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Mihai Mutascu, Aurora Murgea

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## **Globalization and financial performances in French cosmetic industry**

**Mihai Mutascu**

Le Studium Fellow, Loire Valley Institute for Advanced Studies,  
Orléans and Tours, France  
& LEO, University of Orléans, France  
and  
Faculty of Economics and Business Administration,  
West University of Timisoara, Romania  
Email: [mihai.mutascu@gmail.com](mailto:mihai.mutascu@gmail.com)

**Aurora Murgea**

Faculty of Economics and Business Administration,  
West University of Timisoara, Romania  
Email: [aurora.murgea@e-uvt.ro](mailto:aurora.murgea@e-uvt.ro)

**Abstract:** The paper analyses the impact of globalization on financial performances of the French cosmetic companies, based on a sample with 704 cosmetic business entities, for the period 2003-2015. The main finding shows that the openness has a positive linear impact on their financial performances, both for producers and distributors. Moreover, the producers are more sensitive to the regulation adjustments, while the investments and debt management are very important for distribution companies. Contrary to other sectors, the economic crisis does not generate notable disturbances on the cosmetic market, as this market exhibits a sort of rigidity in respect to the purchasing power.

**Key words:** Globalization, Financial performances, Panel analysis, Effects, French cosmetic industry

**JEL-codes:** F61, F36, C23

## Introduction

During the last decades, the globalization process became a strong challenge for both governments and companies, having deep and complex implications especially at the microeconomic level. In this context, new realities changed the face of the international business and made globalization to be nowadays a very hot topic (e.g. trade liberalization; competition at the global scale; the lowered cost of global communication; financial integration; high innovation; or growing in the economic, socio-cultural, political and military interdependence).

The globalization process has been proven to generate both positive and negative effects over time. As a fire which used properly can be extremely helpful or disastrous if used carelessly, the globalization is neither good nor bad. An extended literature covers different categories of effects, starting from benefits (the increase in competitiveness, the ease of technology transfer, the unemployment reduction, just to list a few) to major threats (the inequality rise, the financial market volatility increases, the grown spillover of the financial crises, the environmental risks and many others).

The main researches are concentrated in various fields, such as: the economic development and prosperity (Alesina et al., 2016, Kose, et al., 2009; Pehnelt, 2007; Rao et al., 2011), culture (Chiu and Cheng, 2007; Pieterse, 2015; Robertson, 1992), political systems (Ezrow and Hellwig 2014; Fukuyama, 2014; Luard, 2016), environment (Gassebner et al., 2008, Lamla, 2009; Najam et al, 2007; Newell and Roberts, 2016), and not in the last place the psychological wellbeing (Benería et al., 2015; Inglehart, 2000; Weisbrot, 2002), just to name a few.

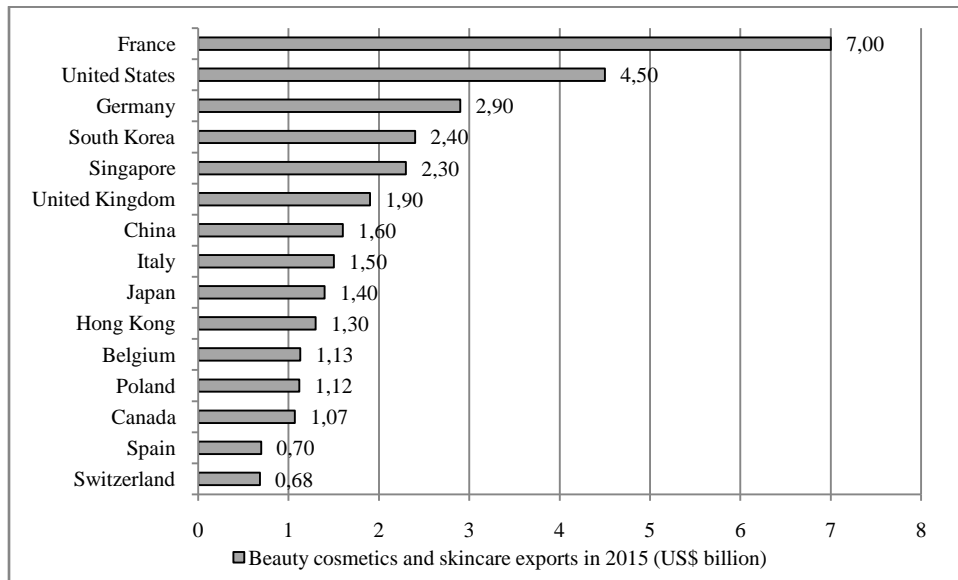
At the micro level, an extended literature in international business field highlights the opportunities and challenges determined by globalization. Globalization may contribute to firm profits through many channels as cost reductions due to job offshoring, economies of scale, exploiting market imperfections, arbitrage opportunities, risk reduction, access to more diverse knowledge, experiential learning and many other. On the other hand, the companies are facing a very competitive and uncertain global environment, a continuously changing business climate and a plethora of national cultural barriers that have to be overwhelmed. The technology is changing very fast and the information regarding the new products are easily accessible to consumers so they could shift very rapidly between producers, making demand less predictable. Hence, as globalization does not affect in an unidirectional manner the company's performance the final outcome, even mostly positive, could be considered as a *mélange* effect of both opportunities and threats.

Even if globalization is a continuous process that affects business in all facets, the pattern of the relationship is still on debate. Seven different patterns: linear positive, linear negative, no relationship, U-shaped, inverted U-shaped, horizontal S-shaped and sinus-shaped have been proposed and tested in the literature, each with supportive arguments. Despite the impressive number of studies, the current state of research findings is often characterized as 'inconclusive' (Tallman and Li, 1996) or 'contradictory' (Contractor, 2007), on the one side due to different measures used both for globalization and financial performances and on the other side due to different specificities in analysed industries or in home countries. Given the growing importance of international activities, the lack of a consensus in this area is quite disturbing and underlies the need for further examination of the issue.

The globalization process has also deep and complex implications on the world market, especially from financial performance point of view. Hence, the present research offers a clearer view on this topic. The focus is set on the relation between globalization and financial

performances in the case of a very particular industry, beauty industry almost neglected from our knowledge in the hitherto researches. This industry arises a special interest. It has several particularities: very strict targeted customers, different elasticity reactions under external shocks, and specific regulations which vary from one country to another. In this research, we define globalization from a supply chain perspective where the term of global supply chains is used to include sourcing the materials from foreign countries, the establishment of manufacturing plants, distribution networks at the worldwide level and the satisfaction of customers need on a global level.

Since France is the largest beauty products world exporter, with 7 US \$ billions in 2015 (Figure 1), and Paris is pretty often considered the world capital of beauty (Jones, 2011), choosing France as a representative market to test is not unexpected.



Source: performed based on International Trade Center (2017)

Figure 1: Beauty cosmetics and skincare exports distribution

France cosmetic industry also has other important particularities. Euromonitor International (2016) allows us to identify at least three trends in the last decade: the increase of customers' attention for less expensive brands, the increase of propensity towards natural and organic ingredients and the shift towards chemists/pharmacies and para-pharmacies/drugstores distribution channel. The propensity to buy products sold by less expensive brands came as a natural result of an increased uncertainty induced by the fragile economic situation and by the terrorist's attacks. Natural products sector has shown an important increase following the new research in the medical area that shown the damaging effect of different artificial components. Over the last period chemists/pharmacies and para-pharmacies/drugstores were able to increase their shares in beauty and personal care mainly due to two reasons: they offer more affordable brands than those found in beauty specialist retailers and department stores and are preferred by consumers because they offer a higher level of advice due to the presence of pharmacists. Plus, in the last years even premium brands as Clarins or Clinique, previously sold only through beauty specialist retailers, have started to offer lines of products to this distribution network.

Analysing a sample of 704 French cosmetic companies, for the period 2003-2015, the main finding shows that the globalization has a positive impact on their financial performances, for both producers and distributors. The producers are more sensitive to the regulation adjustments, while the investments and debt management are very important for distribution companies. Not at least, the big companies performed better as they can reach economies of scale.

The contributions of the paper for the literature are fourfold. Principally, according to our best knowledge, this is one of the first papers which analyse the financial performances of companies from cosmetic industry under globalization context. Second, the paper is a pioneered work on French cosmetic industry, by using the econometric tool. Third, as a novelty, the research follows an extended sample, with 704 companies, divided into two sub-samples, one for production sector and another for distribution. Fourth, the results are obtained by using as robustness check two very important financial performance rates: the return on assets - ROA and return on capital employed - ROCE.

Forwards, we proceed as follows. Section 2 describes the most important globalization effects in the beauty industry. Section 3 illustrates the existing literature. Section 4 presents the data and methodology, while Section 5 shows the results. Finally, Section 6 concludes.

## **Globalization of beauty**

Beauty industry shows a number of very distinctive characteristics that raise unusual interest and make it a very good candidate for our analysis. Even if relatively young compared with other industries, its roots can be traced back to ancient times as early as Egyptian, Greek and Roman era. Early major development includes the use of castor oil in ancient Egypt as a protective balsam or using oil-based perfumes by Romans on their bodies, in their baths and fountains (Kumar, 2005). Ancient Greeks also used cosmetics. For instance Galen, an ancient Greek physician is known to be the inventor of the first cold cream (Adkins and Adkins, 2014). Marketed initially to women, cosmetic products benefit from large advertising budgets and knowledge from different fields as health, aesthetic, psychology.

Maybe the most important distinct feature regards the way beauty societal and cultural norms shape the demand in this area. The cosmetic products affect in an intimate fashion the way the individuals perceive themselves and the others in terms of attractiveness. There are compelling research in the recent literature regarding the so-called “beauty premium” which enables those considered more attractive to get better jobs, to get promoted, to get higher tips, earn higher student evaluations and other benefits (Cipriani and Zago, 2011; Guéguen and Jacob, 2012; Hamermesh and Biddle, 1994; Mobius and Rosenblat, 2006; Mocan and Tekin, 2010).

The growth of the world beauty market was connected to the waves of globalization which began in the nineteenth century. Starting with the mid-nineteenth century, thousands of entrepreneurs primarily based in Western countries crossed border and establish operations in foreign countries carrying with them strong assumptions concerning what it meant to be “beautiful”. For instance, both French and British perfume houses as Piver, Guerlain and Rimmel set large export business by the middle of nineteenth century.

This is the main reason why, the first main impact globalization exercised in cosmetic industry regarded the homogenization of beauty ideals (Jones, 2011). In this first globalization stage beauty ideas and assumption prevalent in Western societies spread as a global benchmark. Among these ideas a major role was played by the aspirational status of Paris as a capital of

fashion and beauty, reflecting well known France's reputation for refined luxury. The process continued also after 1914 with the development of Hollywood, a very important driver of the unique beauty ideal idea, the first World pageant contests<sup>1</sup>, the extended presence in the worldwide media of Western pop stars, actors, models who Western norm of beauty (Unnikrishnan and Prasad, 2016; Yan and Bissell, 2014). Even though the World War 1 began to disintegrate the first global economy and to lower market integration the international consumer culture survive in the case of this industry.

As the firms expanded internationally they were able to benefit from new ingredient and methods found in the host countries, hitherto unfamiliar but at the same time they found that inherited local and social values, linguistic differences, climate and culinary conditions, differences in distribution systems and other factors preserve the specific of local preferences. While mass brands usually engaged in greater customization to adapt the local markets, the luxury brands preferred to minimize local adaptation because they were selling in a way aspiration associated with their origin countries (Jones, 2011). New distribution networks, duty-frees, were also created as a result of globalization.

The latest stage of globalization that begin during 1980 was characterized by the re-integration into the international economy of countries which has been excluded for decades as Russia, China, formerly closed Communist countries, India, much of Latin America. The rapid growth of these markets started to change the beauty ideal raising awareness of the non-Western cultures and physical types. As in the first stage globalization served to impose a Western beauty ideal and associated beauty product to achieve it, this last stage came to serve as a diffuser of non-Western beauty norms.

As in any other industry, globalization made firms face all sorts of challenges starting from a fierce competition and continuing with restrictive or prohibitive national regulations related to market entry or products safety, harmonization with local demand, calls for scientific data to document product claims, pressures from the growing animal right movement in the context of increased environmentalism. Despite all these, the cosmetics companies have found the way to overcome all the obstacles and to continue the globalization-driven growth path. Different than many other industries profoundly affected by financial crises during the time, recessions appear to increase women's spending on beauty products because the consumers under pressure still want to feel good and to lift their spirit (Hill et al., 2012; Ling, 2012; Murgea, 2012). The effect, coined in 2008<sup>2</sup> by the head of the cosmetic group Estée Lauder, Leonard Lauder as the „lipstick effect” seems to be driven by two important determinants mood enhancing (Arnold and Reynolds, 2003; Manchanda, 2012) and mating desires (Buss, 1990; Durante et al., 2011; Hill et al., 2012; Li et al., 2002; Sabini and Silver, 2005).

## Literature review

Over the last four decades, a considerable body of research examined the effect of globalization on performance based on different samples of US, Japanese and European firms but the results

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<sup>1</sup> Based in 1951 in Britain, it became huge media spectacles televised in many countries and helped set the so-called “Miss Universe standard of beauty” that included among other paler skins and wider eyes

<sup>2</sup> Even if the term is relatively new the effect seems to be present long time before someone name it because for instance during the Great recession, cosmetic sales have also increased by 25%.

have been decidedly mixed. The early researches point out usually a linear relationship, positive, negative or even no relationship whatsoever while the newer studies document mostly a non-linear pattern: quadratic (i.e., J, U, inverted U), cubic (i.e., horizontal S) or sinus-shaped curve types (for comprehensive reviews one could see Hitt et al., 2006 or Hennart, 2011).

**(i) Linear models.** In the international business early literature the relationship between globalization and firm performance was found mostly positive (Caves, 1971; Grant, 1987; Kim and Lyn, 1986; Kim et al., 1993; Zahra et al., 2000), negative (Collins, 1990; Click and Harrison, 2000; Denis et al., 2002) or not significant (Bodnar, et al., 2003; Buckley et al., 1984)

*In the positive side*, the main arguments that justify the globalization impact on performance refers to exploiting market imperfections, both for product and factor markets and financial markets (Caves, 1971; Grant, 1987; Kim and Lyn, 1986), leverage home-based managerial skills and competences into foreign regions (Papadopoulos and Denis, 1988); ability to arbitrage institutional restrictions such as tax and antitrust laws (Doukas and Travlos, 1988); corporate diversification and reduced risk (Kim et al., 1993). Caves (1971) and Grant (1987) have found positive relationships between globalization and performance, arguing that globalization enables firms to exploit market imperfections across borders, increasing returns to intangible assets as technological know-how, ownership of brand names and other managerial and organizational skills mainly because those assets generate monopoly rents for their owners. Plus, these monopoly rents lead, according to Kim and Lyn (1986) to excess market value (seen as the difference between the market value of common equity and its book value, normalized by sales). The second benefit is explained through the principle of market familiarity present in the location choice studies. Since in an overwhelming number of cases the location is chosen based on criteria as psychic distance, cultural or geographic distance that presupposes relatively similar administrative mechanism, consumer tastes and distributions systems, firms would be able to leverage their home country competence in these locations more easily, and as a result to increase profitability (Papadopoulos and Denis, 1988). The ability to arbitrage institutional restrictions was also considered a very important globalization effect. Using a set of US firms engaged in international acquisitions over a nine-year period (1975-1983), Doukas and Travlos (1988) reported abnormal stock returns and enhanced stockholder value when expanding into new markets through acquisition. Justifying Bowman's paradox (1980) that firms with high returns can have low risks, based on a sample with 125 multinationals, Kim et al. (1993) claim that global market diversification could lead to high return-low risk profile due to the options and opportunities the global companies have over the domestic ones. The opportunities listed by authors include the exploitation of economies of scale, broader learning opportunities and ability to develop more capabilities and last but not least benefits from intercountry differences in factor costs. Enhanced learning opportunities are also used as an argument for the positive globalization role in Zahra et al. (2000).

Same positive results are also found in newer studies that use qualitative data in order to highlight the correlation. Among these, Kraemer et al. (2005) use data from large-scale cross-country surveys, from three industries (manufacturing, distribution and finance). They report a complex relationship between globalization and e-commerce. Mainly globalization leads to improved performance for all the three industries but the effects are different between upstream business activities (prone to be more global) and downstream business activities (more locally oriented). Thourunroj and Tansuhaj (2007) analyse the electronics and chemical industries from Thailand and US and measure firm performance using self-reported manager's satisfaction in term of return on investments, sales, profit and growth. Their findings support the existing literature since a positive relationship between a global market opportunities and firm

performance is found. The global competitive threats negatively influence the firm performance, being in dissonance with to previous literature (Burgers et al., 1993; Courtney, 2001) the firms from those sectors seems to be insensitive to uncertainty driven by globalization. Questionnaire were also used by Akinola (2012) to study the globalization impact on the Nigerian Banking Industry but Akinola (2012) decided to include in the study not only the managers but also other stake holders. Plus he has also used both qualitative and quantitative data (profit after tax, profit before return, return on equity and others). The primary information were collected from 1520 individuals (50 top management staff, 220 marketers and 1250 customers) and secondary data from annual reports and statements. Main findings suggest that performance of Nigerian Banks (using profit before taxes as a proxy for performance) increases with globalization.

*In the negative side*, paradoxically the arguments rest in the same directions but in a different sense since, international diversification it is seen as a factor of risk growth, performance decrease (Collins, 1990; Click and Harrison, 2000) and reduction in excess value (Denis, et al., 2002). Opposite to Kim et al. (1993), Collins (1990) analysed three groups of American companies: domestic firms, US-based companies present mostly in developed countries and US-based companies with a substantial presence in developing market and conclude that, especially for the last category, operating internationally has a negative effect on shareholder's value. According to Collins (1990), the stock market penalizes in this way the companies for the extra risk their activities imply. The same line of thinking is also present in Click and Harrison (2000), whose explain that the main mechanism through which stock market penalizes the multinational corporation is an asset channel since the multinationals usually have a disproportionately high level of assets compared to the value of earnings they generate. Denis et al. (2002), using a sample of over 44.000 firms, argue that international diversification leads to excess value reduction since the very complex business structure has also inconvenience: supplementary costs to coordinate sophisticated corporate policies and inefficient cross-subsidiarization of less profitable business units.

*Insignificant results* have been found in several studies. Among those, Bodnar et al. (2003) analysed the international diversification and performance in four groups of US firms: domestic single activity (3061 firms), internationally diversified single activity (1995 firms), internationally diversified operating in multiple industries (729 companies), internationally diversified operating in multiple industries, and concluded that, after adding control variables, international operation will not significantly add value to the firm. Buckley et al. (1984) previously obtained similar results for a sample including the world's largest companies. Based on a sample of 636 firms in 1972 and 866 firms in 1977, Buckley et al. (1984) concluded that multinationalism has no impact on performance (measured by ROA).

**(ii) Non-linear models.** Opposite with the first stage researches, largely limited to examining linear forms of association between multinationality and performance, in the last decades, there are considerable theoretical and empirical evidences to suggest that the form of the relationship might be a non-linear, dynamic one since multinationality has both positive and negative effects on performances that vary over time. The results seem to be inconclusive in this side too, with inverted U-shaped relationship (Hitt et al., 1997; Gomez and Ramaswamy, 1999; Qian, 2002; Li and Qian, 2005; Kirca, et al., 2016), U-shape relationship (Capar and Kotabe, 2003; Berry and Kaul, 2016) and sigmoid one (Contractor et al., 2003; Lu and Beamish, 2004; Rugman and Oh, 2010; Thomas and Eden, 2004).

The main argument for an *inverted U-shape relationship* resides partially from the rationale of researches who argue for a positive impact of globalization. Basically, the firm who operate at multinational level will be able to have higher performance in the first stage due to scale cost



reduction, market imperfections exploiting across borders, managerial skills but after a certain point the complexity and the cost of managing cross-border operations exceed the advantages benefits and the performance is started to decrease. Following this reason, Hitt et al. (1997) found a curvilinear relationship based on a Herfindahl type index (measures both the level of overseas sales and the number of global market regions where the firm operates), but the strength of the relationship was weak. One of the main criticisms addressed to Hitt et al. (1997) study is the fact they did not explore the relationship dynamic nature. This lack is covered by Gomez and Ramaswamy (1999). They studied four industries: chemical, drug and pharmaceutical, computers and office equipment, electrical and electrical products, considered representative since large proportion of the firms who operate in these sectors are highly global. The main results confirm the curvilinearity but also the dynamic character of this relation and the presence of strong industry effects. In a newer study drawn based on 500 Indian firms listed on Bombay Stock Exchange, for the period 2007-2012, Kirca et al. (2016) have found the same type of curvilinear relationship. Kirca et al. (2016) hypothesis is that international asset dispersion weakens the effect of globalization on financial performance after a specific point. This effect seems to be more intense for manufacturing companies compared with service industries.

*The U-shape relationship* is justified mostly by the lower performances occurred in the initial stages of the globalization due to different barriers as ownership restrictions, domestic preference policies, unbalanced employment rules or unfavourable tax treatments. Products and especially services marketed internationally have to be more adapted to the customer's linguistic and cultural differences which lead to higher costs. Capar and Kotabe (2003) address this relationship for 81 major German service firms, spanning across four industries and conclude that relationship between multinationality and performance seems to have a clear U-shape form in the analysed service firms. Capar and Kotabe (2003) argue that aside the first two arguments explaining decreased performance, a very important determinant in service companies, comes from the inseparability between production and consumption. This feature force the parent company to create some local facilities which are associated with a higher investment level that diminishes the performance, compared with a manufacturing firm where the globalization usually starts through exporting their products. A marginally significant U-shaped relationship is also found in Berry and Kaul (2016) for a part of the analysed firms but the relationship seems to be depended by the firms' capabilities and home country environments.

Starting from the U-shape and inverted U-shape relationship reported in previous literature, the attempt to explain the globalization and performance relation become more complicated. A *three-stage (sigmoid) relationship* was proposed to explain this very complex relationship (Contractor et al, 2003). In the first stage, along with the globalization start, the performance decline since the companies have to face many upfront costs and the scale economy is still insufficient. In the second stage, geographic diversification enables firms to exploit more efficient the assets across the markets and experiential learning helps them to fundament the optimum way to establish a subsidiary in a host country. As a result, the performance starts to increase and it continues that trend until the company becomes too globalized and the complexity and cost of overexpansion change again the trend and the decline starts (stage 3). Following this reasoning, Lu and Beamish (2004), and Rugman and Oh (2010), found similar results on samples consisting of Japanese firms respectively American firms.

On this ground, we investigate the impact of globalization on financial performances of the active French cosmetic companies, by considering both production and distributions sectors.

## Data and methodology

### Data

The impact of globalization on the financial performances of the active companies from the French cosmetic industry is analysed based on a panel model approach. We consider 704 companies, for the period 2003-2015, divided into two samples.

The first sample includes companies from production sector (371 companies), while the second one contains companies from distribution one (333 companies). The initial database had 1415 French cosmetic firms, for the period 2001-2015. By removing all the companies and years with missing data, we fixed 704 firms, over 2003-2015, as final dataset. The source of data is Diane interface for France, Orbis platform database of Bureau van Dijk (2017), excepting the crisis dummy variable.

The dependent variable describes the financial performance. For robustness, we consider two such variables: return on assets (ROA) and return on capital employed (ROCE). ROA measures the company's profitability related to its total assets, while ROCE denotes the company's profitability and the efficiency of employed capital. ROA is a good choice to express the financial performance (e.g. Gomes and Ramaswamy, 1999; Hitt et al., 1997; or Lu and Beamish, 2004). ROCE is added as alternative, this rate being related to the capital employed instead of the assets, as in the case of ROA.

The interest variable is the globalization. In order to capture the openness, we consider as a proxy the volume of exports in absolute value (E). The measure is widely used in the literature to capture the international openness, the trade flows being the main common feature during the two waves of globalization (i.e. before World War I, and from 1960s to present, respectively), as Bairoch and Kozul-Wright (1998), Baldwin and Martin (1999) or Williamson (2002) state. According to the literature section, the openness can have linear, non-linear or no effect on financial performances. Thus, a positive or negative sign of variable is equally expected.

A set of control variables is also considered to isolate the effect of the interest one: capital intensity, credit period, debt period, debt structure, firm size, crisis and regulation.

Capital intensity (EC) is captured via the level of extraordinary charges, the variable denoting the fixed capital investments. On the one hand, the investments in plants and equipment raise the worker productivity and accelerate the inventory flows, improving the company financial performances, as Han (2009) highlights. Not at least, according to Gaur et al. (2005), this variable can be also considered a good proxy for the inventory status. On the other hand, Hendricks and Singhal (2001) show that the investments can erode the profitability on the short term, as results of high expenditures and lagged effects over time. Hence, we expect the capital intensity has positive or negative influence on financial performances.

Credit (CRP) and debt periods (DP) are two variables which express the payment terms related to the commercial relationships with customers and providers, respectively. The management of those commercial payment terms influences the liquidity, with direct impact on company financial performances.

According to Tang (2014), relaxing the credit period term means many aspects: '(i) the decreases in the operational costs, (ii) the increases of sales, (iii) the emerging of implicate rate on return and (iv) the establishing of stable commercial relationships with buyers' (p. 2). Conversely, a

compression of credit time period can gravely affect the payment balance. Credit period can have both positive and negative effect on financial performance.

Debt period seems to have a positive impact on financial performances. Tang (2014) argues that the 'trade credit can be more accessible, especially over the period of a tight monetary policy' (p. 3), reducing the operational costs with a positive impact on financial performances.

Debt structure (DEBT) offers a general framework of the company regarding the debt status, being captured via a synthetic rate as report between total liabilities and total assets. The positive influence of debt structure on financial performance is explained either by tax deductions on interest expenses which raise the returns via the leverage (Modigliani and Miller, 1958) or by higher performance of management forced to change its own incentive structure (Grossman and Hart, 1986). Conversely, a different opinion is sustained by Smith and Warner (1979) or Majumdar and Chhibber (1999). They argue a high level of debt increases the risks and exposes the company to failure, the management not being able to deal with such complex challenges. We expect a positive or negative sign for debt structure variable.

Firm size (SIZE) represents the annual absolute change of natural logarithm of total assets. The variable is widely used in the literature, representing the company's resources potential (e.g. Mehran, 1995; Rumyantsev and Netessine, 2007; Han, 2009; or Dang and Li, 2015). We choose the absolute change to capture the annual growth of assets and also to avoid any endogeneity issue in respect to ROA. Mehran (1995) finds a negative correlation between financial performances and total assets, explaining that the small companies find easier high growth opportunity. Contrary, Dang and Li (2015), and Rumyantsev and Netessine (2007) claim a positive connection. The large companies exhibit economies of scale in respect to products and negotiations on market, improving the financial performances. Hence, the positive or negative sign is expected for the firm size.

Crisis (CRISIS) is a dummy variable which discriminates between pre-crisis, and crisis and post-crisis periods, respectively. The variable is introduced to control for crisis circumstances as our span covers also the last world economic turbulences. The crisis dummy variable has value 0 for the period 2003-2006, and value 1 for years 2007-2015. It is expected the crisis and post-crisis periods to have a negative impact on financial performances.

Regulation (REG) is also a dummy variable, denoting the major European regulation adjustment in the cosmetic industry. According to Regulation (EC) N° 1223/2009, which entered into force in July 2013, the European Union cosmetic producers must follow specific requirements in the preparation of products. The regulation dummy has value 0 for 2003-2012, and value 1 for 2013-2015. A positive sign is expected for the pre-regulation period and a negative one for post-regulation period.

Detailed information about variables is presented in Table A1, in Appendix. All explanatory variables are treated as elasticity. Therefore, excepting the variables already expressed as percentages, the exports, capital intensity, credit period and debt period finally appear in natural logarithm form (i.e. Ln\_E, Ln\_EC, Ln\_CRP and Ln\_DP, respectively). Firm size is the result of logarithm difference, appearing as variable SIZE. The stationarity property of variables are tested via the Levin-Lin-Chu adjusted  $t^*$ , Im-Pesaran-Shin W-stat, ADF-Fisher Chi-square and PP-Fisher Chi-square tests, with constant only (i.e. we assume the trend inconsistency, as the series have only several years). A matrix of correlations is also performed in order to check the multicollinearity implications.

## Methodology

The impact of globalization on the active companies' financial performances from the French cosmetic industry is analysed based on a panel model approach, for production and distribution sectors, respectively. We assume those sectors to have different elasticity reactions in terms of financial performances under shocks of openness. Herein, we suspect the distribution sector to be more sensitive than the production one, the globalization disturbances being firstly absorbed by the distribution channels. The producers also have a prompt reaction but under regulation changes. Not at least, this split helps us to also deal with the so-called 'industry effects', given by the concentration levels and entry barriers, as Waldman and Jensen (2006) claim.

The empirical strategy comprises both static and dynamic panel estimations, for each of two sectors, by using for robustness both ROA and ROCE rates.

(i) *The static approach* includes classical OLS models, fixed- and random-effects models, and instrumental variable estimators. A preamble with naive OLS models with different polynomial orders of Ln\_E is employed in order to check the validity of non-linearity hypothesis between openness and financial performances.

The extended classical OLS panel model is as follows:

$$Y_{it} = \alpha + \beta_1 X_{it} + \sum_{k=1}^n \beta_k X'_{k,it} + \varepsilon_{it} \quad (1)$$

where  $Y$  reveals the dependent variable (ROA, ROCE),  $\alpha$  is the intercept,  $\beta_{1,k}$  are the slopes of independent variables,  $X$  reflects the interest variable (Ln\_E),  $X'$  is the control variable  $k$  by  $n$  type (Ln\_EC, Ln\_CRP, Ln\_DP, DEBT, SIZE, CRISIS and REG),  $i$  denotes the country,  $t$  is the time, while  $\varepsilon_{it}$  represents the error term, which varies over both country and time.

The panel may have homogeneity issue. Often, such estimator suffers from unobservable factors that are correlated with the variables included in the regression. In this context, the fixed-effects panel model is a good solution to eliminate the omitted variable bias. Hence, the estimator evidences the disparities between cross-sections and deals with unobservable heterogeneity. It is as follows:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \sum_{k=1}^n \beta_k X'_{k,it} + \varepsilon_{it} \quad (2)$$

On the other hand, Alisson and Waterman (2002), and Albuлесcu and Tamasila (2015) argue the fixed-effects panel does not control for all stable covariates. As in our case the number of cross-sections is higher than the number of periods ( $N > T$ ), the random effects panel model can offer more consistent estimation. The random-effects panel model handles the intercepts not as fixed, but as random parameters, and has this form:

$$Y_{it} = \alpha + \beta_1 X_{it} + \sum_{k=1}^n \beta_k X'_{k,it} + (\nu_i + \varepsilon_{it}) \quad (3)$$

where  $\nu_i$  denotes a standard random variable with zero mean.

F-test and Hausman test are performed to discriminate between OLS and fixed-effects models, and fixed-effects and random-effects models, respectively.

We also suspect the existence of a reverse causality between the dependent variable (ROA, ROCE) and the interest explanatory one (Ln\_E). This endogeneity issue deserves further

investigations. Therefore, we follow classical instrumental variable estimator (IV model) in order to deal with endogeneity, by using as instruments the lags of Ln\_E. The Sargan-test is employed to verify if the instruments are well identified. The endogeneity status is tested via the Wu-Hausman, and Durbin-Wu-Hausman tests, respectively. Unfortunately, such group of static models is not consistent under heteroskedastic disturbance. The Pagan-Hall test is performed to check the heteroskedasticity status for IV models.

To clarify heteroskedasticity problem, Baum et al. (2003) claim that “if heteroskedasticity is present, the GMM estimator is more efficient than the simple IV estimator, whereas if heteroskedasticity is not present, the GMM estimator is no worse asymptotically than the IV estimator” (p.11).

(ii) *The dynamic approach* comprises GMM models. These estimators control the issue of heteroscedasticity and also fix the bias generated by the use of lagged dependent variable.

The advantages of GMM estimators are highlight by Roodman (2009): “1) “small T, large N” panels, meaning few time periods and many individuals; 2) a linear functional relationship; 3) one left-hand-side variable that is dynamic, depending on its own past realizations; 4) independent variables that are not strictly exogenous, meaning they are correlated with the past and possibly current realizations of the error; 5) fixed individual effects; and 6) heteroskedasticity an autocorrelation within individuals but not across them” (p. 86).

The pioneer work belongs to Arellano-Bond (1991), whose propose a dynamic GMM estimator (GMM-dynamic), with this form:

$$\Delta Y_{it} = \varphi \Delta Y_{it} + \beta_1 \Delta X_{it} + \psi \Delta Vx'_{it} + \Delta v_i + \Delta \varepsilon_{it} \quad (4)$$

where  $\varphi$  is the coefficient of lagged variable  $Y$ , while  $\psi$  denotes the coefficient of the vector control variables  $Vx'$ . The GMM-dynamic fails under instrument specification, as the lagged levels of regressors are poor instruments for the first-differenced ones.

Therefore, an improved version of GMM-dynamic is developed by Blundell and Bond (1998), called GMM-system estimator. This version follows the level of variables, as in equation (3), for constructing a system with two equations: one differenced and one in levels. Sargan test is calculated to check if the instruments are well identified. Additionally, Hansen’s J-test is also performed to check the validity of instruments because in the robust GMM estimations, as in our case, the Sargan test is inconsistent.

Not at least, the Arellano-Bond test for autocorrelation is applied to identify the autocorrelation in residuals. Herein, we focus on the AR(2) test in first differences, because it detects the autocorrelation in levels, as Mileva (2007) emphasizes.

## Results

The findings of panel unit root tests, for each variable, for both production and distribution sectors, are illustrated in Table A2, in Appendix. Without any exception, all tests clearly show that the null hypothesis of common unit root process can be rejected at all levels of significance. Hence, our estimations are performed based on stationary series, which is required condition in the time-series domain. As all the series are I(0), this approach allows us to also avoid any implications generated by the co-integration assumption. Moreover, for both production and distribution panels, there are no multicollinearity issues between variables. Tables A3 and A4, in

Appendix, reveal the coefficients of correlation not exceed the level of 0.586 in the case of production sector, and 0.636 in the case of distribution one, respectively.

The empirical results for the nonlinear polynomial assumption, for both production and distribution, are presented in the Table A5, in Appendix. Our naïve-OLS scenarios performed by considering different polynomial orders (i.e. from 2 to 5) clearly conduct to the conclusion that the non-linear polynomial assumption can be rejected for both sectors. The ROA's production scenario validates the 'polynomial order trap', as the coefficients are significant for each superior added order (between orders 2 and 4, in our case). The rest of estimations shows no significance of coefficients up to polynomial order 5, inclusively.

i) The static estimations are presented in Tables A6 and A7, in Appendix. Table A6 shows the case of production sector. Based on F- and Hausman tests, the findings enforce the fixed-effects models are more appropriate than OLS and random-effects models, for both ROA and ROCE scenarios. In order to deal with endogeneity issues, the IV models are finally considered. Herein, the Sargan tests show that the instruments are well identified. The Wu-Hausman and Durbin-Wu-Hausman tests evidence no endogeneity issue.

The results illustrate that two control determinants are not significant in all scenarios:  $\ln\_EC$  and  $\ln\_CRP$ . The rest of control variables are all quasi-significant.  $\ln\_DP$ ,  $DEBT$ ,  $CRISIS$  and  $REG$  are negatively correlated with ROA and ROCE, while only the  $SIZE$  has a positive impact on them. The  $CRISIS$  is not significant in the IV models. The increase of commercial debt period is not a good incentive for financial performances, as well as high levels of debt which increases the risks and exposes the company to failure. Fortunately, the size of company facilitates good financial performance through the economies of scale. Strong rebound of cosmetic producers' financial performances has been generated by the world economic crisis and European regulation adjustment in the cosmetic industry. The most important result shows the  $\ln\_E$  has a significant and positive influence on ROA and ROCE, revealing that cosmetic French production companies can improve their financial performance by globalizing more.

The estimations for distribution sector are presented in the Table A7. Both the F- and Hausman tests claim for fixed-effects models. As in the case of production sector, the IV models are finally considered in order to fix the endogeneity issues. The Sargan tests validate that the instruments are well identified, while the Wu-Hausman and Durbin-Wu-Hausman tests find no endogeneity issue. Irrespective of model specification, the  $\ln\_EC$ ,  $\ln\_CRP$ ,  $CRISIS$  and  $REG$  are not significant, for both return rates. The  $\ln\_DP$  and  $DEBT$  remain significant but with a negative sign in respect to ROA and ROCE. The  $SIZE$  is also significant but positively correlated with financial performance rates. The distribution companies similarly react on globalization as producers, the openness being an optimal choice to enhance good financial performances. As a particularity, the crisis and European regulation seem not to play a crucial role considering the performances of distribution companies, validating the rigidity of demand in the cosmetic market. Unfortunately, excepting the ROA in the distribution case, all IV models suffer from heteroscedasticity, as the Pagan-Hall test claims. Hence, dynamic panel models should be considered to fix the issue.

ii) The dynamic estimations are illustrated in Table 8, in Appendix. In all GMM-system models employed with robust standard errors, if we admit the presence of heteroscedasticity, the Sargan and Hansen tests reveal the instruments are well identified. Moreover, the AR(2) tests in first differences state no autocorrelation in residuals.

The GMM-system models for production sector shows that the globalization remains a good option to improve the ROA and ROCE rates. Herein, the  $SIZE$  continues to have a significant and positive impact on financial performances, while the  $REG$  is negatively related to them. Only for

production ROA scenario, the Ln\_EC is significant, with a positive sign. The rest of control variables are not conclusive. Overcomes show that the cosmetic French producers register better financial performances if they globalize more, especially when they obtain economies of scale. Capital intensity seems to erode the profitability on the short term, being destructive for performance. Not at least, the cosmetic regulation adjustments have also a distortive effect on financial vectors, generating a strong elastic reaction.

The case of distribution sector is not so different. Globalization is still the best choice to perform better in financial terms, for both ROA and ROCE ratios. The control determinants are not significant in all scenarios. Only in the case of ROA, the Ln\_EC and DEBT are significant but negatively connected with ROA. The SIZE is also significant, with a positive sign. Globalization plays a major role for financial performances for French cosmetic distribution companies, with the support of the economies of scale, under a strict control of investments and debts.

Our results confirm the positive linear impact of the globalization on financial performances for both French cosmetic producers and distributors, confirming the contributions of Caves (1971), Grant (1987), Kim and Lyn (1986), Kim et al. (1993), Zahra et al. (2000), Kraemer et al. (2005), Thourungrroje and Tansuhaj (2007) or Akinola (2012). We are in dissonance with the rest of contributions, as we used a panel approach with different estimators, by including only the cosmetic French companies, for a given period 2003-2015.

## **Conclusions**

The word cosmetic market is indissoluble related to the French cosmetic industry. The French cosmetic companies play a crucial role in this market, irrespective if they are producers or distributors. Over the last decades, the globalization process rapidly extended on the word, and the beauty industry does not represent an exception.

Our main result shows that the globalization represents a good incentive in the case of French cosmetic industry, both for cosmetic producers and distributors. More openness improves the financial performances of those companies since a linear positive correlation between globalization and financial performance vectors has been found. Herein, the companies exploit market imperfections across borders and free-flow of knowledge, reducing the costs. We find that the big cosmetic companies which reach the economies of scale perform better. Besides that, the strategy of investment and the debt management also play an important role for the distributors. The cosmetic producers are more sensitive to the regulation changes compared with the distributors, the effect being propagated with time-lag on the distribution channel. The regulation shocks are firstly received by the producers as such changes generally refer to the cosmetic substance composition.

The economic crisis did not generate notable disturbances over the cosmetic market, as this market exhibits a sort of rigidity in respect to the purchasing power. Europe, United States of America, Canada and Asia are the main targeted markets, with great and stable purchasing power potential. The major part of the French cosmetic actors focus on the luxury classes of perfumes, cosmetics, dermo pharmacy or niche products. Usually, under a market shock, the producers stop the production until the distributors finish their existing stocks. Hence, the impact of such an event cannot be quickly visible in sales.

Our finding also claims that the economic crisis and cosmetic regulation adjustments are not conclusive in the cosmetic distribution channel, as this is very heterogeneous: specialised retailers, big shops, perfumeries, tax-free shops, internet online etc.

Important policy implications for French cosmetic industry regarding the financial performances arise. The big producers must pay attention especially to the regulation adjustments, while the small ones should also be preoccupied to reach economies of scale. For the distributors, an optimal management of investments and debts is crucial to improving their financial performance vectors. But the main policy implication is related to the openness. Hence, in order to register high financial performances, it is required for the French cosmetic companies to globalize more.

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## Appendix

Table A1: Description of variables

Variable	Description	Unit	Expected sign
ROA	Return On Assets - the rate is calculated by dividing the net incomes by total assets.	%	
ROCE	Return On Capital Employed - the rate is the report between the earnings before interest and tax (EBIT) and the capital employed.	%	
E	Exports - the indicator reveals the volume of total exports in absolute value.	Euros	+/-
EC	Capital intensity - the indicator reveals the volume of total extraordinary charges in absolute value.	Euros	+/-
CRP	Credit period - the indicator denotes the number of payment days in the commercial relationships with the customers.	Days	+/-
DP	Debt period - the indicator shows the number of payment days in the commercial relationships with the providers.	Days	+
DEBT	Debt structure - the rate is calculated by dividing the total liabilities by total assets.	%	+/-
SIZE	Firm size - the annual change in the volume of natural logarithm of total assets	Euros	+/-
CRISIS	Dummy variable, which takes value 0 for 2003-2006 (pre-crisis period) and value 1 for 2007-2015 (crisis and post-crisis periods).	0/1	- for 0/ + for 1
REG	Dummy variable, which takes value 0 for 2003-2012 (pre-regulation period) and value 1 for 2013-2015 (post-regulation period).	0/1	+ for 0/ - for 1

Table A2: Panel unit root tests

Tested variable	Levin-Lin-Chu adjusted t*	Im-Pesaran-Shin W-stat	ADF-Fisher Chi-square	PP-Fisher Chi-square
<b>Production</b>				
Ln_E	-26.02***	-5.26***	667.7***	986.2***
Ln_EC	-13.39***	-5.84***	694.3***	1299.5***
Ln_CRP	-13.17***	-5.36***	967.2***	1539.1***
Ln_DP	-15.69***	-4.96***	973.7***	1384.3***
DEBT	-94.73***	-10.7***	969.1***	1302.9***
SIZE	-29.95***	-14.9***	1450.4***	2792.4.2***
<b>Distribution</b>				
Ln_E	-22.01***	-3.98***	644.7***	996.2***
Ln_EC	-22.01***	-8.91***	816.7***	1225.5***
Ln_CRP	-11.33***	-2.50***	748.2***	1355.8***
Ln_DP	-14.14***	-3.80***	821.1***	1239.3***
DEBT	-19.16***	-3.30***	802.8***	991.4***
SIZE	-19.42***	-14.69***	1345.79***	2792.7***

(a) \*, \*\* and \*\*\* reveals stationarity significance at 10, 5 and 1%, respectively;

(b) For all tests, the null hypothesis assumes there is a common unit root process.

Table A3: Matrix of correlations - production sector

Correlation	ROA	ROCE	L_E	L_EC	L_CRP	L_DP	DEBT	SIZE	CRISIS	REG
ROA	1.000000									
ROCE	0.585874	1.000000								
L_E	0.098397	0.086083	1.000000							
L_EC	0.032718	0.035021	0.474631	1.000000						
L_CRP	-0.172354	-0.078312	0.069496	-0.020329	1.000000					
L_DP	-0.347726	-0.167646	-0.014364	-0.041790	0.550994	1.000000				
DEBT	-0.251846	-0.130559	-0.039596	-0.013675	0.310039	0.544409	1.000000			
SIZE	0.142492	0.150837	0.024706	-0.028816	0.094908	0.073882	0.022576	1.000000		
CRISIS	-0.049236	-0.064463	0.060986	0.036551	-0.066642	-0.038224	-0.032900	-0.077367	1.000000	
REG	-0.037141	-0.044881	0.062687	0.044485	-0.059302	-0.038276	-0.066972	-0.067471	0.298566	1.000000

Table A4: Matrix of correlation - distribution sector

Correlation	ROA	ROCE	L_E	L_EC	L_CRP	L_DP	DEBT	SIZE	CRISIS	REG
ROA	1.000000									
ROCE	0.635263	1.000000								
L_E	0.079418	0.026648	1.000000							
L_EC	0.025335	-0.017767	0.598385	1.000000						
L_CRP	-0.146095	-0.083320	0.163831	0.175735	1.000000					
L_DP	-0.367106	-0.209229	0.008791	0.100136	0.463284	1.000000				
DEBT	-0.290562	-0.156360	-0.056943	0.034772	0.263194	0.593865	1.000000			
SIZE	0.200969	0.143422	-0.011218	-0.027743	0.088600	0.111648	0.033602	1.000000		
CRISIS	-0.019610	-0.033363	0.053990	0.012643	-0.124989	-0.053977	-0.078571	-0.042880	1.000000	
REG	-0.001682	-0.034649	0.074204	0.041446	-0.059656	-0.032963	-0.096588	-0.024525	0.312915	1.000000

Table A5: Empirical results for nonlinear assumption - production and distribution

Dependent variable					
Independent variables	Production		Distribution		Expected sign
	ROA	ROCE	ROA	ROCE	
	Model				
	Naïve-OLS	Naïve-OLS	Naïve-OLS	Naïve-OLS	
	(1)	(2)	(3)	(4)	
Intercept	-8.10** (3.40)	18.94*** (3.98)	2.77*** (0.89)	12.46*** (2.86)	
Ln_E	14.55*** (2.05)	-4.10* (2.49)	-0.28 (0.72)	-0.75 (2.05)	+/-
Ln_E <sup>2</sup>	-4.84*** (0.76)	-0.32 (0.93)	0.12 (0.17)	-0.72 (0.56)	+/-
Ln_E <sup>3</sup>	0.68*** (0.19)	0.32 (0.22)	0.03 (0.05)	0.24** (0.12)	+/-
Ln_E <sup>4</sup>	-0.04** (0.02)	-0.03 (0.02)	-0.007 (0.006)	-0.02 (0.01)	+
Ln_E <sup>5</sup>	0.001 (0.0001)	0.001 (0.0001)	0.001 (0.0001)	0.001 (0.0001)	+/-
R-squared	0.023	0.011	0.013	0.003	
Obs.	4824	4824	4329	4329	
Groups	354	354	333	333	

(a) (...) denotes the standard error;

(b) \*\*\*, \*\*, and \* show significance at 1, 5 and 10 % level of significance, respectively.



Table A6: Empirical results of static panels - production

Dependent variable		ROA				ROCE				Expected sign
Independent variables	Model									
	OLS	FE	RE	IV	OLS	FE	RE	IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
Intercept	41.3*** (2.47)	32.5*** (4.37)	39.4*** (3.10)	40.4*** (3.24)	90.3*** (10.59)	69.1*** (23.1)	92.4*** (12.21)	75.2*** (12.5)		
Ln_E	0.52*** (0.12)	1.01*** (0.27)	0.45*** (0.17)	0.73*** (0.16)	1.87*** (0.50)	-0.74 (1.39)	1.31** (0.60)	2.43*** (0.16)	+/-	
Ln_EC	-0.04 (0.11)	0.12 (0.13)	0.07 (0.12)	-0.16 (0.13)	-0.10 (0.48)	0.66 (0.70)	0.21 (0.53)	-0.08 (0.53)	+/-	
Ln_CRP	-0.06 (0.50)	1.49** (0.67)	1.80 (0.56)	-4.47 (0.62)	-0.53 (2.12)	-2.14 (3.41)	-0.67 (2.36)	0.06 (2.42)	+/-	
Ln_DP	-5.38*** (0.57)	-4.96*** (1.00)	-5.57*** (0.70)	-5.35*** (0.76)	-14.14*** (2.57)	-7.54 (5.66)	-13.4*** (2.95)	-11.9*** (2.98)	+	
DEBT	-0.14*** (0.006)	-0.18*** (0.01)	-0.14*** (0.006)	-0.12*** (0.013)	-0.11** (0.05)	-0.36*** (0.11)	-0.14** (0.06)	-0.15** (0.06)	+/-	
SIZE	5.55*** (0.83)	4.80*** (0.72)	5.12*** (0.70)	10.85*** (1.60)	29.02*** (3.81)	24.16*** (4.01)	27.07*** (3.73)	33.79*** (6.38)	+/-	
CRISIS	-1.61*** (0.75)	-2.00*** (0.63)	-1.65*** (0.61)	-1.90 (1.28)	-8.26*** (3.14)	-9.98*** (3.24)	-8.63*** (3.03)	-7.22 (4.98)	- for 0/ + for 1	
REG	-1.68*** (0.77)	-2.33*** (0.65)	-1.92*** (0.63)	-2.03** (0.83)	-4.95 (3.23)	-7.42** (3.28)	-5.63* (3.10)	-7.72** (3.19)	+ for 0/ - for 1	
R-squared	0.358	0.666	0.306	0.352	0.068	0.297	0.055	0.149		
F-test [p-vales]		5.27 (0.00)				1.83 (0.00)				
Hausman test [p-vales]			18.85 (0.01)				15.66 (0.01)			
Number of instruments				2				2		
Sargan test [p-vales]				1.670 [0.196]				0.786 [0.375]		
Wu-Hausman test				0.805 [0.369]				0.105 [0.745]		
Durbin-Wu- Hausman test				0.810 [0.368]				0.105 [0.744]		
Pagan-Hall test				68.52 [0.000]				39.18 [0.000]		
Obs.	4824	4824	4824	4824	4824	4824	4824	4824		
Groups	354	354	354	354	354	354	354	354		

(a) (...) denotes the standard error, while [...] is the p-vales;

(b) \*\*\*, \*\*, and \* show significance at 1, 5 and 10 % level of significance, respectively.

Table A7: Empirical results of static panels - distribution

Dependent variable		ROA				ROCE				Expected sign
Independent variables	Model									
	OLS	FE	RE	IV	OLS	FE	RE	IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
Intercept	47.9*** (2.84)	46.3*** (4.30)	45.7*** (3.32)	42.1*** (3.41)	108.5*** (13.54)	116.3*** (18.05)	116.3*** (14.5)	110.2*** (12.88)		
Ln_E	0.35*** (0.12)	0.72*** (0.24)	0.42*** (0.15)	0.46*** (0.16)	0.75*** (0.24)	-1.34 (1.08)	1.85* (0.48)	0.97* (0.58)	+/-	
Ln_EC	0.15 (0.11)	0.19 (0.13)	0.16 (0.11)	0.13 (0.13)	-0.22 (0.28)	-0.02 (0.57)	-0.14 (0.42)	-0.26 (0.47)	+/-	
Ln_CRP	1.67*** (0.59)	2.02*** (0.70)	2.28*** (0.61)	0.10 (0.67)	-0.32 (2.67)	-4.03 (3.20)	-2.43 (3.12)	0.17 (2.44)	+/-	
Ln_DP	-8.66*** (0.61)	-8.29*** (0.90)	-8.72*** (0.70)	-6.55*** (0.71)	-18.86*** (3.26)	-11.7*** (4.09)	-15.9*** (3.56)	-20.1*** (2.81)	+	
DEBT	-0.17*** (0.01)	-0.22*** (0.01)	-0.22*** (0.01)	-0.15*** (0.014)	-0.10* (0.05)	-0.60*** (0.13)	-0.34*** (0.08)	-0.06 (0.06)	+/-	
SIZE	14.9*** (1.001)	9.05*** (0.897)	10.9*** (0.85)	22.01*** (1.66)	32.3* (7.50)	09.3*** (5.23)	23.54*** (6.05)	48.43*** (6.27)	+/-	
CRISIS	-0.32 (0.66)	-1.38** (0.55)	-0.85 (0.54)	-0.97 (1.05)	-3.97* (2.10)	-5.69*** (2.10)	-4.80** (1.90)	-6.10 (3.85)	- for 0/ + for 1	
REG	-0.60 (0.69)	-1.15** (0.56)	-1.07* (0.55)	-0.32 (0.70)	-4.30** (2.05)	-9.08*** (3.34)	-7.06*** (2.55)	-3.39 (2.59)	+ for 0/ - for 1	
R-squared	0.356	0.667	0.311	0.427	0.076	0.477	0.072	0.162		
F-test [p-vales]		6.04 (0.00)				4.88 (0.00)				
Hausman test [p-vales]			90.3 (0.00)				0.00 (1.00)			
Number of instruments				2				2		
Sargan test [p-vales]				0.001 [0.971]				9.963 [0.076]		
Wu-Hausman test				0.019 [0.888]				0.649 [0.420]		
Durbin-Wu- Hausman test				0.019 [0.887]				0.653 [0.418]		
Pagan-Hall test				11.28 [0.256]				30.59 [0.003]		
Obs.	4329	4329	4329	4329	4329	4329	4329	4329		
Groups	333	333	333	333	333	333	333	333		

(a) (...) denotes the standard error, while [...] is the p-vales;

(b) \*\*\*, \*\*, and \* show significance at 1, 5 and 10 % level of significance, respectively.

Table A8: Empirical results of dynamic panels – production and distribution

Dependent variable		Production		Distribution		Expected sign
Independent variables	ROA	ROCE	ROA	ROCE	Model	
	GMM-SYS	GMM-SYS	GMM-SYS	GMM-SYS		
	(1)	(2)	(3)	(4)		
	Intercept	33.1 (24.4)	55.6 (81.9)	23.14 (25.22)		
Ln_E	1.47*** (0.52)	4.27** (1.80)	1.05** (0.42)	2.42** (1.12)	+/-	
Ln_EC	-1.91** (0.97)	-4.80 (3.81)	-1.31* (0.68)	-3.14 (2.05)	+/-	
Ln_CRP	1.59 (8.91)	-8.20 (26.4)	6.61 (5.20)	12.65 (14.53)	+/-	
Ln_DP	-7.69 (9.09)	1.13 (25.4)	-6.77 (6.79)	-29.48 (27.2)	+	
DEBT	-0.01 (0.11)	-0.28 (0.58)	-0.26** (0.12)	0.65 (0.61)	+/-	
SIZE	6.69* (3.55)	27.4** (13.7)	7.04* (4.08)	7.26 (10.3)	+/-	
CRISIS	1.39 (1.10)	-7.60 (5.26)	-0.06 (0.88)	1.85 (2.88)	- for 0/ + for 1	
REG	-1.90** (0.96)	-11.80*** (3.41)	-0.43 (0.97)	-4.60 (5.05)	+ for 0/ - for 1	
Number of instruments	36	36	70	81		
Sargan test	30.08	35.54	73.59	113.58		
[p-vales]	[0.310]	[0.126]	[0.129]	[0.001]		
Hansen test	18.88	17.99	56.47	52.61		
[p-vales]	[0.874]	[0.904]	[0.640]	[0.958]		
Arellano-Bond	[0.713]	[0.646]	[0.881]	[0.129]		
p-vales test for AR(2)						
Obs.	4824	4824	4329	4329		
Groups	354	354	333	333		

(a) (...) denotes the standard error, while [...] is the p-vales;

(b) \*\*\*, \*\*, and \* show significance at 1, 5 and 10 % level of significance, respectively.