Corporate efficiency in Europe ☆

Jan Hanousek [a,b,*], Evžen Kočenda [c], Anastasiya Shamshur [a,d,1]

[a] CERGE-EI, Charles University and the Academy of Sciences, Prague, Czech Republic
[b] CEPR, London, UK
[c] Institute of Economic Studies, Charles University, Opletalova 21, 110 00 Prague, Czech Republic
[d] Norwich Business School, University of East Anglia, Norwich, Norfolk NR4 7TJ, UK

A B S T R A C T

Using a stochastic frontier model and a comprehensive dataset, we study factors that affect corporate efficiency in Europe. We find that (i) larger firms are less efficient than smaller firms, (ii) greater leverage contributes to corporate efficiency, and (iii) high competition is less conductive to efficiency than moderate or low competition. In terms of ownership, we find that (iv) efficiency increases when a majority owner must deal with minority shareholders and that (v) domestic majority owners improve efficiency more than foreign majority owners when no minority shareholders are present, but (vi) the opposite is true when minority shareholders hold a substantial fraction of the firm's equity. In the analysis, we distinguish between a pre-crisis period (2001–2008) and a post-crisis period (2009–2011), and find that our results are sensitive to the period of observation.

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1. Introduction

What determines corporate efficiency is a central question in economics and finance. Corporate (technical or production) efficiency can be defined as the ability of a firm to produce the most output with a given amount of inputs. Several factors can reduce the ability of a firm to operate at the best (most efficient) technical level. First, as firms grow larger, they may lose focus and become more complacent and prone to agency problems (Campa and Kedia, 2002; Dhawan, 2001; Jensen and Meckling, 1976; Leibenstein, 1966; Monsen and Downs, 1965; Mueller, 1972; Villalonga, 2004). Lack of competition may also make firms become more complacent

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* Corresponding author at: CERGE-EI, Charles University, Academy of Sciences, Politickych veznu 7, P.O. Box 882, 111 21 Prague, Czech Republic. Tel.: +420 224 005 119; fax: +420 224 005 444.
E-mail addresses: jan.hanousek@cerge-ei.cz (J. Hanousek), kocenda@fsv.cuni.cz (E. Kočenda), a.shamshur@uea.ac.uk (A. Shamshur).
[1] Tel.: +44 1603 591459.

(Aghion et al., 1999; Bloom and Van Reenen, 2007; Raith, 2003). In finance, the free-cash flow hypothesis similarly suggests that leverage promotes efficiency because the servicing of debt puts constraints on managerial discretion (Jensen, 1986). Ownership concentration and foreign ownership are also generally believed to be conducive to more efficient operation (Aitken and Harrison, 1999; Blomström et al., 2001; Gugler, 2001; Sánchez-Ballesta and García-Meca, 2007; Temouri et al., 2008). Yet, to date, empirical research on the determinants of corporate efficiency and performance is fragmented (Arocena and Oliveros, 2012; Barth et al., 2005; Cabeza-García and Gómez-Ansón, 2011; Dilling-Hansen et al., 2003; Margaritis and Psillaki, 2010; Palia and Lichtenberg, 1999; Shyu, 2013; Weill, 2008). The extant literature typically analyzes the effects of firm size, competition, capital structure, and ownership characteristics in isolation, despite the fact that these factors may be closely intertwined. Moreover, the literature tends to focus on specific industries or countries, raising concerns about generalizability.

In this paper, we take a more integrated approach. We analyze the effects of size, competition, capital structure, and ownership characteristics in a large and comprehensive dataset covering more than 3 million firm/year observations. The analysis covers both firms operating in "old" European Union (EU) countries and in "new" EU countries,[2] as well as manufacturing and services firms. Methodologically, we employ a stochastic production frontier model.

Our results indicate that several factors contribute to corporate efficiency in Europe. We find that larger firms are less efficient than smaller firms, and that leverage contributes to corporate efficiency. Furthermore, moderate competition in the product market is associated with greater efficiency in the old EU countries. In the new EU countries both moderate and low competition are associated with greater efficiency.

As expected, we find a positive association between ownership concentration and efficiency. Interestingly, the effect of foreign ownership appears to be contingent on whether control is divided. When minority shareholders hold a substantial fraction of the firm's equity, foreign majority ownership is conducive to efficiency. However, if there are no minority shareholders, domestic majority owners are superior. Overall, our results demonstrate that capital structure and ownership characteristics, as well as a number of other factors, matter for corporate efficiency in European countries.

The paper makes a number of important contributions to the literature. We focus on the technical efficiency of firms, instead of accounting ratios. Technical efficiency is estimated using the stochastic production possibility frontier approach (SFA) introduced by Aigner et al. (1977) and Meeusen and van den Broeck (1977) and further developed by Battese and Coelli (1988, 1992) and Kumbhakar and Lovell (2000). More precisely, we use a time-invariant technical efficiency model for panel data adjusted to account for the specific two-digit (NACE) industries in which firms operate.[3] This approach also addresses the potential problem of unobserved (fixed) firm heterogeneity, including the endogeneity of firm ownership with respect to its efficiency. Furthermore, by using several short panels (with maximum four years), we overcome the shortcomings of time-invariant firm-level inefficiency, while benefitting from easier identification and smaller bias (Cornwell and Smith, 2008; Greene, 2005, among others).

Our results highlight the potential for efficiency associated with firm growth. As firms grow larger and expand their scale of operations, they become more complacent or prone to agency problems (Campa and Kedia, 2002; Mansi and Reeb, 2002; Villalonga, 2004). Managers with cash in hand may grant themselves higher salaries or invest in "pet projects". The situation may be aggravated by higher bureaucracy, higher communication costs and a greater resistance to change than that in smaller firms. As our dataset provides a wide coverage of small and medium firms, we can analyze the effect of firm size on firm efficiency with greater reliability than that in previous studies.

We also highlight the role of capital and ownership structures in affecting corporate efficiency. Both capital structure and concentrated ownership can exert a disciplining effect on managers, albeit for different reasons. Higher leverage helps discipline managers by reducing the amount of cash at their disposal and by increasing the cost of misbehavior (Jensen, 1986). Higher ownership concentration, on the other hand, motivates owners to closely monitor managers, so that their actions comply with firm goals. Different degrees of concentration can potentially have different implications for firm efficiency. For each firm in the sample, we are able to determine ownership concentration, its domestic or foreign origin, and the degree to which owners control the firm. Following legal standards, we distinguish several ownership categories that provide owners with different degrees of control, including potential coalitions of owners. In particular, we distinguish between majority ownership, monitored majority ownership, majority ownership plus blocking minority, controlling blocking minority and combined controlling minority ownership. The available information on ownership structures allows us to document its effects on firm efficiency to an extent not found in earlier studies.

On the temporal dimension, we distinguish between a pre-crisis period (2001–2008) and a post-crisis period (2009–2011). Two results stand out. First, we find that the magnitude of coefficients is often smaller in absolute value in the post-crisis period than that in the pre-crisis period. This is not unexpected. During a severe downturn, many of the most inefficient firms may drop out of the sample. Thus, firms may on average be closer to the efficiency frontier in the later part of the sample. More surprising is the fact that the sign of many coefficients change after the crisis. In some cases, the results are easy to rationalize. For instance, consistent with the free cash flow hypothesis, before the crisis we find that leverage is associated with greater efficiency. However, after the crisis, leverage is associated with lower efficiency. The latter result may be due to the fact that, after the crisis, highly leveraged firms may find it difficult to refinance their operations. While interesting, we view these temporal patterns with caution and focus mostly on the pre-crisis period when business conditions were arguably more "normal". A full investigation of the implications of the 2008 financial crisis on efficiency is left for future research.

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[2] Specifically, we use firm-level data from the following countries. Old EU: Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. New EU: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, Slovenia and Slovakia.

[3] Chirinko et al. (2010) show that a production function accounting for interactions with industrial dummies is flexible and with their sample of 1860 firms, even the OLS estimates are consistent.