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Modelling the effect of national culture on multinational banks' performance: A conditional robust nonparametric frontier analysis

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ABSTRACT

Most of the efficiency studies of large multinational banks operating in different countries calculate banks' inefficiency levels without taking into account the environmental factors in which they are operating in. As a result the estimated inefficiencies are subject to a combination of true managerial inefficiencies and the impact of environmental factors which most of the time are not appropriately controlled in the analysis. This study by examining 282 multinational banks from 43 different countries calculates the influence of their national culture on their estimated efficiency levels. By using conditional and unconditional robust efficiency estimators this paper provides empirical evidence of how different cultural values influence banks' global practices and thus their performances. The results indicate that there is a cultural pattern that has a positive effect on banks' performance. That is lower masculine, uncertainty avoidance and power distance values and moderate individualistic values.

1. Introduction

According to the literature the majority of the studies calculating multinational banks' efficiency assume that all banks have a common efficient frontier (Bos and Kool, 2006). In addition the use of such assumption leads to biased efficiency results and thus to misevaluation of policy implications (Dietsch and Lozano-Vivas, 2000). As such cross-country bank efficiency studies must adjust their efficiency measurements towards capturing environmental influences, which usually are beyond the control of management. According to several authors little work has been done on identifying and measuring the environmental factors which affect multinational banks' efficiency levels (Chaffai et al., 2001; Lozano-Vivas et al., 2001; Lozano-Vivas et al. 2002; Berger and Lorreta 1997; Bos and Kool, 2006).

In a global environment the dynamics and complexities require full collaboration of all operations and production processes within the business in order for the multinational to take advantage of its scale and scope capabilities. Hayes and Thies (1991) suggest that services add more complexity to this complication due to its nature of being labour intensive. In that respect productivity is mostly based upon making the worker more efficient. However, the performance of banks operating in global market place face different challenges when trying to maximising their performances through different production operations management (POM) approaches. Pagell et al. (2005) suggest that national culture is one of the main factors explaining differences in international operational decision making. Similarly, Bendoly et al. (2006) emphasise the fact that national culture can moderate the effects of task interdependence on perceptions of the importance of enterprise resource planning (ERP) communicative capabilities.

Based on those lines our study measures and evaluates the impact of multinational banks' national cultures on their efficiency levels. In addition the study investigates the effect of national culture on banks' performance with an attempt to identify cultural patterns that distinguish higher from lower performers.

In order to model the effect of national culture on banks' efficiency levels we use conditional and unconditional robust nonparametric techniques. Daraio and Simar (2007a) suggest that robust frontiers have many advantages compared to traditional full frontiers due to the fact that they are less influenced by extreme points and outliers. Therefore they can provide us with measures which avoid the most important limitation when using a nonparametric technique, which is its deterministic nature.

In addition, these robust measures of efficiency don't suffer from dimensionality problems. Furthermore our paper in order to establish the cultural patterns that influence multinational bank's performance uses Hofstede's (1980) national cultural dimensions. In contrast with the critique of the usage of Hofstede's cultural measures Merritt (2000) has confirmed the validity of those measures in workplace.

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Table 1
Descriptive statistics of the sample size, inputs, output and external variables.

Country	PDI	IDV	MAS	UAI	Number of banks	Country	PDI	IDV	MAS	UAI	Number of banks
Australia	36	90	61	51	6	Luxembourg	40	60	50	70	1
Austria	11	55	79	70	3	Malaysia	104	26	50	36	6
Belgium	65	75	54	94	2	Mexico	81	30	69	82	2
Brazil	69	38	49	76	5	Morocco	70	46	53	68	1
Canada	39	80	52	48	7	Netherlands	38	80	14	53	2
Chile	63	23	28	86	1	Pakistan	55	14	50	70	1
China	80	20	66	30	8	Poland	68	60	64	93	1
Colombia	67	13	64	80	1	Portugal	63	27	31	104	1
Denmark	18	74	16	23	3	Russia	93	39	36	95	2
Finland	33	63	26	59	1	Saudi Arabia	80	38	52	68	1
France	68	71	43	86	5	Singapore	74	20	48	8	3
Germany	35	67	66	65	5	South Africa	49	65	63	49	2
Greece	60	35	57	112	6	South Korea	60	18	39	85	8
Hong Kong/China	68	25	57	29	4	Spain	57	51	42	86	7
Hungary	46	80	88	82	1	Sweden	31	71	5	29	4
India	77	48	56	40	11	Switzerland	34	68	70	58	5
Indonesia	78	14	46	48	3	Taiwan	58	17	45	69	10
Ireland	28	70	68	35	3	Thailand	64	20	34	64	6
Israel	13	54	47	81	4	Turkey	66	37	45	85	4
Italy	50	76	70	75	14	United Kingdom	35	89	66	35	9
Japan	54	46	95	92	65	United States	40	91	62	46	47
Jordan	80	38	52	68	1						
Total number of Countries						43					
Total number of Banks						282					

Inputs/output	Assets ($bil)—input	Number of employees—input	Sales ($bil)—Output
Mean	165.10	25,705.00	9.62
Std	345.40	51,915.00	20.56
Min	8.35	500.00	0.29
Max	1949.20	380,285.00	146.56

External variables	PDI	IDV	MAS
Mean	52.82	55.97	63.82
Std	17.08	25.04	21.13
Min	11	13	5
Max	104	91	95

External variables	UAI
Mean	65.74
Std	23.96
Min	8
Max	112

The paper is organized a follows. Section 2 reviews the relevant literature whereas Section 3 presents the various variables used in the formulation of the proposed models. In Section 4 the techniques adopted both in theoretical and mathematical formulations are presented. Section 5 discusses the empirical findings of our study. The final section concludes the paper commenting on the derived results and the implied policy implications.

2. Literature

Farrell (1957) extended the work initiated by Koopmans (1951) and Debreu (1951) by defining overall productive efficiency as the product of technical and allocative efficiency. Extending the ideas of Farrell (1957), the operations research discipline has developed the popular Data Envelopment Analysis (DEA) approach (Charnes et al., 1978) to the estimation of production frontiers and efficiency measurement which employs linear programming techniques. Based on DEA methodology several papers have measured banks' efficiency using different DEA models (Halkos and Salamouris, 2004; Berg et al., 1991; Berg et al., 1993; Ferrier and Lovell, 1990; Fucuyama, 1993). Most of the DEA studies have examined bank branch performance (Giokas, 2008; Athanassopoulos, 1997; Berger et al., 1997; Schaffnit et al., 1997; Drake and Howcroft, 1994; Al-Faraj et al., 1993; Oral and Yolalan, 1990; Sherman and Gold, 1990).[2]

But Simar and Wilson (2008) and Daraio and Simar (2007a) claim that in efficiency measurement studies a crucial issue is to examine environmental factors that influence the production process and are beyond management control. In addition, Chiou and Chen (2009) with the help of a sample of 29 banks in Taiwan for the time period 2002–2004 used a stochastic frontier regression model and DEA in order to capture the external environment risk effects on banks' efficiency.

However, the issue of performance variation in a multinational context is even more important magnifying its effect on banks' performance. Kobrin (1991) suggests that multinationals increase their performances by learning and adapting effectively to different domestic markets. By taking advantage of their international activities firms can increase their performances (Dunning, 1977, 1981). Nevertheless, inefficiencies may arise when the investing company comes from a country with 'strong' cultural values.

Halkos and Tzeremes (2008) based on efficiency measurement results of 100 non-financial multinational corporations using DEA methodology, restructured Kogut and Singh's (1988) cultural index. They found that

[2] See Berger and Humphrey (1997) for a comprehensive review on efficiency studies of financial institutions in 21 countries.