Bank efficiency determinant: Evidence from the gulf cooperation council countries

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Economic Freedom, Country Risk and Cost Efficiency in Jordan and the GCC Countries

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Abstract

Using data from 2003 to 2010, we examine the impact of economic freedom and country risks on the bank costs of potential Gulf Cooperation Council (GCC) union. In estimating a common frontier, this article employs Stochastic Frontier Approach (SFA) to control for country-specific variables, that is, economic freedom, country risk, macroeconomic conditions, bank accessibility and bank structure, for an unbalanced panel of 90 Jordanian and the GCC countries' banks. This article further estimates bank efficiency levels in the potential GCC union member countries to shed some light on the capability and capacity of the banks to compete and survive within the future GCC union. We find that economic freedom helps in reducing potential bank costs. Enhancing economic freedom is crucial for the region to attract more investments and create a viable banking system. In order for the GCC members to have a successful union and achieve the objectives faster, it is important to have a similar level of economic performance, in particular in the banking sector.

Keywords

Economic freedom, country risk, SFA, Jordan, GCC

Introduction

The essential for any economy to progress is the freedom of choice, open competition in business, liberal trade with others and ease of securing property rights (North & Thomas, 1976). Economic freedom stimulates the banking environment, promotes innovative ideas and expands productive capacities (Chortareas, Girardone, & Ventouri, 2012; Soo-Wah Low, 2010; Sufian & Habibullah, 2010a; Sufian & Majid, 2012). Given the importance of economic freedom to the banking sector, several studies have been undertaken in this respect, such as in Europe (Chortareas et al., 2012), in the six East Asian countries (Soo-Wah Low, 2010) and for Middle East and North Africa (MENA) Islamic banking (Sufian & Majid, 2012). Economic freedom allows a country to be flexible in pursuing economic activities without much

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interference from the government. Restriction on the movement of capital, both domestic and international, undermines the efficient allocation of resources, reduces productivity and distorts economic decision-making, which affects investment freedom as well as labour mobility across countries (Chortareas et al., 2012). As opposed to economic freedom, country risks depress bank performance (Euromoney, 2010). When country risks are high, it reduces investment, discourages investors and thus affects the banking sector as deposits are reduced (Iannotta, Nocera, & Sironi, 2007).

The Gulf Cooperation Council (GCC), which comprises of six countries,[1] plans to convert its cooperation status into a union to enhance economic integration as well as strengthen the economy. Jordan has been invited to join them. Despite differences in environmental conditions, the GCC countries have undertaken parallel economic programmes to promote economic growth and development. They have instituted a number of reforms in the banking sector with the objective of enhancing efficiency as well as stimulating international competitiveness of the banking systems. The reforms include economic freedom, banking regulations, privatization and liberalization of state-owned banks (Al-Obaidan, 2008; Alshammari, 2003). As for Jordan, it began the liberalization programme of the banking sector and privatization since the early 1990s to increase efficiency, avoid future financial crises as well as promote economic freedom (Al-Jarrah & Molyneux, 2010).

The effects of poor economic freedom and high country risks could be greater if the countries are closely linked in the form of cooperation or union. However, in this respect, no study has been undertaken on these countries. Therefore, this article would determine the effects of economic freedom and country risks on the GCC countries. We chose the GCC countries as they were planning to form a union. Therefore, this study could assist the GCC countries in evaluating their performance and future plans. The GCC countries have been in cooperation status since 1981. They have been trying to facilitate economic freedom and remove barriers among themselves and confront any country risks in order to maintain healthy and stable economies. These countries have been associated with investment freedom (Bossdorf, Engels, & Weiler, 2013) free movement of labour (Jbili, Galbis, & Amer Bisat, 2007), debt in default (Arvai, Prasad, & Katayama, 2014) credit ratings (Beidas, Rasmussen, & Robinson, 2011) and economic performance (Beidas et al., 2011). Several studies have associated corruption with these countries, including Jordan (Colombo, 2012; Ndonga, 2009). These factors might pose as risks to the potential GCC union.

To evaluate the success of the potential union, we have to gauge the performance of the banks in each country and the determining factors. Therefore, the focal point of this article is to examine the banking efficiency as well as the determinants, particularly focusing on economic freedom and country risks. This article utilizes the SFA methodology to estimate the efficiency levels of the commercial banks in Jordan and the GCC member countries. The advantages of SFA are that it could deal with both the random noises, that is, the measurement problems and systemic differences between banks, given the heterogeneity across banks (Kumbhakar, Lozano-Vivas, Lovell, & Hasan, 2001). This enables a comparison of different banks, for instance, large commercial banks with Islamic banks and small banks with large banks, taking into account the environmental factors and random errors (Bader, Mohamad, Ariff, & Hassan, 2008). In estimating a common frontier, we employ economic freedom, country risks, macroeconomic conditions, bank accessibility and bank structures to control for country-specific differences as well as to determine the impact of these factors on bank costs.

Previous studies on GCC and Jordan (i.e., Al-Jarrah, 2010; Al-Jarrah & Molyneux, 2010; Al-Obaidan, 2008; El Moussawi & Obeid, 2010; Hamilton, Qasrawi, & Al-Jarrah, 2010; Srairi, 2010) did not consider the impact of economic freedom and country risk on bank cost. This article further estimates bank efficiency levels of the potential GCC union, taking into account economic freedom and country risk. The findings show that economic freedom, particularly freedom from corruption, labour mobility and investment freedom, is associated with low banking costs. However, no links were evident between

country risks and bank costs. Therefore, it is crucial for the authorities in Jordan and the GCC countries to enhance economic freedom in order to have a successful union, particularly in reducing the banking costs. Given the earlier discussion, this article contributes by filling the gap on the impact of economic freedom and country risk variables on bank costs for the potential GCC union. Additionally, it is best to further investigate the aspect of the importance of country risks on bank performance.

The remainder of this article is organized as follows. The next section provides a brief literature review and this is followed by a description of the methodology in 'Methodology' section. Sections 'Data' and 'Analysis' explain the analysis, data and empirical specifications, while the next section reports the discussion of the results. Finally, the concluding section offers some conclusions, managerial implications and further future research.

Review of Literature

The following literature briefly reviews the estimation process employed to measure bank efficiencies. The focus is on the impact of economic freedom and country risks on bank performance.

Efficiency is calculated as the difference between input and output levels and the corresponding optimum values. The output-oriented measure of efficiency evaluates output against the optimum output levels of certain inputs. However, the computation of efficiency-oriented input compares the level of input with the minimum amount of inputs required to maximize production levels. Such comparisons would assist in minimizing costs and maximizing profits and measure efficiency in resource allocation. A number of earlier studies have adopted a cost function approach, for example, Ferrier and Lovell (1990), Mester (1993), Dietsch and Lozano-Vivas (2000), Isik and Hassan (2002), Carvallo and Kasman (2005), Mokhtar, Abdullah and Al-Habshi (2006) and Al-Gasaymeh (2016a). Thus, this article would adopt the same approach for the potential GCC member countries.

Previous studies employed economic variables as control variables for environmental differences to estimate a common frontier for panel data (Carvallo & Kasman, 2005; Dietsch & Lozano-Vivas, 2000; Fang, Hasan, & Marton, 2011). The authors indicated that efficiency scores obtained from a model without control variables are not reliable. Moreover, Alshammari (2003) and Al-Jarrah and Molyneux (2010) suggest that the method employed to allow for environmental factors would have a significant impact on relative efficiency estimates. Most earlier studies on Jordan and the GCC countries used macroeconomic variables and market structures (Al-Jarrah, 2010; Al-Jarrah & Molyneux, 2010; Al-Obaidan, 2008; El Moussawi & Obeid, 2010; Hamilton et al., 2010; Srairi, 2010). They were of the view that low inflation, higher gross domestic product (GDP) per capita and greater pressure of competition force banks to reduce the costs (Al-Gasaymeh, 2016b). While, Sathya (2006) found evidence of concentration of efficiency parameters among peer bank groups in India.

Many studies have been conducted in the past two decades to evaluate the financial institutions' efficiency, using SFA across countries. They used a common frontier and control for country-specific variables, that is, macroeconomic conditions, such as per capita GDP, inflation and gross national income, accessibility of banking such as population density and banking structure such as asset concentration ratio (Abdul-Majid, Saal, & Battisti, 2010; Fathi, 2010; Fries & Taci, 2005; Koutsomanoli-Filippaki, Mamatzakis, & Staikouras, 2009; Shen, Liao, & Weyman-Jones, 2009; Weill, 2003). They conclude that macroeconomic conditions play a vital role in increasing efficiency. They also indicate that higher concentration would bring about a decrease in efficiency, while higher efficiency level results in increased competition.

Fakarudin, Bany Ariffin, Junaina and Mohamad Ali (2014) examine the cost, revenue and profit efficiency levels of 74 banks in GCC countries over the periods 2007 to 2011. The level of efficiencies was

measured using data envelopment analysis (DEA) method which applied the intermediation approach. They found that revenue efficiency seems to play the main factor, leading to the lower or higher profit efficiency levels. In addition, the result of this study also shows that there are statistically significant difference on cost, revenue and profit efficiency between Islamic and conventional banks in GCC countries. While, Mohamad and Nor Hayati (2012) investigate the efficiency of the Islamic banking sectors in 25 countries during the period 1992–2009 consisting of 78 Islamic banks. The efficiency estimates of individual banks are evaluated using the non-parametric DEA method. The empirical findings seem to suggest that the world Islamic banks have exhibited high pure technical efficiency (PTE). Moreover, they found a positive relationship between bank efficiency and loan intensity, size, capitalization and profitability. Also results show that technically more efficient banks are those that have higher market share and a low non-performing loan ratio. Moreover, Poonam & Kanhaiya (2015) examine bank efficiency using technical efficiency taking into account bank size as an indicator for public bank. It is observed during the analysis that only a few of the banks are close to high efficiency and rest lie on a satisfactory efficiency level. In addition, to assess the degree of correlation among various efficiency parameters, the Statistical Package for the Social Sciences (SPSS) technique has been used for measuring the efficiency of banks. It was further observed that there is a significant relation among return on assets (ROAs), spread and profit per employee.

A few studies have used economic freedom variables as independent variables in evaluating bank efficiency (Chortareas et al., 2012; Soo-Wah, 2010; Sufian & Habibullah, 2010a; Sufian & Majid, 2012). Using OLS, Sufian and Habibullah (2010a) further examined the impact of economic freedom on profits of the Malaysian banking sector during the period 1999–2007. They noted that corruption, which is an indicator of economic freedom, has a corrosive impact on Malaysian banks' profitability. They conclude that overall economic freedom has a positive and statistically significant impact on the Malaysian banking sector. Using GMM, Sufian and Majid (2012) examined the impact of economic freedom, that is, corruption, financial, monetary and business indices, on the efficiency of MENA Islamic banks for the period 2000–2008. They suggest that economic freedom had an adverse impact on the efficiency of Islamic banks and lack of freedom of investment lowered bank efficiency. As for the association between economic freedom and banking sector development, Soo-Wah Low (2010) used panel data analysis on six East Asian countries for the period 1975–2006 and found that there was a positive relationship.

Finally, using the methodology of DEA, Chortareas et al. (2012) focused on a sample of banks operating in 27 European countries for the period 2001–2009. They obtained efficiency scores to determine the effects of freedom on bank efficiency. They found that the economic freedom indices, that is, corruption freedom, government spending and property rights could be used as a significant policy tool to enhance the efficiency of the banking institutions in the new European countries. Additionally, excessive regulatory restrictions on bank activities and governance interventions adversely affect the efficient operation of banks. They also thought that with greater economic freedom and democratic political systems, the banking sector is more likely to benefit from higher operating efficiency levels. Further, it would foster a climate of entrepreneurship, innovation and sustained economic growth and development. Sufian and Habibullah (2010b) examine the efficiency of the Thai banking sector from 1999 to 2008 by using DEA method. The results indicate that inefficiency in the sector stems mainly from scale rather than pure technical efficiencies. The findings suggest that small banks are most efficient, while medium-sized banks have been the least efficient banking group. Domestic banks have been relatively more efficient than their foreign bank peers, which can be attributed largely to a higher PTE level. The results from the multivariate regression analysis suggest that banks with higher loans intensity and which are relatively better capitalized tend to exhibit higher efficiency levels. On the other hand, credit risk is negatively related to bank efficiency. The empirical findings suggest that the recent global financial crisis exerts a

negative impact on the efficiency of Thai banks. Another study for Sufian and Zulkhibri (2015) examine the impact of economic freedom on Islamic banks' profitability in the MENA banking sectors during the period 2000–2010 using dynamic panel model. The findings suggest that greater financial freedom positively influences the profitability of Islamic banks in the MENA banking sectors, implying that lower intervention in the system increases Islamic banks' profitability. Furthermore, the larger, more diversified and better-capitalized Islamic banks are relatively more profitable, while credit risk and expenses preference behaviour negatively impact on Islamic bank profitability as expected.

Apart from economic freedom, country risk affects the performance of the banking sector (Euromoney, 2010). Country risk refers to the instability in international business transactions due to uncertainties associated with a particular country (Vij & Kapoor, 2007). The concept evolved in response to the banking sector's efforts to define and measure its loss exposure in cross-border lending. However, no one has tested the influence of country risk on banks' costs. Due to the importance of country risk, this article would examine the impact of country risks on the costs of the GCC union. There is a very limited literature on the impact of country risks, that is, high debt, low economic performance and low credit rating on bank performance. Hence, this article endeavours to examine the effects of both economic freedom and country risks on bank performance (Euromoney, 2010).

Based on the earlier discussion, there are a number of studies which investigated bank efficiencies in Jordan and in the GCC countries, using bank specific and macroeconomics variables, and did not take into account economic freedom and country risk variables. Therefore, this article makes a comprehensive empirical analysis using the SFA to examine the impact of economic freedom, that is, corruption, investment and labour freedom and country risk, on bank costs for the potential GCC union.

Methodology

This article uses the stochastic frontier approach, as developed by Aigner, Lovell and Schmidt (1977), to estimate cost efficiency. Following is a single-equation stochastic cost function model for an individual bank:

$$lnC_{n,t} = f(Y_{n,t}, W_{n,t}, Z_{n,t}) + \varepsilon_{n,t}, \tag{1}$$

where $C_{n,t}$ is the observed total cost of production for the nth firm at time t, $Y_{n,t}$ is a vector of outputs, $W_{n,t}$ is an input price vector and $Z_{n,t}$ is an exogenous factor vector. Following Aigner et al. (1977), this article assumes a composed error term.

$$\varepsilon_{n,t} = v_{n,t} + u_{n,t}, \tag{2}$$

where $\varepsilon_{n,t}$ is a composed error term, comprising $v_{n,t}$ that affects the nth firm at time t. $v_{n,t}$ and $u_{n,t}$ are independently distributed; $v_{n,t}$ represents random uncontrollable error and is assumed to be normally distributed with zero mean and variance; $\sigma_v^2 . u_{n,} \geq 0$ is drawn from a one-sided distribution that is assumed to capture inefficiency. $u_{n,t}$ is assumed to be drawn from a half-normal distribution with mean zero and variance σ_u^2 (Berger & Mester, 1997; Mester, 1996). Given this assumption, the log likelihood for inefficiency is expressed in terms of two variance parameters, $\sigma^2 = \sigma_v^2 + \sigma_u^2$ captures the variance of composed error and $\lambda = \sigma_u / \sigma_v$ is a measure of the amount of variation originating from inefficiency relative to statistical noise (Jondrow, Knox Lovell, Materov, & Schmidt, 1982).

Maximum likelihood estimates are obtained by estimating a translog cost function, which provides a second order approximation of any potential cost function. The specified cost function—after including

environmental variables, imposing the standard assumption of homogeneity in input prices and allowing for the composed error terms—is:

$$\ln \tilde{C}_{n,t} = \varphi + \sum_{k=1}^{k-1} \alpha_k \ln P_{k,n,t} + 0.5 \sum_{k=1}^{k-1} \sum_{s=1}^{k-1} \alpha_{k,s} \ln P_{k,n,t} \ln P_{s,n,t} + \sum_{m=1}^{M} \beta_m \ln Y_{m,n,t} + 0.5 \sum_{m=1}^{M} \sum_{j=1}^{M} \beta_{m,j} \ln Y_{m,n,t} \ln Y_{j,n,t} + \sum_{K=1}^{K-1} \sum_{m=1}^{M} \theta_{k,m} \ln P_{k,n,t} \ln Y_{m,n,t} + \sum_{k=1}^{K-1} \delta_K \ln P_{k,n,t} t + \sum_{m=1}^{M} \psi_m \ln Y_{m,n,t} t + \lambda_1 t + 0.5 \lambda_{11} t^2 + \sum_{h=1}^{H} \xi_h Z_{h,n,t} + v_{n,t} + u_{n,t}, \quad (3)$$

where, $P_{k,n,t} = W_{k,n,t}/W_{\mathrm{K},n,t}$ and $\tilde{C}_{n,t} = C_{n,t}/W_{K,n,t}$. $k = 1, ..., k$ and $s = 1, ..., k$ are indices for input prices; $m = 1, ..., M$ and $j = 1, ..., M$ are indices for output prices; $h = 1, ..., H$ is an index for environmental variables. φ, α_k, $\alpha_{k,s}$, β_m, $\beta_{m,j}$, $\theta_{k,m}$, δ_K, ψ_m, λ_1, λ_{11}, ξ_h are unknown parameters and t represents a time trend and accounts for technology changes over time. Finally, symmetry constraints are imposed to the second order parameters by imposing the constraints $\alpha_{k,s} = \alpha_{s,k}$; $\beta_{m,j} = \beta_{j,m}$ (Battese & Coelli, 1995; Coelli, Rao, O'donnell, & Battese, 2005; Feng & Serletis, 2010; Michaelides, Vouldis, & Tsionas, 2010).

Based on the earlier model specification and assumptions, a measure of cost efficiency could be derived as the ratio of observed costs to predict efficiency costs, which are theoretically equivalent to:

$$CE_{n,t} = \exp(u_{n,t}). \quad (4)$$

The efficiency scores of relative efficiency range from zero to one, and one represents the highest efficiency. However, $CE_{n,t}$, depends on the unobservable inefficiency, $u_{n,t}$.

Data

The inputs and outputs were drawn from the Bankscope database (Bureau van Dijk's, 2010) based on an unbalanced panel of 610 bank year observations. The data is first converted to real units using GDP deflators extracted from the International Monetary Fund (IMF, 2004) and then expressed in US dollars (US$), using purchasing power parity (PPP). The conversion rates were drawn from the World Bank's World Development Indicators (WDI, 2010), and GDP deflators were provided by the IMF, 2010. The selection of output and input variables adheres to the intermediation approach which was widely employed in Islamic and conventional bank studies, given the intermediary role of banks (Al-Jarrah, 2010; Allen & Rai, 1996; Alshammari, 2003; Carbo, Gardener, & Williams, 2002; Casu & Girardone, 2002; Maudos, Pastor, Perez, & Quesada, 2002; Mester, 1996; Yudistira, 2004). Total costs are defined as operating and financial costs, calculated as the sum of labour expenses, physical capital expenses and income paid to depositors for Islamic banks or interest expense for conventional banks. Two outputs and three inputs are used in this article. The outputs are total loans (Y1) and other earning assets (Y2). The inputs are price of labour (W1), which is personal expense over total assets, while price of physical capital (W2) is non-interest expense over fixed assets and price of financial capital (W3) is the interest expense over total deposits.

Analysis

Table 1 describes the sample of banking institutions in Jordan and the GCC countries by type of banks for each year under study. The sample which covers 58 per cent of population includes 65 conventional

Table 1. Sample of Conventional and Islamic Banks by Country, 2003–2010

Countries	Bank Type	2003	2004	2005	2006	2007	2008	2009	2010	Total
Jordan	Conventional	9	9	9	9	9	9	12	12	12
	Islamic	3	3	3	3	3	3	3	3	3
Bahrain	Conventional	7	7	7	7	7	7	7	7	7
	Islamic	5	5	5	5	5	5	5	5	5
Oman	Conventional	10	10	10	10	10	10	10	10	10
	Islamic	na	na	na	na	na	na	na	na	na
Qatar	Conventional	5	5	5	5	5	6	6	6	6
	Islamic	2	2	2	2	3	3	3	3	3
Kuwait	Conventional	6	6	6	7	8	8	8	8	8
	Islamic	1	1	1	1	1	2	2	2	2
Saudi Arabia	Conventional	7	7	7	7	7	7	7	7	7
	Islamic	4	4	4	4	4	4	4	4	4
United Arab Emirates	Conventional	10	10	12	15	15	15	15	15	15
	Islamic	3	3	4	4	5	8	8	8	8
All Countries	Conventional	55	55	57	61	62	63	65	65	65
	Islamic	17	17	18	18	20	24	25	25	25

Source: Bankscope.
Note: na: not available.

and 25 Islamic banks for the period 2003 to 2010, assuming that conventional and Islamic banks are homogeneous in terms of technology. By illustrating trends in the number of conventional and Islamic banks, the table reveals an increasing preponderance of conventional banks over time, especially in Jordan and the United Arab Emirates. The number of Omani conventional banks, however, remained the same for the sample period. There were no Islamic banks operating in Oman.

Table 2 shows the average values of bank assets, total bank costs, bank inputs and outputs presented in million US$ for each country under study. The difference in bank size is relatively small in all countries, except for Kuwait, with an average value of US$0.849 million. The variations in bank costs are substantial, ranging on average between US$56.114 million in Oman and US$329.583 million in the United Arab Emirates. The banks in Jordan, however, incur higher costs at US$465.648 million than the banks in Bahrain at US$214.794 million. Qatar and Saudi Arabia have on an average lower total bank costs of US$56.114 million and US$153.860 million, respectively. Jordan has the smallest volume of inputs US$1.623 million and largest outputs US$15,138.568 million compared to the GCC countries, whereas Oman has the greatest amount of inputs US$3.427 million and smallest outputs at US$2,698.417 million.

In estimating a cost frontier for the sample countries, besides economic freedom and country risks, other variables were identified that describe the distinctive features of the economy, accessibility of banking services and banking structure in each country. As for the economic features, the variables are economic freedom and country risks. Economic freedom is measured by the degree of freedom from corruption, labour mobility and investment freedom. These measures were selected as they influence bank costs and their importance in explaining the discrepancies in the efficiency of the banking sectors in the potential GCC union member countries. The higher level of economic freedom is associated with a higher level of banking efficiency as well as per capita GDP (Chortareas et al., 2012; Holmes et al., 2008). Higher efficiency also leads to higher customer satisfaction, as efficient banks are in a better position to offer quality and new services at competitive prices, resulting in higher profits and lower costs.

Freedom from corruption improves the quality of governance and transparency, and protects the interests of the shareholders, which in turn helps the banking sector to lower costs (Chortareas et al., 2012).

Table 2. Average Values of Bank Assets, Total Cost, Input Prices and Outputs by Country, 2003–2010 (US$, mill)

			Input Prices[1]			Outputs[1]	
Countries	Bank Assets	Total Cost	Labour	Physical Capital	Financial Capital	Loans	Other Earning Assets
Jordan	3.730	465.648	0.011	1.514	0.098	7,701.564	7,437.004
Bahrain	3.233	214.794	0.002	2.677	0.295	3,800.795	4,097.197
Oman	3.212	56.114	0.014	3.332	0.081	2,025.694	672.723
Qatar	3.654	192.217	0.007	5.850	0.076	4,307.434	2,361.619
Kuwait	0.849	268.811	0.009	1.700	0.089	6,949.900	3,947.080
Saudi Arabia	3.860	153.860	0.003	1.678	0.020	4,396.771	2,797.430
United Arab Emirates	3.915	329.583	0.009	2.098	0.030	8,205.271	3,956.949
All Countries	3.207	240.147	0.007	2.692	0.098	5,341.065	3,610.000

Source: Bankscope.

Note: [1]Total costs, input prices and outputs were deflated using domestic GDP deflators and were converted in international US dollar using PPP.

In countries where corruption levels are low, there is more equitable treatment and greater regulatory efficiency (Miles, Holmes, & Mary Anastasia, 2006). Corruption creates additional costs through distortions. Hence, a negative coefficient is expected for freedom from corruption because corruption erodes profits by introducing insecurity and uncertainty into economic relationships (Sufian & Majid, 2012). Labour mobility is the ability of individuals to work freely wherever they want (The Heritage Foundation, 2010). The imposition of restrictions on labour movement affects the liberty that labour has in a market, which finally leads to inefficient banking sector (Chortareas et al., 2012). Businesses must be able to contract freely for efficient experts across countries, thereby reducing bank costs. Therefore, labour movement between countries benefits the banking sector. Hence, a negative coefficient is expected for labour mobility on bank costs. Investment freedom implies a free and open investment environment that provides maximum entrepreneurial opportunities for higher economic activity, greater productivity and expanded job creation (The Heritage Foundation, 2010). Restrictions on cross-border investments could hamper and limit inflows and outflows of capital, thus, shrinking markets and reducing opportunities for growth. This would negatively affect the costs of the banking sectors as the major clients of the banks are the investors (Miles, Holmes, & Mary Anastasia, 2006). Higher bank costs are incurred from import barriers and from poor investments across countries (World Bank, 2010). Hence, a negative coefficient is expected for investment freedom on bank costs.

In terms of country risk, which is a measure of credit rating, debt in default, and economic performance, the higher value of country risk is associated with better positions and less risks (Euromoney, 2007; Saini & Bates, 1984). Credit ratings bring about changes in relative asset demands and bond prices that would affect bank performance, as banks have to incur extra interest charges when the ratings are low (Cantor & Packer, 1996; Reisen & Von Maltzan, 1999). Moreover, credit ratings adversely affect banks' performance due to the pervasive role of government debt in the financial system. The second factor in country risk is debt defaults, the failure to promptly pay interest or principal on the dates due. Default occurs when a debtor is unable to meet the legal obligation of debt repayment. When the lenders are unable to assess the extent of outstanding loans, it would affect bank performance (Reisen & Von Maltzan, 1999). Finally, the economic performance of a country worsens with the debt position of the country, firms and investors. For example, if a country has poor economic performance, it would

discourage investors, which in turn would have an impact on the banking sector (Iannotta et al., 2007). In conclusion, as there are very limited studies on the impact of country risks—that is, credit rating, debt in default and economic performance on bank costs—there are no expectations as to its effects (Cihak & Hesse, 2010). Hence, a negative coefficient is expected for country risk variables on bank costs.

As for macroeconomic conditions, we have included inflation, accessibility of banking and bank structure. Inflation is an important economic factor that also influences the macroeconomic conditions and financial system. There is a positive relationship between inflation and bank costs (Kasman & Yildirim, 2006). The higher inflation rate leads to depreciation of the national currency and increase in the prices of products (Shen et al., 2009). This would result in higher input prices in the banking production process (Shen et al., 2009). Hence, a positive coefficient is expected for inflation. As for bank accessibility, this article uses a measure of population density ratio of inhabitants per square kilometre (Abdul-Majid, Saal, & Battisti, 2010). A direct relationship between better bank accessibility and lower costs is expected because the retail distribution of banking services becomes less costly. Hence, a negative coefficient is expected for population density. Finally, for banking structure, the concentration ratio is used, which is the ratio of the sum of the assets of 5 of the largest banks. It measures the share of the industry's largest banks in terms of total industry assets. Banks in concentrated markets take advantage of market power, which allow costs to rise (Berger & Hannan, 1998). Hence, a positive coefficient is expected for concentration ratios.

Table 3 illustrates that for economic freedom variables, the corruption level is low in most countries, except Saudi Arabia, with an average value of 39. Labour mobility is high in Kuwait and Saudi Arabia, with average values of 82 and 80, respectively. Jordan has the highest level of investment freedom of 59 compared to the GCC countries. In contrast, Saudi Arabia has the lowest value of 35. In terms of country risks, the gap with the least risk for debt default, that is, between Jordan and the other GCC countries, is huge. Jordan has the highest risks, that is, 6.6 for debt in default, 3.01 for credit ratings and 8.1 for economic performance. However, most of the countries have almost similar risks for credit rating and economic performance. As for macroeconomic variables, inflation rate is above average in Qatar (6.4), United Arab Emirates (6.2) and Jordan (4.9). Large variations exist in accessibility of banking services, where Bahrain has the highest (1,214.156) and Qatar the lowest (11.648) in contrast to bank structure.

In conclusion, descriptive statistics suggest that differences in the environmental variable exist among the GCC countries due to government's role. There are substantial variations in economic freedom variables and country risk is low in all the GCC countries in contrast to Jordan. Inflation is high in most of the GCC countries and above average in Jordan. The variations in bank accessibility are large in contrast to bank structures. We have added a dummy variable to indicate if a bank is an Islamic bank as shown in Table 1 to control for potential impact of Islamic banking on bank costs. Given mixed findings in the literature, there are no assumptions with respect to the direction of the effects (Abdul-Majid, Saal, & Battisti, 2010; Al-Jarrah & Molyneux, 2010; El-Gamal & Inanoglu, 2005; Mokhtar et al., 2006).

Discussion

The estimated cost function parameters for the three models are reported in Table 4. All the models have economic freedom variables as well as macroeconomic conditions, bank accessibility and bank structure. Model 1 employs six control variables, namely, corruption freedom, labour mobility, investment freedom, inflation, population density and concentration ratio. Model 2 includes three country risk variables, that is, debt defaults, credit ratings and economic performance, to test the influence of country risk on bank costs. However, they are all insignificant, indicating no link between country risk and bank cost.

Table 3. Environmental Characteristics by Country, 2003–2010

	Economic Freedom[2]			Country Risk[3]			Macroeconomic Conditions	Banking Accessibility	Bank Structure
Countries	Corruption Freedom	Labour Freedom	Investment Freedom	Debt in Default[1]	Credit Rating[2]	Economic Performance[3]	Inflation	Population Density	Concentration Ratio
Jordan	50.125	74.336	59.375	6.665	3.016	8.183	4.923	63.380	0.901
Bahrain	59.750	55.750	54.375	18.518	6.003	9.375	2.511	1,214.156	0.660
Oman	60.375	76.813	53.125	16.423	5.815	9.375	3.900	8.210	0.843
Qatar	61.500	62.725	38.125	15.231	7.081	9.375	6.404	98.131	0.875
Kuwait	52.500	81.825	43.125	22.235	7.533	9.375	4.182	135.460	0.886
Saudi Arabia	39.375	80.162	35.625	11.315	6.577	9.375	3.535	11.648	0.668
United Arab Emirates	64.125	75.813	38.125	14.550	7.775	9.375	6.173	62.580	0.602
All Countries	55.392	72.394	45.982	14.991	6.257	9.204	4.478	253.335	0.776

Source: The Heritage foundation, Euromoney, IFS-World Bank and Bankscope.

Notes: [2]Indices range between 0 and 100 with the higher value representing the higher freedom. Hence, less corruption, higher labour mobility and less barriers on investors respectively.

[3]Ranges between 0 and 25 with the higher value representing less risk;

[b2,3]Range between 0 and 10 with the highier value representing less risk ([b2,3] : Credit Rating 2***; Economic Performance 3***).

Table 4. Stochastic Frontier Approach Estimates for Parameters of Cost Function for Jordan and the GCC Banks, 2003–2010

		Model 1		Model 2		Model 3	
Parameters	Coefficient	Estimated Value	Standard Error	Estimated Value	Standard Error	Estimated Value	Standard Error
φ	Constant|	1.614***	0.327	1.622***	0.390	1.625***	0.326
β_1	Y1	0.511***	0.041	0.515***	0.042	0.511***	0.041
β_2	Y2	0.491***	0.038	0.487***	0.039	0.495***	0.038
α_1	P1	0.386***	0.025	0.386***	0.025	0.390***	0.025
α_3	P3	0.411***	0.034	0.408***	0.034	0.409***	0.034
$\beta_{1,2}$	Y1Y2	–0.237***	0.031	–0.237***	0.031	–0.236***	0.031
$\beta_{1,1}$	Y1Y1	0.269***	0.039	0.270***	0.039	0.268***	0.039
$\beta_{2,2}$	Y2Y2	0.196***	0.030	0.195***	0.030	0.198***	0.030
$\alpha_{1,1}$	P1P1	0.012	0.014	0.012	0.014	0.013	0.022
$\theta_{1,1}$	P1Y1	–0.111***	0.022	–0.110***	0.022	–0.111***	0.020
$\theta_{1,2}$	P1Y2	0.033*	0.020	0.033	0.020	0.034*	0.008
$\alpha_{3,3}$	P3P3	–0.077***	0.020	–0.077***	0.020	–0.077***	0.020
$\theta_{3,1}$	P3Y1	0.004	0.023	0.004	0.023	0.004	0.023
$\theta_{3,2}$	P3Y2	0.104***	0.019	0.104***	0.019	0.103***	0.019
$\alpha_{1,3}$	P1P3	0.029**	0.013	0.029**	0.013	0.0294**	0.013
λ_1	*t*	– 0.016	0.014	–0.016	0.016	–0.019	0.014
λ_{11}	t2	0.047***	0.009	0.046***	0.010	0.048***	0.009
ψ_1	Y1t	–0.049***	0.011	–0.049***	0.011	–0.049***	0.011
ψ_2	Y2t	0.034***	0.009	0.035***	0.009	0.033***	0.009
δ_1	P1t	0.008	0.008	0.008	0.008	0.008	0.008
δ_3	P3t	–0.003	0.007	–0.004	0.008	–0.004	0.007
	Economic freedom						
ξ_1	Corruption freedom	–0. 017***	0.002	–0.017***	0.002	–0.018***	0.002
ξ_2	Labour freedom	–0.013***	0.002	–0.013***	0.002	–0.014***	0.002
ξ_3	Investment freedom	–0.004**	0.001	–0.005**	0.002	–0.004**	0.001
	Country risk						
ξ_4	Debt in default			0.005	0.017		
ξ_5	Credit ratings			–0.009	0.018		
ξ_6	Economic performance			0.003	0.002		
ξ_7	Inflation	0.013***	0.002	0.013***	0.002	0.013***	0.002
ξ_8	Population density	–0.001**	0.494	–0.004**	0.003	–0.001**	0.004
ξ_9	Concentration ratio	0.772***	0.241	0.778***	0.242	0.809***	0.242
ξ_{10}	Islamic bank					0.005	0.003
Lambda		0.574***	0.114	0.617***	0.111	0.554***	0.116
Sigma		0.451***	0.0006	0.456***	0.006	0.448***	0.006
Log Likelihood		–327.813		–327.669		–326.741	

Source: Authors' own findings and calculations.

Notes: Y1, Y2, W1, W3 and *t* refer to loans, other earning assets, price of labour, price of financial capital and year.
*, ** and *** are significant at the 10 per cent, 5 per cent and 1 per cent level, respectively.

Finally, Model 3 tests for the similarity of Islamic bank technology with other banks. However, the results show insignificant value, indicating that Islamic banks are similar to conventional banks in terms of technology. Based on the above, the following discussion is limited to Model 1. The significant value of λ that equals to 0.574 indicates that the standard deviation of the estimated inefficiency is statistically different from zero due to inefficiency.

Model 1 shows that freedom from corruption (ξ) is negative as expected, denoting that free from corruption would lower bank costs. Countries with high corruption levels, such as Saudi Arabia, Jordan and Kuwait, have to reduce corruption in order to reduce bank costs (Sufian & Zulkhibri, 2015). The coefficient of labour mobility (ξ_2) is negative (–0.013), which shows that ease of mobility of labour among union countries reduce bank costs by facilitating the hiring of the right people. The coefficient of investment freedom (ξ_3) is negative and significant (–0.004), which indicates that a liberal investment climate and an easier access to financial markets greatly diminish bank costs. Hence, the banking sectors in countries with low corruption levels, freedom of labour movement and liberal investment environment, which represent economic freedom, perform better in terms of reduced costs (Soo-Wah Low, 2010; Sufian & Majid, 2012). In sum, union requires cooperation among countries to provide a corruption free as well as liberal investment environment with high labour mobility.

The coefficient of inflation is positive and significant, which indicates that the banks in countries with higher inflation levels have higher potential costs. As expected, the negative sign of population density suggests that the retail distribution of banking services is less costly. A direct relationship between better bank accessibility and lower costs is expected because the retail distribution of banking services becomes less costly (Abdul-Majid et al., 2010). Finally, an increase in concentration of banks is associated with a 77.2 per cent increase in costs. Higher concentration ratio is a result of market power, which leads to inefficiency (Dietsch & Lozano-Vivas, 2000; Leibenstein, 1966). The findings imply that low inflation, high population density and low concentrations ratios reduce bank costs for the potential GCC union.

Tables 5 illustrates the relative difference in the estimated mean of inefficiency scores and *t*-test for the sample banks. Statistics above the diagonal indicate the differences in the estimated efficiency score of each country relative to the country in the first column. Below the diagonal is the corresponding *t*-ratio for a test of the significance of the difference in the estimated efficiency score of each country relative to the country identified in the first row in the same column. For example, the first row demonstrates that the estimated efficiency score of Jordanian banks at 0.308 is higher than for United Arab Emirates banks, thereby suggesting that United Arab Emirates banks are on an average less efficient.

Though some countries are equally comparable in terms of bank cost efficiency, others are significantly different from each other. The Saudi Arabian banks are significantly different from most of the banks in the other potential union member countries. The low performing union members have to catch up with the rest in order to achieve faster the objective of having similar level of bank performance. Table 6 shows the average rate of bank efficiencies in each country. The measure of efficiency takes a maximum value of one, which corresponds to the most efficient bank in the sample. The countries with the highest average level of bank efficiency are Bahrain, Jordan, United Arab Emirates, Qatar, Kuwait, Saudi Arabia and Oman, with average measures in the range of 0.81–0.85.

Efficiency levels in Oman and Saudi Arabia are the same at 0.81, less than the average. The results further indicate that efficiency levels declined over time in Oman from 0.82 to 0.79, while it remained stable in Jordan, Qatar and Kuwait. In contrast, bank efficiency levels in Saudi Arabia and the United Arab Emirates increased during the period. The efficiency scores further show that the countries are competitive in terms of cost efficiency as the scores are almost the same. However, Bahrain and Jordan appear to be relatively efficient. The Omani banks' low cost efficiency coupled with its declining trend negatively affects the formation of the potential union of the countries.

Table 5. Relative Difference in Country's Estimated Mean of Inefficiency Scores and *t*-test

	Jordan	Bahrain	Oman	Qatar	Kuwait	Saudi Arabia	UAE
Jordan		–0.006	0.028	0.003	0.008	0.025	0.308
		(–0.742)	(3.218)***	(0.349)	(0.908)	(3.441)***	(3.441)***
Bahrain			0.034	0.008	0.014	0.031	0.008
			(0.002)	(5.021***)	(1.534)	(1.914)*	(6.344)***
Oman				–0.026	–0.020	–0.003	–0.026
				(1.371)	(–3.681)***	(–2.440)**	(–0.497)
Qatar					0.005	0.022	–0.002
					(–3.518)***	(0.736)	(4.514)***
Kuwait						0.017	–0.006
						(–0.036)	(2.514)***
Saudi Arabia							–0.023
							(–3.94)***
UAE							

Source: Authors' own findings and calculations.
Note: *, ** and *** are significant at 10 per cent, 5 per cent and 1 per cent, respectively.

Table 6. Average Efficiency Scores by Country, 2003–2010

Country	2003	2004	2005	2006	2007	2008	2009	2010	All Year
Jordan	0.868	0.860	0.852	0.835	0.822	0.820	0.836	0.860	0.844
Bahrain	0.839	na	0.860	0.852	0.844	0.850	0.863	0.841	0.850
Oman	0.827	na	0.824	0.820	0.820	0.831	0.798	0.790	0.815
Qatar	0.836	0.822	0.854	0.856	0.847	0.845	0.839	0.832	0.841
Kuwait	0.857	0.838	0.840	0.813	0.820	0.822	0.842	0.858	0.836
Saudi Arabia	0.806	0.806	0.817	0.821	0.815	0.830	0.830	0.827	0.819
United Arab Emirates	0.818	0.827	0.855	0.852	0.849	0.837	0.851	0.844	0.841
All Countries	0.836	0.831	0.843	0.836	0.831	0.834	0.837	0.836	0.835

Source: Authors' own findings and calculations.
Note: na: not available.

Conclusion

This article aims to examine the impact of economic freedom and country risks on the costs of potential GCC union for the period 2003–2010. In estimating a common frontier, the current study employs SFA to control for country-specific variables—that is, economic freedom, country risk, macroeconomic conditions, bank accessibility and bank structure—for an unbalanced panel of 90 Jordanian and the GCC countries' banks, which include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. This article further estimates bank efficiency levels in the potential GCC union member countries to shed some light on the capability and capacity of the banks to compete and survive within the future GCC union. Low inflation, high population density and low concentration ratio reduce banking costs. The efficiency score further shows that Bahraini banks are the most efficient in the GCC countries while Omani banks, the least efficient. In contrast, the newly invited country, Jordan, is expected to have similar level of bank cost efficiency as the majority of the potential union members. In order for the GCC members to have a successful union and achieve the objectives faster, it is important to have a similar level of economic performance, in particular in the banking sector.

Managerial Implications

The results indicate that economic freedom represented by freedom from corruption, labour mobility and investment freedom significantly helps the potential GCC union in reducing potential bank costs. Enhancing economic freedom is crucial for the region to attract more investments and create a viable banking system. In particular, freedom from corruption improves the quality of governance and transparency and protects the interests of shareholders, as well as assists the banking sector to lower costs. Further, investment freedom and free labour movement between countries benefit the banking sector.

Limitations/Future Research

The article suggests that future research should test for other factors that might have an impact on bank costs of union members such as banking regulations, privatization, liberalization of state-owned banks, unemployment rate and economic crises.

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Note

1. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates.

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