WP/18/84

IMF Working Paper

How do Regulations of Entry and Credit Access Relate to Industry Competition? International Evidence

by Deniz Igan, Ali Mirzaei, and Tomoe Moore

INTERNATIONAL MONETARY FUND

 WP/18/84

IMF Working Paper

Research Department

How do Regulations of Entry and Credit Access Relate to Industry Competition? International Evidence

Prepared by Deniz Igan, Ali Mirzaei, and Tomoe Moore†

Authorized for distribution by Maria Soledad Martinez Peria

April 2018

Abstract

We examine the extent to which regulations of entry and credit access are related to competition using data on 28 manufacturing sectors across 64 countries. A robust finding is that bureaucratic and costly entry regulations tend to hamper competition, as proxied by the price-cost margin, in the industries with a naturally high entry rate. Rigid entry regulations are also associated with a larger average firm size. Conversely, credit information registries are associated with lower price-cost margin and smaller average firm size in industries that rely heavily on external finance—consistent with access to finance exerting a positive effect on competition. These results suggest that incumbent firms are likely to enjoy the rent and market share arising from strict entry regulations, whereas regulations enhancing access to credit limit such benefits.

JEL Classification Numbers: G18, G38, L11, L51, L60

Keywords: Entry regulations, Credit access, Price-cost margins, Industry competition

Authors' E-Mail Addresses: digan@imf.org; amirzaei@aus.edu; tomoe.moore@brunel.ac.uk

† Mirzaei is at the School of Business Administration, American University of Sharjah, UAE. Moore is at the Department of Economics and Finance, Brunel University London. We are thankful to Claudia Berg, Huancheng Du, Romain Duval, and Sole Martinez Peria for helpful comments.

Contents

I. INTRODUCTION

The world is aging, with the workforce starting to shrink in several countries, and productivity growth is still struggling ten years after the global financial crisis (and monetary and fiscal policies already at their limits in many countries). Structural reforms—that aim to enhance competition and flexibility in product and labor markets, among other objectives targeting government efficiency and transparency—seem to be the most promising policy option to revive productivity growth and maintain or continue to increase living standards (IMF, 2015). A related call is for improving financial inclusion—in particular, access to finance—so that productivity-enhancing innovation (sometimes in the form of entry by new firms into an industry) and other investment can be financed (Furusawa, 2016).

In the pursuit for faster productivity growth, economic regulation aspires to achieve a competitive environment that fosters efficiency and innovation. Competition is often seen as a driver of productivity, and competition matters not only for the efficiency of production but also for the quality of products and the degree of innovation in industries—notwithstanding the fact that these relationships, both in theory and practice, tend to display an inverted U-shape (see Aghion et al., 2005, and the references therein). Cetorelli and Strahan (2006) argue that competition is an important determinant of a sector's capital allocation which contributes to overall economic growth. Bhuyan (2005) also discusses whether competition can positively affect allocative efficiency because it helps convergence of market equilibrium to that when maximum efficiency is achieved (i.e., prices set equal to marginal costs).

Economic regulation targets competition primarily through rules that limit who can enter a business.[1] Setting clear and coherent entry regulations would generate information and screen out potential frauds and cheats (e.g., Klapper et al., 2006), but going excessive may hamper competitiveness and thus hinder economic growth (e.g., Kalyvas and Mamatzakis, 2014). Entry regulations vary widely across countries (as do industrial competition and growth performance). For example, to meet government requirements for starting a business in Brazil, an entrepreneur must complete 11 procedures taking at least 80 business days with a cost of 5.2 percent of income per capita.[2] In contrast, to form a new business, an entrepreneur in New Zealand has to complete only 1 procedure that takes just 1 day with a much lower cost of 0.3 percent of income per capita. On average, entrepreneurs in emerging markets need to follow around 9 procedures and wait for around 31 days bearing a cost of 14 percent of income per capita, but these figures are considerably lower for their peers in advanced economies (5 procedures, 8-day processing, at a cost of 8 percent of income per capita).

In addition, access to finance is a vital component for new firms and those seeking to innovate, and the lack thereof can become a barrier to entry. The latter is likely to be the case

[1] There is a great degree of consensus that the other tool for economic regulation, namely price controls, should be confined to situations where temporary use of controls may be effective in easing the transition from a high to low inflation (Rockoff, 2008).

[2] Based on the most recent round of data collection (completed in June 2016) for the Doing Business project of the World Bank.

if regulatory features governing access to finance—such as legal protection of lending relations or availability of information on credit histories—are inadequate. A growing literature on institutions, finance, and economic growth indeed highlight the role of access to finance and the regulatory features that govern it (Aghion et al., 2007). These features also vary across countries. For example, while the strength of legal rights and the depth of credit information scores are high in New Zealand (based on the Doing Business index), they are very low in Jordan. In general, the index values tend to be lower in emerging markets as compared to advanced economies.

In this paper, we empirically investigate the extent to which differences in market entry and credit access regulation across countries explain differences in industry competition. We focus on these two factors, since rigid entry regulations and poor access to credit are likely to make it harder for prospective entrepreneurs to start operating and to gain competitive advantage over existing firms.

The dataset covers 28 industries across 64 countries over the period 2004–10. In the empirical specification, we focus on cross-industry, cross-country interaction effects. specifically, we explore whether competition is lower in industries with a higher "natural" propensity for entry (Klapper et al., 2006) when the country has higher hurdles for business incorporation and whether competition is lower in industries with more reliance on external finance (Rajan and Zingales, 1998) when the country has regulations making it more difficult to get credit. The methodology has the advantage of addressing several issues that plague cross-country regressions—such as reverse causality (e.g., countries with more competitive industries may choose more business-friendly regulations) or omitted variable bias (e.g., a country with good institutions may score well in a range of indicators including the degree of competition and the extent of bureaucracy). By focusing on interactions, we can absorb country-level variables and instead study the differential effects of country-level variables we are interested in across industries that might be most responsive to these variables.[3]

Our primary measure for competition is the price-cost margin (PCM).[4] The presence of significant cross-country differences in regulations of business entry and access to finance as well as the presence of significant cross-industry differences in PCM allow exploration of the relationship between regulation and competition. To the best of our knowledge, this is the first attempt to do so. The study of market competition captured by PCM can help one understand the differential implications of changes in regulations across industrial sectors. As an alternative measure of competition, we also look at the average firm size (AFS).

[3] The disadvantage is that we cannot compute the overall magnitude of these effects but only the relative magnitude on the industries examined.

[4] The price-cost margin (PCM) captures competition based on the reasoning that changes in regulations affect entry barriers and, hence, the number of firms, and this, in turn, influences the mark-up of price over marginal costs. See Blanchard and Giavazzi (2003) for further explanation of this mechanism. Alesina et al. (2005) also argue that regulation can influence the costs that even existing firms face when expanding their investment capacity. Moreover, Egger and Egger (2004) show that price-cost margins are closely related to other measures of competition. Our choice of PCM over other competition measures is primarily driven by simplicity and data availability (that we can compute it directly using industry-level data, without resorting to firm-level data).

While manufacturing sectors in countries such as Denmark, Germany, and Israel are highly competitive (i.e., PCMs close to 0), they are less competitive in countries like Colombia, Indonesia, and Korea (i.e., high PCMs). Our empirical analysis essentially explores what might account for these differences. Among several potential factors, we focus on market-entry regulations (i.e., procedural burden, time, and costs of starting a business) and access to finance (i.e., strength of legal rights and depth of credit information).[5] These two regulatory dimensions have been reported to explain variations in the business environment in terms of competition using other measures and country-level data (e.g., Black and Strahan, 2002; Di Patti and Dell'Ariccia, 2004), but industry-level data have not been explored.

Our empirical analysis delivers the following results. Bureaucratic and costly entry regulations hamper competition in industries, and the effect is much stronger where there is a relatively high level of entry. When the regression model is re-estimated with AFS as an alternative dependent variable, we find a positive relationship between entry regulations and AFS. This implies that stricter regulations are also associated with larger AFS, possibly contributing to the process of concentration in industrial sectors. Our evidence seems to favor the public choice theory over the public interest theory of regulation in accordance with that presented in Djankov et al. (2002).[6] This implies that incumbent firms are likely to expand their market share when there are stricter regulations in place. We also find that credit information registries and collateral and bankruptcy laws protecting creditor rights appear to reduce PCM and AFS in industries that rely heavily on external finance. These findings suggest that improving access to finance is likely to enhance competition. The direction of the relationship likely runs from regulations to competition, given the differential results in industries that have a relatively high level of entry and that benefit more from improved access to finance. This interpretation is further supported by instrumental variables regressions and regressions run on subsamples of industries that are less likely to be able to affect regulations and, hence, the case for reverse causality is weaker.

The remainder of the paper is organized in the following manner. Section II reviews the literature and clarifies the contributions of the paper. Section III introduces a simple conceptual setup to describe the relationship between industry structure and competition, and then specifies the empirical model used. Section IV is dedicated to the data and descriptive analysis. In Section V, we present the empirical results. Section VI concludes.

[5] Business regulations data are retrieved from the Doing Business project of the World Bank. The project classifies regulations under the following categories: *starting a business*; *getting credit*; *registering property; protecting investors*; *enforcing contracts*; *paying taxes*; *resolving insolvency; dealing with construction; getting electricity* and *trading across borders*. We focus on the first two categories (*starting a business* and *getting credit*), which are closely associated with entry regulations and, arguably, have more influence on competition. As Kalyvas and Mamatzakis (2014) assert, the Doing Business data are highly decomposed and, hence, have advantages over alternative measures of business regulations, such as economic freedom.

[6] See Section II for the detailed discussion of public choice theory and public interest theory.

II. Related Literature and Theoretical Considerations

A. Related Literature

Our paper connects two strands of existing literature. One deals with the effect of product market regulation on productivity (and other economic outcomes). The other investigates the relationship between productivity and competition. In terms of the literature on the former, for instance, Buis et al. (2016) examine the economic effects of major product market reforms using a unique mapping between new annual data on reform shocks and sector-level outcomes for five network industries in 26 countries spanning over three decades. They find that major reductions in barriers to entry yield large increases in output and labor productivity. Similar studies using country-time or country-time-industry panel data document a significant positive effect of product market reform on productivity, investment, employment, and output (see, for instance, Aghion et al., 2009; Alesina et al., 2005; Bassanini and Duval, 2009; Nicoletti and Scarpetta, 2003). Furthermore, Duval and Furceri (2016) apply a local projection method to a new dataset of major country- and country-sector-level reform shocks in various areas of labor market institutions and product market regulation covering 26 advanced economies. Product market reforms are found to raise productivity and output. The impact of labor market reforms is primarily on employment, but it varies across types of reforms and depends on overall business cycle conditions. Gal and Hijzen (2016) also contribute to the emerging literature on the effects of product market reforms by providing a comprehensive analysis for 10 regulated industries in three broad sectors (network industries, retail trade, and professional services) across 18 advanced economies during the period 1998–2013. They find that the effects of product market reforms on output and investment are positive in the short term and strengthen over time.

Turning to the literature on the relationship between productivity and competition, there is evidence that competition—and policies affecting it—is an important determinant of productivity growth. Firm-level evidence has supported the idea that competitive pressures are a driver of productivity-enhancing innovation and adoption (e.g., Griffith et al., 2002; Haskel et al., 2007; Aghion et al., 2004). Further evidence has also been provided at the industry level (e.g., Inklaar et al., 2008; Buccirossi et al., 2009). Bourles et al. (2013) argue that regulations that bridle access to otherwise competitive markets and unnecessarily constrain business operations can be a drag on productivity growth. They further assert that such regulations can also have powerful indirect depressing effects on the productivity of other sectors through input-output linkages and label regulations such as legal barriers to entry as "anticompetitive upstream regulations."

To sum, these studies empirically find that there is a positive relationship between product market reform and productivity, and also between productivity and competition. Our paper complements these studies by filling a gap through direct investigation of the relationship between market regulations and competition.

Our paper also contributes to the following three strands of the literature. First, it is closely related to those studies that document market-entry regulations as barriers to entrepreneurship. Desai et al. (2003) and Klapper et al. (2006) find that market-entry regulations have a negative impact on firm formation. Using firm-level data from 10 OECD

countries, Scarpetta et al. (2002) also show a negative correlation between strict product-market regulations and the entry of small and medium-sized enterprises. For instance, if entry costs are fixed at a high level, then this would increase the average size of entrants. Fisman and Sarria-Allende (2010) document that existing firms within industries will expand fast if they are located in countries with strict entry regulations. They also show that new firm creation is limited under such circumstances.

Second, our paper is related to literature that focuses on the economic impact of financial development and access to finance. Rajan and Zingales (2003) argue that a well-developed financial system enhances competition in industrial sectors by allowing easier entry. They present the basic mechanism showing that the correlation between credit allocation and a borrower's collateral and reputation falls as a financial system develops. This increases the entry of new, unknown (potentially more innovative) firms, improving the degree of competition and thus reducing the rent of incumbents. De Serres et al. (2006) also find that regulations that improve efficiency and stability of financial systems increase the rate of entry of new firms. In Cetorelli (2004), enhanced bank competition in the United States is associated with more firms in operation with a smaller average firm size. In a seminal paper, Rajan and Zingales (1998) distinguish industries between the heavy users of external finance and the lighter users of external finance and find that industries that rely more on external finance grow disproportionately faster in financially developed countries. Similarly, Klapper et al. (2006) show that, in Europe, financial development facilitates entry in the sectors that are more dependent on external finance. Using firm-level data in 16 advanced and emerging economies, Aghion et al. (2007) also support the finding of Rajan and Zingales (1998) by arguing that financial development encourages entry by small firms to the sectors that are heavy users of external finance. Empirical evidence, in general, appears to suggest that small firms are more sensitive to financial development, since they are prone to credit constraints (Beck et al., 2004).

Third, this paper is linked to the literature that attempts to measure determinants of competition in industrial sectors. Determinants of product market competition have been analyzed in many studies (e.g., Chevalier, 1995; Kovenock and Phillips, 1995 and 1997; Maksimovic, 1988). Others have particularly focused on determinants of firm size (e.g., Kumar et al., 2001; Campbell and Hopenhayn, 2005; Cetorelli and Strahan, 2006).

Our paper relates to these parallel lines of research and makes a contribution by distinguishing itself from previous empirical studies in two ways. First, we explore, for the first time to the best of our knowledge in the literature dealing with manufacturing sectors, the implications of country-wide regulations related to starting a business and credit access for industry competition using industry-level data. We use a relatively large dataset of 28 industries in 64 countries, that includes an entire range of listed and non-listed firms within each industry. Second, we exploit the heterogeneity in the relationship between regulations and competition across industries based on their varying degrees of market-entry rates and external-finance dependence. This helps us take a step toward identifying the causal effect of business regulations on competition. We conduct several exercises to establish the link better, including instrumental variables regressions and subsamples.

B. Theoretical Considerations

Our main research question can be formulated as: what is the association between market-entry regulations and competition? There are two competing theories.

First is the public interest theory of regulation (Pigou, 1938), which suggests that stricter regulation of entry should be associated with socially superior outcomes. Entry regulations ensure that companies meet minimum standards to provide goods and services while limiting market power (e.g., formation of monopolies). Under this theory, one would expect that entry regulation is associated with high-quality products from "desirable" sellers and fewer externalities such as pollution (Arrunada, 2007), and with maintaining a "healthy" degree of competition.

The opposing theory is the public choice theory (Stigler, 1971; Peltzman, 1976), which comes in two flavors. The capture theory by Stigler (1971) argues that regulation is acquired by the industry and primarily designed for its own benefit. Stigler predicts that stricter regulation raises barriers to entry, leading to greater market power and profits for firms, rather than benefits to consumers. The strict regulation of entry keeps out the competitors and raises rents for incumbents and it is susceptible to corruption (Djankov et al., 2002). Acemoglu (2008) argues, in a variation of the capture theory, that political power is in the hands of major firms who try to block new entrepreneurs. The second strand of the public choice theory, the so-called 'tollbooth view' (Djankov et al., 2002) holds that regulation is pursued for the benefit of politicians in order to create rents or to extract them through campaign contributions, votes, and bribes.

We hypothesize in light of the public choice theory that stiffer entry regulations should be associated with less competition. Evidence on the contrary would be interpreted as support for the public interest theory.

Credit constraints also play their part as entry barriers, as discussed in many studies including Hubbard (1998) and Stein (2003). Albuquerque and Hopenhayn (2004), Clementi and Hopenhayn (2006), and Cabral and Mata (2003) develop models in which financial constraints severely limit entry as well as post-entry growth of firms. Evans and Jovanovic (1989) argue that liquidity constraints may prevent investors from starting a business, suggesting that entry rates should be lower in countries where access to finance is difficult. Empirical studies by Klapper et al. (2006) and Aghion et al. (2007) confirm that financial constraints are detrimental to firm market entry and growth. One might argue that beneficiaries of highly developed financial markets are the incumbent firms: they get more funds than new entrants do, which can in turn reduce competition. However, highly developed markets are likely to provide better access to finance for new entrants than less developed markets can. So, in a cross-country context, we expect onerous entry regulations together with lower financial development to generate an unfavorable business environment, and a relaxation of barriers to entry and better access to credit to increase competition within industrial sectors.

Note that we use industry data for computing price-cost margins, because the implications of entry regulations and credit access for industry competition may vary across industries (see Braun and Raddatz, 2008). For instance, while, in some industries, technological constraints

(e.g., a minimum efficient scale) may be the main obstacle to competition, in other industries access to finance may be more important as a constraint. Thus, incumbents may behave differently when they face lax entry regulations and/or easier access to credit. Braun and Raddatz (2008) present empirical evidence that the impact of financial development on competition, measured by price-cost margins and average firm size, is heterogeneous across industries. Rajan and Zingales (1998) find that industries that are more dependent on external finance grow disproportionately faster if they are located in countries with more developed financial markets. Cetorelli (2001), Cetorelli (2004), and Cetorelli and Strahan (2006) also document the heterogeneous impact of financial development on manufacturing industries. In our empirical analysis, we consider heterogeneity from the aspect of entry rates and external-finance dependence that vary across industrial sectors.

III. METHODOLOGY

A. Industry Structure, Competition, and Price-Cost Margin

Consider an industry with N firms and an inverse demand curve given by $p = f(X)$, where X is the market output and is computed as the sum of the outputs of the firms, i.e., $\sum_i x_i$. Assume that the firms produce a homogenous product and each firm has the (same) cost function that includes a fixed cost c_i^f and a constant variable cost $c_i^v(x_i)$. Then the profit function for the ith firm is:

$$\pi_i = px_i - c_i^v(x_i) - c_i^f \qquad (1a)$$

where $\pi_i$is profit, x_i is output rate, and p is price. Rearranging this equation, we obtain:

$$\pi_i = f(X)x_i - c_i^v(x_i) - c_i^f \qquad (1b)$$

Assuming profit-maximizing behavior, the first-order condition for a maximum is:

$$\frac{\partial \pi_i}{\partial x_i} = \frac{\partial f(X)}{\partial x_i}.x_i + \left[f(X) - \frac{dc_i^v}{dx_i}\right] = 0 \qquad (1c)$$

Since $p = f(X)$, we have $\frac{\partial f(X)}{\partial x_i} = \frac{\partial X}{\partial x_i}.\frac{dp}{dX}$. Now substituting the latter formula into Eq. (1c) gives:

$$\frac{\partial X}{\partial x_i}.\frac{dp}{dX}.x_i + \left[p - \frac{dc_i^v}{dx_i}\right] = 0 \qquad (1d)$$

or

$$\frac{p - \frac{dc_i^v}{dx_i}}{p} = -\frac{x_i}{p}.\frac{\partial X}{\partial x_i}.\frac{dp}{dX} \qquad (1e)$$

The market elasticity for the industry under consideration is $e = -\frac{dX}{dp}.\frac{p}{x_i}$, and assuming $\frac{\partial X}{\partial x_i} = 1$ for simplicity (see Hay and Liu, 1997, for the general case), we get:

$$\frac{p - \frac{dc_i^v}{dx_i}}{p} = \frac{1}{e} \qquad (1f)$$

However, following Hay and Liu (1997) and setting $\frac{\partial X}{\partial x_i} = 1 + \frac{\partial \sum_{j \neq i} x_j}{\partial x_i} = 1 + \tau_i$, a variety of competitive behavior can be presented. Here τ_i is the expected changes in the output of rivals for a given change in the output of firm i. Then $\tau_i > 0$ indicates collusive behavior. If all firms tend to increase their output, then we have $\tau_i = \frac{1 - s_i}{s_i}$, where s_i is the market share of firm i, indicating full collusion with all firms changing outputs so as to preserve market shares. The Nash-Cornet case has $\tau_i = 0$, while $\tau_i < 0$ is competitive.

Equation (1e) can be rearranged to obtain an expression for the price-cost margin as:

$$\frac{p - \frac{dc_i^v}{dx_i}}{p} = \frac{s_i}{e}(1 + \tau_i) \qquad (2a)$$

When we sum over the N firms in the industry, we get:

$$\frac{p - \frac{dc_i^v}{dx_i}}{p} = \frac{(1 + \tau_i)}{Ne} \qquad (2b)$$

where $\sum s_i = 1$. Note that the left-hand side of Eq. (2b) represents price-cost margin or the Lerner index (the mark-up of price over marginal cost) of monopoly power (Cowling and Waterson, 1976), which is inversely associated with the industry price elasticity and with the number of firms in the industry. Also note that Waterson (1984) shows how price-cost margins can be aggregated over firms and be related to industry concentration.

From this equation, we can conjecture that stricter market entry regulation or poorer access to finance will decrease the number of firms (N) in each industry and, hence, increase price-cost margins. For example, with better access to finance, new firms will be created, implying that N rises and price-cost margins fall.

B. Empirical Specifications

In line with previous studies (e.g., Braun and Raddatz, 2008), we estimate the following regression models:

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict} \qquad (3a)$$

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \varphi_3 Y_{ct} + \theta_i + \emptyset_c + \vartheta_t + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \varepsilon_{ict} \qquad (3b)$$

where i, c, and t denote industry i in country c in year t. As to be explained further below, the first specification includes a rich set of interaction fixed effects. Note that the pair-fixed effects (industry-country, industry-time, and country-time) would absorb all the single fixed effects (industry, country and time). The second specification drops the interaction between country and time fixed effects so as to allow inclusion of individual fixed effects as well as control variables that vary at the country-time dimension.[7]

$Competition$ is product market competition at the industry level measured using the price-cost margin (PCM).[8] This measure captures the ability of firms in an industry to set prices above marginal costs.[9,10] PCM is computed using proxies for sales and costs, as available in industry data, as follows (Braun and Raddatz, 2008):

$$Price\ Cost\ Margin\ (PCM) = \frac{Value\ of\ Sales - Payroll - Cost\ of\ Materials}{Value\ of\ Sales} = \frac{Value\ Added - Wages}{Output} \quad (4)$$

We also use average firm size (AFS) as an alternative dependent variable (Cetorelli and Strahan, 2006). Following Cetorelli (2001), AFS is similarly measured using the available proxies, namely, by the ratio of total employment to the total number of establishments.

$Regulation$ stands for the two categories of business regulations we consider in the analysis. $Starting\_Business$ is a composite measure of market entry regulations by taking a principal component of four elements*:* procedure, time, cost, and capital. $Access\_Finance$ depicts regulations with direct implications on availability of finance, where we also take a principal component of four elements*:* strength, depth, public, and private. Section IV and Table 1 provide further details on each of these components.

[7] The first, more restrictive specification is our baseline (following Levintal, 2013).

[8] Several other studies also use price-cost margin as an indicator of industry competition. See, for example, Cowling and Waterson (1976), Bhuyan (2005), Dickson (2005), Egger and Egger (2004), Braun and Raddatz (2008), Boulhol (2008), and Stiegert et al. (2009).

[9] Note that PCM as computed here differs from the original formulation of the Lerner index of monopoly power, outlined in Section III.A, which uses marginal rather than average costs and assumes the industry is in equilibrium. In our context, this is not too worrisome since we will not be driving inferences based on the level of PCM but will just use its within-country, cross-industry variation. Also, industry-level PCM in practice is a measure of the profitability of incumbents, calculated as profit over value of total output. One could think of a variety of refinements including adjustments for capital investment and taxes. We go for the simple version of the indicator due to data availability.

[10] Fluctuations in PCM could be due to changes in demand rather than market structure. Yet, the sensitivity of margins to aggregate demand would again differ between concentrated and un-concentrated industries. Domowitz et al. (1986) show that the observed concentration-margins relationship is independent of the business cycle. They find that industry price-cost margins respond positively to increases in demand in concentrated industries, i.e., increasing concentration is associated with margins that are more procyclical. In our empirical specification, country-time fixed effects aim to capture demand-related changes.

The implications of business regulations for competition are not, however, homogeneous across industries. In the empirical specifications, we exploit this heterogeneity as an identification strategy. Particularly, we distinguish industries with a relatively high entry rate and also industries with a relatively heavy dependence on external finance from other industries. Hence, $Charateristic$ is either the industry entry rate ($Entry\_Rate$) or external-finance dependence ($External\_Finance\_Dependence$). The logic for the first is as follows (Klapper et al., 2006): if rigid market-entry requirements have an impact on industry competition, they should particularly hamper entry into industries that have naturally high entry rates. Klapper et al. (2006) compute entry rates of new firms for the United States by two-digit NACE industry codes taking the fraction of new firms to total number of firms in an industry. New firms are defined as a firm that is one or two years old. The data were averaged for the years 1998–99. We use their data by matching the two-digit NACE with three-digit ISIC (see Section IV for details). As for the second industry characteristic, we follow Rajan and Zingales (1998). Using U.S. firm-level data, they estimate external-finance dependence of each industry. We expect that, if access to credit matters for industry PCM, it should be more pronounced for industries that are more dependent on external finance.[11]

X and Y are vectors of industry-country-year and country-year control variables, respectively. Here, we consider several industry-specific and country-specific variables that may explain differences in PCM across industries and countries. First, we include a proxy for industry market *share*. We expect that industries with a larger market share have a better position in setting prices above marginal costs. As a proxy for market share, we use the share of value added of each industry to total value added of all industries in the country (Rajan and Zingales, 1998). Second, we consider two proxies for industry *inefficiency* and *productivity*. The former is the ratio of each industry's wages to output, and the latter is the ratio of value added growth to number of employees in each industry.[12] Note that, to mitigate the concern that these measures computed at the industry level may be affected by the degree of competition in the same industry and, hence, generate endogeneity, we use lagged values of these variables. Third, PCM has been shown to be positively correlated with measures of *concentration* across industries (e.g., Collins and Preston, 1969; Encaoua and Jacquemin, 1980; Braun and Raddatz, 2008). For instance, Collins and Preston (1969) find that there is a strong relationship between four-firm concentration and inter-industry differences in PCM. Given unavailability of proxies for concentration data across individual industries for each country, we use the share of value added of the top five largest industries in each country.[13] Fourth, capital intensity varies across industries and hence industries may respond differently

[11] The external-finance dependence measure is calculated by pooling all—both young and mature—firms in an industry. One could argue that the calculations for young firms may be contaminated by factors other than their dependence on external finance and one should use the calculations for mature firms only. The empirical results are robust to computing the external-finance dependence measure using data for mature firms.

[12] Note that many other industry characteristics, such as industry differences in capital intensity, fixed costs, risk, vertical integration, advertising and demand elasticity, also have a bearing on price-cost margins (Collins and Preston, 1969). However, it is difficult to quantify such factors in a panel data analysis given the lack of consistent, readily-available data across sectors and over time. Nonetheless, industry fixed effects (θ) capture the impact of such factors, to the extent that they are time-invariant.

[13] Do and Levchenko (2007) use a similar approach to compute the top two sectors' share of overall manufacturing exports in each country.

whether capital is abundant or not. *Foreign direct investment* could be a proxy for capital abundance conditions in a country.[14] Finally, changes in consumer demand for an industry's output can be captured, albeit broadly, by macroeconomic fluctuations. Hence, we include *GDP growth* and *inflation* in our empirical specifications to capture such shifts in demand.

Variation in the data also allows us to include industry-country, industry-year, and country-year fixed effects (except when country-level control variables mentioned above are among the regressors). By including this rich set of fixed effects, we mitigate, to a greater degree, the risk of potential reverse causality and/or omitted variables (Cetorelli and Strahan, 2006). Note the full set of the interaction fixed effects account for the impact of the global financial crisis that began in 2007–08.

IV. DATA

We obtain our industry-level data from the UNIDO Industry Statistics. The database contains yearly data at 2-, 3-, and 4-digit sectors. We work with 2- and 3-digit sectors and re-group them into 28 sectors according to ISIC Rev.2. We compute competition indicators (PCM and AFS) for each of the 28 sectors in 64 countries following the definitions in Section III.B.

Data on business regulations (starting a business and getting credit) are obtained from the Doing Business project of the World Bank.[15] The Doing Business project records all procedures officially required, or commonly carried out in practice, for an entrepreneur to start up and formally operate an industrial or commercial business as well as the time and cost to complete these procedures and the paid-in minimum capital requirement. The procedures include obtaining all necessary licenses and permits and completing any required notifications, verifications or inscriptions for the company and employees with relevant authorities. We use four measures of regulation on starting a business: the number of procedures that firms must go through ($Procedure$), the official time required completing the process ($Time$), cost required completing each procedure ($Cost$), and the amount of capital that the entrepreneur needs to deposit ($Capital$). We generate an overall composite index as a principal component of these four entry regulation variables ($Starting\ business$).[16]

With respect to getting credit, the project measures the legal rights of borrowers and lenders with respect to secured transactions through one set of indicators and the sharing of credit information through another. The first set of indicators measures whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws. The

[14] We interpret a high level of FDI as an indication that industries—especially those with high capital intensity—have an easier time procuring capital to engage in production activities. Domestic credit to the private sector—as a proxy for financial development—can be considered as an alternative, however, there is a high correlation between this variable and the variables measuring access to credit.

[15] We refer the interested reader to the World Bank, Doing Business website (www.doingbusiness.org). See Pinheiro-Alves and Zambujal-Oliveira (2012) for a discussion on the reliability of and further details on this dataset.

[16] Conversion of correlated variables into an index using principal component analysis is common in the literature. For example, see Creel et al. (2015) who construct a financial stability index.

second set measures the coverage, scope and accessibility of credit information available through public credit registries and private credit bureaus. Specifically, we use four measures of credit regulations: an index that measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending ($Strength$), an index that measures rules and practices affecting the coverage, scope and accessibility of credit information available ($Depth$), the number of individuals and firms listed in a public credit registry with information on their borrowing history from the past five years ($Public$), and the number of individuals and firms listed by a private credit bureau with information on their borrowing history from the past five years ($Private$). A higher value of these indicators implies better access to finance for new firms. Again, we generate an overall index as a principal component of these four variables ($Access\ finance$).

Table 1 describes all the variables used in this study and provides the sources from which they are retrieved. The sample period is 2004−10 for all variables, except for industry characteristics that are time-invariant. The data starts from 2004 because Doing Business data starts from 2004 and it ends with 2010 because industry data is available up to 2010 due to a lag of several years in the UNIDO data.

Table 2a shows the country-level averages for the computed C*ompetition* indicators—*PCM* and *AFS*—as well as the indicators of *Starting business* and *Access finance*. Table 2b presents industry competition indicators and characteristics—*Entry rate* and *External Finance Dependence*—, taking the average across countries for each industry. Table 2c reports the summary statistics for all the variables used in the analysis. PCM varies substantially across countries as well as across industries. In country-wise statistics, it ranges from around 0 in Israel, Denmark, and Slovenia to 0.337 in Colombia with a cross-country average of 0.118. In industry-wise statistics, it ranges from 0.060 in leather and fur products (ISIC 323) to 0.265 in tobacco (ISIC 314). AFS ranges from 1.90 in Cyprus to 7.07 in Peru across countries, and from 2.47 in other manufacturing (ISIC 390) to 5.26 in tobacco (ISIC 314) across industries.

The number of procedures required to start a business varies from the lowest of 1.71 in Canada and New Zealand to the highest of 16 in Brazil in Table 2a. The minimum official time ranges from the lowest of 2.0 business days in Australia to the highest of as many as 146 days in Brazil. The official cost of following these procedures for an entrepreneur is 0.0 percent of per capita GDP in Denmark but 147.8 percent per capita GDP in Malawi. As for the minimum capital requirement, 20 countries do not impose any such requirement with 0 percent recorded, whilst we find the highest of 1221 percent of per capita GDP in Ethiopia. Overall, for an entrepreneur, formal market entry is burdensome, time-consuming, and expensive in many countries, especially in developing countries.

Table 2a also indicates that *Strength* of getting credit varies from the lowest of 2 in Jordan to the highest of 10 in six countries including the United Kingdom. *Depth* varies from the lowest of 0 in five countries to the highest of 6 in the United Kingdom. In some countries, the public credit registry (*Public*) is 0 percent of population whereas the highest reporting at 70.8 percent is observed in Portugal. For the private credit registry (*Private*), we also observe 0 percent of population in a third of countries whereas 100 percent is reported in Norway, Ireland, and Canada.

Overall, competition among industries varies across countries, and generally in advanced economies tends to be more intensive than in emerging economies. Furthermore, advanced economies regulate entry requirements relatively less than emerging market countries do.

Figure 1 displays trends of entry regulations, access to finance, and industry competition for 64 countries under our study over 2004–10. We observe that entry regulations have a downward slope, but access to finance has an upward slope over time. In Figure 1(c), it appears that the PCM and AFS decrease in line with the relaxation of entry regulations and the improvement of access to finance, though this relationship is disrupted by the financial crisis.

The correlation between PCM and AFS is 0.261 and statistically significant at 1 percent. We plot both variables in Figure 2 country-wise and industry-wise, respectively, as well as by country and industry. As demonstrated, all plots show an upward trend, implying a positive association between the two measures of competition. This is expected if both measures are plausible proxies of competition.

V. EMPIRICAL RESULTS

A. Baseline

We report the results on the relationship between business regulations and industry competition in Tables 3a and 3b. The two tables use the same measures of regulation (*Starting business* and *Access finance*) but differ in the measure of competition: Table 3a shows the results with PCM as the dependent variable, while in Table 3b shows with AFS. Note that country-time fixed effects are specified in Columns 1 and 3 whereas country-specific control variables are specified in Columns 2 and 4. The regression results show a positive relationship between regulations governing procedures to start a new business and PCM and a negative relationship between regulations governing firms' access to finance and PCM. In other words, as starting a business becomes more cumbersome (as indicated by a higher value for the index of *Starting business*), competition declines (as indicated by a higher value for PCM or AFS). Similarly, as the regulations relating to getting credit are less established (as indicated by a lower value for the index of *Access finance*), competition becomes less intense.

These estimates are not only statistically significant but also economically meaningful. For instance, concentrating on Column 1 in Table 3a, the coefficient estimate on the interaction term of regulation and industry characteristic implies that PCM for an industry at the 75th percentile of distribution of *entry rate* is about 1.65 percent more than the one at the 25th percentile of the same distribution when moving from a country with *Starting business* index at the 25th percentile to a country with *Starting business* index at the 75th percentile. Conversely, focusing on Column 3 in Table 3a, PCM for an industry at the 75th percentile of distribution of *external finance dependence* is about 1.67 percent less than the one at the 25th percentile of the same distribution when moving from a country with *Access finance* index at the 25th percentile to a country with *Access finance* index at the 75th percentile. These impacts are economically not trivial, given that the sample mean for the PCM is 11.8 percent.

One relevant question is which set of regulations, market entry or credit access, matter more. Note that the coefficient estimates in the regressions including country-level controls in Columns 2 and 4 rather than country-time fixed effects in Columns 1 and 3 are very close in magnitude. This suggests that both market-entry and credit-access regulations matter because, in the specification with country-time fixed effects, the set of regulations other than the one of interest (*Starting business* or *Access finance*) is controlled for. In order to answer the question more directly, we also include the interaction terms for both *Starting business* and *Access finance* in the same specification. The results in Table 4 indicate that there is no obvious winner in this horse race: coefficients on both interaction terms remain statistically significant and similar in magnitude to those obtained in Tables 3a and 3b.

Overall, we observe that rigid entry regulations and poor access to credit are associated with reduced competition among industrial sectors, whereas the relaxation of regulations and better access to finance tend to promote competition. The magnitude of these relationships is economically meaningful. This is consistent with experiences in some countries, for instance, the average PCM in Azerbaijan—a resource-rich developing country—substantially decreased from 13 percent in 2004 to 4 percent in 2010. This was accompanied by a sharp fall (increase) in the index of *Starting business (Access finance)*, which declined (increased) from 2.4 (-1.7) to -1.1 (-0.3) over the same period.

B. Robustness to Alternative Measures

In Table 5, we confirm the robustness of our results to alternative measures of the main variables, namely, the business regulation indices and industry competition measure.

In Columns 1–2 and 4–5, we specify alternative measures for business start-up entry regulations and access to finance. For entry regulations, we utilize data for the 'registering property' and 'dealing with construction' categories of the 'Doing Business' database to augment the measure we use in the baseline.[17] The results continue to show that competition may be hindered by the complexity of procedures and high cost of transactions. As alternative measure for access to finance, we utilize the 'enforcing contracts' category to augment the original measure of *Access finance*. The results are comparable to those obtained in Tables 3a and 3b.

In Columns 3 and 6, we re-define AFS by using the ratio of total value added to the number of establishments (in log), instead of the ratio of the number of employees to the number of establishments. The results for *Starting business* are consistent with those in Tables 3a and 3b, where the coefficients of the interaction term for *Starting business* are highly significant with a positive sign. Entry regulations appear to protect the incumbents, whilst dampening the creation of new firms, contributing to an anti-competitive environment in manufacturing sectors. In terms of *Access finance*, the coefficient remains significant and negative. This again suggests that protection laws reduce PCM and hence boost competition.

[17] More specifically, for this augmentation, we compute the first principal component for the four aspects of "starting business" (as in the original measure) and the procedure and time aspects of two new dimensions—"registering property" and "dealing with construction"—of entry regulations.

These robustness results indeed support our initial main findings in Table 3 and are in line with earlier empirical literature. For example, Desai et al. (2003) find that entry regulations have a negative impact on firm entry based on a cross-country approach. Scarpetta et al. (2002) also find that stringent product and labor market regulations are negatively correlated with the entry of small and medium-sized firms in OECD countries using firm-level survey data. In Ciccone and Papaioannou (2007), countries where it takes more time to register new businesses witness slower establishment growth in industries that experience expansionary global demand and technology shifts. The results also accord with that reported in Klapper et al. (2006), who find that entry is higher amongst more financially dependent industries in countries that have higher financial development.

C. Direction of Causality

Based on the analysis so far, we know that the findings are not driven by the possibility that there are fewer high-entry industries in countries with high bureaucratic entry barriers or that there are fewer external-finance-dependent industries in countries with poor access to credit. This is because we are able to control for industry effects in our dataset composed of industry-country-time observations. Yet, there is the possibility that there are omitted variables that might jointly drive the propensity to enter or the tendency to be external finance dependent and the degree to which regulations raise barriers for market entry or for access to finance.

To address concerns about the direction of causality, we adopt an instrumental variables (IV) approach using the two-stage least squares method. The literature has shown that the origin of a country's legal system appears to be strongly correlated with the regulatory framework in place today (see, among others, La Porta et al., 1999). In addition, institutional quality of a country can be associated with the effectiveness of regulations. A lack of quality government institutions can hamper not only entrepreneurial activities (Nyström, 2008) but also efficient allocation of resources. Therefore, we use the legal origin and KKZ index as instruments for regulation.[18] The results of this exercise are shown in Table 6a. Note that the magnitudes of the coefficients are larger as compared with those in Tables 3a and 3b. This suggests a higher sensitivity of industry competition to business regulations in the IV model, potentially explained by different groups of countries or industries being differentially affected by the instrument. Nevertheless, the results remain fairly robust in terms of sign and significance level. Only the association between *Access finance* and PCM is no longer significant (and the diagnostic tests seem to suggest that we cannot rule out the possibility that the variables in this specification are exogenous).

The instrumental variable approach may still not fully address the causality problem. It could be that countries with industries of a certain characteristic have a strong entrepreneurial culture and, hence, select business-friendly and transparent regulations. If legal origin also drives culture, it would be exogenous but still correlated with other omitted variables that

[18] Note that legal origin does not change over time while regulations do. Hence, to construct a time-varying instrument for regulations, we interact legal origin with the KKZ index, which measures six different dimensions of governance: government effectiveness, political stability, regulatory quality, rule of law, voice and accountability, and control of corruption.

determine competition. In technical terms, the instrument may be violating the exclusion restriction.

A crude way to address this is to specify the interaction between the industry characteristic and a country's average value for that characteristic. If the country's average characteristic is a proxy for culture, the inclusion of this new interaction term should not materially change the magnitude of the estimated coefficient on the interaction term of interest. The results in Table 6b confirm that it does not (by comparing the coefficients to their counterparts in Tables 3a and 3b).

Another way to check the direction of causality is to see if the results hold when we restrict the sample to industries that are less likely to be able to affect regulations. One could reasonably expect that relatively small industries (defined here with respect to the median level of value added) or those in low-growth (defined here as those with average value-added growth rate below median) or in low-tech (defined based on OECD classification) industries to have less influence in policymaking. We expect the signs to remain the same and significant when one looks only at small industries, low-growth industries, or low-tech industries. The results in Table 6c are largely in line with this expectation.

Another source of omitted variable bias is the interaction between the macroeconomic environment and industry conditions. While the use of country-time fixed effects allows us to control for any macroeconomic shocks directly affecting sectoral outcomes, it could be the case that some macroeconomic variables correlated with entry regulation affect sectoral outcomes through the industry characteristic (i.e. natural entry rate or external financial dependence). We check the robustness of the results by adding interaction terms between the sector specific variables and macroeconomic variables. Specifically, we interact the industry characteristic with variables such as financial depth, trade openness, institutional quality, cross-border capital, GDP growth, and inflation.[19] Table 7a(b) report the results with PCM (AFS) as the dependent variable. We find little sign of potential omitted variables and our main findings remain intact.

D. Channels: A Discussion

So far we have, in general, found that the indicators of *Starting business* (*Access finance*) have a negative (positive) relationship with industry competition. In this sub-section, we aim to have a discussion on the channels through which these relationships are likely to arise.

The components of the regulation indices may give indications of the underlying forces. We repeat the baseline regressions (as displayed in Tables 3a and 3b) with the components rather than the composite indices in Tables 8a and 8b. We observe somewhat mixed results in terms of significance level between PCM and AFS regressions. We focus our discussion on the

[19] Financial depth is computed as domestic credit to private sector and market capitalization of listed companies as percent of GDP. Trade openness is measured by a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. Cross-border capital is measured as FDI in percent of GDP. Institutional quality is proxied by KKZ index, as before. The data sources for these variables are the World Bank WDI, Heritage Foundation, and Worldwide Governance Indicator.

coefficients that are significant at least at the 10 percent level for both regressions. For market-entry regulations, we find that as *Procedure* and *Time* increases, PCM and AFS increases, implying a decline in competition. Interestingly, the coefficient on *Capital* is not statistically significant. In the case of access-to-finance regulations, *Depth* indicates a statistically significant, negative relationship with PCM and AFS, and hence it is likely to promote competition. These results indicate that an increase in the number of procedures and time for starting a business becomes the primary hindrance for potential new establishments, whereas the provision of initial capital may be of less critical importance. The latter is inconsistent with a general belief that lack of credit is the major obstacle for economic growth in the finance-growth literature. Our analysis instead highlights that it is the complexity of procedures that is likely to exert more adverse impact on new enterprises. Note also that the significant coefficient on *Depth* and insignificant coefficients on the other components could be a reflection that a high quality of rules and practices affecting credit information availability—as captured by the *Depth* component—may be contributing to higher values in the other components of *Access Finance* (in particular for the *Public* and *Private* components, which measure the actual coverage in credit registries/bureaus). This interpretation is also consistent with literature on the effects of bank competition on firms' access to finance: for instance, Love and Martinez Peria (2015) find that this impact depends on the quality and scope of credit information sharing mechanisms: better credit information mitigates the damaging impact on access of low banking competition.

Stringent entry regulations can lead to higher levels of industry market power through a reduction in the number of new firms entering a market (Klapper et al., 2006) or through lower investment (Alesina et al., 2005). Thus, we also examine the possible role of extensive and intensive margins. The former is measured by the number of establishments and the latter by the log of fixed capital formation (investment). If these variables form a channel between the competition and regulations, we would expect negative and positive signs on the coefficients of *Starting business* and *Access finance,* respectively. Even if they may not be a valid conduit, we would predict the same sign, if our previous results are credible since an increase in establishments and possibly investment at least provides industries with ground for competition. The results in Table 8c are as expected for establishments: tighter entry regulations reduce the number of establishments whilst better access to finance increase it. We do not find statistically significant relationship between investment and *Starting business* though and the sign of the relationship between investment and *Access finance* is opposite of what one would expect if the latter type of regulations increased external-finance-dependent incumbents to invest more. Taken together, these results seem to suggest that regulations may be promoting competition by allowing firms to expand on the extensive margin rather than the intensive margin.

VI. CONCLUSION

In this paper, we examined the relationship between competition and regulatory indicators for starting a business and for access to finance. The main results are supportive of public choice theory, that is, bureaucratic market entry barriers can lead to lower levels of competition while legal protections and information disclosure for access to finance contribute to competitive structures across industries.

From a policymaker's point of view, our results provide a consistent body of evidence suggesting that entry barriers may distort industry competition. However, this does not necessarily mean a decline in growth, since it is possible that in countries with tougher entry regulations, industries may respond to growth opportunities through the expansion of existing firms,[20] whilst in countries with lighter entry regulations, growth opportunities lead to the creation of new firms. The general point made is that entry regulation may carry costs in terms of anti-competitive industry structures. And, regulations on access to finance may mitigate such detrimental effect. Policymakers should weigh these potential costs of regulating market entry and facilitating access to finance on industries, in particular, for high entry-rate and external-finance-dependent industries.

It is worth noting that regulations serve a purpose and are necessary to ensure that market failures are adequately addressed and fairness is maintained. Overly bureaucratic and costly regulations are more problematic than regulations in and of themselves. Indeed, the indicator of *Starting business* we use in our analysis is appropriate to assess the bureaucratic burden. Well-designed regulations could thrive to ensure that public health and safety are not threatened by industrial activity while keeping the burden on the regulated industries reasonable.

References

Acemoglu, D., 2008. Oligarchic versus Democratic Societies, *Journal of the European Economic Association* 6(l), l–44.

Aghion, P., Askenazy, P., Bourlès, R., Cette, G., Dromel, N. 2009. Education, Market Rigidities and Growth, *Economics Letters*, 102(1), 62–65.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., Howitt, P., 2005. Competition and Innovation: An Inverted-U Relationship, *Quarterly Journal of Economics* 120(2), 701–728.

Aghion, P., Blundell, R., Griffith, R., Howitt, P., Prantl, S. 2004. Entry and Productivity Growth: Evidence from Microlevel Panel Data, *Journal of the European Economic Association* 2(23), 265–276.

Aghion, P., Fally, T., Scarpetta, S., 2007. Credit Constraints as a Barrier to the Entry and Post-Entry Growth of Firms, *Economic Policy* 52(4), 731–779.

Albuquerque, R. Hopenhayn, H. A., 2004. Optimal Lending Contracts and Firm Dynamics, *Review of Economic Studies* 71(2), 285–315.

Alesina, A., Ardagna, S., Nicoletti, G., Schiantarelli, F., 2005. Regulation and Investment, *Journal of the European Economic Association* 3(4), 791–825.

Arrunada, B., 2007. Pitfalls to avoid when measuring the institutional environment: is 'Doing Business' damaging business? *Journal of Comparative Economics* 35, 729–747.

Bassanini, A., Duval, R. 2009. Unemployment, Institutions, and Reform Complementarities: Reassessing the Aggregate Evidence for OECD Countries, *Oxford Review of Economic Policy* 25, 40–59.

Beck, T., Demirgüç-Kunt, A., Maksimovic, V., 2004. Financial and Legal Constraints to Firm Growth: Does Size Matter? *Journal of Finance* 60, 137–177.

Bhuyan, S., 2005. Does vertical integration effect market power? Evidence from U.S. food manufacturing industries, *Journal of Agricultural and Applied Economics* 37, 263–276.

Black, S.E., Strahan, P.E., 2002. Entrepreneurship and bank credit availability, *Journal of Finance* 57, 2807–2833.

Blanchard, O. J., Giavazzi, F., 2003. Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets, *Quarterly Journal of Economics* 118, 879–908.

Blundell, R., Griffith, R., Van Reenen, J., 1999. Market share, market value and innovation in a panel of British manufacturing firms, *Review of Economic Studies* 66, 529–554.

Bourlès, R., Cette, G., Lopez, J., Mairesse, J., Nicoletti, G. 2013. Do Product Market Regulations in Upstream Sectors Curb Productivity Growth? Panel Data Evidence For OECD Countries, *The Review of Economics and Statistics* 95(5), 1750–1768.

Boulhol, H., 2008. The convergence of price-cost margins, *Open Economies Review* 19, 221–240.

Bouis, R., Duval, R., Eugster, J., 2016. Product Market Deregulation and Growth: New Country-Industry-Level Evidence, IMF Working Paper No. 16/114.

Braun, M., Raddatz, C., 2008. The politics of financial development: evidence from trade liberalization, *Journal of Finance* 63, 1469–1508.

Buccirossi, P., Ciari, L., Duso, T., Spagnolo, G., Vitale, C. 2009. Competition Policy and Productivity Growth: An Empirical Assessment, CEPR Discussion Paper No. 7470.

Cabral, L.M. B., Mata, J., 2003. On the Evolution of the Firm Size Distribution: Facts and Theory, *American Economic Review* 93(4), 1075–1090.

Campbell, J.R., Hopenhayn, H.A., 2005. Market Size Matters, *Journal of Industrial Economics* 53(1), 1–25.

Cetorelli, N., 2001. Does Bank Concentration Lead to Concentration in Industrial Sectors? Federal Reserve Bank of Chicago Working Paper No. 2001−01.

Cetorelli, N., 2004. Real Effects of Bank Competition, *Journal of Money, Credit, and Banking* 36(3), 543–558.

Cetorelli, N., Strahan, P.E., 2006. Finance as a barrier to entry: competition and industry structure in local U.S. markets, *Journal of Finance* 61, 437–461.

Chevalier, J., 1995. Capital structure and product market competition: Empirical evidence from the supermarket industry, *American Economic Review* 85, 415–435.

Ciccone, A., Papaioannou, E., 2007. Red tape and delayed entry, *Journal of the European Economic Association* 5, 444–458.

Clementi, G., Hopenhayn, H., 2006. A Theory of Financing Constraints and Firm Dynamics, *Quarterly Journal of Economics* 121(1), 229–265.

Collins, N., Preston, L., 1969. Price-Cost Margins and Industry Structure, *Review of Economics and Statistics* 51, 271–286.

Cowling, K., Waterson, M., 1976. Price-cost margins and market structure, *Economica* 43, 267–274.

Creel, J., Huberta, P., Labondancea, F., 2015. Financial stability and economic performance, *Economic Modelling* 48, 25–40.

De Serres, A., Kobayakawa, S., Slok, T., Vartia, L., 2006. Regulation of Financial Systems and Economic Growth, *OECD Economic Studies* 43, 77–111.

Desai, M., Gompers, P., Lerner, J., 2003. Institutions, capital constraints and entrepreneurial firm dynamics: Evidence from Europe. Unpublished working paper.

Di Patti, E.B., Dell'Ariccia, G., 2004. Bank competition and firm creation, *Journal of Money, Credit, and Banking* 36, 225–252.

Dickson, V., 2005. Price-Cost Margins, Prices and Concentration in U.S. Manufacturing: A Panel Study, *Applied Economics Letters* 12(2), 79–83.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2002. The regulation of entry. *Quarterly Journal of Economics* 117, 1–37.

Do, Q., Levchenko, A., 2007. Comparative advantage, demand for external finance, and financial development, *Journal of Financial Economics* 86(3), 796–834.

Domowitz, I., Hubbard, R., Petersen, B., 1986. Business cycles and the relationship between concentration and price-cost margins, *Rand Journal of Economics* 17(1), 1–17.

Duval, R., Furceri, D. 2016. The Effects of Labor and Product Market Reforms: The Role of Macroeconomic Conditions and Policies, *IMF Economic Review*, forthcoming.

Egger, H., Egger, P., 2004. On the relationship between international outsourcing and price-cost margins in European industries, *Review of Industrial Organization* 25, 45–69.

Encaoua, D., Jacquemin, A., 1980. Degree of monopoly, indices of concentration and threat of entry, *International Economic Review* 21, 87–105.

Evans, D.S., Jovanovic., B, 1989. An estimated model of entrepreneurial choice under liquidity constraints, *Journal of Political Economy* 97, 808–827.

Fisman, R., Sarria-Allende, V., 2010. Regulation of entry and the distortion of industrial organization, *Journal of Applied Economics* 13(1), 91–111.

Furusawa, M., 2016. Financial Inclusion: Bridging Economic Opportunities and Outcomes, Remarks for the Conference on Financial Inclusion in West Africa, September 20. Available at https://www.imf.org/en/News/Articles/2016/09/20/sp092016-Financial-Inclusion-Bridging-Economic-Opportunities-and-Outcomes

Gal, P., Hijzen, A. 2016. The Short-term Impact of Product Market Reforms: A Cross-Country Firm-Level Analysis, IMF Working Paper No. 16/116.

Griffith, R., Redding, S., Simpson, H. 2002. Productivity Convergence and Foreign Ownership at the Establishment level, CEPR Discussion Paper No. 3765.

Haskel, J., Pereira, S., Slaughter, M. 2007. Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms? *Review of Economics and Statistics* 89 (3), 4 82–496.

Hay, D.A., Liu, G.S., 1997. The efficiency of firms: what difference does competition make? *The Economic Journal* 107, 597–617.

Hubbard, G., 1998. Capital Market Imperfection and Investment, *Journal of Economic Literature* 36, 193–225.

IMF, 2015. Structural Reforms and Macroeconomic Performance: Initial Considerations for The Fund, IMF Staff Report dated 10/13/15.

Inklaar, R., Timmer, M. van Ark, B. 2008. Market Services Productivity across Europe and the US, *Economic Policy* 23(53), 139–194.

Kalyvas, A. N., Mamatzakis, E., 2014. Does business regulation matter for banks in the European Union? *International Review of Financial Analysis* 32, 278–324.

Khan, H., Kim, B., 2013. Markups and oil prices in Canada, *Economic Modelling* 30, 799–813.

Klapper, L., Laeven, L., Rajan, R., 2006. Entry regulation as barrier to entrepreneurship, *Journal of Financial Economics* 82, 591–629.

Kovenock, D., Phillips, G., 1995. Capital structure and product market rivalry: How do we reconcile theory and evidence? *American Economic Review* 85, 403–408.

Kovenock, D., Phillips, G., 1997. Capital structure and product market behavior: An examination of plant closing and investment decisions, *Review of Financial Studies* 10, 767–803.

Kumar, K., Rajan, R., Zingales, L., 2001. What determines firm size? NBER Working Paper No. 7208.

Levintal, O., 2013. The real effects of banking shocks: Evidence from OECD countries, *Journal of International Money and Finance* 32, 556–578.

Love, I., Martinez Peria, M.S., 2015. How Bank Competition Affects Firms' Access to Finance, *World Bank Economic Review* 29(3), 413–448.

Maksimovic, V., 1988. Capital structure in a repeated oligopoly, *Rand Journal of Economics* 3, 389–407.

Nicoletti, G., Scarpetta, S. 2003. Regulation, Productivity and Growth: OECD Evidence, *Economic Policy* 18(36), 9–72.

Nyström, K. 2008. The Institutions of Economic Freedom and Entrepreneurship: Evidence from Panel Data, *Public Choice* 136(3–4), 269–282.

Peltzman, S., 1976. Toward a More General Theory of Regulation, *Journal of Law and Economics* 14, 211–240.

Pigou, A. C., 1938. The Economics of Welfare, 4th ed. London: Macmillan and Co.

Pinheiro-Alves, R., Zambujal-Oliveira, J., 2012. The ease of doing business index as a tool for investment location decisions, *Economics Letters* 117(1), 66–70.

Rajan, R, Zingales, L., 1998. Financial Dependence and Growth, *American Economic Review* 88, 559−586.

Rajan, R, Zingales, L., 2003. The great reversals: The politics of financial development in the twentieth century, *Journal of Financial Economics* 69, 5–50.

Rezitis, A., Kalantzi M., 2013. Measuring the Degree of Market Power in the Greek Manufacturing Industry, *International Review of Applied Economics* 27, 339–359.

Rockoff, H., 2008. Price Controls, *The Concise Encyclopedia of Economics*, D. R. Henderson, ed. Retrieved from http://www.econlib.org/library/Enc/PriceControls.html

Scarpetta, S., Hemmings, P., Tressel, T., Woo, J., 2002. The Role of Policy and Institutions for Productivity and Firm Dynamics: Evidence from Micro and Industry Data, OECD Economics Department Working Paper No. 329.

Stein, J., 2003. Agency, Information, and Corporate Investment, in Handbook of Economics of Finance, Amsterdam: Elsevier North-Holland.

Stiegert, K., Wang, S.S., Rogers, R., 2009. Structural Change and Market Power in the U.S. Food Manufacturing Sector, *Agribusiness* 25(2), 164–180.

Stigler, G. J., 1971. The Theory of Economic Regulation, *Bell Journal of Economics and Management Science* 2, 3–21.

Waterson, M., 1984. Economic Theory of the Industry. Cambridge: Cambridge University Press.

Table 1. Definition and sources of variables

Variable	Definition	Source
Industry competition		
Price-cost margin (PCM)	The difference between sales and variable costs over sales, variable costs being the expenditure on labor and materials (Boulhol, 2008)	UNIDO database, and authors' calculations
Average firm size (AFS)	Natural logarithm of the ratio between total employment and total number of establishments	UNIDO database, and authors' calculations
Industry characteristics		
Entry rate	The fraction of new firms--defined as a firm that is one or two years old--to total number of firms in an industry, computed for U.S. firms	Klapper et al. (2006)
Financial dependence	Rajan and Zingales' (1998) measure of reliance on external finance, defined as 1 minus cash flow over investment of publicly traded U.S. firms	Rajan and Zingales (1998)
Business regulations		
Starting a business	Index that identifies the bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm by examining the procedures, time, and cost involved in launching a commercial or industrial firm with up to 50 employees and start-up capital of 10 times the economy's per-capita gross national income	"Doing Business" project, World Bank
Procedure	Total number of procedures required to register a firm, where a procedure is defined as any interaction of the company founders with external parties (for example, government agencies, lawyers, auditors or notaries)	"Doing Business" project, World Bank
Time	Total number of days required to register a firm, as captured by the median duration that incorporation lawyers indicate is necessary to complete a procedure with minimum follow-up with government agencies and no extra payments	"Doing Business" project, World Bank
Cost	Cost required to complete each procedure, including all official fees and fees for legal or professional services if such services are required by law and recorded as a percentage of the economy's income per capita	"Doing Business" project, World Bank
Capital	The amount that the entrepreneur needs to deposit in a bank or with a notary before registration and up to 3 months following incorporation, recorded as a percentage of the economy's income per capita	"Doing Business" project, World Bank
Access to finance	Index that captures two sets of issues: credit information registries and the effectiveness of collateral and bankruptcy laws in facilitating lending	"Doing Business" project, World Bank
Strength	Index that measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending	"Doing Business" project, World Bank
Depth	Index that measures rules and practices affecting the coverage, scope, and accessibility of credit information available through either a public credit registry or a private credit bureau	"Doing Business" project, World Bank
Public	The number of individuals and firms listed in a public credit registry with information on their borrowing history from the past 5 years as a % of the total population	"Doing Business" project, World Bank
Private	The number of individuals and firms listed by a private credit bureau with information on their borrowing history from the past 5 years as a % of the total population	"Doing Business" project, World Bank
Controls		
Share	Value added of each sector as a proportion of the total value added of an economy in each year	UNIDO database, and authors' calculations
Inefficiency	Ratio of each industry's wages to output of that industry	UNIDO database, and authors' calculations
Productivity	Ratio of value added growth to number of employees in each industry	UNIDO database, and authors'
Concentration	Five-industry concentration ratio, calculated as the share of value added of top five largest industries in a country to total valued added of all industries in that country	UNIDO database, and authors' calculations

Table 1 continued …

Foreign Direct Investment	Total foreign direct investment as a percentage of GDP	World Development Indicators, World Bank
GDP Growth	Annual growth rate of real GDP	World Development Indicators, World Bank
Inflation	Annual change in the consumer price index	World Development Indicators, World Bank
Crisis	A dummy variable that takes the value of 1 for the crisis period 2008-10, and 0 otherwise	Own calculation.
Alternatives to industry competition		
Average (firm) size II	Natural logarithm of the ratio between total real value added and total number of establishments	UNIDO database, and authors' calculations
Establishments	Natural logarithm of total number of establishments	UNIDO database, and authors' calculations
Investment	Natural logarithm of total gross fixed capital formation.	UNIDO database, and authors' calculations

Note: UNIDO reports nominal data in U.S. dollars. Nominal value added and output deflated using U.S. producer price index of finished goods index (taken from Economic Research, Federal Reserve Bank of St. Louis).

Table 2a. Industry competition and entry regulations by country

			Industry competition		Starting business				Access finance			
Code	Country	Symbol	PCM	AFS	Procedure	Time	Cost (%)	Capital (%)	Strength	Depth	Public (%)	Private (%)
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Albania	ALB	0.116	2.256	9.29	30.14	37.93	32.83	9.00	1.33	2.78	0.00
2	Australia	AUS	0.047	2.161	2.00	2.00	1.46	0.00	9.00	5.00	0.00	99.23
3	Austria	AUT	0.079	3.445	8.00	25.00	5.57	58.73	7.00	6.00	1.25	40.88
4	Azerbaijan	AZE	0.071	3.988	11.00	63.71	9.40	0.00	6.00	3.67	2.15	0.00
5	Belgium	BEL	0.077	3.057	4.00	23.29	7.87	21.63	6.00	4.00	56.03	0.00
6	Brazil	BRA	0.267	3.923	16.00	146.00	10.04	0.00	3.00	5.00	15.88	51.15
7	Bulgaria	BGR	0.099	3.156	8.43	32.43	7.19	61.43	8.00	5.00	21.08	2.84
8	Canada	CAN	0.146	3.045	1.71	3.57	0.69	0.00	7.00	6.00	0.00	100.00
9	Chile	CHL	0.214	4.364	9.00	27.00	9.31	0.00	4.00	5.00	28.90	27.55
10	Colombia	COL	0.337	4.030	11.71	40.71	20.57	0.00	5.00	5.00	0.00	38.82
11	Cyprus	CYP	0.074	1.901	6.00	8.00	12.90	0.00	9.00	0.00	0.00	0.00
12	Denmark	DNK	-0.002	2.991	4.29	6.29	0.00	44.23	8.67	4.00	0.00	8.00
13	Ecuador	ECU	0.217	4.524	13.86	73.14	38.36	8.17	3.00	4.83	25.67	30.10
14	Estonia	EST	0.070	3.163	5.57	33.57	4.60	36.20	6.00	5.00	0.00	16.85
15	Ethiopia	ETH	0.238	4.729	9.14	26.14	144.39	1221.13	4.00	1.33	0.07	0.00
16	Finland	FIN	0.070	2.868	3.00	16.43	1.07	19.50	8.00	4.00	0.00	14.80
17	France	FRA	0.047	3.099	5.43	11.86	1.10	4.17	5.83	4.00	17.82	0.00
18	Georgia	GEO	0.087	2.732	6.29	14.86	11.20	23.94	5.33	3.17	0.00	2.82
19	Germany	DEU	0.030	3.809	9.00	27.43	5.37	39.53	7.67	6.00	0.65	93.75
20	Hungary	HUN	0.090	3.010	5.43	29.29	20.10	60.39	7.00	5.00	0.00	6.73
21	India	IND	0.135	4.226	11.86	53.86	64.87	314.91	7.17	3.50	0.00	6.55
22	Indonesia	IDN	0.287	5.261	11.57	115.71	91.07	56.40	3.00	2.83	12.90	0.08
23	Iran	IRN	0.187	4.386	8.14	25.57	5.61	1.53	4.00	2.83	20.52	0.00
24	Ireland	IRL	0.094	3.634	4.00	15.14	3.89	0.00	9.00	5.00	0.00	100.00
25	Israel	ISR	-0.010	2.853	5.00	20.00	4.91	0.00	9.00	4.67	0.00	93.10
26	Italy	ITA	0.078	2.419	8.14	13.57	19.90	10.46	3.00	5.33	9.82	68.12
27	Japan	JPN	0.227	3.362	9.29	26.43	8.86	32.16	6.83	6.00	0.00	68.68
28	Jordan	JOR	0.242	2.882	9.43	25.00	61.13	719.87	2.00	2.00	0.77	0.00
29	Korea	KOR	0.243	3.207	9.71	16.57	16.67	264.73	8.00	5.33	0.00	83.14
30	Kuwait	KWT	0.076	4.193	13.00	35.00	1.73	110.34	4.00	3.50	0.00	20.82
31	Kyrgyz Republic	KGZ	0.124	3.537	7.43	18.71	9.50	0.47	7.17	2.67	0.00	1.97
32	Latvia	LVA	0.097	2.968	5.00	16.00	4.93	28.20	10.00	3.67	9.37	0.00
33	Lithuania	LTU	0.066	3.377	7.43	26.00	3.13	50.01	5.00	5.50	6.45	10.44
34	Luxembourg	LUX	0.020	3.238	6.00	25.50	7.75	21.10	5.00	0.00	0.00	0.00
35	Macedonia	MKD	0.034	2.682	9.86	27.14	7.90	58.50	7.00	3.33	7.20	0.00
36	Malawi	MWI	0.070	5.417	10.00	39.86	147.84	0.00	7.00	0.00	0.00	0.00
37	Malaysia	MYS	0.101	4.081	10.00	31.00	24.91	0.00	10.00	6.00	42.62	82.00
38	Mauritius	MUS	0.100	4.165	5.71	29.00	7.37	0.00	6.00	1.67	16.90	0.00

Table 2a continued …

39	Mexico	MEX	0.205	5.138	8.57	38.43	14.51	12.83	5.00	6.00	0.00	61.10
40	Moldova	MDA	0.181	4.426	9.57	25.71	14.06	19.51	8.00	0.00	0.00	0.00
41	Mongolia	MNG	0.091	2.519	7.14	14.00	8.53	119.06	6.00	3.00	12.15	0.00
42	Morocco	MAR	0.104	4.124	6.71	15.43	17.59	326.60	3.00	1.83	1.60	2.33
43	Netherlands	NLD	0.066	2.937	6.43	8.43	9.17	59.19	6.00	5.00	0.00	75.23
44	New Zealand	NZL	0.043	2.626	1.71	8.86	0.24	0.00	10.00	5.00	0.00	98.93
45	Norway	NOR	0.024	2.646	4.86	10.29	2.56	24.84	6.00	4.00	0.00	100.00
46	Oman	OMN	0.265	4.465	8.86	28.71	4.17	546.31	4.00	2.00	17.58	0.00
47	Peru	PER	0.121	7.068	9.86	78.29	31.30	0.00	5.67	6.00	19.20	30.25
48	Poland	POL	0.137	2.990	9.43	31.14	20.47	184.39	8.17	4.83	0.00	47.33
49	Portugal	PRT	0.079	2.528	8.57	33.86	9.53	37.21	3.00	5.00	70.80	10.97
50	Qatar	QAT	0.279	3.712	6.75	6.75	9.20	99.25	4.00	2.00	0.00	0.00
51	Romania	ROM	0.039	3.358	5.14	15.14	5.54	1.73	8.50	4.83	3.12	12.05
52	Russia	RUS	0.123	3.723	8.86	31.71	5.54	3.91	3.00	2.17	0.00	4.78
53	Singapore	SGP	0.056	3.584	5.43	5.71	0.84	0.00	10.00	3.00	0.00	40.33
54	Slovak Republic	SVK	0.058	4.091	8.29	38.86	4.91	37.83	9.00	3.50	1.02	37.52
55	Slovenia	SVN	0.000	2.923	7.57	46.43	8.33	35.69	4.67	3.17	2.67	0.00
56	South Africa	ZAF	0.089	2.780	8.00	31.57	7.66	0.00	10.00	5.50	0.00	58.60
57	Spain	ESP	0.071	2.817	10.00	66.14	15.93	14.96	6.00	5.00	43.73	7.40
58	Sri Lanka	LKA	0.284	4.768	6.86	46.57	20.46	0.00	3.33	4.17	0.00	5.52
59	Sweden	SWE	0.078	2.572	3.00	16.00	0.66	33.43	7.00	4.00	0.00	99.67
60	Tanzania	TZA	0.214	4.361	10.57	27.00	116.14	0.00	7.00	0.00	0.00	0.00
61	Turkey	TUR	0.080	2.489	7.00	10.57	23.79	18.97	4.00	5.00	8.95	30.76
62	United Kingdom	GBR	0.071	3.163	6.00	13.00	0.80	0.00	10.00	6.00	0.00	89.38
63	Uruguay	URY	0.145	.	10.86	47.29	45.30	129.94	4.00	5.50	12.20	88.32
64	Vietnam	VNM	0.072	4.711	11.14	45.29	23.50	0.00	7.00	3.17	7.70	0.00

Table 2b. Industry competition and industry characteristics by industry

		Industry competition		Industry characteristics	
		PCM	AFS	Entry rate	Financial dep.
ISIC	Industry	(1)	(2)	(3)	(4)
311	Food products	0.113	3.371	5.24	0.14
313	Beverages	0.213	3.812	5.24	0.08
314	Tobacco	0.265	5.260	7.45	-0.45
321	Textiles	0.073	3.318	6.92	0.4
322	Wearing apparel, except footwear	0.079	3.070	6.44	0.03
323	Leather and fur products	0.060	2.782	7.75	-0.14
324	Footwear, except rubber or plastic	0.074	3.238	9.06	-0.08
331	Wood products, except furniture	0.109	2.720	5.98	0.28
332	Furniture and fixtures, excel. metal	0.083	2.780	7.92	0.24
341	Paper products	0.117	3.753	5.26	0.18
342	Printing and publishing	0.107	2.611	5.49	0.2
351	Industrial chemicals	0.153	4.167	5.94	0.25
352	Other chemical product	0.176	3.860	6.08	0.22
353	Petroleum refineries	0.178	5.055	5.8	0.04
354	Misc. petroleum and coal products	0.138	4.225	5.8	0.33
355	Rubber products	0.101	3.648	4.46	0.23
356	Plastic products	0.113	3.439	4.46	1.14
361	Pottery, china, earthenware	0.085	2.996	5.79	-0.15
362	Glass and products	0.137	3.604	5.79	0.53
369	Other non-metalic mineral products	0.157	3.107	5.79	0.06
371	Iron and steel	0.129	4.422	4.9	0.09
372	Non-ferrous metals	0.132	4.096	4.9	0.01
381	Fabricated metal products	0.105	2.913	5.71	0.24
382	Non-electrical machinery	0.110	3.394	6.49	0.45
383	Electrical machinery	0.089	3.694	5.71	0.77
384	Transport equipment	0.079	4.080	6.58	0.31
385	Professional and scientific equipment	0.120	3.120	5.72	0.96
390	Other manufacturing	0.111	2.471		0.47

Table 2c: Summary statistics of all variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Industry competition					
Price-cost margin (PCM)	9114	0.118	0.143	-0.996	0.930
Average firm size (AFS)	8996	3.489	1.313	-3.152	9.675
Industry characteristics					
Entry rate	27	6.020	1.040	4.460	9.060
Financial dependence	28	0.240	0.320	-0.450	1.140
Starting business					
Index	437	-0.045	1.398	-2.249	9.088
Procedure	437	7.819	3.207	1.000	19.000
Time	437	30.796	28.395	1.000	168.000
Cost (%)	437	19.948	38.959	0.000	483.900
Capital (%)	437	79.365	218.420	0.000	1964.200
Access finance					
Index	353	0.037	1.301	-2.272	2.745
Strength	375	6.309	2.261	2.000	10.000
Depth	374	3.939	1.816	0.000	6.000
Public (%)	365	7.918	15.147	0.000	81.300
Private (%)	353	30.862	36.532	0.000	100.000
Controls					
Share	9949	0.041	0.059	-0.030	0.688
Inefficiency	9153	0.214	0.121	0.017	0.618
Productivity (*10000)	8738	0.014	7.548	-49.374	39.692
Concentration	404	0.627	0.136	0.421	0.928
Foreign Investment (%)	448	13.970	48.533	-35.693	504.277
GDP Growth (%)	447	4.210	4.418	-8.539	18.600
Inflation (%)	442	4.922	4.421	-1.088	24.524
Crisis	448	0.429	0.495	0.000	1.000

Table 3. Entry regulations and industry competition

This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$
$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \varphi_3 Y_{ct} + \theta_i + \emptyset_c + \vartheta_t + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS). $Regulation$ is a vector of entry regulations (starting business / access finance) indices. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. Y is a vector of country-year control variables. Table 1 describes the variables in detail. θ_i, $\emptyset_c$, ϑ_t, $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry, country, year, industry*country, industry*year, and country*year, respectively. Regressions are estimated using OLS. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

3a: PCM

	Starting Business		Access Finance	
	(1)	(2)	(3)	(4)
$Regulation_{ct} \times Characteristic_i$	0.008***	0.007***	-0.025**	-0.023**
	[3.09]	[2.87]	[-2.22]	[-2.03]
$Share_{ict-1}$	0.256***	0.220***	0.304***	0.274***
	[3.54]	[3.17]	[4.12]	[3.63]
$Inefficiency_{ict-1}$	-0.197***	-0.237***	-0.227***	-0.252***
	[-3.67]	[-4.69]	[-3.92]	[-4.60]
$Productivity_{ict-1}$	1.704	0.875	1.047	1.046
	[0.62]	[0.29]	[0.34]	[0.31]
$Controls_{ct}$ (Regulation, Foreign Investment, GDP Growth, Inflation)	Excluded	Included	Excluded	Included
Constant	0.086***	0.155***	0.117***	0.150***
	[3.84]	[5.03]	[5.96]	[4.47]
θ_i	N	Y	N	Y
$\emptyset_c$	N	Y	N	Y
ϑ_t	N	Y	N	Y
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	N	Y	N
# Countries	64	64	64	64
# Industries	27	27	28	28
N	6612	6533	6189	6106
Adj. R^2	0.798	0.777	0.787	0.765

3b: AFS

	Starting Business		Access Finance	
	(1)	(2)	(3)	(4)
$Regulation_{ct} \times Characteristic_i$	0.018**	0.022***	-0.249***	-0.253***
	[2.23]	[2.63]	[-4.06]	[-3.99]
$Share_{ict-1}$	1.229***	1.272***	1.276***	1.344***
	[4.03]	[4.08]	[3.59]	[3.75]
$Inefficiency_{ict-1}$	-0.065	-0.249*	-0.023	-0.190
	[-0.40]	[-1.77]	[-0.12]	[-1.16]
$Productivity_{ict-1}$	-0.312	0.476	-1.318	1.876
	[-0.04]	[0.06]	[-0.15]	[0.21]
$Controls_{ct}$ (Regulation, Foreign Investment, GDP Growth, Inflation)	Excluded	Included	Excluded	Included
Constant	0.626***	0.739***	0.645***	0.744***
	[6.79]	[5.46]	[6.91]	[5.01]
θ_i	N	Y	N	Y
$\emptyset_c$	N	Y	N	Y
ϑ_t	N	Y	N	Y
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	N	Y	N
# Countries	64	64	64	64
# Industries	27	27	28	28
N	6369	6290	5925	5842
Adj. R^2	0.963	0.960	0.963	0.961

Table 4. Entry regulations and industry competition

This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$
$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \varphi_3 Y_{ct} + \theta_i + \emptyset_c + \vartheta_t + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS). $Regulation$ is a vector of entry regulations (starting business / access finance) indices. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. Y is a vector of country-year control variables. Table 1 describes the variables in detail. θ_i, $\emptyset_c$, ϑ_t, $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry, country, year, industry*country, industry*year, and country*year, respectively. Regressions are estimated using OLS. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

	PCM		AFS	
	(1)	(2)	(3)	(4)
$Starting\_Business_{ct} \times Characteristic_i$	0.008***	0.008***	0.023**	0.027***
	[2.99]	[2.79]	[2.40]	[2.81]
$Access\_Finance_{ct} \times Characteristic_i$	-0.022**	-0.021*	-0.256***	-0.261***
	[-2.10]	[-1.92]	[-4.10]	[-4.07]
$Share_{ict-1}$	0.296***	0.260***	1.199***	1.249***
	[4.11]	[3.56]	[3.42]	[3.49]
$Inefficiency_{ict-1}$	-0.194***	-0.240***	-0.105	-0.291*
	[-3.36]	[-4.43]	[-0.54]	[-1.80]
$Productivity_{ict-1}$	0.352	0.226	-2.419	0.972
	[0.11]	[0.07]	[-0.27]	[0.11]
$Controls_{ct}$ (Regulation, Foreign Investment, GDP Growth, Inflation)	Excluded	Included	Excluded	Included
Constant	0.079***	0.156***	0.558***	0.797***
	[3.43]	[4.59]	[5.51]	[5.27]
θ_i	N	Y	N	Y
$\emptyset_c$	N	Y	N	Y
ϑ_t	N	Y	N	Y
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	N	Y	N
# Countries	64	64	64	64
# Industries	27	27	27	27
N	5972	5893	5725	5646
Adj. R^2	0.795	0.773	0.963	0.960

Table 5. Entry regulations and industry competition: Robustness to alternative measures of the main variables
This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + +\theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS). $Regulation$ is a vector of entry regulations (starting business / access finance) indices. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry*country, industry*year, and country*year, respectively. Regressions are estimated using OLS. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

	Starting Business		Alternative competition measure	Access Finance		Alternative competition measure
	Alternative regulation measure			Alternative regulation measure		
	PCM	AFS		PCM	AFS	
	(1)	(2)	(3)	(4)	(5)	(6)
$Regulation_{ct} \times Characteristic_i$	0.007***	0.022**	0.036**	-0.037**	-0.296***	-0.306***
	[2.86]	[2.06]	[2.46]	[-2.49]	[-3.56]	[-4.43]
Share	0.170**	1.251***	3.261***	0.311***	1.316***	3.450***
	[2.04]	[3.34]	[5.81]	[4.16]	[3.63]	[5.42]
Inefficiency	-0.163***	-0.002	-0.616**	-0.227***	-0.019	-0.425
	[-2.63]	[-0.01]	[-2.36]	[-3.91]	[-0.10]	[-1.49]
Productivity	0.826	-0.018	16.810	1.019	-1.350	16.548
	[0.28]	[-0.00]	[1.03]	[0.33]	[-0.15]	[0.89]
Constant	0.052*	0.541***	8.850***	0.116***	0.648***	8.913***
	[1.78]	[3.56]	[56.60]	[5.92]	[6.95]	[59.00]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64
# Industries	27	27	28	28	28	28
N	5376	5176	6387	6189	5925	5947
Adj. R ^{2}	0.806	0.961	0.956	0.787	0.963	0.956

Table 6. Entry regulations and industry competition: Robustness to addressing causality and selection issues
This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS). $Regulation$ is a vector of entry regulations (starting business / access finance) indices. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. Table 1 describes the variables in detail. $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry*country, industry*year, and country*year, respectively. Regressions are estimated using IV in 6a and OLS in 6b and 6c. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

6a: IV

	Starting Business		Access Finance	
IV: (legal origin, KKZ)*Characteristic	PCM	AFS	PCM	AFS
	(1)	(2)	(3)	(4)
$Regulation_{ct} \times Characteristic_i$	0.034***	0.122***	-0.058	-0.575***
	[3.95]	[2.78]	[-1.45]	[-2.63]
Share	0.227***	1.122***	0.314***	1.356***
	[3.75]	[4.42]	[5.04]	[4.50]
Inefficiency	-0.203***	-0.100	-0.225***	0.002
	[-4.42]	[-0.71]	[-4.67]	[0.02]
Productivity	1.323	-2.065	0.979	-2.239
	[0.57]	[-0.30]	[0.38]	[-0.30]
Constant	0.327***	1.274***	0.108***	0.528***
	[5.73]	[4.43]	[5.75]	[4.89]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y
# Countries	64	64	64	64
# Industries	27	27	28	28
N	6612	6369	6189	5925
Adj. R^2	0.790	0.961	0.786	0.963
Test of endogeneity				
Robust score X^2 (p-value)	0.05	0.02	0.35	0.10
Robust regression F (p-value)	0.00	0.04	0.44	0.17
First stage regression				
R^2	0.998	0.998	0.976	0.977
Adj. R^2	0.997	0.997	0.966	0.967
Test of overidentifying restrictions				
Score X^2 (p-value)	0.30	0.00	0.72	0.00

6b: Additional interaction terms with country-level variables

Additional interaction terms with country-level variables	Starting Business		Access Finance	
	PCM	AFS	PCM	AFS
	(1)	(2)	(3)	(4)
$Regulation_{ct} \times Characteristic_i$	0.007***	0.020**	-0.025**	-0.248***
	[2.84]	[2.34]	[-2.23]	[-4.01]
$Country\_average\_charac_{ct} \times Characteristic_i$	0.050***	-0.155	0.420*	1.693**
	[3.52]	[-1.38]	[1.93]	[2.23]
Share	0.223***	1.337***	0.297***	1.249***
	[3.11]	[4.27]	[4.09]	[3.55]
Inefficiency	-0.199***	-0.057	-0.230***	-0.027
	[-3.70]	[-0.35]	[-3.97]	[-0.14]
Productivity	1.870	-0.903	0.980	-1.492
	[0.69]	[-0.11]	[0.32]	[-0.17]
Constant	-1.499***	5.555	0.106***	0.599***
	[-3.34]	[1.56]	[5.06]	[6.25]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y
# Countries	64	64	64	64
# Industries	27	27	28	28
N	6612	6369	6189	5925
Adj. R^2	0.799	0.963	0.787	0.964

6c: Subsamples

Subsamples	Starting Business						Access Finance					
	PCM	AFS	PCM	AFS	PCM	AFS	PCM	AFS	PCM	AFS	PCM	AFS
	Small industries (log(value added)<median)		Low growth industries (growth rate of value added <median)		Low and lower-medium tech/innovation industries (based on OECD classification: http://www.oecd-		Small industries (log(value added)<median)		Low growth industries (growth rate of value added <median)		Low and lower-medium tech/innovation industries (based on OECD classification: http://www.oecd-	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$Regulation_{ct} \times Characteristic_i$	0.006*	0.003	0.005*	0.031**	0.006***	0.009	-0.037**	-0.206***	-0.006	-0.750***	-0.012	-0.130*
	[1.65]	[0.30]	[1.72]	[2.28]	[2.67]	[1.28]	[-2.07]	[-2.62]	[-0.25]	[-5.34]	[-1.04]	[-1.93]
Share	0.096	0.660	0.608***	2.186***	0.270***	0.476	0.145	0.624	0.618***	2.566***	0.262***	0.515
	[0.80]	[1.53]	[5.41]	[4.37]	[3.12]	[1.39]	[1.22]	[1.39]	[4.67]	[4.43]	[2.96]	[1.40]
Inefficiency	-0.171***	0.131	-0.223***	0.015	-0.186***	0.039	-0.167**	0.122	-0.291***	0.090	-0.226***	0.085
	[-2.64]	[0.68]	[-4.06]	[0.05]	[-3.74]	[0.23]	[-2.46]	[0.53]	[-2.76]	[0.22]	[-3.57]	[0.40]
Productivity	1.063	-4.774	15.300***	16.160	-0.648	-6.763	0.321	-8.198	12.158***	10.157	0.145	-9.898
	[0.39]	[-0.72]	[4.44]	[0.90]	[-0.19]	[-0.75]	[0.10]	[-1.09]	[3.30]	[0.48]	[0.04]	[-1.05]
Constant	0.132***	0.794***	0.042	0.464*	0.096***	0.687***	0.160***	0.781***	0.066*	0.309	0.130***	0.685***
	[4.21]	[7.42]	[1.26]	[1.75]	[4.39]	[6.98]	[5.52]	[7.37]	[1.80]	[1.18]	[6.68]	[6.68]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64	64	64	64	64	64	64
# Industries	27	27	27	27	27	27	28	28	28	28	28	28
N	3123	3100	3454	3305	4558	4388	2918	2893	3232	3072	4331	4142
Adj. R^2	0.706	0.968	0.871	0.962	0.848	0.976	0.694	0.969	0.859	0.964	0.837	0.976

Table 7. Entry regulations and industry competition: Robustness to addressing omitted variables concern

This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + +\varphi_3 Macro_{ct} * Charateristic_i + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS. $Regulation$ is a vector of entry regulations (starting business / access finance) variables. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. $Macro$ is a vector of country-year macro variables. Table 1 describes the variables in detail. $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry*country, industry*year, and country*year, respectively. Regressions are estimated using OLS. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

7a: PCM

	Starting Business							Access Finance						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
$Regulation_{ct} \times Characteristic_i$	0.008***	0.008***	0.007***	0.008***	0.008***	0.008***	0.008***	-0.026**	-0.024**	-0.020*	-0.025**	-0.024**	-0.024**	-0.020*
	[3.14]	[3.11]	[3.09]	[3.14]	[3.10]	[3.14]	[3.27]	[-2.38]	[-2.19]	[-1.94]	[-2.25]	[-2.19]	[-2.18]	[-1.86]
Share	0.260***	0.255***	0.258***	0.256***	0.256***	0.260***	0.266***	0.303***	0.304***	0.311***	0.305***	0.304***	0.309***	0.318***
	[3.55]	[3.54]	[3.48]	[3.54]	[3.54]	[3.59]	[3.56]	[4.11]	[4.12]	[4.21]	[4.12]	[4.12]	[4.17]	[4.27]
Inefficiency	-0.197***	-0.197***	-0.196***	-0.197***	-0.197***	-0.197***	-0.197***	-0.228***	-0.227***	-0.224***	-0.227***	-0.228***	-0.228***	-0.224***
	[-3.67]	[-3.67]	[-3.66]	[-3.67]	[-3.66]	[-3.67]	[-3.66]	[-3.93]	[-3.92]	[-3.90]	[-3.91]	[-3.93]	[-3.93]	[-3.88]
Productivity	1.717	1.696	1.711	1.704	1.700	1.765	1.781	1.069	1.046	1.036	1.046	1.054	1.012	1.021
	[0.63]	[0.62]	[0.63]	[0.62]	[0.62]	[0.65]	[0.65]	[0.35]	[0.34]	[0.34]	[0.34]	[0.34]	[0.33]	[0.33]
Financial dev. × Characteristic	-0.000						-0.000	0.0002						0.000*
	[-1.04]						[-1.12]	[1.44]						[1.75]
Trade freedom × Characteristic		0.0001					0.0001		-0.000					-0.0001
		[0.59]					[0.77]		[-0.03]					[-0.17]
Institutions × Characteristic			-0.002				-0.002			-0.057				-0.077
			[-0.23]				[-0.27]			[-0.94]				[-1.21]
FDI × Characteristic				-0.000			-0.000				-0.0004			-0.001
				[-0.06]			[-0.09]				[-0.78]			[-1.17]
GDP growth × Characteristic					0.000		0.000					0.001		0.001
					[0.09]		[0.10]					[0.46]		[0.93]
Inflation × Characteristic						-0.001	-0.001						-0.0004	-0.001
						[-1.03]	[-1.14]						[-0.28]	[-0.39]
Constant	0.087***	0.054	0.080**	0.086***	0.085***	0.091***	0.045	0.117***	0.117***	0.112***	0.117***	0.117***	0.117***	0.111***
	[3.89]	[0.93]	[2.43]	[3.82]	[3.41]	[3.89]	[0.68]	[5.94]	[5.69]	[5.56]	[5.94]	[5.95]	[5.97]	[5.20]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64	64	64	64	64	64	64	64	64
# Industries	27	27	27	27	27	27	27	28	28	28	28	28	28	28
N	6612	6612	6612	6612	6612	6533	6533	6189	6189	6189	6189	6189	6106	6106
Adj. R^2	0.798	0.798	0.798	0.798	0.798	0.796	0.796	0.787	0.786	0.787	0.787	0.787	0.784	0.784

7b: AFS

	Starting Business							Access Finance						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
$Regulation_{ct} \times Characteristic_i$	0.011	0.016**	0.020**	0.018**	0.018**	0.018**	0.007	-0.234***	-0.240***	-0.265***	-0.253***	-0.254***	-0.250***	-0.257***
	[1.33]	[1.97]	[2.46]	[2.20]	[2.22]	[2.23]	[0.81]	[-3.88]	[-3.84]	[-4.17]	[-4.14]	[-4.11]	[-4.08]	[-3.98]
Share	0.980***	1.236***	1.051***	1.229***	1.230***	1.247***	0.966***	1.279***	1.279***	1.261***	1.280***	1.279***	1.298***	1.285***
	[3.42]	[4.05]	[3.60]	[4.03]	[4.03]	[4.06]	[3.31]	[3.58]	[3.60]	[3.57]	[3.60]	[3.60]	[3.62]	[3.59]
Inefficiency	-0.037	-0.063	-0.072	-0.065	-0.064	-0.064	-0.035	-0.017	-0.025	-0.034	-0.018	-0.017	-0.022	-0.023
	[-0.23]	[-0.39]	[-0.44]	[-0.40]	[-0.39]	[-0.39]	[-0.22]	[-0.09]	[-0.13]	[-0.18]	[-0.10]	[-0.09]	[-0.11]	[-0.12]
Productivity	-0.522	-0.245	-0.721	-0.312	-0.343	-0.302	-0.709	-1.436	-1.394	-1.284	-1.314	-1.422	-1.420	-1.609
	[-0.07]	[-0.03]	[-0.09]	[-0.04]	[-0.04]	[-0.04]	[-0.09]	[-0.16]	[-0.16]	[-0.15]	[-0.15]	[-0.16]	[-0.16]	[-0.18]
Financial dev. × Characteristic	0.001***						0.001***	-0.001*						-0.001**
	[5.28]						[4.97]	[-1.92]						[-2.05]
Trade freedom × Characteristic		-0.001					-0.002**		-0.003					-0.002
		[-1.30]					[-2.23]		[-1.11]					[-0.79]
Institutions × Characteristic			0.107***				0.030			0.232				0.330
			[2.81]				[0.81]			[1.03]				[1.41]
FDI × Characteristic				0.000			0.000				-0.003			-0.002
				[0.04]			[0.53]				[-1.42]			[-0.87]
GDP growth × Characteristic					0.0002		0.0002					-0.007		-0.007
					[0.20]		[0.15]					[-1.26]		[-1.23]
Inflation × Characteristic						-0.0002	0.001						-0.001	-0.0001
						[-0.18]	[0.70]						[-0.15]	[-0.02]
Constant	0.606***	0.929***	0.934***	0.625***	0.619***	0.626***	1.199***	0.648***	0.673***	0.662***	0.644***	0.648***	0.641***	0.694***
	[6.75]	[3.68]	[6.69]	[6.78]	[6.31]	[6.68]	[4.31]	[6.93]	[7.01]	[7.00]	[6.89]	[6.93]	[6.84]	[7.08]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64	64	64	64	64	64	64	64	64
# Industries	27	27	27	27	27	27	27	28	28	28	28	28	28	28
N	6369	6369	6369	6369	6369	6290	6290	5925	5925	5925	5925	5925	5842	5842
Adj. R^2	0.963	0.963	0.963	0.963	0.963	0.962	0.963	0.963	0.963	0.963	0.963	0.963	0.963	0.963

Table 8. Entry regulations and industry competition: Decomposition of entry regulations variables

This table reports the results estimating

$$Competition_{ict} = \varphi_0 + \varphi_1 Regulation_{ct} * Charateristic_i + \varphi_2 X_{ict} + \theta_i \times \emptyset_c + \theta_i \times \vartheta_t + \emptyset_c \times \vartheta_t + \varepsilon_{ict}$$

where i, c and t denote industry i in country c in year t. $Competition$ is industry competition measured as price-cost margin (PCM) or average firm size (AFS). Note that the dependent variable in Table 8c is log either number of establishment or fixed capital investment. $Regulation$ is a vector of entry regulations (starting business / access finance) variables. $Characteristic$ is a proxy for entry rate (in the case of starting business) or a proxy of external financial dependence (in the case of access finance) of each industry. X is a vector of industry-country-year control variables. Y is a vector of country-year control variables. Table 1 describes the variables in detail. $\theta_i \times \emptyset_c$, $\theta_i \times \vartheta_t$, and $\emptyset_c \times \vartheta_t$ denote the dummies for industry*country, industry*year, and country*year, respectively. Regressions are estimated using OLS. The statistical inferences are based on robust standard errors (associated t-values reported in parentheses). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Our sample includes 28 industries with three-digit ISIC, Rev.2 for 64 countries over 2004-2010. Sample size varies across regression specifications because not all variables are available for all industries, all countries or all years.

8a: PCM

	Starting Business				Access Finance			
	Procedure	Time	Cost	Capital	Strength	Depth	Public	Private
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Regulation_{ct} \times Characteristic_i$	0.002**	0.0003***	0.0002**	-0.000	-0.010	-0.007*	0.001	-0.0004
	[2.20]	[2.92]	[2.41]	[-0.26]	[-1.44]	[-1.89]	[0.87]	[-0.56]
Share	0.252***	0.259***	0.270***	0.264***	0.256***	0.269***	0.282***	0.284***
	[3.49]	[3.55]	[3.63]	[3.57]	[3.49]	[3.72]	[3.87]	[3.79]
Inefficiency	-0.194***	-0.198***	-0.195***	-0.195***	-0.233***	-0.234***	-0.218***	-0.229***
	[-3.63]	[-3.69]	[-3.64]	[-3.63]	[-4.32]	[-4.33]	[-4.05]	[-3.90]
Productivity	1.732	1.764	1.798	1.816	1.810	1.821	2.441	1.536
	[0.63]	[0.65]	[0.66]	[0.66]	[0.67]	[0.67]	[0.82]	[0.53]
Constant	-0.006	0.065**	0.091***	0.118***	0.134***	0.121***	0.119***	0.123***
	[-0.11]	[2.40]	[4.11]	[6.12]	[6.39]	[6.20]	[6.09]	[6.38]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64	64	64
# Industries	27	27	27	27	28	28	28	28
N	6612	6612	6612	6612	6835	6813	6642	6319
Adj. R^2	0.798	0.798	0.798	0.798	0.790	0.790	0.794	0.786

8b: AFS

	Starting Business				Access Finance			
	Procedure	Time	Cost	Capital	Strength	Depth	Public	Private
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Regulation_{ct} \times Characteristic_i$	0.006*	0.001***	-0.0002	0.000	-0.217***	-0.066***	-0.004	-0.002
	[1.69]	[2.78]	[-0.63]	[0.30]	[-4.92]	[-3.21]	[-1.61]	[-0.76]
Share	1.213***	1.232***	1.241***	1.247***	1.352***	1.367***	1.401***	1.161***
	[4.02]	[4.01]	[4.04]	[4.05]	[4.20]	[4.34]	[4.34]	[3.34]
Inefficiency	-0.059	-0.071	-0.058	-0.059	0.022	-0.000	-0.034	-0.028
	[-0.36]	[-0.43]	[-0.36]	[-0.36]	[0.14]	[-0.00]	[-0.19]	[-0.15]
Productivity	-0.246	-0.222	0.019	-0.017	-0.219	0.075	1.465	-2.691
	[-0.03]	[-0.03]	[0.00]	[-0.00]	[-0.03]	[0.01]	[0.17]	[-0.33]
Constant	0.331	0.534***	0.732***	0.702***	0.958***	0.683***	0.679***	0.705***
	[1.39]	[5.14]	[7.56]	[8.14]	[9.11]	[7.78]	[7.68]	[7.76]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	Y	Y	Y	Y	Y	Y	Y
# Countries	64	64	64	64	64	64	64	64
# Industries	27	27	27	27	28	28	28	28
N	6369	6369	6369	6369	6576	6554	6380	6056
Adj. R^2	0.963	0.963	0.963	0.963	0.964	0.964	0.963	0.963

8c: Channels

	Establishments		Investment	
	Starting Business	Access Finance	Starting Business	Access Finance
	(1)	(2)	(3)	(4)
$Regulation_{ct} \times Characteristic_i$	-0.027***	0.214***	-0.024	-0.317**
	[-3.26]	[4.72]	[-0.91]	[-2.36]
Share	0.821***	0.838***	1.901**	2.144**
	[3.94]	[3.50]	[2.24]	[2.41]
Inefficiency	0.210*	0.193*	-0.305	-0.047
	[1.85]	[1.71]	[-0.60]	[-0.09]
Productivity	7.873	10.690	41.905	66.763**
	[1.25]	[1.57]	[1.59]	[2.42]
Constant	7.424***	7.345***	16.154***	15.945***
	[99.72]	[105.54]	[53.86]	[56.09]
$\theta_i \times \emptyset_c$	Y	Y	Y	Y
$\theta_i \times \vartheta_t$	Y	Y	Y	Y
$\emptyset_c \times \vartheta_t$	Y	N	Y	N
# Countries	64	64	64	64
# Industries	27	28	27	28
N	6464	6023	5018	4660
Adj. R^2	0.989	0.990	0.944	0.944

Figure 1. Regulations and competition over time
Starting a business (a), access to finance (b) and industry competition (c) in 64 countries over 2004-2010

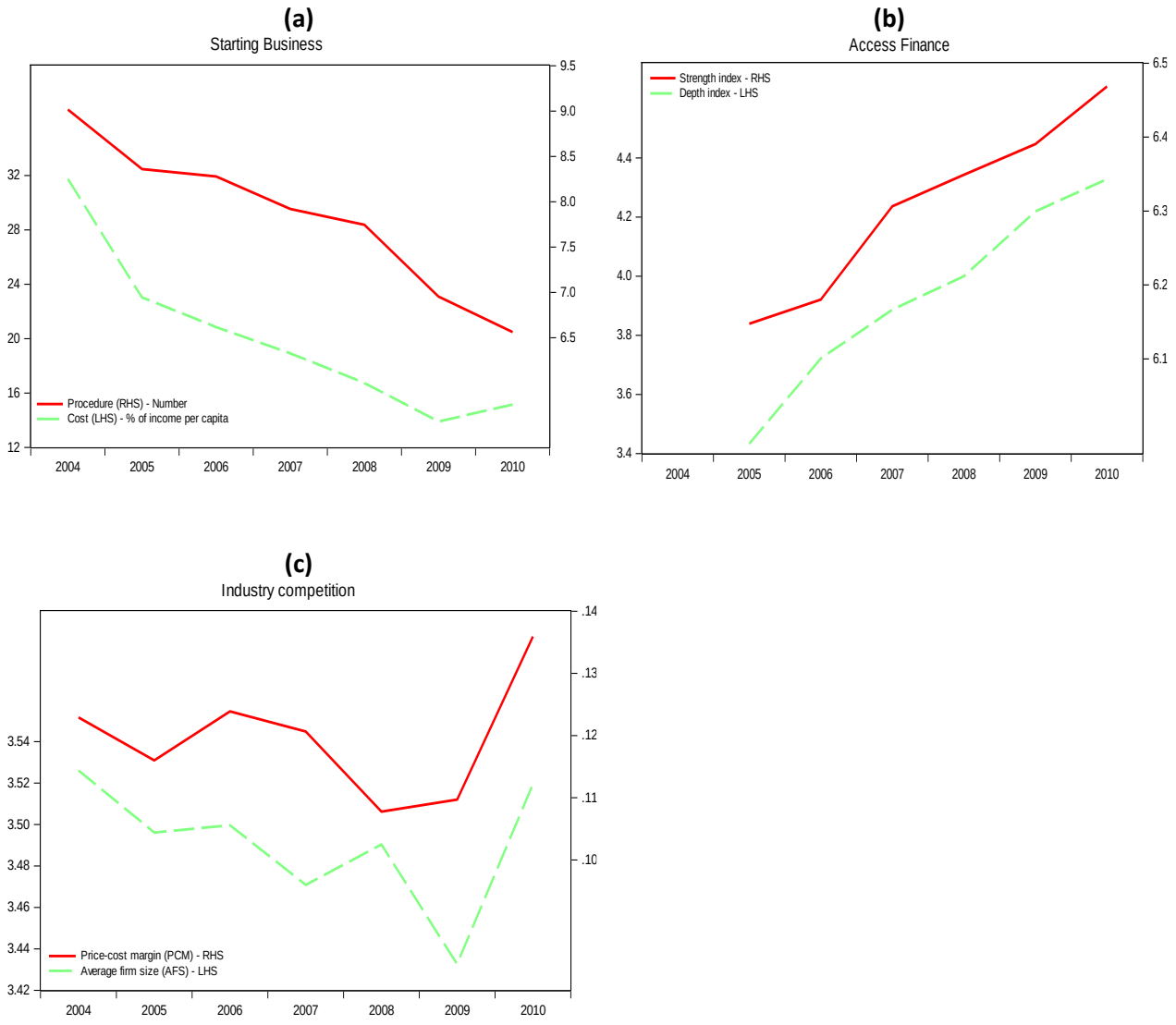

Figure 2. Industry competition measures
The association between the two dependent variables (PCM and AFS) by country (a), industry (b) and industry-country (c)