatory frameworks (Bougatef & Mgadmi, 2016; Murinde & Yaseen, 2006). However, these findings contradict the results

of Klomp and De Haan (2013), who find that strict regulations limit banks' risk-taking in emerging economies.

Belkhir et al. (2016) demonstrate that countries with strong institutional structures (rule of law, financial development and regulatory effectiveness) prefer debt over equity as a source of financing. Likewise, Awartani et al. (2016) find that institutional quality remains positively associated with the use of long-term debt. However, the institutional environment plays a vital role in determining the capital ratios of banks. Therefore, bank regulations may be less effective in explaining these capital ratios (Allen et al., 2011). While there are a number of studies on bank-level characteristics, there is a lack of evidence for how the institutional environment and macroeconomic factors influence bank capital ratios in SAARC countries. Based on the literature review above, we present the following hypotheses.

Hypothesis 1: Ceteris paribus, higher political stability—in terms of the propensity of a government to collapse—is likely to reduce bank capital ratios.

Hypothesis 2: Ceteris paribus, higher indications of getting credit—in terms of the strength of credit reporting systems and effectiveness of collateral and bankruptcy laws—are likely to reduce bank capital ratios.

Hypothesis 3: Ceteris paribus, higher indications of resolving insolvency—in terms of the time, cost and outcome of insolvency—are likely to reduce bank capital ratios.

Hypothesis 4: Ceteris paribus, higher economic freedom—in terms of free movement of capital, labor and goods in an economy—is likely to increase bank capital ratios.

Hypothesis 5: Ceteris paribus, financial openness—in terms of regulating exports of specified goods and services—is likely to increase bank capital ratios.

Hypothesis 6: Ceteris paribus, corruption perceptions—in terms of perceived levels of government corruption—are likely to reduce bank capital ratios.

3. Research Methodology

3.1. Data and Sample Selection

Initially, we extract data on bank-level characteristics from the Banker Database for all SAARC countries for 2010 to 2019. However, we exclude any banks that lack consecutive data for three years. After filtering the data, we have an unbalanced panel dataset of 145 banks from seven SAARC countries—Bangladesh, India, the Maldives, Nepal, Pakistan, and Sri Lanka. The sample comprises 109 conventional and 36 Islamic banks.

We further split these banks based on asset size. Banks with total assets greater than or equal to the second quantile (Q50) are considered large banks, while all other banks are considered small banks. Macroeconomic data are collected from the World Development Indicators database, while institutional data are extracted from the World Heritage Foundation, Transparency International, the Doing Business database (creditors' rights) and World Governance Indicators.

3.2. Study Variables

We use two capital ratios—the TCR and EQTA—as dependent variables. Regarding predictors, political instability (PS) is measured in values between -2.5 and +2.5, with higher values showing higher political stability and vice versa. Almost all SAARC countries face problems of political instability, as the average political stability measures -1.251 for the last ten years. A better political institutional environment in a country stimulates higher bank risk behavior (Ashraf, 2017). Therefore, countries with a sound political environment hold higher amounts of capital and vice versa.

We use two indicators of creditors' rights: getting credit (GC) and resolving insolvency (RI). The first is linked to the ease of acquiring credit and its relevant information. The second is linked to the ease of liquidation proceedings of a business. Higher values indicate greater creditors' rights in a country. When creditors' rights are increased, there is a chance that the firm might go into financial distress. Managers are therefore reluctant to increase debt use because it could compromise their control over the firm (Alraheb et al., 2019). On the other hand, when creditors' rights are increased, firms can avail credit on more favorable terms. This leads to two things: easier access to external funding and less information asymmetry.

We include two measures of economic freedom (EF). This refers to a situation where individuals can comfortably move their capital, labor, property and goods. We also include an indicator of financial openness (FO). Higher economic and financial openness creates competition in a given economy, which may result in banks holding higher capital. In addition, we use a corruption perception index (CPI). In a corrupt environment, banks might not follow strict capital regulations, which may lead them to hold lower levels of capital. This remains a prominent issue, especially in underdeveloped and emerging economies.

In terms of bank-level characteristics, we use the natural logarithm of total assets as a proxy for bank size (Brewer et al., 2008; Fonseca & González, 2010). Bank profitability is measured by returns on assets (ROA). The role of performance measures such as returns on equity (ROE) generates criticism of encouraging banks to have high leverage (Moussu & Petit-Romec, 2017). However, there are no data available for ROE in the Banker Database for the SAARC countries. Therefore, we follow Alraheb et al. (2019) and include ROA as a performance and risk-based measure. Banks invest their profits as retained earnings in their capital, as explained in POT. Therefore, they might have higher capital-to-asset ratios (Gropp & Heider, 2010). In contrast, according to Berger and Sedunov (2017), higher profitability results in lower funding costs. Thus, such banks may hold lower levels of capital.

We also include a proxy for bank risk. Risk is measured through the standard deviation of ROA for a rolling period of three years. This ratio measures the earnings volatility of a given bank. Banks hold more capital when they invest in riskier assets because it serves as a cushion for any expected losses. Apart from these bank-level characteristics, we control for audit quality through a proxy that takes a value of 1 if the bank is audited by the Big Four (audit firms) and 0 otherwise.

In terms of country-level characteristics, we control for regulatory capital stringency (REG). These values range from 0 to 3 and indicate a combination of different risks that are covered by a country's regulatory environment. We also control for deposit insurance schemes (DIS) proxied by 1 and 0 dummy variables. The literature points to moral hazard problems under deposit insurance schemes. Depositors and owners are certain that they will not suffer a loss if a bank becomes insolvent under the deposit insurance scheme. Therefore, banks use a high amount of leverage, which results in lower levels of bank capital (Keeley, 1990).

Finally, we control for GDP growth and inflation. Favorable macroeconomic conditions provide investment opportunities to banks. Therefore, banks are expected to hold more capital during economic booms (Berger, 1995). However, at the same time, there is an inverse relationship between macroeconomic conditions and capital (Alraheb et al., 2019; Shim, 2013). We also use dummy variables of 1 and 0 for Islamic and conventional banks and apply similar criteria for the inclusion of small and large banks.

3.3. Study of Variables

Table 1 defines the variables used in this study.

Table 1: Definition and Measurement of Independent and Dependent Variables

Variable	Definition	Measurement
Dependent variables		
Total capital ratio	Combination of tier 1 and tier 2 capital to total risk-weighted assets.	Tier 1 + tier 2/risk-weighted assets
Equity-to-total assets ratio	Measures the amount of assets financed by owners' investment by comparing total equity in the company to total assets.	Equity/total assets
Independent variables		
Political stability	Propensity of a government to collapse either because of conflicts or rampant competition between various political parties.	Perception of the likelihood of political instability.
Getting credit	Strength of credit reporting systems and effectiveness of collateral and bankruptcy laws in facilitating lending.	Sum of the scores for the strength of legal rights index and depth of credit information index.
Resolving insolvency	Time, cost and outcome of insolvency.	Measured by questionnaire responses by local insolvency practitioners.
Economic freedom	Extent to which capital, labor and goods can move freely in an economy.	Measured by 12 quantitative and qualitative factors grouped into four broad categories or pillars of economic freedom: rule of law, government size, regulatory efficiency and open markets.

Variable	Definition	Measurement
Financial openness	Approach to foreign investments in corporations within its jurisdiction, to the policies of each country with respect to regulating exports of specified goods and services.	Measured by trade and financial freedom in a country.
Corruption perception index	Scores countries on perceived levels of government corruption.	Measured on a scale of 0 (severely corrupt) to 100 (no corruption).
Bank-level variables		
Islamic banks	Whether a bank is Islamic or conventional.	A dummy variable that takes a value of 1 if a bank is Islamic and 0 otherwise.
Large banks	Whether a bank is large or small.	A dummy variable that takes a value of 1 if a bank's assets are above second quartile and 0 otherwise.
Audit quality	Key elements that create an environment that maximizes the likelihood that quality audits are performed on a consistent basis.	A dummy variable that takes a value of 1 if a bank is audited by the Big Four audit firm and 0 otherwise.
Return on assets	Indicator of how profitable a company is relative to its total assets.	Net income/total assets
Risk	Defined in financial terms as the chance that an outcome or investment's actual gains will differ from an expected outcome or return.	Standard deviation of ROA
Size	Ownership of assets by banks.	Measured by natural logarithm of total assets
Country-level variables		
GDP growth	Monetary value of all finished goods and services made in a country during a specific period.	Measured as the percentage rate of increase in the real gross domestic product
Inflation	General increase in the prices of goods and services in an economy.	Measured by the rise in general price level
Deposit insurance	Measure implemented in many countries to protect bank depositors.	A dummy variable that takes a value of 1 if a country has a deposit insurance scheme and 0 otherwise.
Regulatory stringency	Every risk type covered by the country's regulatory jurisdiction.	Measured on a scale of 0 to 3

3.4. Estimation Method

The fixed-effects panel data model assumes that all independent variables are correlated with random individual effects. However, the random-effects panel model assumes that all independent variables are uncorrelated with random individual effects. The traditional fixed-effects model drops all time-invariant variables from the model despite the assumption above. The Hausman and Taylor (1981) model reduces the opportunity for both extremes, as mentioned in the assumptions of the fixed-effects and random-effects models. It allows some of the time-invariant variables to be correlated with individual effects (Alraheb et al., 2019).

The introduction of various bank-level characteristics in the model means that we must contend with the issue of endogeneity. The use of the Hausman-Taylor model not only allows us to deal effectively with such endogeneity problems but also captures cross-country variations (Utami et al., 2021). In addition, we perform a principal component analysis and make two indexes—IFI and CRT. The first is a combination of four indicators (PS, FO, EF, and CPI). The second is a combination of two indicators (GC and RI). The eigenvalues for both components are 2.15 and 1.34, respectively.

3.5. Econometric Models

We use the following econometric models to determine how the institutional environment affects a bank's capital structure:

$$CAP_{ijt} = \beta_0 + \beta_1 Institutional_{ijt} + \beta_2 Bankcontrols_{ijt} + \beta_3 Countrycontrols_{jt} + \beta_4 Other_{ijt} + C_j + C_t + \mathcal{E}_{ijt} \quad (1)$$

$$CAP_{ijt} = \alpha_0 + \alpha_1 Institutional_{ijt} + \alpha_2 Bankcontrols_{ijt} + \alpha_3 Countrycontrols_{jt} + \alpha_4 Institutional * Banktype_{ijt} + C_j + C_t + \mathcal{E}_{ijt} \quad (2)$$

CAP_{ijt} represents capital ratios. $Institutional_{ijt}$ is a combination of multiple variables reflecting a country's institutional environment. $Bankcontrols_{ijt}$ is a set of different bank-level control variables used here. $Countrycontrols_{jt}$ is a vector of variables other than institutional and bank-level variables. $Other_{ijt}$ is a vector of dummy variables that reflects Islamic and large banks. C_j and C_t control for country-specific and time-specific effects. $\mathcal{E}_{ijt}$ reflects the error terms clustered at the bank level. We also include an interaction term between institutional variables and type of bank. The type of bank is then further replaced by the dummy variables used for Islamic and conventional banks and small and large banks in equation 2.

4. Results and Discussion

4.1. Data Stationarity

The t-statistics and p values for the unit root test are reported in Table 2. Based on the results, we reject the null hypothesis that a variable contains a unit root. All variables are stationery at level. The p values are significant at a 1 percent level of significance. This means that the data are sound enough for further analysis.

Table 2: Unit Root Test Results

Variables	t-statistics	p value	Variables	t-statistics	p value
Total capital adequacy	33.802	0.000	Islamic banks	-12.643	0.000
Equity to total assets	42.825	0.000	Large banks	-3.518	0.000
Political stability	38.833	0.000	Audit quality	-6.886	0.001
Getting credit	41.231	0.000	Risk	25.522	0.000
Resolving insolvency	37.713	0.000	Return on assets	27.602	0.000
Economic freedom	38.237	0.000	GDP growth	18.941	0.000
Financial openness	39.445	0.000	Inflation	37.051	0.000
Corruption perception index	31.835	0.001	Deposit insurance	34.533	0.000
Bank size	46.703	0.001	Regulatory stringency	38.638	0.000

Note: The table reports the results of the augmented Dickey-Fuller test.

4.2. Descriptive Statistics

The descriptive statistics are presented in Table 3. Table 4 gives countrywise descriptive statistics for banks for the sample period.

Table 3: Descriptive Statistics

Variables	Mean	SD	Obs.
TCR	16.543	9.205	1284
EQTA	0.114	0.086	1349
GC	23.827	17.664	1450
RI	45.055	12.293	1450
PS	-1.251	0.750	1450
CPI	25.622	13.433	1450
EF	54.399	2.252	1373
FO	98.776	13.247	1373
Islamic	0.248	0.432	1450
Audit quality	0.314	0.464	1450
Large	0.470	0.499	1349
ROA	1.134	1.116	1349
Risk	0.383	0.494	1214
Size	7.944	1.762	1349
GDP growth	6.058	2.110	1450

Variables	Mean	SD	Obs.
INF	6.512	2.825	1450
DIS	0.797	0.402	1015
REG	2.690	0.868	1015

Note: All ratios are expressed as percentages.

Bank capital ratios in the SAARC countries are higher than the Basel requirement and international standards. The mean values of TCR demonstrate large variations across countries compared to EQTA. Furthermore, among all the SAARC countries, TCR and EQTA remain highest for Indian banks and lowest for banks in Nepal. In our sample, Pakistani banks are the least profitable, whereas banks in Bangladesh encounter the highest profitability during the period 2010–19. Likewise, banks in Bangladesh are found to be riskier, whereas banks in Nepal are the least risky among the sample countries.

Table 4: Bank-level Characteristics by Country

Country	Stat	TCR	EQTA	ROA	Risk	Size
Afghanistan	Mean	24.836	0.131	0.640	1.064	5.612
	Median	21.500	0.121	0.700	0.898	5.678
	Minimum	11.400	-0.195	-2.900	0.058	3.840
	Maximum	58.100	0.399	8.800	4.373	6.880
Bangladesh	Mean	13.274	0.097	1.245	0.392	7.655
	Median	11.700	0.085	1.100	0.208	7.661
	Minimum	6.300	0.030	-4.200	0.000	5.359
	Maximum	58.100	1.078	5.100	2.931	9.633
India	Mean	17.081	0.120	0.791	0.328	9.325
	Median	14.300	0.087	0.800	0.208	9.495
	Minimum	7.700	0.002	-4.700	-0.100	4.619
	Maximum	66.800	0.897	3.700	2.775	13.240
Maldives	Mean	27.126	0.207	2.710	0.822	5.512
	Median	27.400	0.193	3.350	0.635	5.167
	Minimum	13.200	0.080	-3.500	0.153	3.842
	Maximum	41.000	0.381	5.500	2.757	7.307
Nepal	Mean	12.392	0.078	1.795	0.261	6.376
	Median	12.095	0.092	1.700	0.173	6.431
	Minimum	10.400	0.000	0.700	0.000	5.609
	Maximum	16.400	0.151	3.500	0.850	7.242
Pakistan	Mean	17.034	0.093	1.037	0.206	8.369
	Median	15.065	0.080	1.035	0.115	8.349
	Minimum	6.300	0.007	-1.800	0.000	5.853
	Maximum	52.600	0.261	3.000	1.193	10.098
Sri Lanka	Mean	21.167	0.148	1.382	0.299	7.168
	Median	16.000	0.112	1.400	0.153	7.293
	Minimum	10.800	0.033	-2.200	0.000	4.047
	Maximum	57.400	0.616	5.400	1.947	9.515

Note: All ratios are expressed as percentages.

There is great variation in institutional quality among the SAARC countries, as shown in Table 5. Their political stability has a range of -2.595 to 0.145 with an average of -1.24. The mean value of -1.24 demonstrates a lack of political stability. The indicators of financial openness and economic freedom have mean values of approximately 93 and 54, respectively. These values show that people living in this region are at ease in importing and exporting goods and services. The corruption perception level deviates from approximately 10 to 31 for the whole sample, with an average of approximately 23 for all the SAARC countries.

Table 5: Descriptive Statistics for Independent Variables by Country

	PS	GC	RI	EF	FO	CPI
Afghanistan	-2.595	8.060	45.130	50.566	72.666	10.390
Bangladesh	-1.268	8.250	40.320	53.690	85.400	21.410
India	-1.064	36.720	39.350	54.700	107.840	31.640
Maldives	0.145	17.440	52.710	50.840	77.390	22.300
Nepal	-1.012	10.460	49.520	51.870	91.600	24.340
Pakistan	-2.519	20.550	49.830	54.900	105.930	24.780
Sri Lanka	-0.358	45.740	59.800	58.080	113.050	30.850

4.3. Results of Regression Analysis

Table 6 gives the main regression results. The institutional variables are introduced in the regression separately due to the possible high degree of correlation between the variables. Columns 1–8 in Table 6 give the results of the regression for TCR, while columns 1–8 in Table 7 present the regression results for EQTA. All institutional variables except political stability and economic freedom maintain a significant relationship with TCR. The negative values for creditors' rights (GC and RI) are inconsistent with the results of González and González (2008), who find that firms operating in countries with better creditors' rights prefer more debt over equity and are therefore more leveraged.

Our results provide evidence that creditors' rights are negatively related to TCR. This implies that in the case of loan default, banks can recover the amount easily and therefore tend to keep a lower capital buffer. It also implies that banks operating in countries with better creditors' rights protection may hold less capital because it is easier to resolve insolvency. Likewise, the ease of liquidation is deemed an important part of creditors' rights. Strict liquidation rules for banks may imply that they hold less capital. La Porta et al. (1997) argue that firms operating in a favorable

creditors' rights situation are more leveraged because debt is easily available in such conditions.

In addition, our results demonstrate that financial openness is significantly related to TCR. This implies that in expanding their international exposure, banks face higher competition and thus need to hold more capital to show more financial strength to attract funds. A higher CPI makes it more difficult to conduct business and discourages firms from taking loans due to the heavy bribes involved in the process. We find that the CPI is negatively related to TCR. This implies that increased corruption perception results in banks holding lower levels of capital, reflecting the results of Fan et al. (2008).

Table 6: Institutional Variables and TCR

	1	2	3	4	5	6	7	8
GC	-0.144*** (-5.03)							
RI		-0.132*** (-4.94)						
PS			-0.332 (-0.32)					
CPI				-0.220*** (-5.00)				
EF					-0.097 (-0.52)			
FO						0.099*** (3.01)		
Institutional index							-0.220 (-0.52)	
Creditors' rights								-1.624*** (-4.95)
Islamic	3.908 (0.80)	3.607 (0.73)	3.987 (0.83)	3.162 (0.65)	7.714 (1.32)	7.219 (1.25)	7.714 (1.32)	3.905 (0.79)
Audit quality	-0.014 (-0.03)	-0.167 (-0.30)	-0.391 (-0.69)	-0.400 (-0.72)	0.003 (0.01)	-0.050 (-0.09)	0.003 (0.01)	-0.179 (-0.32)
ROA	0.604*** (2.97)	0.631*** (3.09)	0.523** (2.53)	0.687*** (3.34)	0.500** (2.44)	0.527** (2.58)	0.500** (2.44)	0.632*** (3.10)
Risk	0.056 (0.15)	0.003 (0.01)	-0.397 (-1.03)	0.150 (0.38)	-0.399 (-1.05)	-0.218 (-0.57)	-0.399 (-1.05)	0.005 (0.01)
Size	-3.056*** (-6.05)	-3.705*** (-6.11)	-3.613*** (-5.95)	-3.902*** (-6.47)	-3.488*** (-5.75)	-3.646*** (-6.02)	-3.488*** (-5.75)	-3.597*** (-6.03)
Large	-0.931 (-0.26)	-0.178 (-0.05)	-0.736 (-0.20)	0.631 (0.17)	-1.884 (-0.50)	-1.120 (-0.30)	-1.884 (-0.50)	-0.862 (-0.24)
GDP growth	-0.127 (-1.35)	-0.207** (-2.09)	-0.011 (-0.13)	-0.000 (-0.01)	-0.110 (1.04)	-0.137 (-1.38)	-0.110 (-1.04)	-0.207** (-2.08)
INF	0.055 (0.71)	-0.016 (-0.20)	0.060 (0.74)	0.064 (0.82)	0.083 (1.02)	-0.025 (-0.29)	0.083 (1.02)	-0.015 (-0.19)
DEP-INS	-1.42 (-1.29)	-1.844* (-1.66)	-1.129 (-0.98)	-2.069* (-1.85)	-1.748 (-1.34)	-1.233 (-1.11)	-1.478 (-1.34)	-1.833* (-1.65)

	1	2	3	4	5	6	7	8
REG	2.191	2.048	1.760	2.586	-1.406	-2.641	-1.406	1.544
	(1.35)	(1.18)	(1.70)	(1.60)	(-0.46)	(-0.87)	(-0.46)	(0.96)
Obs.	851	851	851	851	839	839	839	851

Note: Results for TCR were derived using the Hausman-Taylor methodology. t-statistics are reported beneath each coefficient in parentheses. *, ** and *** = significance level at 10%, 5% and 1%, respectively.

Political interference and the involvement of government officials in financial decision-making create higher perceptions of corruption in the minds of individuals. Therefore, in a corrupt environment, banks might not follow strict capital regulations, which may lead them to hold lower levels of capital.

Our results show that the first principal component, the institutional index, has a negative relationship with TCR. This means that banks operating in better institutional environments (less corruption, higher political stability, financial openness and high economic freedom) have a lower TCR. Likewise, the creditors' rights index is negatively related (β = -1.624, ρ < 0.01) to TCR. These findings are similar to those of Alraheb et al. (2019).

Table 7: Institutional Variables and EQTA

	1	2	3	4	5	6	7	8
GC	-0.000***							
	(-2.72)							
RI		-0.000**						
		(-2.57)						
PS			-0.000					
			(-0.01)					
CPI				-0.001***				
				(-2.88)				
EF					-0.000			
					(-0.02)			
FO						0.001***		
						(2.86)		
Institutional index							-0.000	
							(-0.02)	
Creditors rights index								-0.006**
								(-2.57)
Islamic	-0.238	-0.250	-0.270	-0.259	-0.214	-0.244	-0.247	-0.253
	(-1.38)	(-1.44)	(-1.50)	(-1.44)	(-1.15)	(-1.26)	(-1.26)	(-1.41)
Audit quality	-0.006	-0.009	-0.008	-0.007	-0.007	-0.008	-0.007	-0.009
	(-1.01)	(0.111)	(-1.45)	(-1.17)	(-1.17)	(-1.24)	(-1.16)	(-1.59)
ROA	0.005***	0.006***	0.005***	0.005***	0.004**	0.005***	0.004**	0.006***
	(3.08)	(3.33)	(2.99)	(3.06)	(2.20)	(2.28)	(2.18)	(3.33)
Risk	-0.005	-0.005	-0.007*	-0.005	-0.005	-0.003	-0.005	-0.005
	(-1.37)	(-1.50)	(-1.87)	(-1.26)	(-1.35)	(-0.87)	(-1.35)	(-1.51)
Size	-0.128***	-0.128***	-0.128***	-0.130***	-0.132***	-0.134***	-0.132***	-0.128***
	(-19.22)	(-19.17)	(-19.10)	(-19.42)	(-18.97)	(-19.19)	(-18.92)	(-19.15)

	1	2	3	4	5	6	7	8
Large	0.443***	0.448***	0.449***	0.456***	0.466***	0.479***	0.472***	0.448***
	(5.51)	(5.61)	(5.59)	(5.60)	(5.65)	(5.74)	(5.65)	(5.61)
GDP growth	-0.001*	-0.001**	-0.001	-0.000	-0.003***	-0.004***	-0.003***	-0.001**
	(-1.83)	(-2.00)	(-1.34)	(-1.17)	(-3.31)	(-3.99)	(-3.30)	(-2.00)
INF	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.000
	(1.64)	(0.74)	(1.03)	(1.06)	(1.09)	(-0.08)	(1.29)	(0.74)
DIS	0.005	0.002	0.006	0.003	0.000	0.002	0.000	0.002
	(0.47)	(0.11)	(0.49)	(0.27)	(0.06)	(0.24)	(0.06)	(0.011)
REG	0.010	0.012	0.010	0.012	0.022	0.016	0.029	0.007
	(0.28)	(0.34)	(0.29)	(0.33)	(0.28)	(0.21)	(0.37)	(0.21)
Obs.	917	917	917	917	864	864	864	917

Note: Results for EQTA were derived using the Hausman-Taylor methodology. t-statistics are reported beneath each coefficient in parentheses. *, ** and *** = significance level at 10%, 5% and 1%, respectively.

We find that bank size is inversely associated with TCR. Large banks hold less capital because in adverse situations, they will find it less difficult to raise capital quickly. This is because such banks are prone to systemic stability and are backed by government bailouts and deposit insurance schemes. This induces them to retain low capital ratios in normal circumstances. These findings emerge in previous studies such as Fonseca and González (2010) and Demirgüç-Kunt et al. (2013). Such banks also hold lower capital than small banks. Profitability remains positively related to TCR. Thus, profitable banks may hold higher capital ratios due to higher retained earnings. According to POT, banks invest their profits as retained earnings in their capital and may therefore possess higher capital (Brewer et al., 2008; Gropp & Heider, 2010).

Our results reveal that risk remains insignificant in explaining the bank regulatory capital ratio. Thus, the level of risk in SAARC banks does not affect capital ratios. GDP growth also maintains an insignificant relationship in most of the models, showing that there is no cyclical behavior of capital ratios in the SAARC countries. Similarly, REG remains insignificant in determining bank capital ratios. REG measures the stringency of capital regulations. A country's regulatory framework does not seem to affect the capital ratio, especially when it is already higher than the required level. Awdeh et al. (2011) and Bougatef and Mgadmi (2016) have similar results. This is reasonable because the TCR in SAARC countries is higher than the minimum required capital imposed by the BCBS.

The regression results for EQTA given in Table 7 are similar to the results obtained for TCR. However, the magnitude of the institutional variables is more pronounced for TCR than for EQTA. Therefore, we argue that institutional variables appear to affect the regulatory parameters linked

with capital more than the capital ratios set by banks internally. Among the control variables, EQTA is positively related to profitability at a 1 percent significance level. However, size maintains a significant negative relationship with EQTA. This is because large banks hold less equity than small banks. All these control variables demonstrate similar results as those obtained from TCR except for the dummy variable for large banks.

The dummy variable maintained a significant positive relationship with EQTA, showing that large banks have easy access to equity and thus hold higher equity in their capital structure. Large banks are expected to benefit more from government bailouts and insurance schemes than small banks (Subhani & Zeb, 2021). Moreover, when banks grow, they are more capable of diversifying their investment activities (Anginer et al., 2018), which may enable them to bear a higher cost of equity financing. In such circumstances, large banks may hold higher levels of equity financing than small banks. Based on the findings given in Tables 6 and 7, we can accept all our proposed hypotheses (hypothesis 1 to hypothesis 6).

We also determine the effect of size and bank type on the institutional environment. For this purpose, we include an interaction term between institutional variables and bank size (INST*Large). The dummy variable for 'large' is considered 1 if the bank meets the criteria for a large bank and is otherwise 0. This is used to check whether there is a different effect for large banks. Table 8 gives the results obtained for bank size. We find that small banks tend to hold a higher TCR than large banks even when the relationship between these variables is insignificant. However, for EQTA, the findings are significant for both large and small banks. This may imply that small banks face greater competition in the SAARC countries than large banks. Therefore, small banks are more likely to comply with the Basel capital regulations, not only to attract new funds but also to improve their credit rating.

Next, we assess the effect of Islamic and conventional banks relative to the institutional environment. The variable (INST*Islamic) takes a value of 1 for Islamic banks and 0 for conventional banks. The results in Table 9 reveal that the impact of creditors' rights on TCR and EQTA is more distinct for conventional banks. For Islamic banks, the measure of creditors' rights is unlikely to affect capital ratios. This may be because such banks do not use capital to hedge against risk.

Table 8: Comparison between Large and Small Banks

	1	2	3	4	5	6	7	8	9	10	11	12
	Panel A: TCR						Panel B: EQTA					
Large (B1)	-3.305	-2.173	-2.791	-1.483	9.421	7.032	0.234***	0.208***	0.206***	0.183***	0.328**	0.236***
	(-1.29)	(-0.93)	(-0.96)	(-0.78)	(0.69)	(1.30)	(4.90)	(4.94)	(4.36)	(5.26)	(2.19)	(3.16)
GC (B2)	-0.161***						-0.001**					
	(-4.54)						(2.11)					
GC*Large (B3)	0.036						-0.001					
	(0.82)						(-0.20)					
RI (B2)		-0.139***						-0.001**				
		(-4.71)						(-2.22)				
RI*Large (B3)		0.016						-0.001				
		(0.57)						(-1.40)				
PS (B2)			-0.209						0.001			
			(-0.19)						(0.06)			
PS*Large (B3)			-0.492						-0.006			
			(-0.43)						(-0.53)			
CPI (B3)				-0.238***						-0.001**		
				(-4.73)						(-2.08)		
CPI*Large (B3)				0.014						-0.000		
				(0.80)						(-0.42)		
EF (B2)					-0.036						0.000	
					(-0.18)						(0.39)	
EF*Large (B3)					-0.200						-0.002	
					(-0.82)						(-0.96)	
FO (B2)						0.126***						0.001***
						(3.43)						(2.81)

	1	2	3	4	5	6	7	8	9	10	11	12
	Panel A: TCR						**Panel B: EQTA**					
FO*Large (B3)						-0.087*						-0.000
						(-1.72)						(-0.68)
Constant	39.411***	46.138***	37.107***	42.916***	48.808***	38.126***	0.904***	0.877***	0.872***	0.848***	0.808***	0.790***
	(7.25)	(7.87)	(5.84)	(8.49)	(3.59)	(7367)	(8.33)	(8.58)	(8.02)	(9.21)	(4.31)	(5.44)
Observations	851	851	851	851	839	839	917	917	917	917	864	864
Groups	135	135	135	135	131	131	145	145	145	145	134	134
Wald P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(B2) + (B3)	-0.125	-0.123	-0.701	-0.224	-0.236	0.039	-0.002	-0.002	-0.005	-0.001	-0.002	0.001

Note: Results for large vs small banks were derived using the Hausman-Taylor methodology. T-statistics are reported beneath each coefficient in parentheses. *, ** and *** = significance level at 10%, 5% and 1%, respectively.

Table 9: Comparison between Islamic and Conventional Banks

	1	2	3	4	5	6	7	8	9	10	11	12
	Panel A: TCR						Panel B: EQTA					
Islamic (B1)	-1.654	-7.011**	3.659	-1.546	2.301	3.770	-0.084	-0.068	-0.041	-0.043	-0.066	-0.016
	(-0.58)	(-2.33)	(1.20)	(-0.77)	(0.13)	(0.68)	(-1.64)	(-1.62)	(-0.81)	(-1.07)	(-0.33)	(-0.23)
GC (B2)	-0.145***						-0.000***					
	(-4.83)						(-2.85)					
GC*Islamic (B3)	0.004						0.001					
	(0.05)						(1.18)					
RI (B2)		-0.130***						-0.000***				
		(-4.84)						(-3.04)				
RI*Islamic (B3)		0.136***						0.000*				
		(2.70)						(1.74)				
PS (B2)			-0.674						-0.000			
			(-0.63)						(-0.05)			
PS*Islamic (B3)			2.079						0.003			
			(1.55)						(0.21)			
CPI (B3)				-0.204***						-0.001**		
				(0.000)						(-2.52)		
CPI*Islamic (B3)				0.037						0.000		
				(1.44)						(0.74)		
EF (B2)					-0.091						-0.000	
					(-0.45)						(-0.07)	
EF*Islamic (B3)					-0.040						0.000	
					(-0.13)						(0.23)	

	1	2	3	4	5	6	7	8	9	10	11	12
	Panel A: TCR						**Panel B: EQTA**					
FO (B2)						0.112***						0.001**
						(3.08)						(2.59)
FO*Islamic (B3)						-0.042						-0.000
						(-0.76)						(-0.12)
Constant												
	44.313***	49.291***	40.911***	46.818***	52.938***	40.816***	0.882***	0.891***	0.857***	0.875***	0.986***	0.918***
	(8.32)	(8.93)	(6.87)	(8.97)	(3.88)	(5.13)	(12.63)	(13.00)	(11.59)	(12.89)	(5.78)	(7.83)
Observations	851	851	851	851	839	839	917	917	917	917	864	864
Groups	135	135	135	135	131	131	145	145	145	145	134	134
Wald P value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(B2) + (B3)	-0.141	0.006	1.405	-0.167	-0.131	0.070	0.001	0.000	0.003	-0.001	0.000	0.000

Note: Results for Islamic vs conventional banks were derived using the Hausman-Taylor methodology. T-statistics are reported beneath each coefficient in parentheses. *, ** and *** = significance level at 10%, 5% and 1%, respectively.

Finally, to check robustness, the study uses the generalized method of moments (GMM). The p value of the second-order (AR-2) correlation and the Hansen test are well within the assumptions of the GMM estimation. Our primary findings indicate that the previous period's capital ratios significantly influence the current period's bank capital ratios. These findings are similar to what we observe in Tables 6 and 7. The results for the lagged dependent variables in Table 10 justify the endogenous nature of the capital ratios.

Table 10: Results of Generalized Method of Moments (GMM) Estimation

Variable	Coefficient	p value	Variable	Coefficient	p value
TCR-1	0.291	0.000	EQTA-1	0.191	0.000
Islamic banking	-12.483	0.419	Islamic banking	-1.375	0.841
Audit quality	-0.217	0.455	Audit quality	-0.003	0.613
Large banks	8.035	0.185	Large banks	0.759	0.548
ROA	0.918	0.001	ROA	0.005	0.000
Risk	1.414	0.000	Risk	0.001	0.942
Size	-0.975	0.239	Size	-0.216	0.000
GC	0.028	0.435	GC	-0.001	0.570
RI	-0.015	0.388	RI	-0.001	0.916
PS	-0.994	0.044	PS	-0.016	0.052
CPI	-0.098	0.001	CPI	-0.001	0.002
EF	-0.218	0.141	EF	-0.004	0.162
FO	0.054	0.061	FO	0.001	0.854
GDP growth	-0.277	0.001	GDP growth	-0.002	0.128
INF	0.064	0.193	INF	0.001	0.496
DEP-INS	14.819	0.428	DEP-INS	-2.737	0.799
REG	-7.801	0.231	REG	-0.190	0.875
AR2	-	0.971	AR2	-	0.534
Sargan/Hansen test	-	0.175	Sargan/Hansen test	-	0.609
Observations	712	-	Observations	730	-

Note: For further information on the variables, see Table 1.

5. Conclusions

This study builds on institutional theory, which concerns how different organizations adhere to the rules and norms defined in their institutional environment. Institutional theory highlights the significant role of the external environment in regard to the daily operations and technical problems of an organization. Institutional pressure is considered an effective way to achieve sustainable financial performance in the banking sector. It is

important to note that emerging economies tend to comprise weak institutions. These institutional weaknesses lead to institutional voids that not only restrict the effective functioning of economic markets but also hamper firms' operational ability. Moreover, systemic banking crises may be more intense in weak institutional settings.

Drawing on the theoretical arguments of institutional theory, our objective was to investigate the impact of institutional variables on the capital ratios of banks operating in SAARC countries from 2010 to 2019. We applied the Hausman-Taylor methodology to unbalanced panel data for 145 banks (109 conventional and 36 Islamic banks). Two different capital measures—the total capital ratio and the equity-to-total assets ratio—were used. The first accounts for the level of risk in a bank's asset portfolio, and the second is the bank's nonrisk-weighted leverage.

Our findings demonstrate that banks with greater creditors' rights have a low regulatory capital ratio (TCR). Likewise, banks are reluctant to hold higher levels of capital in a corrupt environment, suggesting a negative relationship between the corruption perception index (CPI) and the bank's regulatory capital ratio (TCR). This implies that without paying bribes, it may be more difficult for firms to access government services. This reduces the demand for financial services, which may in turn decrease the need to hold higher levels of capital. Adusei and Sarpong-Danquah (2021) report similar findings.

Countries with greater financial openness hold more regulatory capital. This result remains identical for both capital ratios, EQTA and TCR. Our analysis of bank size shows that, with more financial openness (ease in importing and exporting goods and services), small banks hold more regulatory capital than large banks. This implies that small banks face greater competition in the SAARC countries than large banks. Therefore, small banks are more likely to comply with the Basel capital regulations not only to attract new funds but also to improve their credit ratings. Finally, we provide evidence that the impact of creditors' rights is more distinct in conventional banks than in Islamic banks in SAARC countries. This may be because these banks do not use capital to hedge against risk.

5.1. Theoretical and Managerial Implications

Our study has several important theoretical and policy implications. Institutional quality cannot be measured merely by stock market development, especially when determining the capital structure of banks and the financial sector in developing countries such as the SAARC

countries. This region is characterized by many institutional deficiencies that could lead to significant fallouts for all sectors, including the financial sector. Our results demonstrate that banks operating in countries with strong institutions hold more capital and, as a result, are considered safer than banks in countries where institutions are weak. Therefore, policymakers should make policies to facilitate institutional strengthening, which could contribute toward a sounder financial sector in the SAARC countries. This may in turn attract new investors toward the overall economic development and financial strengthening of weak institutions in the SAARC countries.

We also show that the strength of institutional factors varies across risk-weighted regulatory capital as well as the nonrisk-weighted equity-to-total assets ratio. The region comprises various underdeveloped stock markets where weak market discipline and low institutional quality play a key role in defining the capital structure of banks. Thus, regulations that lead to stronger institutions may ensure stricter compliance with the capital regulations defined by the BCBS. We therefore suggest that regulators need to improve institutional quality to ensure the stability of the banking sector as a whole.

Institutional quality, such as better creditors' rights, supports the view that managers prefer equity over debt, as, in the worst-case scenario, control is not handed over to the creditors. Therefore, banks in SAARC countries need to be careful when raising external finance through debt. Supervisors and regulators also need to closely monitor banks in countries where institutions are weak.

5.2. Research Limitations and Future Research Directions

The study has several limitations. First, it draws on the theoretical arguments of institutional theory and institutional environments in explaining bank capital ratios. However, macroeconomic variables such as foreign direct investment, unemployment, policy rates and reserve ratios in determining bank capital ratios could also be considered in future research. Second, the role of performance measures such as return on equity (ROE) leads to criticism of policies encouraging banks to have high leverage (Moussu & Petit-Romec, 2017). Moreover, ROE data were missing or less readily available than ROA data for the SAARC countries. Therefore, this study is limited in terms of including only ROA as a performance and risk-based measure in determining bank capital ratios in the SAARC countries. Future studies could investigate the role of institutional environments in explaining the financial performance of SAARC banks by using different profitability measures such as ROE, Tobin's-q and net interest margin.

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