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ABSTRACT

Good and Bad Institutions: Is the Debate Over? Cross-Country Firm-Level Evidence from the Textile Industry*

Using firm-level data from nine developing countries we demonstrate that (a) certain institutions like restrictive labour market regulations that are considered to be bad for economic growth might be beneficial for production efficiency, whereas (b) good business environment which is considered to be beneficial for economic growth might have an adverse impact on production efficiency. We argue that our results suggest that the debate about the implications of institutional quality is far from being over, and classification of institutions into "good" and "bad" might be premature.

JEL Classification: D02, D23, D24

Keywords: institutional quality, production efficiency, stochastic frontier model

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1. Introduction

It is now stylised that institutions have significant impact on economic performance. North (1991) argues that institutions – formal and informal – are created to reduce uncertainty about exchanges; property right is a textbook example (Demsetz, 1967; Alchian and Demsetz, 1973). As such, institutions can refer to both the governance structures that define the rules of the game and to the rules of the game themselves (Coase, 1937; Shubik, 1975; Williamson, 1975, 1985). Efficient institutions clearly define the boundaries within which economic agents can act, thereby enabling transactions at low cost. The logical outcome of efficient institutions, therefore, is better economic performance.

Over the past two decades, there has been a proliferation of papers that have examined various aspects of the relationship between institutional quality and economic performance. Researchers have demonstrated that governance characteristics that define the rules of the game have an impact on economy-wide development performance (Campos and Nugent, 1999), such that institutional quality, as opposed to factors such as geography and trade, is arguably the key determinant of economic growth (Rodrik, Subramanian and Trebbi, 2004). In particular, researchers have argued that the nature of property rights (Knack and Keefer, 1995; Acemoglu and Johnson, 2005), legal institutions (Levine, 1998), and labour market institutions (Nickell and Layard, 1999; Besley and Burgess, 2004) affect a country's (or region's) economic growth, investment and production efficiency.

However, the debate about the nature of institutions that improve economic performance is far from being over. For example, there is as yet no consensus about whether democracy or autocracy is better at generating economic growth. While property rights can be credibly guaranteed in a democracy (Olson, 1991), with the

attendant (positive) impact on economic growth, lobbying by groups with different interests, that is an integral part of a democracy, results in inefficient use of resources (Becker, 1983). To complicate matters further, it has been argued that political institutions may not influence economic growth significantly after all; growth instead is an outcome of economic policies pursued by government (Glaeser et al., 2004). Similarly, it has alternately been argued that corruption can be both transaction facilitating and therefore growth enhancing (Huntington, 1968; Lui, 1985), and transaction inhibiting and hence growth reducing (Shleifer and Vishny, 1993).

More importantly, the focus of the literature has largely been macro performance of economies, as manifested in economic growth and its correlates like investment. Other than in the literature on corporate governance,[1] the impact of institutions on firm performance is largely ignored. The little evidence that is available is inconclusive. Using firm-level data on mostly Asian developing economies, Dollar, Hallward-Driemeier and Mengiste (2005) find that cross-country differences do affect firm performance, even after controlling for country fixed effects. By contrast, Commander and Svejnar (2007) find that the impact of institutional quality (or "business environment") on firm performance is limited in the post-socialist countries of Central and Eastern Europe.

In this paper, we contribute to this nascent literature by examining the institutional quality-firm performance relationship, using a unique cross-country micro data set to examine the impact of institutions on firm level efficiency. We choose efficiency (with which inputs are converted into output) as our measure of firm performance because it is consistent with a key developmental concern, namely,

[1] In the corporate governance literature, researchers have argued, for example, that a weak legal system and, correspondingly, weak enforceability of contracts lead to creation of family firms and concentration of equity in the hands of these families and this, in turn, has implications for the quality of corporate governance and firm performance.

the generation of economic growth using limited resources. We focus on firms in the textile industry in nine developing countries, textile being an industry in which developing countries have comparative advantage and a strong presence in the global market.[2] Further, as we shall discuss later, we concentrate on institutions such as economic freedom that define the rules of the game and thereby influence the ease with which transactions can take place in product and factor markets.

Our results indicate that institutions do indeed influence firm-level efficiency, after controlling for factors such as size and ownership, but not in the way that is suggested by conventional wisdom. Labour market institutions that provide greater social security benefits and employment rights *reduce* inefficiency in production. Better business environments *increase* such inefficiencies. Our results suggest that there is greater scope for research on the relationship between institutional quality and firm performance; the debate about this relationship is far from being over. While restrictive or low quality institutions may adversely affect outcomes such as firm entry rates, they might be beneficial for productive efficiencies of incumbent firms, such that blanket classification of institutions as "good" or "bad" might be too simplistic.

The rest of the paper is structured as follows: In Section 2, we discuss the empirical strategy. In Section 3, we discuss the data and specification. The results are discussed in Section 4. Finally, Section 5 concludes.

2. Modelling firm efficiency

The neo-classical production theory implicitly assumes that all production activities take place on the frontier of a feasible production set (subject to random errors). The

[2] At the middle of the decade, even before the end of the quotas embedded in the Multi-Fibre Agreement, developing countries accounted for half the world's textile exports and three-quarters of the clothing exports (UNCTAD, 2005).

frontier itself is defined as of the maximum possible output that is technically attainable for the given inputs (output-oriented measure), or as the observed output level that can be produced using least amounts of inputs (input-oriented measure). The production efficiency literature, however, relaxes the assumption, and considers the possibility that production activities might take place inside the frontier due to technical inefficiency. Technical inefficiency can be *output-oriented* if actual output produced is less than the frontier output for a given amount of input (subject to random errors). Alternatively, it can be *input oriented* if the amount of inputs actually used is more than the minimum required to produce a given level of output. These are two ways of examining inefficiency. Graphically, the inefficient production plans are located below the production frontier.

<INSERT Figure 1 about here>

In Figure 1, $f(x)$ is the production frontier, and point A is an inefficient production point. There are two ways to see why the production plan in A is inefficient. The first way is to see that at the current level of input usage (x = ON) maximum possible output that can be produced is OA, given the technology. Thus, the distance AB shows the amount of output that is lost due to technical inefficiency, and it forms the basis from which the output-oriented (OO) technical inefficiency is measured. The other way to see why point A is inefficient is to recognize that the same level of output can be produced using less inputs, which means that the production point can move to the frontier by reducing inputs. Thus, the distance AC measures the amount by which the input can be reduced without reducing output.

Since this move is associated with reducing inputs, the horizontal distance AC forms the basis to measure input-oriented (IO) technical inefficiency.

Mathematically, we can write the production relationship as

$$y = X\beta + (v - u) \quad (1)$$

where X is a vector of factor inputs, v is the *iid* error term which follows a normal distribution with a zero mean and positive variance, and u is the non-negative inefficiency term that has a half normal distribution (see Kumbhakar and Lovell, 2000). Inefficiency (at the firm-level, for example) itself can then be modelled as

$$u = Z\delta \quad (2)$$

where Z is a vector of explanatory variables (Battese and Coelli, 1995). The two equations are estimated simultaneously using the maximum likelihood method, and the resultant estimates are unbiased and efficient.

In our paper, we adopt the Battese and Coelli (1995) approach to modelling output and efficiency. We model output as a translog function of material inputs, labour and capital, and simultaneously model firm level inefficiency as a function of firm level characteristics like size and a number of institutional variables that characterise the environment in which the firms operate. We discuss the specific measures of variables in the next section.

3. Specification and data

We opt for a translog production function:

$$\ln y = \beta_0 + \beta_1 \ln m + \beta_2 \ln l + \beta_3 \ln k + {}^{1}/_{2}\,[\beta_4 \ln m^2 + \beta_5 \ln l^2 + \beta_6 \ln k^2] + \beta_7 (\ln m \times \ln l) + \beta_8 (\ln m \times \ln k) + \beta_9 (\ln l \times \ln k) + v - u \quad (3)$$

when y is sales, m is cost of materials used for production, l is the cost of labour, k is capital stock, u is the half-normally distributed inefficiency term, and v is the *iid* error term.

Next, we identify variables that explain firm-level inefficiency generated from equation (3). Our focus on a single globalised industry eliminates the need to control for the extent of competition which usually affects firm performance. We, therefore, use the following variables to explain inter-firm differences in inefficiency:

Size: We control for firm size which has implications for economies of scale, and hence efficiency. Our measure of firm size is a categorical variable that ranks firms on a 5-point scale. The categories themselves are based on the number of employees.

Ownership: There is a large literature on the impact of ownership on firm performance, in particular on the beneficial impact of private and foreign ownership on firm performance (Djankov and Murrell, 2002). Hence, we use ownership as another explanatory variable for efficiency. We have continuous data for proportion of a firm that is owned by the state, domestic private investors and foreign investors. However, with a few exceptions, the largest shareholder of each firm – whether the state, domestic private or foreign – owned close to 100 percent of the shares. Hence, instead of using the continuous variables, we use dummy variables to indicate the type of the controlling owner. Since fewer than 2 percent of domestic firms are state owned, it is meaningless to distinguish between state-owned and privately-owned firms.[3] We, therefore, control for foreign ownership alone. In our sample, 4.5 percent of the firms are foreign owned.

[3] We nevertheless experimented with a dummy for state ownership in the specification for the inefficiency equation. However, the state ownership dummy was insignificant and was dropped form the specification.

Labour market institutions: It is stylised in the literature that labour market rigidities adversely affect macroeconomic performance and intermediating factors such as the net entry rate of firms that is a key determinant of competition (Eichengreen and Iversen, 1999; Besley and Burgess, 2004). On the other hand, Storm and Naastepad (2007) demonstrate that the "rigid" labour market conditions promote long run labour productivity growth. This latter view is consistent with firm-level evidence that suggests that incentives like employee stock ownership and employment security can improve employee commitment, and are also positively correlated with performance enhancing strategies like greater investment in R&D and new technology (Kruse and Blasi, 1995; Michie and Sheehan, 1999). We choose a measure of labour market institutions that captures benefits to employees. We use a measure of the nature of the social security legislations in the countries in our sample, as reported in Botero et al. (2004). The index captures the extent of protection provided to employees against old age, death and disability, sickness and healthcare coverage, and unemployment benefits. The extent of protection increases with the value of the index.

Business environment: Finally, we include in the inefficiency specification measures of the quality of the business environment. In keeping with a large section of the literature, we use the indices of institutional quality provided by the Heritage Foundation (see Johnson, Kaufman and Zoido-Lobaton, 1998; Klapper, Laeven and Rajan, 2004).The index ranges in value from 0 to 100, with institutional quality or quality of business environment increasing in the value of the index. As we shall see later, we experiment with three different measures of institutional quality or business environment: a narrow measure that accounts for the quality of property rights, an

intermediate measure that accounts for business freedom, and a wide measure that accounts for overall economic freedom.[4]

The inefficiency equation, therefore, is specified as follows:

$$u = \delta_0 + \delta_1\, Firm\ size + \delta_2\, Ownership + \delta_3\, Labour\ market\ institution$$
$$\delta_4\, Business\ environment + e \qquad (4)$$

To recapitulate, we are interested in the impact of institutions on firm efficiency, and hence the focus of our analysis is the sign and significance of the δ_3 and δ_4.

For our empirical exercise, we use firm level data from nine developing countries: Brazil, China, Egypt, India, Indonesia, Malawi, Pakistan, South Africa and Zambia. They are not only very different from a macroeconomic perspective but also, as reported in Table 1, they also have quite different levels of institutional quality. For example, at one extreme we have a country like South Africa with an index of economic freedom that is 67.1, very close to the threshold of 70 for "mostly free" countries, and at the other end we have India with an index value of 51.2, just above the threshold of 50 below which lie the "repressed" countries. Similarly, the index for labour institutions indicate that we have, at the one extreme, countries like Zambia (0.32) which do not provide much protection to employees and, at the other extreme, countries like China (2.24) and Egypt (2.22) that provide a fair degree of protection.

< INSERT Table 1 here>

The firm-level data are obtained from the World Bank Enterprise Surveys which collect data from manufacturing sector firms from around the world. The

[4] Not surprisingly, all measures of business environment are highly correlated with the stylised measure of corruption, namely, the Corruption Perception Index published by Transparency International. Hence, the specification for the inefficiency equation does not include a proxy for corruption.

surveys use standardised survey instruments, making data from different countries comparable. We pool together cross-section data sets from countries that were surveyed between 2002 and 2005. Nominal variables used for the estimation of the production function were converted into real US dollars, thereby making them comparable across the countries. Some countries had to be dropped from the sample because of lack of data on all relevant institutional variables. After accounting for missing data, our sample includes a cross-section of 1625 firms.

5. Regression results

The regression results are reported in Table 2. The specification of the (translog) production function is the same across the columns, but there are differences in the specification for the inefficiency equation. In column (1), we report the specification with the broad measure of institutional quality, namely, index of economic freedom. In column (2), we report the specification with the intermediate measure of institutional quality, namely, index of business freedom. And in column (3), we report the specification with the narrow measure of business environment, namely, index of property rights. The statistical significance of the parameter γ indicates that there is indeed inefficiency in the production relationship such that ordinary least squares (OLS) would not have been the appropriate method to estimate the production function.[5]

<INSERT Figures 2 and 3 here>

[5] If the null hypothesis of $\gamma = 0$ cannot be rejected, then $\sigma_u = 0$, and the inefficiency term u should then be removed from equation (3).

Since the focus of our analysis is the impact of institutional quality on firm-level inefficiency, we do not discuss the coefficient estimates of the production function itself, and proceed to a discussion of the estimates of firm-level inefficiency and its determinants. However, we report the distribution of technical efficiency across firms and across countries, in Figures 2 and 3, respectively. Figure 2 shows that most of the firms are quite close to the frontier; a large majority of them has technical efficiency between 0.65 and 0.95. The average technical efficiency is 0.78 and the median is 0.80. This can be expected in a competitive globalised industry where production efficiency might be the key to sustained export capabilities. Figure 3 indicates that the average firm-level efficiency varies significantly across countries. In keeping with expectations, it is much higher in major exporters like China and India than in countries like Malawi and Zambia. These results are robust to the choice of the measure of business environment in the inefficiency equation.

<INSERT Table 2 here>

The coefficient estimates of the inefficiency equation indicates the following: (a) inefficiency decreases with firm size , (b) foreign ownership *increases* firm level inefficiency, (c) labour market institutions that protect employees reduce inefficiency, and (d) an improvement in the overall institutional quality or business environment i*ncreases* firm level inefficiency. The qualitative result about the impact of business environment on firm-level inefficiency is robust to the choice of the measure of business environment. It is easy to explain the estimated impact of firm size on inefficiency: economies of scale matters. But the other three relationships are apparently counterintuitive and hence they merit some discussion.

The literature on the impact of ownership on firm performance posits that foreign ownership is generally beneficial. Foreign ownership paves the way for greater access to better technology and export markets, and enables firms to move up the value chain. Note, however, that this view of the impact of foreign ownership generally examines the impact of ownership on profitability, whether current profitability as measured by (say) return to assets or expected long term profitability as measured by the Tobin's *q*. In other cases, the impact of ownership on export intensity is examined. The efficiency with which firms convert inputs into output is generally not examined by this literature, and yet in this context the impact of foreign ownership could be very different. Management scholars have long emphasised the difficulty experienced by foreign owners as they grapple with very different organisational cultures in overseas locations (Brouthers, Brouthers and Werner, 2003). If cultural differences results in the failure of foreign managers to translate their global management practices into efficient production modes in a developing country context, production inefficiency relative to domestic firms who also compete in a highly globalised environment is entirely plausible. Given that profits are determined by factors such as mark ups which might favour foreign firms with greater (global) market power, this production inefficiency is not necessarily inconsistent with higher profitability.

Next, we discuss the positive impact of labour market institutions that protect the employees on firm-level efficiency. As we have already seen, employee commitment might improve and firm behaviour become consistent with greater efficiency (and productivity) if employees are provided incentives in the form of profit sharing and employment security. While this line of argument appears inconsistent with the evidence about the adverse impact of restrictive labour market

institutions on unemployment rates, firm entry rates etc, this apparent incongruence is easily explained. Consider an entrepreneur working in an environment that mandates significant social security benefits and employment rights to employees. These labour market institutions might deter the entrepreneur from starting new firms, but should she enter the market nevertheless, an action that would be rational only if it is optimum given the various constraints imposed by labour market institutions, among other things, it is entirely conceivable that the incentives provided to employees in the form of greater social security benefits would be beneficial for the productive efficiency of the firms.[6]

Finally, we discuss the negative impact of the business environment on firm-level efficiency. Our result is stronger than that of Commander and Svejnar (2007) who find that cross-country differences in the measure of business environment do not have significant impact on firm performance, in the transition country context. Interestingly, in our results, the extent of the impact of business environment on firm-level efficiency increases with the broadness of the measure; it is small (0.01) and weakly significant (at the 10 percent level) for the index of property rights, and large (0.30) and strongly significant (at the 1 percent level) for the index of economic freedom. In other words, while things like property rights have a very limited impact on production inefficiency – as one would expect – greater economic freedom that both raises prospects of future growth and provide greater access to factor inputs might result in greater accumulation of factor inputs, especially capital, relative to output. The negative impact of business environment on production efficiency, therefore, is quite plausible.

[6] Institutions that emphasise employment protection might, of course, aggravate moral hazard problems as well, but the net effect could still be positive for firm performance.

5. Conclusion

It is generally argued that institutional quality is a key factor determining economic growth, as well as covariates of growth like market entry by firms and employment generation. Institutional quality is also believed to add to firm performance, when measured in terms of sales growth, investment growth and profitability. However, some recent studies suggest that, while better institutional quality may have beneficial macro implications, it may not have positive implications for firm performance.

We use cross-country firm-level data from nine developing countries to examine this issue. We use production efficiency as our measure of firm performance because in a developing country context efficient use of limited resources has greater developmental implications than sales growth or profitability. We find that certain restrictive institutions like greater protection of employee rights, which are believed to have negative implications for macro variables like employment growth, may actually enhance production efficiency. By contrast, better business environment may actually be detrimental for production efficiency. Our results suggest that the debate about the implications of institutions and the classification of institutions into “good” and “bad” is far from being over, and there is need to examine this issue further.

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Figure 1: Technical efficiency

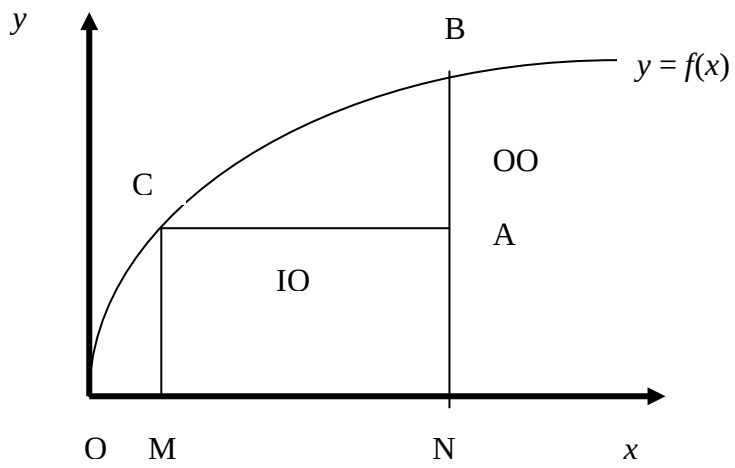

Table 1: Institutional quality across the countries

Country	Index of Economic Freedom	Index of Business Freedom	Index of Property Rights	Index of Labour Regulation
Brazil	63.4	70	50	1.65
China	52.6	55	30	2.24
Egypt	55.5	55	50	2.22
India	51.2	55	50	1.20
Indonesia	55.8	55	30	0.53
Malawi	54.7	55	50	0
Pakistan	55.8	55	30	1.39
South Africa	67.1	70	50	1.69
Zambia	59.6	55	50	0.32

Figure 2: Distribution of technical efficiency across firms

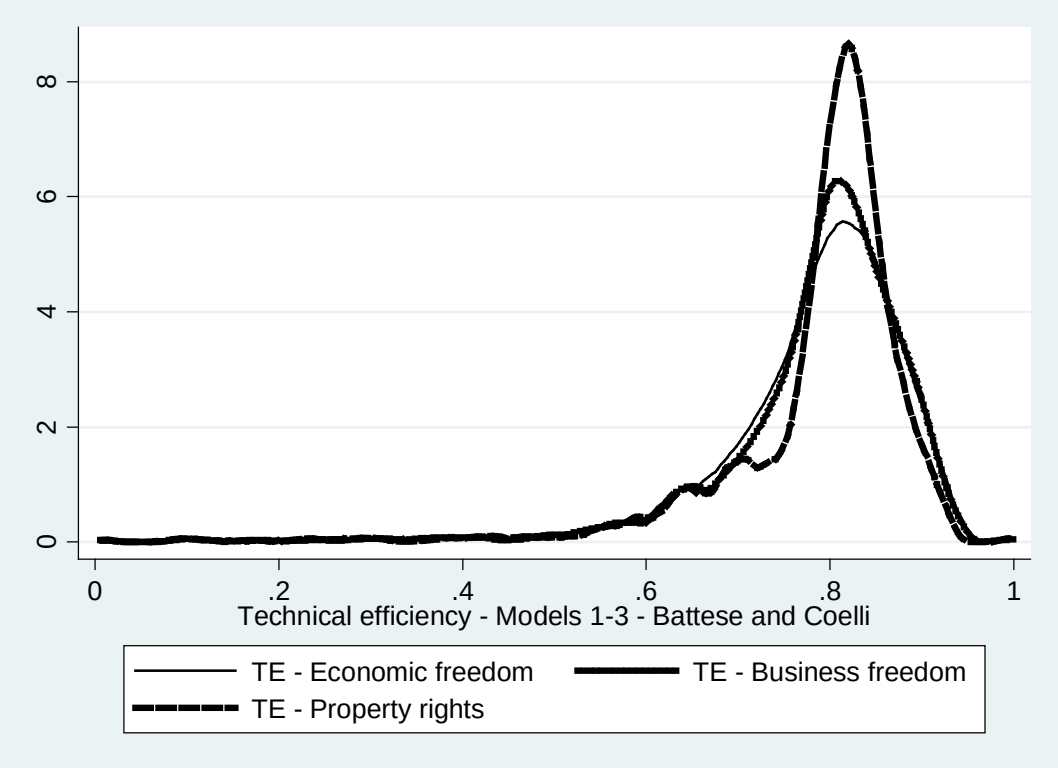

Figure 3: Variation in technical efficiency across countries

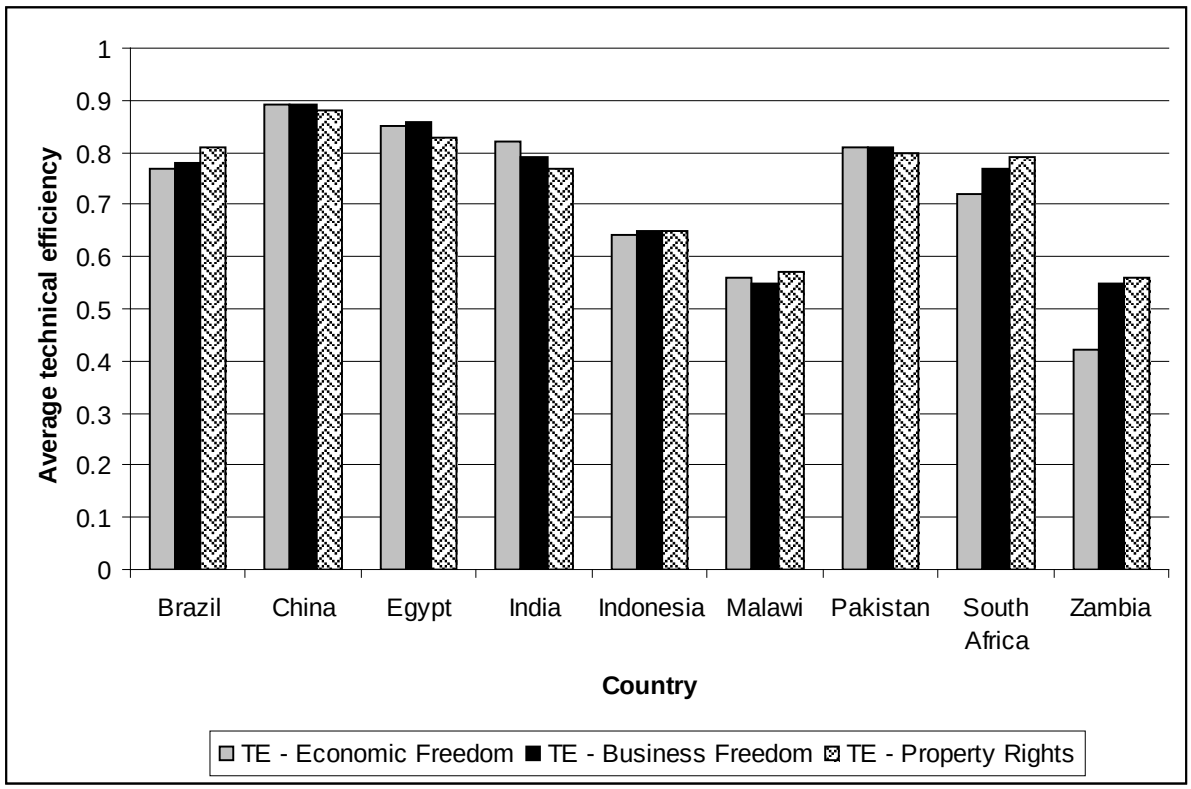

Table 2: Impact of institutions on efficiency

	(1)	(2)	(3)
Production function (frontier)			
Constant	1.32 *** (0.12)	1.35 *** (0.13)	1.38 *** (0.12)
Ln material	0.29 *** (0.03)	0.29 *** (0.03)	0.28 *** (0.03)
Ln material sq.	0.07 *** (0.004)	0.07 *** (0.004)	0.07 *** (0.004)
Ln labour	0.49 *** (0.04)	0.48 *** (0.04)	0.45 *** (0.04)
Ln labour sq.	0.06 *** (0.003)	0.06 *** (0.003)	0.05 *** (0.003)
Ln capital	0.15 *** (0.03)	0.16 *** (0.03)	0.15 *** (0.03)
Ln capital sq.	- 0.004 (0.003)	- 0.003 (0.004)	- 0.002 (0.003)
Ln material × Ln labour	- 0.14 *** (0.008)	- 0.13 *** (0.008)	- 0.13 *** (0.008)
Ln material × Ln capital	0.006 (0.007)	0.0007 (0.007)	- 0.002 (0.007)
Ln labour × Ln capital	0.02 *** (0.009)	0.02 *** (0.009)	0.03 *** (0.009)
Inefficiency equation			
Constant	- 14.13 *** (1.11)	- 7.20 *** (1.22)	- 0.68 (0.45)
Size	- 0.13 *** (0.05)	- 0.16 *** (0.06)	- 0.08 (0.06)
Foreign stake	0.008 *** (0.002)	0.008 *** (0.002)	0.009 *** (0.002)
Social security legislation	- 3.76 *** (0.13)	- 4.35 *** (0.40)	- 4.79 *** (0.67)
Index of economic freedom	0.27 *** (0.01)		
Index of business freedom		0.15 *** (0.02)	
Index of property rights			0.01 * (0.008)
Log likelihood	- 1622.79	- 1625.16	- 1620.48
LR χ^2 (Prob > χ^2)	169.30 (0.00)	164.57 (0.00)	173.92 (0.00)
γ	0.77 *** (0.02)	0.79 *** (0.02)	0.85 *** (0.01)
No. of obs.	1625	1625	1625

Note: The values within parentheses are standard errors.
***, ** and * indicate significance at 1%, 5% and 10% levels.