Economic Freedom, Country Risk and Banking Efficiency: The Case of Potential Gulf Countries Union

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ABSTRACT

Economic freedom is vital for the development of banking sector which categories of prioritised by developing nations in promoting efficient banking system within an increasingly globalised economy. As such, the purpose of this paper to estimate the cost efficiency of Jordanian banking sector relative to GCC countries over a period of 2003-2010 uses stochastic frontier analysis focusing on economic freedom, country risk and banks specific variable. This study finds that, Jordanian banking sectors is efficient compared to GCC countries. The findings suggest that greater economic freedom the higher the benefits for banks in terms of cost advantages for banks operating in Jordan and GCC. Interestingly, the impact of investment freedom is negative implying that higher investment increases banks' cost, providing support to the benefits of labour freedom and free from corruption while the insignificant country risk variables suggesting that, no link between country risk and cost efficiency.

Keywords: Banking cost efficiency; SFA, economic freedom, country risk, Jordan, GCC,

INTRODUCTION

Economic freedom is vital for the development of banking sector which categories of prioritised by developing nations in promoting efficient banking system within an increasingly globalised economy. Theoretically argued, economic freedom motivates environment that leads to the establishment of efficient financial system, innovative ideas and productive capacities. Nevertheless. Understanding of the links between economic freedom and financial activities remains vague (Terpilih 2010).

Economists have long recognised that minimum government intervention in economic activities will lead to economic growth. There is an extensive literature that highlight the importance of variuos institutional and policy variables in promoting economic growth, (Henrekson et al. 1997) (Knack&Keefer 1995) and (Barro 1996). More specifically, this growth literature points out that stable and predictable rule of law, good enforcment of contracts, protection of individual and investment freeom, labour movement and prperity rights, sound money, etc are the keys to economic progress (Terpilih 2010).

Gulf Cooperation Council (GCC), which is a co-operation in status, comprising of six countries namely; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates countries among all Arab countries in the Middle East region has started to practise economic freedom on a narrow scale since they started their cooperation in 1981. Therefore, Jordan started the program of liberalizing in the banking sectors and privatization since early 1990s to meet the same level of economic freedom with neighbouring countries in order to increase efficiency and avoid any financial crises in the future and promote economic freedom (Al-Jarrah&Molyneux 2010). Economic theories suggest that economic freedom tend to affects incentives, productive efforts, and the effectiveness of resource use. Economists and economic historians have argued that the central ingredients for economic progress are the freedom to choose and supply resources, competition in business, free trade with others, and secure property rights (North&Thomas 1976). In addition, the institutional problems, such as lack of investment and financial freedom and weak systems for protecting property rights and preventing corruptions continue to degrade the region's overall economic freedom and economic potential (North&Thomas 1976).

In order to achieve a better economic performance and economic integration in GCC countries and to face the challenges occurred in the global markets. GCC has sought to shift from the phase of cooperation to the union stage inviting Jordan to join the Gulf union as a new member. The importance

of a union is free of tariffs and quantitative restrictions. This implies that the impact of the accession of these countries to the Union on trade will be determined by the removal of contingent protection measures, such as, anti-dumping duties or undertakings, but more importantly by their access to the single market, mobility of labour (Bonin et al. 1998), (Koutsomanoli-Filippaki et al. 2009). The full incorporation of the GCC into the single market will provide for the complete freedom of movement of goods produced in the GCC throughout all of the existing 6 member countries and the new member of Jordan. This will entail the removal of customs frontiers, and the associated costs of delays and documentation currently incurred when goods from the GCC cross the border, equal access to government procurement contracts in GCC countries, and the removal of barriers to trade imposed by differing technical regulations in the GCC and in Jordan country (Brenton et al. 2001).

As part of its efforts at regional integration, the GCC has adopted a regime of free movement extended to member-states' citizens. The GCC documents demonstrate a fairly liberal interpretation of free movement rights, allowing citizens to move across the six states' borders for a variety of purposes, including residence and employment, and to gain access to a host of social security benefits in any of the member-states. This regime has so far had no spillover effect to improve mobility conditions for non-citizens (Babar 2011). Up to now, there are still unfinished steps required for the achievement of economic integration and to remove all barriers to investment freedom and labour movement (Kufuor 2010)

In the area of country risk, which is associated with investing in a foreign country? These risks include political risk, debt in default, economic performance and credit rating, which is the risk of capital being locked up or frozen by government action. Country risk varies from one country to the next. Countries have high risk to discourage much foreign investment. Moreover, on the fundamental premise that growing imbalances in economic, social, or political factors increase the risk of a shortfall in the expected return on an investment. Imbalances in a specific risk factor map to one or more risk categories. Mapping all the factors at the appropriate level of influence creates an overall assessment of investment risk. The mapping structure differs for each type of investment, so an imbalance in a given factor produces different risks for different investments (Meldrum 2000).

From this perspective, this paper propose to develop a general framework to assess the preparedness of the GCC countries for a union and the main objective of this paper is to investigate the effect of economic freedom and country risk on bank efficiency of potential Gulf union and to extend the earlier works on the efficiency of the banking sector in a developing economy and establish for the first time empirical evidence on the impact of economic freedom for GCC and Jordan countries. The paper also investigates to what extent the performance of banks is influenced by internal factors (i.e. bank specific characteristics) and to what extent by external factors (i.e. macroeconomic and financial market conditions). Although empirical evidence which examines the efficiency of banking sectors are abundant in the literature, to the best of our knowledge, virtually very few has been published to address the impact of economic freedom on the banking sector's performance and nothing has been published to address the impact of country risk on banking sector's. In light of the knowledge gap, this study provides for the first time empirical evidence of the impact of economic freedom, country risk on banking sector's efficiency in Jordan and GCC countries.

Overall, the results indicate that there is a link between economic freedom and bank cost efficiency. In particular, the higher the degree of an economics freedom, the better the banks' cost is in terms cost advantages and overall efficiency. The evidence also suggests that any beneficial effects of investment freedom, labour freedom and free from corruption on bank efficiency tend to be more pronounced in countries with freer systems in which governments formulate and implement sound policies and higher quality governance.

The present study should interest not only the managers of the banks, but numerous stakeholders such as the central banks, bankers associations, governments, and other financial authorities. As in virtually all-emerging markets, banks are the dominant financial institutions in GCC. Furthermore, explicit knowledge of the factors that influences the banking sector's performance would be useful for policymaking and research purposes. This paper is structured as follows. The rest of the paper is organised as follows. Section 2 provides a brief literature review focused on the relative performance of banks across countries, and is followed by a description of the methodology in Sect. 3. Data and the empirical specification are discussed in Sect. 4. Section 5 reports the results which are comprised of the cost function. Finally, Sect. 6 offers some conclusions.

LITERATURE REVIEW

On the perspective of economic freedom, economic theories suggest that economic freedom tend to affect incentives, productive effort, and the effectiveness of resource use. Economists and economic historians have argued that since the time of Adam Smith, central ingredients for economic progress are the freedom to choose and supply resources, competition in business, trade with others, and secure property rights (North&Thomas 1976). As defined by (Berggren 2003) economic freedom as "the degree to which an economy is a market economy that is, the degree to which it entails the possibility of entering into voluntary contracts within the framework of a stable and predictable rule of law that upholds contracts and protects private property, with a limited degree of interventionism in the form of government ownership, regulations, and taxes".

On the area of country risk, when business transactions occur across international borders, they carry additional risks not present in domestic transactions. These additional risks, called country risks, typically include risks arising from a variety of national differences in economic structures, policies, socio-political institutions, geography, and currencies. Country risk analysis attempts to identify the potential for these risks to decrease the expected return of a cross-border investment (Meldrum 2000).

The empirical literature that link economic freedom and banking performance is relatively recent and only a few studies were available in the literatures. (Sufian&Habibullah 2010; Sufian&Majid 2012), (Chortareas et al. 2012) and (Terpilih 2010). However, when government coercion rises beyond the minimal level, it becomes corrosive to freedom and the first freedom affected is economic freedom. Greater direct control by government is a threat to the functions that the banking system plays because excessive government interference can introduce inefficiencies and outright corruption (William&Kane 2008). Heavy bank regulation reduces opportunities and restricts economic freedom, (Beach&Kane 2008) suggest that the marketplace should be the primary source of protection by performing the role as independent auditors and information services in a free banking environment. Such oversight is distinguished from burdensome or intrusive government regulation or government ownership of banks, both of which interfere with market provision of financial services to consumers. In this vein, (Porta et al. 1997) among others argue that the government owned banks are typically vehicles for political patronage, fail to provide a useful intermediation role, and consequently worsen the prospects for competitive market development. The earlier studies by among others (Acemoglu 2008), (Giavazzi&Tabellini 2005), (Beck et al. 2003), also suggest that the rate of success of an economy critically depends on a good government. Therefore, it is such government intervention in the market, not the market itself that limits economic freedom.

These important insights have spurred further exploration into the various channels in which economic freedom influences economic growth (Heckelman&Knack 2009), (Altman 2008),; (Powell 2002); (Adkins et al. 2002); (De Haan&Sturm 2000); (Heckelman&Stroup 2000); (Reedom&Rowth 2000); (De Haan&Siermann 1998). Most of these studies conclude that there exists a positive impact of various measures of economic freedom on economic growth. Noticeably absent in the literature is an examination of the links between economic freedom and bank performance. The limited research in this area is somewhat surprising given the importance of bank lending in promoting economic development (Chinn&Ito 2007); (Beck et al. 2000); (Levine 2005); (Rajan&Zingales 2003); (Levine&Zervos 1998), and the impact that economic freedom is likely to have on the banking sector.

Additionally, on the economic freedom indexes, extensive empirical studies has been produced (Chortareas et al. 2012); (Justesen 2008). While (Sala-I-Martin et al. 2007), consider the effects of economic freedom on inequality, (Xu&Li 2008), and consider income convergence aggregate productive efficiency. For labour markets (Feldmann 2009) and migration flows (Ashby et al. 2010). Indexes of economic freedom have also been used as explanatory variables in financial economics (Roychoudhury&Lawson 2010); (Jones&Stroup 2010) characterizing the effects of the recent global recession (Giannone et al. 2010). The empirical literature taking into consideration the effects of the economic freedom indexes on various aspects of the economy is extensive but a common thread that emerges from the evidence is that economies enjoying a high degree of economic freedom can, on balance, achieve better economic outcomes. In the financial economics and banking literature the indexes of economic freedom have been used as control variables in various contexts (Roychoudhury&Lawson 2010); (Jones&Stroup 2010).

A number of studies have already included indicators that examine the degree of financial liberalization. (La Porta et al. 2000) does not directly account for banking sector's efficiency but include traditional indicators of common law, creditor rights, rule of law and find that countries with more robust investor protection (where agency costs are restricted by the law) have larger capital markets. The "rule of law" has been also used to capture the effects of severe enforcement practices for

any given level of creditors or shareholders" protection. In contrast, (Fries&Taci 2005) consider the role of banking sector reform and liberalization in the transition countries to capture the effect on bank cost efficiency. The key explanatory variable of interest is an index of banking sector reform published by the European Bank for Reconstruction and Development (EBRD) Transition Reports. Their results show that progress in banking reform is significantly associated with a decrease in banks" costs.

An important issue for bank manager and policy makers is the relationship between country risk and inefficiency. The hypothesis of bad management accepted to precede the future risk and insolvency. (Berger&Humphrey 1997), (Jonathan 2004), (Podpiera&Weill 2008), and (Fiordelisi et al. 2010) stated that lax supervision, high operating cost, low quality loans and profit are inefficiency factors that precede risks. Moreover, shocks and risks direct the attention of managers with strategies that increase costs. Country risk originates in supervisory and internal environment, whereas country risks are beyond the control of banks. Managers that operate in country risk need to take precautionary strategies that prevent contagious effects. Economic performance, debt in default and credit rating requires more attention. Government stability, regulation, non-corruption, and issues-related to finance are some aspects of a politically stable country. Previous studies did not take into account these aspects in efficiency measurement.

METHODOLOGY

Cost efficiency is determined by how close a bank's costs lie to the efficient cost frontier for a given technology. An efficiency study estimates a common frontier to compare the performance of banks against the efficient frontier. Farrell (1957) developed the technical inefficiency as the maximum possible radial expansion of an output from given inputs. Moreover, Aigner et al. (1977), Meeusen and Broeck (1977) suggested the parametric Stochastic frontier analysis (SFA). SFA has been widely used by a considerable number of studies in evaluating banking efficiency (Berger&Mester 1997); (Kumbhakar et al. 2001); (Bikker&Bos 2005); and specifically both cost and profit efficiency; (Bos&Kool 2006), and (Kwan 2006); (Kraft&Tırtıroğlu 1998) and (Yildirim&Philippatos 2007). Significant merits of SFA are that it covers both the random noises, *e.g.* due to well-known measurement problems, and systematic differences between banks in the sample due to heterogeneity across banks (Kumbhakar et al. 2001). These features allow a relative comparison of markedly different banks, for example large commercial versus Islamic, small banks versus large banks, thus explicitly allowing for both environmental factors and random errors.

The two-sided statistical noise has a normal distribution with zero mean and σ_v^2 variance $\left(IIDN(0, \sigma_v^2)\right)$. With regard to the inefficiency component of the error term, Aigner et al (1977) assumed a half-normal distribution that is truncated above at zero $\left(IIDN^+(0, \sigma_u^2)\right)$. However, (Stevenson 1980) used a truncated normal distribution that is truncated above at μ $\left(IIDN^+(\mu, \sigma_u^2)\right)$. In another study, Meeusen and Broeck (1977) employed an exponential distribution to separate the two components. Finally, (Greene 1990) developed a two-parameter gamma distribution $\left(G(\Theta, P)\right)$ to separate inefficiency from statistical noise.

This study uses a half-normal distribution to generate bank cost efficiencies. A common frontier in Jordan and GCC region demonstrates the efficient levels of outputs for given input prices. In order to estimate the frontier, cost functions adopt multi-inputs and multi-outputs using a cost minimizing assumption (Fries&Taci 2005), (Yildirim&Philippatos 2007), (Allen&Rai 1996), (Ferrier&Lovell 1990); (Mester 1993); (Kwan 2006); (Dietsch&Lozano-Vivas 2000); (Isik&Hassan 2002); (Abdul-Majid et al. 2011); (Carvallo&Kasman 2005) and (Mokhtar et al. 2006).

The importance of focusing on cost efficiency of banks as an indication of progress. First, greater relative cost efficiency is associated with the changes in incentives and constraints in banking associated with structural and institutional reforms and with the more efficient provision of public services by the state, such as the economic freedom. Second, efficiency gains reduce the resources associated with operation of payments systems and with intermediation of savings into investments. Greater cost efficiency in banking contributes directly to overall economic development. Third, cost efficiency may be associated with other dimensions of bank performance that contribute to overall development, such as the making of more productive loans, but that cannot be directly measured with available bank-level data. This association may exist if factors that contribute to greater cost efficiency also promote improvement in other aspects of banking performance (Fries&Taci 2005). The general form of the cost function is given as follows:

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

The identification of K-inputs and M-outputs follows the intermediation approach which is suggested by Sealey and Lindley's (1977). As stated by (Coelli et al. 1999), (Iqbal et al. 2006) the main role of banks is to operate as intermediaries of services between borrowers and lenders. These services are related either directly or indirectly to the financial assets and liabilities such as the services associated with loans and deposits. Furthermore, (Iqbal et al. 2006) stated that to maximize profits needs minimizing the total cost not just the production one, it shows that the intermediation approach is 'superior' for evaluating the importance of frontier efficiency for the profitability of financial institutions. While, (Heffernan 2005) argue that most of the studies on bank efficiency applied the intermediation approach because of the data problems associated with it compared to the production approach. Among others, studies utilized this approach in bank efficiency studies include (Miller&Noulas 1996), (Mester 1996), (Deyoung 1998), (Casu&Molyneux 2003) and (Abdul-Majid et al. 2010; Abdul-Majid et al. 2011).

Hence, banks use the price of labor, capital and financial capital as inputs, $(w_{1nt}, w_{2nt}, \ldots, w_{Knt})$, to produce loans and other earning assets as outputs, $(y_{1nt}, y_{2nt}, \ldots, y_{Mnt})$. In a panel study, country-specific variables allow us to control environmental differences between countries. $Z_{n,t}$ is a vector of country-specific control variables $(z_{1,nt}, z_{2,nt}, \ldots, z_{h,nt})$. Consistent with most empirical studies, a translog specification represents the functional form of the model:

$$\ln \check{C}_{n,t} = \varphi + \sum_{k=1}^{k-1} \alpha_k \; lnP_{k,n,t} + 0.5 \sum_{k=1}^{k-1} \sum_{s=1}^{k-1} \alpha_{k,s} \; lnP_{k,n,t} \; lnP_{s,n,t} + \sum_{m=1}^{M} \beta_m \; lnY_{m,n,t} +$$

$$0.5 \sum_{m=1}^{M} \sum_{j=1}^{M} \beta_{m,j} \; lnY_{m,n,t} \; lnY_{j,n,t} + \sum_{K=1}^{K-1} \sum_{m=1}^{M} \theta_{k,m} \; lnP_{k,n,t} \; lnY_{m,n,t} + \sum_{k=1}^{K-1} \delta_K \; lnP_{k,n,t} \; t +$$

$$\sum_{m=1}^{M} \psi_m \; lnY_{m,n,t} \; t + \lambda_1 \, t + 0.5 \lambda_{11} \, t^2 + \sum_{h=1}^{H} \xi_h \; Z_{h,n,t} + v_{n,t} + u_{n,t}$$

(2)

Where, $P_{k,n,t} = W_{k,n,t} / W_{k,n,t}$ and $\check{C}_{n,t} = C_{n,t} / W_{k,n,t}$

$k = 1, \ldots, k \; and \; s = 1, \ldots, k$ are indices for input prices; $m = 1, \ldots M \; and \; j = 1, \ldots, M$ are indices for output prices; $h = 1, \ldots H$ is an index for environmental variables. $\varphi, \alpha_k, \alpha_{k,s}, \beta_m, \beta_{m,j}, \theta_{k,m}, \delta_K, \psi_m, \lambda_1, \lambda_{11}, \xi_h$ are unknown parameters; $CE_{n,t} = \exp(u_{n,t})$ represents cost efficiencies; and *t* represents a time trend and accounts for technology changes over time. Finally, $\alpha_{ks} = \alpha_{s,k}$ and $\beta_{mj} = \beta_{j,m}$ are symmetry constraints to the second order parameters (Battese&Coelli 1995; Coelli et al. 2005; Cuesta&Orea 2002; Feng&Serletis 2010; Jiang et al. 2009; Michaelides et al. 2010; O'donnell&Coelli 2005).

The cost function is linearly homogeneous in input prices and cost. Moreover, the second-order parameters are symmetric (Altunbaş et al. 2001). Therefore, the following restrictions apply to the parameters of the cost function:

$$\alpha_{ij} = \alpha_{ji}, \quad for \; all \; i, j$$
$$\beta_{km} = \beta_{km}, \quad for \; all \; k, m$$
$$\sum_{j} \alpha_j = 1 \quad \sum_{j} \alpha_{j1} = 0, \; for \; all \; j \qquad \sum_{k} \delta_{ki} = 0, \quad for \; all \; k \qquad (3)$$
$$P_{k,n,t} = W_{k,n,t} / W_{k,n,t} \; and \; \check{C}_{n,t} = C_{n,t} / W_{k,n,t}$$

THE DATA AND THE EMPIRICAL SPECIFICATIONS

The data used to estimate the cost function consist of 90 commercial banks from Jordan and GCC countries, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates over the period 2003 to 2010. The inputs and outputs were collected from Bankscope (Bureau Van Dijk) database, giving an unbalanced panel of 610 annual observations. The data are deflated by Gross Domestic Product (GDP) deflators in constant 2000 prices in Local Currency Units (LCU) and are expressed in the US Dollar (USD). The conversion rates were drawn from the World Bank's World

Development Indicators (WDI), and GDP deflators were provided by the International Monetary Fund (IMF). Table 1 shows the distribution of 90 conventional and Islamic banks.

The selection of output and input variables follows the existing literature (Allen&Rai 1996); (Casu&Girardone 2002), (Mester 1996) and (Abdul-Majid et al. 2011) are normalized around their means and the values. Total costs (C) are defined as operating and financial costs and are calculated as the sum of labour expenses, physical capital expenses, and either income paid to depositors for Islamic banks or interest expense for conventional banks (Abdul-Majid et al. 2011). Two outputs and three inputs are used in this study; the outputs are total loans (Y1) and other earning assets (Y2). While the inputs are price of labour (W1) which is personal expense over total assets, price of physical capital (W2) is non-interest expense over fixed assets and price financial capital (W3) is the interest expense over the total deposit.

However, most of the recent empirical studies of banking efficiency are based on the intermediation approach. The intermediation approach was suggested by (Sealey&Lindley 1977). It views bank as an intermediator of financial services and assumes that banks collect funds (deposits and purchased funds with the assistance of labour and capital) and transform these into loans and other assets. The deposits are treated as inputs along with capital and labour and the volumes of earning assets are defined as measures of output. The intermediation approach may be more appropriate for evaluating entire financial institutions because this approach is inclusive of interest and funding expenses, Moreover, the intermediation approach may be superior for evaluating the importance of frontier efficiency for the profitability of financial institutions, since the minimisation of total costs, and not just production costs, is needed to maximise profits (Iqbal et al. 2006).

Table 1 describes the sample distribution of banks by type of bank for each country under study. The selection of output and input variables follows the intermediation approach which has been widely employed in conventional bank studies (Maudos et al. 2002); (Abdul-Majid et al. 2011) (Carbo et al. 2002), Islamic bank studies (Brown&Skully 2003); (Hassan 2003); (Yudistira 2004) for Islamic and conventional bank studies (Alshammari 2003) and (Al-Jarrah&Molyneux 2010). The intermediation approach focuses on a bank's role in intermediating savers and investors of funds.

Table 2 shows set of variables included in order to estimate the effect of these variables on efficiency in the banking sectors across country. We retrieve the economic freedom index from the 2010 Index of Economic Freedom report maintained by the Heritage Foundation (www.heritage.org/index), while country risk variables are collected from Euromoney database www.euromoney.com. The macroeconomic variables are retrieved from IMF Financial Statistics (IFS) database.

All economic freedom indices can be used as a significant policy tool in enhancing the efficiency of the banking institutions. Where all freedom indices have 0 to 100 scales, where 100 represents maximum freedom. A score of 100 signifies an economic environment, or set of policies that is most conducive to economic freedom. The index uses 10 specific freedom namely, Business freedom, Trade freedom, Fiscal freedom, Government spending, Monetary freedom, Investment freedom, Financial freedom, Property rights, labor freedom, and Freedom from corruption. Overall, one can argue that economic freedom can be used as a significant policy tool in enhancing the efficiency of the banking institutions. More banking freedom is associated with higher efficiency scores. Moreover, banking freedom is associated with higher efficiency scores. (Holmes et al. 2008) points out that a higher level of economic freedom is associated with a higher level of per capita GDP. Hence, it is expected a negative coefficients for freedom-related variables.

This study includes three economic freedom variables which are consistent for transition countries namely, investment freedom, labour freedom and corruption freedom. The investment freedom index is a free and open investment environment provides maximum entrepreneurial opportunities and incentives for expanded economic activity, greater productivity, and job creation, Labour freedom index is the ability of individuals to work as much as they want and wherever they want is a key component of economic freedom. By the same token, the ability of businesses to contract freely for labour and dismiss redundant workers when they are no longer needed is a vital mechanism for enhancing productivity and sustaining overall economic growth. Finally, Corruption freedom where, corruption is defined as dishonesty or decay, in the context of governance, it can be defined as the failure of integrity in the system, a distortion by which individuals are able to gain personally at the expense of the whole. Freedom from corruption is expected to promote equitable treatment and greater regulatory efficiency (Miles et al. 2006).

Additionally, Table 2 represents the country risk variables index which is a weighting to seven categories, these categories are political risk, economic performance, debt indicators, and debt in default or rescheduled, credit ratings, access to bank finance/capital markets and discount on forfaiting.

The higher value of the index is better position and less risk. Hence, it is expected a negative coefficients for country risk variables on cost efficiency (Saini&Bates 1984).

This study includes three country risk variables which may have an impact on the efficiency in the banking sectors i.e. credit ratings, debt in default and economic performance. The credit ratings and debt in default indices have 0 to 10 scales, where 10 represent less risk. The economic performance which has 0 to 25 scales, where 25 represent high performance and less risk. The definition of credit ratings plays a key role in the financial system, but the determinants of their quality are poorly understood. This paper focuses on the information content of bank credit ratings, which affect the costs. In light of the shortcomings in the current rating process, public policy should encourage alternative sources of credit rating information. A debt in default may also impose direct costs of the economy of the defaulting country. For example, if default damages the domestic. Financial system by inducing a domestic banking crisis, domestic output will fall. Another mechanism through which the domestic economy may be affected by a default is through its effects on international trade. The issue of economic performance been widely debated in the literature for the last ten to fifteen years. One view is that improved environmental performance mainly causes extra costs for the firm and thus reduces profitability (Schaltegger&Synnestvedt 2002). However, also the opposite has been argued for improved environmental performance would induce cost savings and increase sales and thus improve economic performance. Theoretical and empirical researches have provided arguments for both positions and have not been conclusive so far (Schaltegger&Synnestvedt 2002).

The benefits of such an environment show not only to the individual companies that take the entrepreneurial risk in expectation of greater return, but also to society as a whole. An effective investment framework will be characterized by transparency and equity, supporting all types of firms rather than just large or strategically important companies, and will encourage rather than discourage innovation and competition (Miles et al. 2006).

Additionally, market structure variables are included in this study such as concentration ratio; higher concentration ratio may associate with either higher or lower costs. If higher concentration ratio is a result of market power, it may expect costs go in the same direction. Hence, it is expected a positive coefficients. However, if higher concentration ratio result from the superior management, one may expect a negative sign (Dietsch&Lozano-Vivas 2000). Finally, population density and inflation rate, population density is measured by the ratio of inhabitants per square kilometre, and it is expected that with high population density, the retail distribution of banking services becomes less costly. Inflation is the (end of year) change in consumer price index at time *t*. Higher Inflation increases costs and reduces profits, and thus inflation has a statistically significant and positive impact on cost and profit inefficiency (Kasman&Yildirim 2006). Hence, the expected a negative sign for population density, while a positive sign for inflation.

Table 3 presents the average values of bank assets, total bank total cost, bank outputs and inputs, expressed in international dollar. The table also highlights the substantial variation in banks cost by country. Thus, for example Jordan banks are, on average, the largest banks in the sample, while Oman banks are quite small. Within most countries in this study, the sample suggests Oman Qatar and Saudi Arabia tend to be small in total cost, and thus have smaller volumes of loans, this is not the case in United Arab Emirates is considerably larger than other GCC banks. Moreover, other earning asset is larger in Jordan as compared to GCC countries.

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EMPIRICAL RESULTS

The cost function estimates

Table 4 demonstrates the SFA estimates for parameters of the cost function for banks of 6 GCC countries and Jordan by three models. The purpose of applying three models is to differentiate between the control variables used and its effect on cost efficiency and for robustness purposes. The first model we include two country specific variables i.e. inflation and population density, and bank structure variable i.e. concentration ratio with three economic freedom variables i.e. investment freedom, labour freedom and corruption from freedom. While the second model we add the dummy variables for Islamic banks as Islamic and conventional banks are of no match in term of operational deepening and capital size. The third model used other set of control variables related to country risk i.e. economic performance, debt in default and credit rating.

The similarity of the results in the three models report significant positive coefficients for inputs and outputs, implying that higher bank inputs and outputs lead to higher costs. For example 1 per cent increase in financial capital prices leads to 0.411 per cent increase in costs, because banks should pay higher interests on deposits. Although, technology has improved in the sample countries, it is not significant enough to reduce costs, and the coefficient of T is negative insignificant (-0.016). Therefore, banks still have potential capacity to improve efficiencies by investing on technologies which reduce costs.

To allow for the effect of country characteristics on bank's underlying technology, we also include country level variables in the estimation of the stochastic frontier, which may be associated with the variations of inefficiency measures across banks and may affect managerial incentives and decisions. In other words, by introducing country-specific variables in the estimated cost frontier, we are able to attribute differences in banking sectors across countries to the characteristics of the operating environment that are beyond the control of bank managers, thus effectively conditioning the frontier of the banking sector in each country in a way that is willing for cross-country comparisons of bank performance. These variables include economic freedom namely, corruption index, labour freedom and investment freedom. The macroeconomic variables namely, inflation and population density and finally, the concentration ration for the five-firm capturing asset market concentration.

All country specific variables are significant and consistent with the expected signs. Corruption index has a significant positive relationship with costs, implying that 1 per cent decrease of corruption causes 0.17 per cent decrease of costs. The coefficient of economic freedom variables is negative and significant at 5 per cent and 10 per cent for investment freedom which indicate that the higher freedom leads to a lower cost efficiency. Regarding investment freedom shows that an easier access to financial market significantly reduces bank costs. The negative coefficient of labour freedom highlights the fact that labour mobility among countries benefits banks by reducing the cost of finding an appropriate employee.

The second category includes macroeconomic conditions, and consists of a measure of population density. As expected the coefficient of population density is negative and significant at 5 per cent indicating that the higher population will lead to increase in cost efficiency (Abdul-Majid et al. 2010). The coefficient of concentration ration is positive and significant at 1 per cent level which indicates the higher concentration of banks is a result of market power, then the banks may become inefficient in increasing costs (Leibenstein 1966). We control for inflation because (Kasman&Yildirim 2006) argue that high inflation may affect behaviour and induce banks to compete through excessive branch networks and (Demirguc-Kunt et al. 2003) find a positive impact of inflation on bank costs. Therefore, the coefficient of inflation is positive and significant at 1% which indicates the higher inflation decrease cost efficiency which is in line with previous studies of both concentration ration and inflation.

Table 4 also shows other two models of the cost function using SFA; model 2 includes a dummy variable for Islamic banks operating in Jordan and GCC countries. The results show insignificant coefficient for Islamic dummy variable, and log likelihood has improved little that we can ignore it. Theoretically, the main difference between Islamic and conventional banking is related to revenue. However, this study has used a cost behavioral function to examine efficiencies. Moreover, it has used a wide range of input prices which can capture potential heterogeneities related to costs. Therefore, the insignificant coefficient of Islamic dummy variable verifies Model 1 as a well-specified Model.

For robustness Table 4 shows model three with 3 more control variables related to country risk, the results show that the control variables added are insignificant with the unexpected sign except for the case of credit rating has the expected sign and insignificant. Therefore, they also verify the results of Model 1 as the main model. The insignificant country risk variable just suggests that it has no

link to cost efficiency. Higher investment freedom may lead to greater cost efficiency - perhaps this can be explained by more foreign banks entering (that out compete domestic banks) making the banking system less cost efficient overall. (We know that foreign banks are usually found to be more efficient than domestic banks in emerging markets) but the overall effect may result in a negative link. Table 5 reports the difference in the estimated efficiency score of each country relative to the country on 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 on the first row in the same column. For example, the first row demonstrates the estimated efficiency score of Jordanian banks is 0.308 higher than that for UAE banks, thereby suggesting that UAE banks are on average less efficient. The related t-statistic in the first column (0.002) demonstrates that this estimated difference is statistically not significant. In contrast, while Bahrain efficiency score is -0.006 higher than Jordanian, thereby suggesting higher average efficiency in Bahrain, this difference is not statistically significantly different from zero based on a t-statistic of -0.742. Choosing Oman as another example, the third row demonstrates that Bahrain banks' estimated efficiency distributions are -0.006 higher than Omani banks. In contrast, Qatar and Kuwait banks' estimated inefficiency distributions are 0.003 and 0.008 lower than Jordanian banks, respectively. As the respective t-tests for these four statistics (0.025, 0.308) are statistically significantly different from zero, this suggests that Saudi Arabia and UAE are statistically less efficient. In contrast, the t-ratio of 1.371 as in the second column demonstrates that the estimated difference in the estimated inefficiency distributions for Bahrain is not statistically significant from zero implying that Bahrain banks are not significantly more efficient relative to Jordanian banks. In sum, analysis of various statistics reported in Table 5 suggest that Oman, Saudi Arabia, UAE, Kuwait and Qatar banks are significantly less efficient as compared to Jordan while Bahraini banks are significantly more efficient than Jordanian banks.

Table 6 reports the bank efficiency averaged for each of the 7 countries in the sample using the panel estimation reported above. The measure of efficiency takes a maximum value of 1, which corresponds to the most efficient bank in the sample. Consider the average measures of bank efficiency when country-level factors are allowed to influence the position of the cost efficiency frontier with the country-level factors are reflected in the measure of bank efficiency. The countries with the highest average level of bank efficiency are Bahrain, Jordan, UAE, Qatar, Kuwait, Saudi Arabia and Oman with average measures in the range 0.81-0.85 respectively. Table 7 suggests little variation in estimated efficiency between Jordan and GCC banks, although

Table 6 also shows that, on average, Jordan banks have moderately better efficiency performance than most GCC banks, it is clear that the substantially lower cross-country average estimated efficiency for Omani banks relative to other GCC. Table 6 shows that the most efficient country is Bahrain which ranges at 0.85 score. Table 6 does suggest that the efficiency is decreased over time for the case of Oman from 0.82 to 0.79, while kept almost stable in the case of Jordan, Qatar and Kuwait.

SUMMARY AND CONCLUSIONS

This study employs cost function to examine the efficiency of Jordan banks relative to six GCC banks, for the period 2003-2010. A common frontier with country-specific environmental variables has been estimated for an unbalanced panel with 90 banks and 610 observations. We focus on cost efficiency of banks as an indication of progress because greater relative cost efficiency may be associated with the changes in incentives and constraints in banking associated with structural and institutional reforms and with the more efficient provision of public services by the state, such as the economic freedom. The findings suggest that greater economic freedom the higher the benefits for banks in terms of cost advantages for banks operating in Jordan and GCC. Interestingly, the impact of investment freedom is negative implying that higher investment increases banks' cost, providing support to the benefits of labour freedom and free from corruption while the insignificant country risk variables suggesting that, no link between country risk and cost efficiency.

Policies that many governments and central banks in Jordan and GCC countries adopted to promote the transformation of socialist banking systems into market-oriented ones have therefore contributed to increased cost efficiency in the sectors, a useful indicator of progress. Looking ahead, some banking sectors will face major new challenges in the form of greater competitive pressures with their countries accession to the GCC. In these countries, policy makers can draw on lessons from the past and promote further cost efficiencies in banking by sustaining progress in legal and regulatory reforms. At the same time, banking markets should remain open and contestable, including through entry of foreign banks.

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TABLE 1: Sample of commercial and Islamic banks, 2003-2010

Countries	Commercial Banks	Islamic Banks	Total Number
Jordan	12	3	15
Bahrain	7	5	12
Oman	10	n.a	10
Qatar	6	3	9
Kuwait	7	3	10
Saudi Arabia	8	3	11
United Arab Emirates	15	8	23
All Countries	65	25	90

Source: bankscope,   na: not avaalable

Note: the data on 65 commercial banks and 25 Islamic banks from Jordan and 6 GCC (Gulf Cooperation Coucil) countries were obtained from the Bankscope.

TABLE 2: Average values of country-specific variables by country, 2003-2010

Countries	Economic Freedom				Country Risk		Macroeconomic Conditions		Bank Structure
	Corruption[1] freedom	Labor[2] freedom	Investment[3] freedom	Debt in default[4]	Credit rating[5]	Economic performance[6]	Population density[7]	Inflation[8]	Concentration ratio[9]
Jordan	50.125	74.336	59.375	6.665	3.016	8.183	63.380	4.923	0.901
Bahrain	59.75	55.75	54.375	18.518	6.003	9.375	1214.156	2.511	0.660
Oman	60.375	76.813	53.125	16.423	5.815	9.375	8.210	3.900	0.843
Qatar	61.500	62.725	38.125	15.231	7.081	9.375	98.131	6.404	0.875
Kuwait	52.500	81.825	43.125	22.235	7.533	9.375	135.46	4.182	0.886
Saudi Arabia	39.375	80.162	35.625	11.315	6.577	9.375	11.648	3.535	0.668
United Arab Emirates	64.125	75.813	38.125	14.550	7.775	9.375	62.580	6.173	0.602
All Countries	55.392	72.394	45.982	14.991	6.257	9.204	253.335	4.478	0.776

1,2,3 Freedom from corruption, investment and labor freedom are three indices which range between 0 and 100 with the higher value representing the higher freedom. Hence, the higher value represents less corruption, higher labor mobility, and less barriers on investors.

4,5, Credit rating and debt in default are indices which illustrate the credit and debt status of countries under study. They range between 0 and 10 with 10 representing the best conditions.

6Economic performance is an index which considers bank status, monetary and currency status, budget status, unemployment, and economic economic growth. It ranges between 0 and 25 with the higher value representing a better economic performance.

7,8,9 Population density, Inflation are macroeconomic variables and concentration ratio is bank strycture.

Source: Heritage foundation for economic freedom, Euromoney for country risk variables, World Bank database for macroeconomic variable, and Bankscope for concentration ratio.

TABLE 3: Average values of outputs, inputs, and total costs by country, 2003-2010 ($, mil)

Countries	Bank Assets	Total Cost	Input Prices[1]			Outputs[1]	
			Labor	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

1 Inputs, outputs, and total costs were deflated using domestic GDP deflators and were converted in international USD using PPP (Purchasing Power Parity).

Source: Bankscope

TABLE 4: SFA estimates for parameters of cost function for Jordan and GCC banks

Variables	Model 1 Coefficient	Std Error	Model 2 Coefficient	Std Error	Model 3 Coefficient	Std Error
Constant|	1.614***	0.327	1.625***	0.326	1.622***	0.390
Y1	0.511***	0.041	0.511***	0.041	0.515***	0.042
Y2	0.491***	0.038	0.495***	0.038	0.487***	0.039
W1	0.386***	0.025	0.390***	0.025	0.386***	0.025
W3	0.411***	0.034	0.409***	0.034	0.408***	0.034
Y1Y2	-0.237***	0.031	-0.236***	0.031	-0.237***	0.031
Y1Y1	0.269***	0.039	0.268***	0.039	0.270***	0.039
Y2Y2	0.196***	0.030	0.198***	0.030	0.195***	0.030
W1W1	0.012	0.014	0.013	0.022	0.012	0.014
W1Y1	-0.111***	0.022	-0.111***	0.020	-0.110***	0.022
W1Y2	0.033*	0.020	0.034*	0.008	0.033	0.020
W3W3	-0.077***	0.020	-0.077***	0.020	-0.077***	0.020
W3Y1	0.004	0.023	0.004	0.023	0.004	0.023
W3Y2	0.104***	0.019	0.103***	0.019	0.104***	0.019
W1W3	0.029**	0.013	0.0294**	0.013	0.029**	0.013
T	- 0.016	0.014	-0.019	0.014	-0.016	0.016
T2	0.047***	0.009	0.048***	0.009	0.046***	0.010
Y1T	-0.049***	0.011	-0.049***	0.011	-0.049***	0.011
Y2T	0.034***	0.009	0.033***	0.009	0.035***	0.009
W1T	0.008	0.008	0.008	0.008	0.008	0.008
W3T	-0.003	0.007	-0.004	0.007	-0.004	0.008
Corruption freedom	-0 .017***	0.002	-0.018***	0.002	-0.017***	0.002
Investment freedom	- 0.004**	0.001	-0.004**	0.001	-0.005**	0.002
Labor freedom	- 0.013***	0.002	-0.014***	0.002	-0.013***	0.002
Population density	- 0.001**	0.494	-0.001**	0.004	-0.004**	0.003
Inflation	0.013***	0.002	0.013***	0.002	0.013***	0.002
Concentration ratio	0.772***	0.241	0.809***	0.242	0.778***	0.242
Islamic			0.005	0.003		
Debt in default					0.005	0.017
Economic performance					0.003	0.002
Credit ratings					-0.009	0.018
Lambda	0.574***	0.114	0.554***	0.116	0.617***	0.111
Sigma|	0.451***	0.0006	0.448***	0.006	0.456***	0.006
Log Likelihood	-327.813		-326.741		-327.669	
LR Test	146.028***		148.172***		146.318	

LR Test examine whether the log likelihood of restricted model (excluding control variables) and unrestricted model (including control variables) are different at 1% level of significance. In other world, it shows the contribution of control variables to the model.

1 Y1, Y2, W1, W3 and *t* refer to loans, other earning assets, price of labor, price of financial capital, and year.

3 *, **, *** Significant at the 10%, 5% and 1% level

TABLE 5: Relative difference in country's estimated mean of inefficiency scores and *t*-test

	Jordan	Bahrain	Oman	Qatar	Kuwait	Saudi Arabia	United Arab Emirates
Jordan		-0.006	0.028	0.003	0.008	0.025	0.308
Bahrain	-0.742		0.034	0.008	0.014	0.031	0.008
Oman	3.218***	5.021***		-0.026	-0.020	-0.003	-0.026
Qatar	0.349	1.534	-3.681***		0.005	0.022	-0.002
Kuwait	0.908	1.914*	-2.440**	0.736		0.017	-0.006
Saudi Arabia	3.441***	6.344***	-0.497	4.228***	2.514**		-0.023
United Arab Emirates	0.002	1.371	-3.518***	-0.036	-0.733	-3.947***	

Table 3 shows the diagonal of the difference in the mean inefficiency estimates of each country
The same Table the below part the diagonal represent *t*-test for the difference in the mean inefficiency scores of each country
Note: *, **, *** Significant at 10%, 5%, and 1% respectively

TABLE 6: Average efficiency scores, 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	n.a	0.860	0.852	0.844	0.850	0.863	0.841	0.850
Oman	0.827	n.a	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

n.a: not available