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ANALYZING FIRM PERFORMANCE HETEROGENEITY: THE RELATIVE EFFECT OF BUSINESS DOMAIN

Noël Houthoofd[1]
Sebastian Desmidt[2]
Eduardo González Fidalgo[3]

Abstract

Purpose: An ongoing discussion in strategic management concerns the relative impact of specific strategic decisions on firm performance. In this tradition, this research analyzes the relative impact of business domain choices on firm performance. More specific, the paper at hand (a) discusses a method to assess the relative impact of firm and business domain effects on firm performance within a specific industry, and (b) demonstrates the value of this method.

Design/methodology/approach (mandatory): First, a model was developed to estimate the relative impact of firm versus business domain on performance. Second, all members of a specific SME-dominated industry, namely the Belgian electrical whole sale sector, were questioned in order to test the validity of the developed model.

Findings: The results indicate that (a) the firms in the analyzed industry operate within two distinct business domains, and (b) business domain effects explain from 6.8 percent to 9.7 percent of the variance of the included performance variables.

Practical implications: These findings should urge managers to carefully (re)consider where they are competing and assess the relative performance impact of business domain choices within an industry.

Originality/value: It is widely agreed upon that industry membership has performance implications. The effect of industry membership considers performance variation between industries. This study is, however, one of the first studies to further analyze the performance heterogeneity within an industry by considering the relative effect of business domain choices.

Key words:

Business domain choice electrical wholesale sector, performance differences, variance decomposition

[1] Houthoofd, Noël, Ph.D., Professor of strategic management at HUBrussel, Faculty of Economics and Business, Research Group Strategic Management and Entrepreneurship, Brussels, Belgium(noel.houthoofd@pandora.be).

[2] Desmidt, Sebastian, Ph.D., Assistant Professor at University College Ghent, Department of Applied Business and Public Administration, Voskenslaan 270, B-9000 Ghent, Belgium, 0032(0)9 2488839, Sebastian.Desmidt@hogent.be and post-doctoral researcher at Ghent University, Faculty of Economics and Business Administration, Department of Management, Innovation and Entrepreneurship, Belgium.

[3] González Fidalgo, Eduardo, Ph.D., Associate Professor of Business Administration, University of Oviedo, Business Administration Department, Oviedo, Spain (efidalgo@uniovi.es).

Introduction

One of the major discussions in strategy concerns the determinants of firm performance. Academics from various backgrounds have focused on explaining firm performance and identifying the sources of inter-firm performance differences (McGahan & Porter, 1997). Researchers in the industrial-organization tradition, for example, have argued that industry structure is a central determinant of firm performance and the competitive position of all business units in that specific industry (Chang & Singh, 2000). However, the inability of the industrial-organization tradition to provide a rigorous explanation for intra-industry performance differences has stimulated strategy researchers to focus on the firm itself (Chang & Singh, 2000).

As a result, firms were no longer viewed as identical "black boxes" in a given market structure but as dynamic collections of specific capabilities influenced by specific strategic decisions (Hawawini, Subramanian, & Verdin, 2003). One of these vital strategic decisions is the (implicit or explicit) selected business domain (Sidhu, 2004). However, despite the importance of these issues, assessing the relative impact of business domain effects on performance has received scant empirical study (McGahan & Porter, 1997). Moreover, these issues have only been seldom addressed within the context of SME's (Chang & Singh, 2000).

The paper at hand tackles this issue by analyzing the relative impact of firm and business domain effects on firm performance within a specific SME-dominated industry, namely the Belgian electrical whole sale sector. The results of this study contribute to our understanding of the performance impact of business domain definitions and will help remediate the fact that "few articles have been published that specifically deal with how to support strategic analysis and management in SME's" (Rangone, 1999).

Defining the business domain

Performance differences in firms are often the subject of academic research (Verreynne & Meyer, 2008). The underlying motivation for this kind of research is the quest for those factors that may provide firms with a competitive advantage and hence drive firm profitability. Traditionally, the emphasis in analyzing variations in firm performance has been at the industry level (Frazier & Howell, 1983).

Nonetheless, the inability of the industrial-organization tradition to provide a rigorous explanation for intra-industry heterogeneity in performance has stimulated strategy

researchers to focus on the firm itself (Chang & Singh, 2000). Hence, the idea that a firm's attributes, possessions, and actions are the driving forces behind performance has conquered a central position in the strategy field (Short, Ketchen, Palmer, & Hult, 2007). Within this stream, one view focuses on the strategic decisions of organizations, and more specific the selection of the competitive arena in which a company (implicitly or explicitly) chooses to compete within an industry. As such strategic decisions will significantly effect a firm's structural position in its industry (Frazier & Howell, 1983), it is likely that average performance differs among different competitive arenas or businesses within an industry. By considering businesses instead of the industry as the primary unit of analysis, researchers may gain a more in-depth knowledge of the rivalry patterns between firms and drivers of performance (Houthoofd, 2006).

The question now arises how business groups or business domains within an industry can be delineated. In most cases, the term "business domain" usually refers to the intersection between the supply side (the industry, a product oriented classification) and the demand side (the 'served market' in business language). A business domain can thus be defined as the competitive arena where firms with similar products target customers with similar needs.

Nevertheless, just as there is no best way to define an industry, there is no best way to define a business domain. Abell (1980), for example, was the first to add a third dimension and defined a business domain as a three-dimensional strategic space consisting of (1) customer groups served, (2) customer needs served, and (3) technologies employed. Cool and Schendel (1987), Martens (1988) and McGee and Segal-Horn (1990), in contrast, used geographic reach, in combination with products offered and markets served to picture the scope of the strategy of firms. Day (1981) and Porter (1986), on the other hand, suggested that the level of integration (whether forward or backward) could be a relevant business domain dimension in certain industries.

Prior research on the business definition-performance link

Despite the fact that defining the business domain in which to compete is generally accepted as one of the major hurdles in strategy formulation, only a few studies have addressed the hypothesis that the business domain definition affects performance. Frazier and Howell (1983), for example, delineated clusters of firms in the hospital supply industry based on two criteria: the degree of scope and differentiation of (1) customer needs served with a given technology and (2) customer groups. Profitability (i.e. net profit before taxes, return on assets, return on net worth) did not significantly differ between these clusters. However,

performance criteria associated with sales volume (for example average order size) did vary significantly across the identified clusters. Houthoofd and Heene (1997) report a study (investigating 36 firms) on the differences in business definitions within the Belgian brewing industry. They were able to identify five clusters of firms based on a four dimensional "strategic space" consisting of buyer types, product types, geographical reach and level of vertical integration. These clusters (representing in fact firms competing within different business domains) differ statistically significantly on a risk-adjusted return on assets measure. Sidhu, Nijssen and Commandeur (2000) investigated how 56 firms in different industries conceptualize their business domain (and thus their competitive arena) and how this conceptualization affects performance. They found that delineating competitive arenas relatively narrowly (with an organization's technological competencies as the reference point) is positively associated with performance (i.e. sales growth). In stable industries, on the contrary, a broad definition (encompassing producers of substitute products) is positively correlated to sales growth. Wakabayashi (2005) studied the relationship between past business definitions and financial performance in 50 Japanese electric/electronics companies for a six year-period (1998 – 2004). His study results indicate that functional business domain definitions (i.e. elaborating customer-value orientedness) have a positive impact on sales growth and on the growth rate of aggregate market value (of the firm) over a period of five or six years.

Problem statement and research method

Our analysis of the business domain-performance link indicates that business domain definition choices do have performance implications but that the relative impact of industry, firm and business domain effects on performance has received scant empirical study (McGahan & Porter, 1997). What is more, the analysis indicates that the cited issues have only been seldom addressed within the context of SME's (Chang & Singh, 2000). Despite the traditional explanation that the success of small firms lies in their capacity to select their battlegrounds carefully (Gomes-Casseres, 1997), it seems that research examining the performance impact of the business domain definitions of SME's is scarce. In combination with the observation that when a new venture succeeds or an existing one finds a sustainable path to growth it is "more often than not […] in a market other than the one it was originally intended to serve, with products and services not quite those with which it had set out, bought in large part by customers it did not even think of when it started, and used for a host of purposes besides the ones for which the products were first designed (Drucker, 1985)", it

seems that insights into the relationship between the selected business domain and performance within a specific sector could provide entrepreneurs and managers of SME's with valuable information about the adequateness and profitability of specific business models. Consequently, the paper at hand (a) discusses a method to assess the relative impact of firm and business domain effects on firm performance within a specific industry, and (b) demonstrates the value of this method by measuring the effect of business definition on performance within the context of a specific SME-dominated industry, namely the Belgian electrical wholesale sector.

Research method: Distinguishing firm effects from business domain effects

Our study builds on research focusing on separating (a) industry performance effects from firm performance effects (McGahan & Porter, 1997, 2005; Rumelt, 1991; Schmalensee, 1985), and (b) industry performance effects from group performance effects and firm performance effects (González & Ventura, 2002; Short et al., 2007). Prior research on industry and group effects has relied predominantly on analysis of variance, a statistical tool that allows testing whether average performance differs significantly from one group to another within an industry. In this paper we follow a related approach that uses sequential analysis of variance to estimate how much of the differences in firm performance are due to the group effects. In the paper at hand, business domain definition is used as the central criterion to delineate the groups.

The basic model in our study specifies firm performance as determined by three factors:

$$R_{ijt} = \mu + \alpha_i + \beta_{ij} + \lambda_t + e_{ijt}$$

where R_{ijt} is the yeat t performance of the j-th firm in business domain *i,* μ is the intercept (it would capture the overall performance average if there were no other sources of performance variation), α_i is the effect on firm performance of belonging to business domain *i* (it represents the average performance of firms in group i), β_{ij} is the effect of being the j-th firm in business domain *i (*this term represents the average performance of firm j, which may differ from the average of its business domain i), λ_t is the year effect (again, this term would capture the average performance in year t), and e_{ijt} is the residual term or unexplained performance (the part of the individual year performance of a firm in a group that cannot be related to the year, not to the firm's average and neither to the business domain average). The study at hand focuses on one specific industry and examines almost all industry members. Therefore, we must treat the parameters in the expression above as fixed effects on

performance[4]. Treating the effects as fixed parameters has the advantage that we can actually estimate the value of each effect, which may be obtained by means of applying the Least Squares Dummy Variables estimator (LSDV). However, we are not really interested in the specific values of the effects but rather in determining the relative contribution of each effect (considered globally) to the dependent variable. For such an end it is enough to compare the variance of the dependent variable (firm performance) with the variances of each set of effects included in the model. The Analysis of Variance (ANOVA) estimator is designed specifically to do this comparison. There is a minor complexity when applying the ANOVA estimator to our research setting. As each firm belongs to one and only one business domain, the firm effects in the model are nested on the business domain effects. For this reason, it is impossible to introduce simultaneously all the effects in the ANOVA model as fixed parameters and this impedes the assessment of the relative importance of each effect separately. Instead, a separate estimation has to be made for the nested firm effect by means of a sequential ANOVA model. The effects are introduced sequentially and the percentage of the variance of the dependent variable that is covered by the effects included is registered. First, we incorporate the year effects, then the business effects and finally the nested firm effects, whereby random error would account for any remaining unexplained variance. The increase in the variance explained at each stage in the sequential procedure is interpreted as a measure of the importance of the last effect included.

Research setting: data and sample

The industry studied is a service industry consisting of 25 electrical wholesalers. We have chosen this particular industry for three reasons. First, all firms in this industry are non-diversified firms. Arbitrary splits of overhead costs are thus not needed. Second, this also

[4] From a statistical viewpoint, firm, business domain (group) and year effects may be treated as fixed parameters or as random variables in order to examine their respective contribution to firm performance. In contrast to most previous studies, the research setting at hand calls for a fixed effects model (ANOVA) rather than a random effects model (variance components analysis and its numerous estimators) as the employed sample is nearly equal to the population. Most previous studies are multiple industry studies whereby the employed sample usually consists of a random selection of firms. These samples are characterized by the fact that (a) not all industries are included, and (b) of the included industries not all firms are selected. As a result, the effects in the sample are in fact random what necessitates the use of random effects models. In our dataset, the delineated groups are thus not a random sample and neither are the included firms. Therefore the effects should be treated as fixed.

implies that the corporate level strategy merges with the business level strategy. Third, the number of firms in the selected industry is limited. The limited number of firms makes it possible to get acquainted with all of the industry participants individually and gave opportunities to control the validity of the collected data.

A questionnaire was send to all 25 members of the industry. The questionnaire was carefully prepared in collaboration with members of the wholesalers' interest group. The questionnaire was mailed by the interest group but completed questionnaires were returned directly to the first author, guaranteeing full discretion on the provided data. Additionally, we requested the wholesalers to include specific accounting data for the period 1998-2003 so that we could compute four performance measures (see research design for details). As the questionnaire disclosed the identity of the firm, the validity of the provided accounting and questionnaire data could be verified with other (financial and economic) sources.

In total, 20 firms completed the questionnaire. All participating firms were small, family-owned private firms. Sales vary from EUR 4 million (25^{th} percentile) to more than EUR 28 million (75th percentile) with a median of EUR 8 million. Total employment ranges from 14 (25th percentile) to 78 (75th percentile) with a median of 28 employees (see Table 1 for some descriptive indicators of the sample). As the non-participants were very small firms, over 95 percent of the market, in terms of output, was covered by the sample.

Insert Table 1 about here

Operationalizing the research design

Business domain definition variables. The competitive arena in which a firm operates is defined by its business domain definition. Three dimensions characterize this scope in the electrical wholesale sector: buyer scope, product scope, and geographical reach. Buyer scope is operationalized with two measures: percentage of sales to business clients and percentage of sales to electricians. Product scope is measured through two measures: the percentage of sales of lighting material and percentage of sales of installation material. Geographical reach is measured with the proxy firm size and operationalized as the log of sales (Martens, 1988). In contrast to studies in other industries (e. g. Day, 1981), the level of integration was deemed an irrelevant dimension as none of the Belgian electrical wholesale wholesalers is vertically integrated (neither forward, nor backward).

All selected variables reflect the average situation during the period 1998-2003. Six-year averages were used as variable-measures throughout this paper to (a) cope with variations in accounting practice, (b) give long-term measures, (c) mitigate the effects of various leads and lags, and (d) average the effects of swings in the economy (Barton & Gordon, 1988; Bettis, 1981; Hambrick, 1983; Hambrick & Macmillan, 1985; Souca De Vasconcellos e Sa & Hambrick, 1989; Zeithaml & Fry, 1984). An overview of the variables used and their operationalization can be found in Table 2. Table 3 provides some non-parametric descriptive statistics of the sample.

Insert Table 2 about here

Insert Table 3 about here

Performance variables. Four variables are used to measure (financial) performance, namely (1) gross return on business assets (gROBA), (2) net return on business assets (nROBA), (3) gross profit margin (gPM), and (4) net profit margin (nPM).

ROBA is a performance measure calculated before taxes and debt charges, so tax policy considerations and differences in tax rates are excluded. ROBA is computed (1) before debt charges to cope with differences in capital structure, (2) before depreciation charges (gROBA) and (3) after depreciation charges (nROBA). Given the research interest in the intrinsic profitability of operating activities (excluding pure financial or exceptional activities), return on business assets (ROBA) was chosen as performance measure above the more common profitability measure return on assets (ROA). Business assets are defined as non-financial assets (used here as an accounting term) and are composed of formation expenses, intangible assets, tangible assets, stocks and contracts in progress, amounts receivable within one year and deferred charges and accrued income. The larger this measure, the healthier the firm is supposed to be.

Profit margin is the ratio of operating profits to sales and is also calculated before (gPM) and after depreciation charges (nPM).

Research results

Delineating businesses

The first question is whether specific business domains exist within the examined industry. The statistical tool that was deemed most appropriate to answer this question is Cluster analysis, as it is specially designed to divide the sample into groups of observations (firms) on the basis of the similarities and differences observed in relevant variables . Unfortunately, cluster analysis can be distorted by multicollinearity. When various variables share common information (i.e., there is multicollinearity), the algorithm used to construct the groups counts the shared information as many times as the number of variables which are implied in the problem of multicollinearity. Therefore, it is a common procedure to eliminate the multicollinearity problem by means of factor analysis (FA), a technique that reduces the original list of variables to a reduced list of new variables (components) that condense the most relevant part of the original information but are not collinear[5]. Again, we used the common rule of extracting components as long as the eigenvalue exceeded 1 (i.e., the component contains the same amount of information contained in one of the original variables or more). The factor analysis indicated that a 2-factor solution was appropriate (see Table 4). The two factors could be identified as 'Product-Market-combination' (factor 1) and 'Geographical reach' (factor 2) (see Table 5). Subsequently, the factor scores obtained for these two components were used as input for the cluster analysis[6]. To contrast the appropriateness of the groups formed by the cluster analysis, we tested the significance of the differences in the average values of the components between groups, by means of Kruskal-Wallis test. The results show the presence of two significantly different groups of firms and, therefore, two different business domains within the industry. .

Insert Table 4 about here

Insert Table 5 about here

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[5] More specifically, we run a principal components analysis with orthogonal Varimax rotation on the business definition variables.

[6] Ward's hierarchical cluster analysis was used as it is also the common rule in the literature (Everitt, 1974).

As reported in Table 6, the two clusters differ significantly at conventional statistical levels on both components and also on all of the original variables except for the percentage of sales of lighting material. These results indicate that twelve firms operate within the first business domain and eight firms within the second business domain.

Insert Table 6 about here

The two business domains can be described as follows:

Business domain 1 (called the "locals"): relatively smaller sized firms with above average sales to business clients, below average sales to electricians, above average sales of installation material and lighting material.

Business domain 2 (called the "regional and national firms"): relatively larger firms with below average sales to business clients, above average sales to electricians, below average sales of installation material and lighting material.

The question now arises if these two businesses differ from each other in terms of average performance. Table 6 indicates that these two clusters of firms do indeed differ significantly in terms of performance. Table 7 demonstrates that the "locals" (business domain one) are more profitable on any of the four measures. The median net profit margin in business domain one is 1.3 % higher, the median gross profit margin is 1.6 % higher, the median net ROBA is 3.6 % higher and the median gross ROBA is 5.5 % higher relative to business domain two.

Insert Table 7 about here

To recap, the study results suggest that business definition do matters in terms of performance within the analyzed industry. The next question then is: how much?

Firm effect versus business effect

Table 8 shows the results of the sequential analysis of variance that introduces the year effects first, then the business domain effects and finally the firm effects. The explanatory power of the non-nested effects (i.e. year and business effects) is measured by the R^2 of the corresponding model. We measure the contribution of the nested effect (i.e. the firm effect) by the change in R^2, with respect to the previous model in which it is not included. The results show that firm effects explain most of the variance in firm performance. The

explanatory power of firm effects varies from 55 percent in explaining nROBA and gROBA to 63 percent when explaining nPM and gPM. In turn, business domain effects explain from 6.8 percent to 9.7 percent of the variance of the performance variables. In addition, the analysis also shows that all business domain and firm effects are statistically significant at conventional levels. In contrast, year effects explain only about 2 percent of the variance and are not statistically significant. Table 8 also shows how serial correlation diminishes as additional effects are included in the model.

Insert Table 8 about here

Discussion and Conclusion

It is widely agreed upon that industry membership has performance implications. The effect of industry membership considers performance variation *between* industries. This study is, however, one of the first studies to further analyze the performance heterogeneity *within* an industry by considering the effect of business domain choices. Such choices are really strategic in that they have lasting performance implications and consequences. The very intriguing question from a strategic management viewpoint is: how much of the performance heterogeneity between firms in the same industry can be attributed to differences in business definition and how much of the performance heterogeneity between firms is linked to firm characteristics? It turns out, according to our findings, that differences in business domain explains about 8 percent of the variance in performance between firms within the analyzed industry.

Consequently, it pays for top managers to monitor the business domain definition of the firm. First of all, there are advantages connected with explicitly defining the business itself. By explicitly considering their business domain, firms may improve their competitor and competition analysis and streamline their competitor intelligence. Furthermore, significant threats and opportunities will be detected on a more timely basis, and a better basis for the formulation of appropriate short-term tactics and long-term strategy will be provided (Sidhu, 2004).

Secondly, there are also indirect effects of business domain definition on performance via the operational and functional consequences of the domain choice. Further analysis of the two identified business domains reveals that the supplier/wholesaler – relationship differs. There appears to emerge two different kinds of configurations or profiles of supplier-

wholesaler-buyer relationships. Firms in business domain one (the “locals”) buy a larger part of their products at fewer suppliers. This specialization in brands of a limited number of suppliers not only leads to a larger knowledge of these products, it also helps them to maintain a higher degree of service to their clients (with lower inventories and thus costs). Being loyal to fewer suppliers may also help to obtain discount prices, and to obtain more support from these suppliers. The configuration that comes to the fore in the second competitive arena is that of larger firms, targeting more at electricians, selling more on price and moving large amounts of volume. They are less specialized and have a larger number of suppliers. So they have a larger administrative component (larger back office) and more inventories.

Higher profitability occurs in wholesaling firms in business domain one (see above) with fewer suppliers and tight relations with their two largest suppliers. This finding is at odds with the traditional assumption that a wholesaler can shield itself from pressure of suppliers (producers of electrical material in this case) by buying from as many suppliers as possible. In this case, the opposite seems to be true. Fields that study ‘market power’, e.g. industrial economics, predict that if sellers (the wholesalers in our case) are fragmented and suppliers (the producers of the electronic material) are concentrated, market power for these sellers will be low, and profits will suffer (Cool and Henderson, 1998). Relative concentration goes hand in hand with relative size. If smaller sized sellers are ‘confronted’ with larger sized suppliers, sellers will have to play the game according to the rules of the supplier. That is indeed the general situation of sellers in the wholesale sector. Wholesalers outnumber the number of suppliers, they are relatively much smaller than the suppliers (certainly the sellers in business domain one). So, it seems logic that these sellers don’t play the game very hard and establish a more cooperative attitude with suppliers. Low power on behalf of the sellers in general, and especially in business domain one, does not result, however, in low performance. On the contrary, performance in business domain one is high.

While the market power view has strong theoretical underpinnings, there are streams in the strategy literature that argue against the conclusion that the competitive power game must end with low profitability for the ‘powerless’ (the small sellers in business domain one in this case). The above average performance of the ‘powerless’ firms in business domain one, may reflect, according to the resource-based view, unique resources, including (dynamic) capabilities. That brings us to the second performance effect studied: the firm effect which is about 60% in this study. That bears to the importance of each firm having idiosyncratic resources. The unique resources and capabilities encompass company image, company

loyalty, trust from buyers, but also a dynamic capability like product knowledge, specialized knowledge of the needs of the buyers or efficient service. The dynamic capabilities approach sees competitive advantage as stemming from high-performance routines within the firm rather than from strong market positions shielded by entry barriers or from competitive conflicts raising rival's costs (Teece, Pisano, & Shuen, 1997).

To summarize, a categorization of firms in terms of business domain definition, based on three dimensions (buyer groups, product types, geographical reach), may result in a number of business domains. The study results indicate that the examined industry consists of two distinct business domains whereby business domain membership explains about 8% of the variance in performance. The findings should urge managers to carefully (re)consider where (in terms of businesses) they are competing within the industry. Managers should pay (more) attention on business domain dimensions as business domain definition choices have operational consequences that affect the performance bottom-line. For instance, smaller firms seem to be better off with tight relations with a small number of suppliers in the context of wholesaling. Aligning operations with the chosen domain is warranted.

Limitation of the study and suggestions for future research

This study is a single industry study. The empirical findings, therefore, need confirmation in other industries. The sample size, though it nearly equaled the population, was only 20 firms. Small samples are not unusual in strategic management research. Nevertheless, studies of larger industries are warranted. By using a multiple industry study, all four effects (industry, business, firm, year effect) can be dissected.

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Table 1

Descriptives of the Belgian electrical wholesale sector (Quartiles)

	25th	**50th (median)**	**75th**
Employment (in units)	14	28	78
Total net profits (in EUR)	2,735.95	130,024.58	348,797.43
Total Assets (in EUR)	2,159,754.25	4236412.91	10,646,924.00
Inventories (in EUR)	657,604.72	1,062,911.75	2,422,405.29
Sales (in EUR)	4,537,066.16	8,737,122.75	28,753,382.00

Table 2

Operationalization of variables

Business domain definition variables	**Operational definition**
Market scope (buyer types)	% sales business clients % sales electricians (installers)
Product scope (product types)	% sales installation material % sales lighting material
Geographical reach)	size [log (sales)]
Performance variables	**Operational definition**
Gross return on business assets (gROBA)	Gross operating profit per business assets
Net return on business assets (nROBA)	Net operating profit per business assets
Gross profit margin (gPM)	Gross operating profit per sales
Net profit margin (nPM)	Net operating profit per sales

Table 3

Descriptive statistics of the sample on the business definition variables: rank correlations, minimum, maximum and quartiles

Rank correlations	**(A)**	**(B)**	**(C)**	**(D)**
% sales to business clients (A)	1			
% sales to electricians (B)	-0,766	1		
% sales of installation material (C)	0,516	-0,462	1	
% sales of lighting material (D)	-0,396	0,201	-0,433	1
size (E)	-0,157	0,298	-0,106	-0,211

Minimum, maximum and quartiles	**N**	**Min**	**25th**	**50th**	**75th**	**Max**
% sales to business clients	20	5	18.88	25.23	35.75	69
% sales to electricians	20	19	45.00	57.00	65.00	95
% sales of installation material	20	35	42.18	53.43	59.74	73
% sales of lighting material	20	8	18.62	21.75	25.66	44
Size	20	52.588	5.883	6.159	6.597	7.389

Table 4

Factor analysis of the business definition variables: eigenvalues and values explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	*Total*	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	2.453	49.066	49.066	2.453	49.063	49.063
2	1.257	25.147	74.213	1.257	25.149	74.213
3	.614	12.277	86.490			
4	.472	9.439	95.929			
5	.204	4.071	100.000			

Table 5

Factor matrix of the business definition variables

	Factor 1 Product market combination	Factor 2 Geographical reach
% sales to business clients	.891	
% sales to electricians		.300
% sales of installation material	.768	
Size		.842
% sales of lighting material	-.559	-.657

Notes: 1. Data shown are factor loadings greater than or equal to 0.3
2. The matrix is sorted
3. Blanks for loadings smaller than 0.3 to enhance readability

Table 6

Kruskal-Wallis 1-way ANOVA between businesses

Business definition measures	Chi-Square	df	Asymp. Sig.
% sales to business clients	6.502	1	.011 **
% sales to electricians	13.460	1	.000 ***
% sales of installation material	7.513	1	.006 ***
% sales of lighting material	.252	1	.616
Size	4.339	1	.037 **
Factor 1 product-market-combination	9.524	1	.002 ***
Factor 2 geographical reach	6.095	1	.014 **
Performance measures			
Average nROBA	3.429	1	.064 *
Average gROBA	5.006	1	.025 **
Average nPM	2.881	1	.090 *
Average gPM	3.429	1	.064 *

** $p < .10$*
*** $p < .05$*
**** $p < .01$*

Table 7

Businesses: descriptive statistics of performance measures

Variable	N	Business	Percentiles				
			min	*25*	*50*	*75*	*max*
nROBA	12	Business 1	-2.35	3.72	7.37	10.57	13.47
	8	Business 2	-7.65	.12	2.75	4.49	13.93
gROBA	12	Business 1	.25	7.43	11.09	13.61	16.90
	8	Business 2	-5.11	2.89	5.56	6.99	15.81
nPM	12	Business 1	-2.02	1.67	2.88	5.24	6.79
	8	Business 2	-4.55	.07	1.50	2.16	5.97
gPM	12	Business 1	-.80	3.08	4.57	6.67	8.78
	8	Business 2	-3.10	1.37	2.93	3.37	6.77

Table 8

Business effect versus firm effect (fixed effects models)

			nROBA		
	DF	***R^2***	***ΔR^2***	***F-test***	***Ser. Corr.***
YEAR	5	0.024	-	0.52	0.83
BUSINESS	1	0.072	-	8.52***	0.78
FIRM	19	0.621	0.549	7.93***	0.24
GLOBAL MODEL (FIRM+BUSINESS+YEAR)	24	0.650		6.72***	0.25
ERROR	87	0.350			
TOTAL	111				
			gROBA		
	DF	***R^2***	***ΔR^2***	***F-test***	***Ser. Corr.***
YEAR	5	0.020	-	0.44	0.83
BUSINESS	1	0.097	-	11.77***	0.78
FIRM	19	0.646	0.549	8.84***	0.22
GLOBAL MODEL (FIRM+BUSINESS+YEAR)	24	0.670		7.35***	0.23
ERROR	87	0.330			
TOTAL	111				
			nPM		
	DF	***R^2***	***ΔR^2***	***F-test***	***Ser. Corr.***
YEAR	5	0.020	-	0.40	0.81
BUSINESS	1	0.068	-	8.02***	0.76
FIRM	19	0.696	0.628	11.09***	0.03
GLOBAL MODEL (FIRM+BUSINESS+YEAR)	24	0.718		9.22***	0.05
ERROR	87	0.282			
TOTAL	111				
			gPM		
	DF	***R^2***	***ΔR^2***	***F-test***	***Ser. Corr.***
YEAR	5	0.016	-	0.34	0.81
BUSINESS	1	0.087	-	10.26***	0.76
FIRM	19	0.722	0.635	12.27***	0.01
GLOBAL MODEL (FIRM+BUSINESS+YEAR)	24	0.739		10.02***	0.04
ERROR	85	0.261			
TOTAL	109				