

The Effect of Legal Entry Barriers on Entry Rate, Exit Rate, and Economic Performance: An Application of Difference in Difference Method to a Korean Case *

In Kwon Lee **

This empirical study shows how entry regulations deter the entry and exit rates of firms. The effects of legal entry regulation on the entry and exit rates taken together, entry regulation in itself inevitably decreases the degree of competition. Specifically, this paper shows that legal entry regulations at the four-digit level industries provided enough rent for incumbent firms in 1992 before the regulatory reform. The statistical analysis in this paper also show that firms belonging to industries regulated by legal entry barriers in 1992 but not regulated in 2001 because of subsequent legal entry deregulation have lost 15.2% of economic rent in terms of operating income to sales. This result is derived from comparing two cohorts of firms, a “treatment” cohort of firms belonging in industries that were under legal regulations in 1992 that were later deregulated in 2002, and a “control” cohort of firms that faced legal barrier regulations continuously over the both periods. Using the difference in difference method the net effect of basic regulatory regime change between the two reference years on a firms’ overall economic performance, controlling for the effect of legal entry regulation on a firms’ economic performance is also gauged. A 0.41% gain in economic performance is observed with the after-regulatory reform year anonymous referees of 2001. This efficiency gain is partly secured by the enormous exit of marginal firms following stronger competition pressure in 2001, i.e., after regulatory reforms. Also remaining firms facing higher degree of competition are forced to reduce costs in order to survive. These two factors generated a 0.41% overall enhancement in economic performance. All things taken together, the empirical results in this paper show that further entry

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** Senior Research Fellow, Korea Economic Research Institute, FKI 12th Floor, 28-1, Yoido-dong, Youngdeungpo-gu, Seoul, Korea, E-mail: lkleee@keri.org

deregulation has a positive effect on firms' economic efficiency, largely by deepening the degree of competition and driving out incompetent firms.

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1. INTRODUCTION

The Kim Dae-jung government continued the relaxation of entry regulation that began under the Kim Young-sam government in 1993. A primary feature of this effort has been the substantial dismantling and relaxing of legal entry regulations in the manufacturing sector. This paper statistically estimates the marginal effect of legal entry barriers on a firm's market entry and exit rates. Market entry and exit rates of firms working in industries affected by legal entry regulation are found to be statistically lower than those of firms working in industries unaffected by legal entry regulation. This study also empirically explores the impact of entry regulation and deregulation on firms' economic performance, by comparing basic differences in the regulatory regimes of two years before and after regulatory reform, i.e., 1992 and 2001, respectively. Empirical studies examining the effect of entry regulation and deregulation on a firms' economic performance have been few, due largely to a lack of sufficient data. The change in regulatory regime represented by the two reference years in Korea manufacturing sector provides a natural environment to test some theoretical conjectures. The statistical analysis performed here suggests that firms under the influence of entry regulation in 1992 before regulatory reforms enjoyed statistically significant economic rent. It is also observed that firms belonging to industries regulated by legal entry barrier in 1992 but not regulated by legal entry barrier in 2001 after entry deregulation lost economic rent, compared with firms belonging to industries regulated by legal entry barrier in both years (1992 and 2001). Entry deregulation tends

to expedite rent dissipation, all else being equal. Using the difference in difference method this study also gauges the effect of basic regulatory regime change between two reference years on a firms' overall economic performance, controlling for the effect of legal entry regulation on a firms' economic performance both in 1992 and 2001. It is inferred that continued entry deregulation should contribute to improved economic performance at the firm level. This empirical work serves as a reference for further empirical work on the relationship between entry regulation and economic performance.

2. DATA AND ENTRY REGULATION STATUS

Data was collected from the Annual Reports (for the years 1992 and 2001) of Korean companies provided by the Korea Investors Service (KIS). Firm level data was taken only from financial statements of legally audited firms, which should secure the reliability of data. The sample for regression analysis in this study was composed of 2,632 companies in 61 manufacturing industries in 1992 and 3,543 firms in 36 manufacturing industries in 2001. The status of entry regulations in the two reference years is shown in table 1. Legal entry regulations take a variety of forms including formal permission, licenses, assignments, registration, and reporting. The legal regulations of permission, licenses and assignments are categorized as "real" entry regulations in the analysis. Other types such as registration and reporting are ignored as entry regulations.

It is important to note that public agencies may not accept all kinds of registrations and reports submitted especially by new firms. In some cases (even when official entry regulations are absent) other laws deterring capital regional concentration or laws related to factory location and constructions usually behave as entry regulations. Due to a lack of information and the infrequent occurrence of such cases these registration and reports are not considered as entry regulation for this study.

Table 1 Entry Regulation Status by the Industry

Standard Industry Classification	Name of Industry	Regulation Status in the Year of 1992	Regulation Status in the Year of 2001
15119	Production, Processing, Preserving of Other Meat and Meat Products	Permission	Permission
15125	Processing and Preserving of Edible Seaweeds	Permission	
15126	Processing and Preserving of Salted Edible Seaweeds		Report
15132	Processing and Preserving of Fruit	Permission	Report
15143	Manufacture of Edible Refined Oils and Processed Oils	Permission	Report
15205	Butter and Cheese	Permission	
15209	Other Dairy Products		Permission
15312	Milling of Cereals	Permission	Registration
15322	Manufacture of Glucose and Glucose Syrup, Maltose	Permission	Report
15330	Manufacture of Prepared Animal Feeds	Permission	Registration
15419	Bread Products	Permission	Report
15429	Sugar Products	Permission	Report
15430	Manufacture of Cocoa, Chocolate and Sugar Confectionery	Permission	Report
15440	Manufacture of Noodles and Similar Farinaceous Products	Permission	Report
15455	Yeast Products	Permission	
15459	Seasoning and flavoring Products		Report
15497	Manufacture of Liquefied Health Additive Food	Permission	
15499	Manufacture of Other Food Products n.e.c.		Report
15519	Manufacture of Other Distilled Alcohol from Fermented Materials and Blending of Spirits	License	License
15529	Manufacture of Other Fermented Alcoholic Beverages	License	License

15532	Manufacture of Malt Liquors	License	License
15549	Manufacture of Other Non-Alcoholic Beverages	Permission	Report
16002	Manufacture of Tobacco Products	Government Monopoly	Permission
20109	Wood and Lumber	Registration	
20213	Reinforced Wood	Registration	
20222	Wooden Ware for Construction	Registration	
22110	Publishing of Books, Brochures, Musical Books and Other Publications	Registration	Registration
22122	Publishing of Magazines and Periodicals	Registration	Registration
22130	Publishing of Recorded Audio Media	Registration	Report
22190	Other Publishing	Registration	Registration
22219	Other Printing	Registration	Registration
23210	Petroleum Refineries	Permission	Registration
23229	Reprocessing of Other Fractionated Petroleum	Report	Report
23300	Processing of Nuclear Fuel	Permission	Report
24129	Manufacture of Other Basic Inorganic Chemicals	Permission	Registration
24212	Manufacture of Biological Products	Permission	Registration
24235	Animal Medicine	Permission	
24239	Other Pharmaceuticals		Permission
25243	Plastic Products	Registration	
26104	Glass Products	Report	
26913	Sanitary China Ware	Registration	Registration
26921	Manufacture of Ready-Mix Asphalt Concrete	Registration	
26991	Manufacture of Abrasive Articles	Permission	Permission
28111	Manufacture of Metal Doors and Related Articles	Registration	
28123	Receptacle for Compressed Gas	Permission	Permission
28132	Manufacture of Steam Generating Boilers	Permission	
28999	Manufacture of All Other Fabricated Metal Products n.e.c.	Permission	Permission

29123	Manufacture of Pumps and Compressors	Permission	
29141	Manufacture of Ball and Roller Bearings	Permission	
29152	Equipment for Commodity Handling	Registration	
29196	Ware Washing Appliances	Registration	
29210	Manufacture of Machine-tools for Working metal; for Working any Material By Electron	Registration	
29299	Manufacture of All Other Machine-Tools, n.e.c.	Registration	
29305	Electrical Hair Appliance	Registration	
30029	Manufacture of Other Office Appliances	Report	
31104	Manufacture of Ballasts for Lamps	Registration	
31202	Manufacture of Boards for Electric Control or Distribution	Registration	
31302	Manufacture of Optical Fiber Cables Made-Up Individually Sheathed Fires, Except Insulated Code Sets	Registration	
31503	Advertising Lamp Products	Report	
31909	Other Office Supplies	Report	
32202	Manufacture of Communication Apparatuses Without Any Line Connection and Radio or Television Broadcasting Apparatuses	Assignment	
32300	Manufacture of Television and Radio Receivers, Sound or Video Recording or Reproducing Apparatuses, and Related Goods	Registration	
33119	Medical Appliance	Permission	Permission
35303	Airplane Components	Report	
36926	Electrical Musical Instrument	Report	
36949	Manufacture of Other Game Articles, n.e.c	Permission	Permission

Note: Blank is not identified.

Source: Kim (2002).

3. EMPIRICAL MODEL

The empirical model in this study is composed of 3 structural equations: an entry equation, an exit equation, and a performance equation. The estimation model follows the analytical frameworks of Baldwin and Gorecki (1991), Geroski (1991), and Roberts and Tybout (1996). This study examines factors at two levels that affect industry turnover and firm performance, namely, industrial characteristics and firm-specific factors.

3.1. Entry Equation

$$ER_{jt} = f(GRSALE_{jt}, HHI_{jt}, KS_{jt}, AS_{jt}, RDS_{jt}, AGE_{jt}, EXD_{jt}, ENTRYRE_{jt})$$

ER_{jt} is the dependent variable that representing the market entry rate of industry j . This variable is calculated by dividing the number of new firms by the number of incumbents and new entrants at time t . t denotes either the year 1992 or 2001.

3.2. Exit Equation

$$EX_{jt} = g(GRSALE_{jt}, HHI_{jt}, KS_{jt}, AS_{jt}, RDS_{jt}, AGE_{jt}, EXD_{jt}, ENTRYRE_{jt})$$

EX_{jt} is the dependent variable that representing the market exit rate of industry j . This variable is defined by dividing the number of exiting firms at time t by the number of incumbents and new entrants at a previous time, $t-1$.

3.3. Performance Equation

$$OIS_{it} = h(GRSALE_{it}, MS_{it}, KS_{it}, AS_{it}, RDS_{it}, AGE_{it}, EXD_{it}, ER_{it-1}, 30D_{it}, ENTRYRE_{jt}, ENTRYDER_{jt}, REGIME_{it}, INDUSTRY_{it})$$

OIS_{it} is the dependent variable representing the economic performance of firm i , and is expressed as the ratio of operating income to sales of firm i .

3.4. Explanatory Variables

$GRSALE$ represents the growth rate of sales, which is the percentage change in demand for each firm or industry. This variable, deflated by the producer price index, measures the degree of demand shocks.¹⁾ Arguably, changes in technology and demand patterns shift resources from a contracting sectors to an expanding one. Hence, growing industries can offer more opportunities for entry, particularly in less profitable areas that dominant firms do not pursue. It is expected that entrants will be encouraged since high demand growth reduces the asymmetry between the current prices of incumbents and the future prices of entrants. Geroski and Schwalbach (1991) showed that higher industry growth increases firm entry. Increasing demand also allows weaker firms to survive if stronger firms cannot fully meet the new demand. Hence, the exit rate should drop. Jeong and Masson (1991), Sleuwaegen and Dehandschutter (1991) and Dunne and Roberts (1991) show that higher industry growth reduces exit. All else equal, it is expected that firm performance will be positively correlated with this variable. In this study, macroeconomic effects are not considered as cyclical effects are largely captured by the growth rate of sales.

HHI represents the Herfindahl index (sum of the square of each firm's market share) denotes market concentration rates in an industry. If there are

¹⁾ The data for the producer price index is from the Annual Economic Statistics by the Bank of Korea.

fewer producers (highly concentrated markets), then they are likely to collude (perhaps implicitly). Hence, high market concentration reduces entry (see Baldwin, 1993; Kessides, 1991; Fehr, 1991), as the threat of punishment becomes more credible raising the effective cost of entry. Mata (1991) argues that fewer existing producers with less room for free-riding are likely to engage in driving out new entrants (especially large ones). Also, the increased likelihood of collusion in industries with high market concentration helps increase profitability as higher market concentration reduces exit.

MS represents the market share of a firm at a specific time, which is the ratio of sales of each firm to the total sales of all firms in the relevant industry.

KS represents capital intensity of firm or industry, and is the ratio of tangible fixed assets to sales. In capital-intensive industries, capital investment is usually irreversible thereby implying preemptive commitment. This irreversible investment furthermore increases sunk costs and works well as an effective means to deter new entry.²⁾ It is also argued that high sunk costs also help lower exit.³⁾ After the high initial sunk costs, a firm faces relatively low variable costs, however. Also, weak firms usually cannot reduce losses by selling unused, sunk capital. Therefore, staying in the market will cost only slightly more than exiting. Because they incur relatively low losses, weaker firms are more likely to endure some periods of low demand while waiting for demand to pick up.

AS represents advertising intensity of each firm or industry. This measures the ratio of advertising cost to sales. Advertising expenditure may function as an entry barrier through effect product differentiation and adding to higher fixed costs. The higher the advertising intensity, the higher the expected profit. On the contrary, relatively high advertising cost could lower the profit rate especially when advertising expenditure does not generate product differentiation. Hence, the higher fixed cost effectively ends up as inefficient cost.

²⁾ See Spence (1977), Dixit (1980), Bulow, Geanakoplos, and Klemperer (1985), Dunne, Robert, and Samuelson (1988) and Kessides (1991).

³⁾ See Caves and Porter (1977), Eaton and Lipsey (1981), and Baumol *et al.* (1982).

RDS represents R&D intensity of each firm or industry. This measures the ratio of R&D expenditure to sales. The effects of R&D activity on industrial turnover is usually mixed. However, it is argued that R&D acts as an entry barrier due to economies of scale in the R&D process. Also, R&D can increase the rate of exit as new technologies may spur product differentiation or render existing technologies obsolete. Hence, R&D can impede entry and force producers with existing technologies to exit. As such it is expected that this variable to be positively correlated with the profit rate. However, Fehr (1991) notes that industries with rapid technological development can create opportunities for product niches. Furthermore, with spillover effects, new innovations can be exploited in newly born firms that spin-off from a creator firm. Therefore, high R&D levels in an industry can encourage new entrants.

AGE is a control variable for the maturity of each firm and industry.

EXD is a dummy variable to control for the existence of export markets. It takes on a value of one if each firm or industry has an export market, and zero otherwise.

30D is a dummy variable to control for the effect of business group management, denoted one if a firm is an affiliated firm, and zero otherwise.

ENTRYRE is a dummy variable to control for the effect of entry regulation on entry and exit rates at the industry level, and economic performance at the firm level. It takes on a value of one if a firm belongs to an industry in which legal entry regulation exists, and zero otherwise. This variable is only defined for the year 1992 and 2001.

ENTRYDER is a dummy variable to control for the net effect of entry deregulation on economic rent. It takes on a value of one if a firm belongs to an industry having legal entry barriers in 1992 but not in 2001 i.e., if legal entry barriers are removed in 2001.

REGIME is a dummy variable to capture the net effect of the basic regulatory regime change between the two reference years on a firms' overall economic performance. It takes on a value of one if the firms belong to the regime after significant regulatory reform, and zero otherwise.

Table 2 Summary Statistics for Major Variables

Explanatory Variable	1992		2001		1992 & 2001	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
<i>ROS</i>	7.82	5.3831	7.95	6.3952	7.89	5.9774
<i>GRSALE</i>	15.32	42.1557	11.36	45.0061	13.03	43.8675
<i>HHI</i>	2,982.13	2,542.00	3,166.27	2,980.91	3,052.65	2,704.19
<i>MS</i>	5.40	12.0489	3.54	9.6927	4.34	10.8111
<i>KS</i>	52.40	75.4638	47.94	64.9549	49.86	69.7146
<i>AS</i>	0.91	2.7260	0.69	2.3230	0.78	2.50353
<i>RDS</i>	0.80	3.0150	0.50	4.5690	0.62	3.99030
<i>AGE</i>	16.54	10.9907	18.78	12.4089	17.83	11.8824

4. EMPIRICAL RESULTS AND IMPLICATIONS

Table 3 shows that entry regulations do deter entry. The market entry rate of firms in industries affected by legal entry regulation is on average 5.19% lower than that of firms in industries unaffected by legal entry regulations. This entry rate is significantly low when compared with the entry rate's mean value of 13.6%. As the estimated coefficient on *GRSALE* shows, growing industries can offer more opportunities for entry. But as markets become more concentrated, new entry slows. Also, in more mature industries there are fewer cases of new entrants.

Table 4 shows that entry regulations actually reduce exit. The market exit rate of firms in industries affected by legal entry regulations is on average 3.62% lower than that of firms in industries not affected by legal entry regulations. The exit rate is significantly low when compared with the exit rate's mean value of 8.51%. Interestingly, entry regulations may actually work as an exit barrier. The estimated coefficient on *GRSALE* shows that increasing demand allows weaker firms to survive longer if stronger firms do not fully meet new demand hikes and as a result exits should fall.

**Table 3 Estimation Result of Entry Equation
(Sample Year: 1992&2001)**

Explanatory Variable	Estimated Coefficient	Standard Error	T-value	Prob > T
<i>Intercept</i>	28.52574	3.34900	8.52	0.0001
<i>GRSALE</i>	0.17469	0.04246	4.11	0.0001
<i>HHI</i>	-0.00129	0.00049	-2.65	0.0095
<i>KS</i>	0.00215	0.04651	0.05	0.9632
<i>AS</i>	-0.69257	0.57690	-1.20	0.2332
<i>RDS</i>	-0.48108	0.69906	-0.69	0.4932
<i>AGE</i>	-0.45320	0.15253	-2.97	0.0038
<i>ENTRYRE</i>	-5.19022	2.46015	-2.11	0.0378
Obs.	93			
$\overline{R^2}$	0.3204			
F value	7.26			
Prob > F	0.0001			

Note: Heteroscedasticity-robust standard errors are reported.

**Table 4 Estimation Result of Exit Equation
(Sample Year: 1992&2001)**

Explanatory Variable	Estimated Coefficient	Standard Error	T-value	Prob > T
<i>Intercept</i>	11.28846	2.77333	4.07	0.0001
<i>GRSALE</i>	-0.09134	0.03516	-2.60	0.0110
<i>HHI</i>	0.00006	0.00040	0.15	0.8825
<i>KS</i>	0.03012	0.03851	0.78	0.4363
<i>AS</i>	1.21448	0.47774	2.54	0.0128
<i>RDS</i>	0.38466	0.57889	0.66	0.5082
<i>AGE</i>	-0.22535	0.12631	-1.78	0.0779
<i>ENTRYRE</i>	-3.62464	2.03727	-1.78	0.0787
Obs.	93			
$\overline{R^2}$	0.2222			
F value	4.80			
Prob > F	0.0001			

Note: Heteroscedasticity-robust standard errors are reported.

**Table 5 Estimation Result of Performance Equation
(Sample Year: 1992)**

Explanatory Variable	Estimated Coefficient	Standard Error	T-value	Prob > T
<i>Intercept</i>	5.30779	0.35926	14.77	0.0001
<i>GRSALE</i>	0.01143	0.00264	4.34	0.0001
<i>MS</i>	-0.00956	0.00810	-1.18	0.2377
<i>KS</i>	0.025522	0.00252	10.02	0.0001
<i>AS</i>	0.38522	0.03682	10.46	0.0001
<i>RDS</i>	0.54321	0.05297	10.24	0.0001
<i>AGE</i>	0.01145	0.00914	1.25	0.2101
<i>EXD</i>	-0.09036	0.04235	-2.13	0.0330
<i>30D</i>	-0.64699	0.39231	-1.35	0.0992
<i>ENTRYRE</i>	0.81017	0.30858	2.63	0.0087
Obs.	2632			
$\overline{R^2}$	0.1309			
F value	43.89			
Prob > F	0.0001			

Note: Heteroscedasticity-robust standard errors are reported. Estimated coefficients on industry dummy variables are not reported.

In more mature industries there are fewer cases of exits.

When the effects of entry regulation on the entry and exit rates are taken together, it would seem that entry regulations dull the degree of competition that are likely from economic rent arising from entry regulations. It is noteworthy that operating income to sales (*OIS*) of firms under the influence of legal entry regulation is on average 8.70%, which is 0.81% higher than that of firms not under the affected by legal entry regulations in 1992 (table 5). In 1992, before regulatory reform, legal entry regulation at the four-digit level industries generated enough economic rent for incumbent firms. It is inferred that until 1992 before the all-out entry deregulation, firms under the influence of legal entry regulation reaped higher economic profit than firms not under the influence of legal entry regulation because economic rent

owing to entry regulations overrode economic inefficiency arising from weakened competition pressure.⁴⁾

Market demand was positively correlated with economic performance. The estimated coefficient on the growth rate of sales was statistically significant. Capital intensity was statistically significant and had a positive effect on operating income to sales in 1992. Advertising intensity was positively correlated with operating income to sales. The estimated coefficient on the ratio of advertising cost to sales was statistically significant, suggesting that advertising expenditure functions could have acted as an entry barrier by way of product differentiation and higher fixed costs. R&D intensity seems to have had a positive effect on economic performance. R&D worked as an entry barrier due to economies of scale in the R&D process. R&D also increased exits as new technologies could have spurred product differentiation or rendered existing technologies obsolete. R&D is an important factor impeding entry and forcing producers with old technologies to exit. It was also positively correlated with the profit rate. The estimated coefficient on the dummy variable controlling for the existence of export markets was negative and statistically significant implying that firms sold products at lower prices (or at dumping prices). Another finding is that the affiliation effect or “*chaebol effect*” on economic performance was positive but was not statistically significant.

A “treatment” sample was constructed consisting of observed cohort data, where firms were regulated by legal entry barrier in 1992 but not regulated in 2001 following the removal of legal entry barriers. The estimated coefficient on *ENTRYDER* suggests that firms belonging to industries regulated by legal entry barriers in 1992 but not regulated in 2001 lose about 1.16% of economic rent compared with another cohort of firms, a “control” cohort of firms in industries regulated by legal entry barriers in both 1992 and 2001.⁵⁾ Entry deregulation expedites rent dissipation by 15.2% in terms

⁴⁾ Firms facing weak competitive pressure have less incentive to lower costs or raise economic efficiency compared to firms facing high competition.

⁵⁾ Two cohorts of firms were observed both in 1992 and 2001.

**Table 6 Estimation Result of Performance Equation
(Sample: Cohort Firms Regulated in 1992 and
Observed in 2001)**

Explanatory Variable	Estimated Coefficient	Standard Error	<i>T</i> -value	Prob > $ T $
<i>Intercept</i>	6.79535	0.41890	16.22	0.0001
<i>GRSALE</i>	0.02756	0.00617	4.47	0.0001
<i>MS</i>	0.01537	0.01457	1.06	0.2915
<i>KS</i>	0.01180	0.00313	3.78	0.0002
<i>AS</i>	0.52792	0.06378	8.28	0.0001
<i>RDS</i>	0.27308	0.21551	1.27	0.2053
<i>AGE</i>	-0.00414	0.01335	-0.31	0.7565
<i>EXD</i>	-0.17044	0.07434	-2.29	0.0220
<i>30D</i>	0.44602	0.62716	0.71	0.4771
<i>ENTRYRDER</i>	-1.16390	0.55921	-2.08	0.0376
Obs.	1556			
$\overline{R^2}$	0.0690			
<i>F</i> value	13.80			
Prob > <i>F</i>	0.0001			

Note: Heteroscedasticity-robust standard errors are reported. Estimated coefficients on industry dummy variables are not reported.

of the operating income to sales (*OIS*), all else equal.

As a result of continued regulatory reform under by the Kim Young-sam and Kim Dae-jung governments, significant deregulation is visible. Using the difference method, the net effect of basic regulatory regime change between the two reference years on a firms' overall economic performance is gauged while controlling for the effect of legal entry regulations on firms' economic performance both in 1992 and 2001. The total difference in economic performance between the two regulatory regimes is decomposed into two parts. One is the difference in economic performance between firms under the influence of legal entry regulations and firms that are not affected

**Table 7 Estimation Result of Performance Equation
(Sample Year: 1992 & 2001)**

Explanatory Variable	Estimated Coefficient	Standard Error	T-value	Prob > T
<i>Intercept</i>	6.34808	0.24944	25.45	0.0001
<i>GRSALE</i>	0.01450	0.00189	7.66	0.0001
<i>MS</i>	0.00221	0.00688	0.32	0.7476
<i>KS</i>	0.01695	0.00167	10.16	0.0001
<i>AS</i>	0.47032	0.03287	14.31	0.0001
<i>RDS</i>	0.41565	0.04948	8.40	0.0001
<i>AGE</i>	-0.01477	0.00654	-2.26	0.0240
<i>EXD</i>	-0.08821	0.03549	-2.49	0.0130
<i>30D</i>	0.09589	0.33804	0.28	0.7767
<i>ENTRYRE</i>	0.68480	0.34398	1.99	0.0465
<i>REGIME</i>	0.41158	0.15230	2.70	0.0069
Obs.	6175			
$\overline{R^2}$	0.0696			
F value	47.22			
Prob > F	0.0001			

Note: Heteroscedasticity-robust standard errors are reported. Estimated coefficients on industry dummy variables are not reported.

by the legal entry regulations in the two reference years that is called the “difference economic rent”. The other is the difference in economic performance between firms under the before-regulatory reform regime and firms under the after-regulatory reform regime called the “difference efficiency gap”. The efficiency gap is calculated by subtracting economic rent from the total difference in economic performance. The estimated coefficient on *REGIME* observes a 0.41% statistically significant gain in economic performance in 2001 after regulatory reform. This efficiency gain is partly generated by the large exit of marginal firms that had to face stronger competition in 2001 following regulatory reforms. The exit rate in 1992 accounted for only 6.9% but sharply increased to 11.11% in 2001.

Firms facing higher competition had little choice but to reduce costs in order to survive in the after-regulatory reform regime. These two factors accrue to the 0.41% overall enhancement in economic performance. The empirical results in this paper show that further entry deregulation has a positive effect on firms' economic efficiency.

5. CONCLUSION

This empirical study confirms the fact that entry regulations help deter firms' entry and exit. The effects of legal entry regulations on the entry and exit rates taken together tend to decrease the degree of competition. It is therefore suspected that economic rents derived from the existence of entry regulations. It is noteworthy also that operating income to sales (*OIS*) of firms under the influence of legal entry regulations was 8.70% on average, which was 0.81% higher than that of firms not affected by legal entry regulations in 1992. In other words, legal entry regulations at the four-digit level industries provided enough rents for incumbent firms in 1992 before the regulatory reform. The statistical analysis here also shows that firms belonging to industries regulated by legal entry barriers in 1992 but not in 2001 lost about 1.16% in terms of economic rent compared with a cohort of firms belonging to industries regulated by legal entry barriers both in 1992 and 2001. Entry deregulation seems to have stimulated rent dissipation of about 15.2% in terms of the operating income over sales (*OIS*), all else left unchanged.

Using the difference in the difference method, the net effect of basic regulatory regime change between the two reference years on firms' overall economic performance was measured while controlling for the effect of legal entry regulations on firms' economic performances both in 1992 and 2001. According to estimations, a 0.41% statistically significant gain in economic performance was realized following regulatory reform. This efficiency gain was partly secured by the enormous exit of marginal firms following deeper

competition pressure in 2001 following regulatory reforms. Also in the post-regulatory reform regime, it would seem that firms facing higher degree of competition were forced to reduce costs. That is, these two factors generated a 0.41% overall enhancement of economic performance. The empirical results in this paper imply that further entry deregulation has a positive effect on firms' economic efficiency, largely by deepening the degree of competition and driving out incompetent firms.

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