

# **ARAB ECONOMIC JOURNAL**

**Published by the Arab Society for Economic Research**

**Nos. 55-56, Summer-Autumn 2011**

*Editor-In-Chief*

**Mohammed Samir Moustafa**

*Editorial Advisory Board*

Karima Korayem

Hisham Bissat

Reda Koea

Albert Dagher

**And members of the board of directors**

**All Correspondence to be addressed to**

**Arab Society for Economic Research**

17 B Emarat Al-Uboor, Salah Salem St.

Nasr City P.O. Box: 88 Panorama October

Postal Code: 11811, Cairo - Egypt

Tel: 22621737 - Telefax: 22631715

E-mail: [asfer\\_egypt@yahoo.com](mailto:asfer_egypt@yahoo.com)

Website: <http://www.asfer.org>

**Centre for Arab Unity Studies**

«Beit Al-Nahda» Bldg. - Basra Street - P.O. Box: 113-6001

Hamra - Beirut 2034 2407 - Lebanon

Tel: (+9611) 750084 - 750085 - 750086 - 750087 - Cable: «MARARABI» - Beirut

Fax: (+9611) 750088

E-mail: [info@caus.org.lb](mailto:info@caus.org.lb)

Website: <http://www.caus.org.lb>



# **Crisis, Firms Internationalization Strategies and a New Classification Indicator**



**Fatma Braham**

Corresponding author: Department of Economics;  
High School of Business of Tunis (ESCT), University of Manouba.  
[fatma.braham@gmail.com](mailto:fatma.braham@gmail.com).

**Sami Mensi**

Department of Economics; High School of Business of Tunis (ESCT),  
University of Manouba & PS2D Laboratory. FSEG Tunis.  
[sami.mensi@fsegt.rnu.tn](mailto:sami.mensi@fsegt.rnu.tn).

## Abstract

In this paper, we focus on the internationalization strategies that firms adopt. We study the tendencies, the perspectives and the new policies adopted as a reaction to the current crisis. We stipulate that international openness policy is one of the solutions that might be adopted to overcome the economic and financial crisis. Even better, these policies may contribute to shield against eventual crisis.

On another side, the United Nations Conference on Trade and Development (UNCTAD) publishes index that constitutes the main tool for measuring the internationalization phenomenon for the UNCTAD. Other indicators are used by other international organizations and economists in order to rank multinational firms operating in the same sector, or to distinguish the most internationalized among them called global firms. Nevertheless, these rankings are far from being similar and inadequate to describe the degree of internationalization of such firms. In this paper, we review the main internationalization indicators and set up a new one.

**Keywords:** Internationalization of firms, Global international economic crisis, policies, Indicator.

## Introduction

The emergence of a new international trade concept by the beginning of the 1980s shows an important gap between the standard theory based on the exchange between countries (nations) characterized by different factorial endowments and new international trade theories, where mobility of the new factor of production and Foreign Direct Investment (FDI) are very much involved. Indeed, the productive systems are being more and more dynamic and so generate more situations of imperfect competition, which need new models and tools from industrial and geographical economics.

Many authors study these questions, in particular those concerned with the internationalization of production systems. Coase<sup>1</sup> in his famous book *The Nature of the Firm* has distinguished between firm borders and market borders in the sense that the firm substitutes its borders to the market borders when the cost of the internal transactions is lower than market utilization costs (see also the recent works of Horstman and Markusen).

It is to Dunning<sup>2</sup> that we owe the most convincing synthesis on this running research. To overcome the shortcoming of this approach, called Ownership Loca-

---

(1) Ronald Coase, «The Nature of the Firm,» *Economica*, vol. 4, no. 16 (1937).

(2) John H. Dunning: «Explaining Changing Patterns of International Production: In Defence of the Eclectic Theory,» *Oxford Bulletin of Economics and Statistics*, no. 41 (November 1979); *Multinationals, Technology and Competitiveness* (London: Routledge, 1988), and *Explaining International Production* (London: Routledge, 1988).

tion Internalization (O.L.I.), he proposed a probate explanation on the emergence of the multinational firm. Thus, a firm decides to internationalize its production if:

\* it possesses a certain power on the market ensuing of the appropriation (Ownership) of a production part or a part of the process.

\* if it exists a real gain to delocalize a part of its abroad activities (Location).

\* if there are some advantages for the enterprise to keep the control of production entities delocalized rather than to externalize these activities (Internationalization).

Nevertheless, these new approaches of international trade analysis are far from being to be unified in a coherent theoretical set leading to many questions regarding the phenomenon of the internationalization of firms.

The current economic and financial crisis could be qualified as a major crisis, which complies with five criteria: (1) the extent and speed of its effect on sectors and geographic spaces; (2) the depth and degree of its complexity, i.e. the number of and interactivity of instruments implemented; (3) its duration; (4) the observed losses and potential losses, and (5) the nature and costs of solutions.

The September 2008 crisis is a contagious crisis, as it spread to all the sectors of activity and to the majority of countries. Besides the banking and insurance sectors, and the stock markets, this crisis touches the real economy which already suffers even before the crisis is unleashed. In this paper, we are particularly interested in the evolution of the internationalization phenomenon in an unstable context, and to assess the repercussions for tendencies, future perspectives and adopted policies.

Since 1995, the United Nations Conference on Trade and Development (UNCTAD) publishes the annual world investment report<sup>3</sup>. In this report, we find a list of the top 100 transnational corporations for the developed countries, and the top 50 transnational corporations for the developing countries. These rankings are made using a Transnationality Index (TI). This index constitutes the main tool for measuring the internationalization phenomenon for the UNCTAD.

Other indicators are used by other international organizations and economists in order to rank multinational firms operating in the same sector, or to distinguish the most internationalized among them called global firms. Nevertheless, these rankings are far from being similar and inadequate to describe the degree of internationalization of such firms. In this paper, we review the main internationalization indicators and set up a new one.

The paper is organized as follows: **Section 1** examines two notions which are

(3) United Nation Conference on Trade and Development (UNCTAD), «World Investment Report 1995: Transnational Corporations and Competitiveness,» United Nations (1995).

pivotal and threatened enough, i.e. internationalization and globalization. **Section 2** establishes the post-crisis situation and traces back the tendencies, future perspectives and the new policies relative to internationalization of firms. **Section 3** gives an overview of common criteria used to classify multinational firms. **Section 4** is devoted to the quantification of the globalization strategy by setting up our new indicator after a brief discussion on existing indicators.

In **Section 5** we are concerned with statistical analysis and empirical validation, where we present a concrete use of the new indicator to rank a sample of multinational firms operating in the telecommunication sector and compare with the ranking based on the use of the generalized Herfindhal indicator.

### **1. Internationalization - Globalization and strategies of firm internationalization**

According to some authors, the internationalization is a strategic decision of the firm opting for a foreign market. Thus, an understanding of this phenomenon requires a specification of the internationalization strategy. This specification rests on criteria that can be cut up, but that are expressed often with important nuances. One of these nuance values is the exclusive reference to internationalization, or the maintenance of a distinction between globalization and internationalization. Indeed, Ohmae<sup>4</sup>, is one of the first authors who promoted the idea of internationalization. He exposed his vision of the world economy as well as advices concerning strategy for firms that are concerned by internationalization. The world strategy, according to him, takes into consideration the three poles of the «Triad», the United States, Japan and Europe, and acquires, thanks to an implantation in Anchorage (the geographical center of the Triad), a global vision.

Porter<sup>5</sup> has an approach to globalization that is founded on the nature of firm strategy. He affirms that the global sector is the one in which «the competitive position of a firm in a country is affected meaningfully by its position in other countries and vice-versa». An ulterior work permits to seize the originality of globalization better in relation to the previous engagement mode. Indeed, in the setting of a global strategy, a firm sells its product in several countries and uses a built-in approach to the world. The fact to be merely a multinational doesn't imply a global strategy if the multinational has subsidiaries that operate independently in every nation<sup>6</sup>.

Nevertheless, many publications of the Organization of Economic and Com-

---

(4) Ohmae Kenichi, *La Triade: Emergence d'une Stratégie mondiale de l'entreprise* (Paris: Flammarion, 1985).

(5) Michael E. Porter, «The Structure Within Industries and Companies Performance,» *Review of Economics and Statistics*, no. 61 (May 1979), pp. 214-227.

(6) Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: Free Press, 1980).

mercial Development (OECD) use the term globalization instead of internationalization, because globalization means «the internationalization of the productive system»<sup>7</sup>. Veltz<sup>8</sup>, is among those authors who insist on the difference between internationalization and globalization.

While referring to internationalization, his interest lies in the process of economic space opening. For as much, this opening doesn't lead according to him to the creation of a homogeneous world market. Thus, we argue that strategy is a global concept that concerns all fundamental aspects of the firm behaviour in the implementation of the couple «product- market». This strategy is first national, then international by exporting and creating subsidiaries abroad.

Consequently, there appeared a group of several subsidiaries composed of different nationalities, i.e. the draft of a multinational. The group occupies an international space by intervention in several markets. But, the success of the competitive game depends on features of the product and production costs to which will be added transportation costs. The production out of the firm's original country can serve to supply the original country as well as countries of its commercial network. The firm arranges a network of production/sale that spreads through several countries; then, the firm is qualified as transnational.

This stage of development rests on FDI, a transfer of capital and risk. The firm participates by its exchanges within the group in world trade. Its strategy is then mainly founded on spatial and on competitive conditions. The firm can adopt a regional, continental or global integration strategy.

## 2. Crisis and firms' internationalization strategies

### a. Current crisis

After so many years of economic growth, the current international economic degradation is the fastest and the strongest since the beginning of the 1990s. The international economic environment has become gloomy in the mid of the year 2007 due to the effects of the financial turmoil triggered by the US-based «subprimes» crisis in August 2007, the sensitive corrections undertaken over the real estate industry of many countries and the spectacular increase of raw material prices (specifically energetic and agricultural) which resulted in high inflation levels. These three factors, responsible for causing a decrease in household purchasing power and firms' profitability, have led to a gradual deterioration of growth perspectives.

(7) Graham Vickery, «Introduction: Points de Vue sur la globalisation,» *STI Revue*, no. 2 (Septembre 1993), p. 13.

(8) Pierre Veltz, *Mondialisation, Villes et territoires: L'économie d'archipel* (Paris: Presses Universitaires de France, 1996).

Nevertheless, while these factors should lead to a moderate slackening of the world economy (decrease in international GDP from +4.1% in 2008 to +3.9% in 2009, compared to +5.0% in 2007), the extraordinary character of the financial crisis which is raging the planet since September 2008 has strongly obscured international economic perspectives. The world economy is facing the most serious crisis that has ever developed in the financial markets since the 1930s. These effects reached the whole international financial system and spilled over into the real economy through the decrease of cash availability, hardening of credits' conditions (crunch credit), heavy degradation of consumers' and firms' morale as a reaction to the financial crisis and deterioration of growth perspectives.

According to IMF's predictions, international growth should fall down to 0.5% in 2009 (the lowest rate since WWII) after having recorded an exceptionally high average of 5.0% over the period 2004-2007. The financial crisis is its major cause and no country will be spared from its effects on the real economy. This slackening will affect the so-called advanced economies, which according to the IMF will see their production contract by 2.0% in 2009. This will constitute the highest post-war contraction in these countries.

The 2009 recession would touch the United States (-1.6%), the Euro zone (-2.0%), the European Union (-1.8%) and Japan (-2.6%). Within the EU, the IMF predicts a decrease in activities in Germany (-2.5%), France (-1.9%), the UK (-2.8%), Italy (-2.1%) and Spain (-1.7%). Among the other so-called advanced countries, the same negative perspectives hold for Canada (-1.2%), Australia (-0.3%) and the new industrialized countries of Asia (-3.9%), such as South Korea, Singapore and Taiwan.

Within emerging countries, growth will noticeably slow down, but would nevertheless reach 3.3% in 2009. Growth should recover in the following emerging countries and regions: China (+6.7%), India (5.1%), Near and Middle East (+3.9%), Africa (+3.4%), Brazil (+1.8%), Latin America (+1.1%), and the PECO-CEI, excluding Russia (+0.3%). As they play a leading role in the international economic dynamism since many years, emerging countries are having the lion's share in international growth behind China and the Far East. Emerging countries will be among the less affected countries by the financial crisis since their banks' exposure to equities and products related to «subprime» is relatively low. It is then the emerging countries which will continue to provide oxygen to international trade.

#### **b. The post-crisis scenario: gradual adjustment starting from the second semester of 2009**

According to major international institutions' predictions, many elements allow for recovering despite the seriousness of the crisis and the progressive adjustment efforts undertaken in favour of the world economy before the end of the second seme-



ster 2009. Indeed, international pursuit of supporting measures targeted to financial markets and the softening of monetary policies, as well as the introduction of budgetary measures to stimulate demand, and similar large-scale actions which target the fundamental causes of the crisis, should contribute to limiting the contracting damages of credit conditions on international growth and restore firms' and households' trust before the end of 2009. However, decrease and stability of energy-related raw material prices and agricultural commodities will help maintain inflationary tensions.

Due to growth perspectives deterioration and the impact of the financial crisis, oil prices have decreased by more than 50% compared with their rocketing increases in the summer of 2008. Inflation-based impact of raw material prices will be gradually blurred, and inflation should progressively shrink back and fall down under 2% in 2009 within advanced countries. Despite some loss of their dynamism, emerging countries will offer a source of resistance and business opportunities for the world economy, which will serve as a catalyst for economic recovery in advanced countries starting from the second semester of 2009.

### **c. Internationalization strategies: tendencies and perspectives**

DFI flows have been disturbed everywhere by the financial and economic crisis. DFI inflows should move from 1 billion 700 million dollars to less than 1 billion 200 million dollars in 2009, before slightly recovering in 2010 (about 1 billion 400 million dollars) and speed up in 2011 (with some 1 billion 800 million dollars).

Investments towards developing countries and countries in transition have made a step ahead in their share in DFI flows moving to 43% in 2008. This increase is partly explained by a large decrease in DFI destined to developed countries (29 %). In Africa, foreign investments have reached an unprecedented level, with West Africa having the lion's share with an increase of 63 % compared to 2007; in South East and East Asia, with an increase of 17 %, DFIs have registered a record; DFI destined to central Asia continued to increase for the sixth consecutive year; in Latin America and the Caribbean region, the increase was 13%; South East Europe and CEI have witnessed their successive eighth consecutive increase. Nevertheless, in 2009 DFI will back down in all regions of the world (see World Investment Report, 2009).

The financial and economic crisis had important repercussions for sectors of activity as much as for firms, with benefits shrinking, firing employees increasing and forced restructuring as evidence. According to the estimations of the UNCTAD, the rate of internationalisation of major TNCs has drastically decreased in 2008, whereas international benefits decreased by 27%.

Whatever the thing is, the production output of the first 100 TNCs often represents a large proportion of the total TNCs' international production. During the three years 2006, 2007 and 2008, these 100 TNCs represent an average 9% of for-

eight assets, 16 % of sales and 11% of employment of the total TNCs. As for their combined value added, it increased to 4 % of international GDP, a relatively stable rate since 2008.

If we consider the sectorial repartition of the first 100 TNCs in 2007, it is the manufacturing sector which remains better represented, with at the top General Electric, Toyota Motor Corporation and Ford Motor Company. Nevertheless, service-providing TNCs continued in progress; they were 26 in 2008, compared to 14 in 1993, with Vodafone Group and Electricité de France considered among the biggest. Primary-sector TNCs, among which Royal Dutch/Shell Group, British Petroleum Company and ExxonMobil Corporation, are well ranked due to the increase in their external revenues. As for developing countries' TNCs, there were seven highly diversified firms on the list, such as Hutchinson Whampoa and CITIC Group, and important electrical parts manufacturers, such as LG Corporation and Samsung Electronics.

In the short term, with the persistence of the world recession in 2009, the predicted low growth for 2010 and the spectacular decrease in firms' benefits, DFI should be low. TNCs seem hesitant and less inclined to increase their international operations. This confirms the results of the World Investment Prospects Survey 2009-2011.

The majority (58 %) of large TNCs have shown their intention to reduce their DFI in 2009 compared to 2008, by almost a third (more than 30%), and are even anticipating a decrease in their investments. Regarding the decrease of 44% in DFI inflows internationally during the first quarter of 2009 compared to the same period of the previous year, the total flows for 2009 might be lower than those for 2008.

In the mid-term, the perspectives are more encouraging. The TNCs which responded to the UNCTAD survey expect a gradual recovery of their DFI in 2010, and acceleration in 2011; half of them even think that their DFI of 2011 will exceed those of 2008.

#### **d. Internationalization-oriented support to firms: New policies**

In 2008 and during the first half of 2009, despite fears of a possible increase of protectionism in terms of investments, policies in this area remained on the whole in favour of a larger openness, with notably a reduction of obstacles against DFI and a decrease in taxes on companies. According to the UNCTAD's annual survey on the modifications undertaken in legislations and national regulations in terms of DFI, 110 new measures have been adopted in 2008, of which 85 are more in favour of these investments. Compared to 2007, the percentage of measures which are less in favour of DFI remains unchanged.

The latest survey conducted by UNCTAD with regard to the evolution of investment policies in the 42 countries of the G-20 shows that the majority of mea-

asures undertaken in this area between November 2008 and June 2009 have no restrictive tendency for investments, whether coming from or destined to overseas. What stands out is the will to facilitate these investments, specifically those destined abroad. Some measures have nevertheless been undertaken with a tendency of limiting private investment (including foreign) in some sensitive sectors, or applying new rules and criteria to investments posing a risk for national security.

Investment-related international agreements have a role to play in order to guarantee predictability, stability and transparency of national investment regimes. Decision-makers should also consider making the dispositions of these investment-encouraging agreements more effective and more operational. Investment insurance and other measures undertaken by countries of origin in favour of external investment are areas where international cooperation might be very useful.

### 3. The common classification criteria for the multinational firms

Before starting the question of measurement or quantification of the firm internationalization phenomenon, we must specify important definitions and key concepts. More precisely, we present in this section the main criteria for classifying multinational firms into homogeneous groups. In this respect, we distinguish between the international firm, the multinational and the transnational one. We mention thereafter other criteria used to classify these enterprises. Finally, we will show that the choice of the optimal criterion of the degree of firm internationalization depends strongly on the retained definition.

#### a. Criteria of restraining definitions of Multinational Firms

Many economists, as Vernon<sup>9</sup>, took conscience early that if we consider as multinational every enterprise that had at least one subsidiary, a branch or an abroad involvement, we risk to include a large range of enterprises without taking account of the specific features of the new firm behaviour, known as global, for instance General Motors, IBM.... Thus many economists propose to limit the Multi-National firm expression (MN) to the big enterprises (big size) for which an important part of their production activities is assured by establishments situated in a country other than their home country. This definition excludes networks of distribution that are increasingly prevalent in the world.

Otherwise, several classifications of internationalized firms have been suggested since the 1960s. Indeed, Perlmutter<sup>10</sup> has distinguished three categories of internationalized firms:

(9) Raymond Vernon, «International Investment and International Trade in the Product Cycle,» *Quarterly Journal of Economics*, vol. 80 (May 1966).

(10) Howard V. Perlmutter, «The Tortuous Evolution of the Multinational Corporation,» *Columbian Journal of World Business*, no. 4 (January-February 1969).

\* The ethnocentric Multinational firms, for which production remains centred in the original country.

\* The polycentric Multinational firms, that are implanted in several countries considered as different markets.

\* The geocentric Multinational firms, for which production processes are shared out through the whole world market but still managed as a unique unity.

Many recent works on Multinational firms, consider the last category as Global Firms, especially the works of Porter in the 1990s<sup>11</sup>, where he insists on the high level of coordination and hierarchy between their subsidiaries. Porter distinguished between Global Firms and what he called «Mutidomestique» Firms; the latter are characterized by the weakness of coordination between their subsidiaries due to their extreme dispersion throughout the world.

### **b. International, Multinational and Transnational firms**

Hugonnier<sup>12</sup> explains the distinction between the «multi-», «inter-» or «trans-» national enterprise, by advancing the following definitions:

\* An enterprise is international if we can suppose that its activities have reciprocal impacts of the same nature on at least two countries;

\* A multinational enterprise is one that has several nationalities and whose property and control are spread over people having different nationalities;

\* A transnational enterprise is an enterprise that operates, from its basis, through the national borders of other countries.

The author adds that the multinational term often refers to enterprises that have beneficial effects for both the home country and the host countries. Concerning the transnational term, he adds that «the transnational term recalls ideas of exploitation, domination in business,..., the transnational enterprises are the international modern vector of capitalism in the developing countries»<sup>13</sup>.

The international term was left out because it doesn't correspond to reality. Few enterprises are possessed and controlled by moral or physical people from different countries, and thus satisfy the definition mentioned above. Nowadays, this

---

(11) Michael E. Porter: «The Structure Within Industries and Companies Performance,» *Review of Economics and Statistics*, vol. 61, no. 2 (1979), pp. 214-227; *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, and *Competition in Global Industries* (Boston, MA: Harvard Business School Press, 1986).

(12) Bernard Hugonnier, *Investissements Directs, Coopération internationale et firmes multinationales* (Paris: Economica, 1984).

(13) Ibid.

distinction is left out, since the emergence of South Asian and South American transnational corporations made that the «multinational» and «transnational» terms lost their ideological sense.

### c. Classification of multinational firms

Because the multinational firms don't generally have the same features, Hood and Young<sup>14</sup> have regrouped them in three categories:

- \* Their outside engagement,
- \* Their organizational structure,
- \* Their original countries or their host countries.

In the first case, we are interested in the degree of internationalization that depends on the size, on the presence in the various regions of the world and on the abroad engagement according to the activities of the firm in its original country.

In the second case, they put the accent on the shape of the firm organization. They distinguish between enterprises having accidentally abroad activities and those having a global strategy of engagement throughout the world with the following conditions:

- \* They act on the goal to achieve a global objective through the coordination of activities of all their entities,
- \* They consider that their general operation zone is not limited to their country of origin but is made of all the countries where they operate.

In the third case, an enterprise would not be multinational if it acts solely for the interests of the parent company and/or the country of origin (see previous section on ethnocentric enterprises). Otherwise, the multinational firm must exceed nationalistic considerations and focus on optimizing the interests of all its entities (parent company, subsidiaries, branches, etc.), to be either geocentric or polycentric.

Other classifications have been established, among them the one that consists in taking into account the sector of activity. Three sectors are generally considered: The **primary** sector (extraction and mining, exploitation of raw materials), the **secondary** sector (manufacturing industries) and the **tertiary** sector (services including banking, insurance, tourism, transport, consulting, etc...). The shape of implantation of the multinational in each of the three sectors presents a certain specificity that constitutes a constraint to the generalization of the behaviour of a firm inter-

(14) Neil Hood and Stephen Young, «US Multinational R&D: Corporate Strategies and Policy Implications for the UK,» *Multinational Business*, vol. 2, no. 1 (1982), pp. 10-23.

nationalization. In fact, it is argued that in the primary sector; the minority subsidiaries and enterprises associated are the most dominating, while in the secondary sector it is the majority subsidiaries and in the tertiary sector it is the branches that are the centre of decision.

A last distinction has been made while basing our selves, either on the original country of the multinational firm or on countries of implantation. Regarding the original country, we kept four global models of international engagement:

\* The American-European model: it started in the 1950s and is characterized by a preponderance of orientation toward the developed countries and toward the secondary sector as abroad implantation sector. According to this model, full ownership is the most followed engagement type.

\* The Japanese model: it is characterized by the fact that the FDI are mostly achieved by small and medium enterprises whose main activities are not the production of goods but services trading (notably sales). Indeed, their objective is to find outlets in the world for products of other Japanese enterprises.

\* The Eastern countries model: it is characterized by the fact that activities of enterprises are achieved in the OECD zone, or in the other industrialized countries. The favourite sectors, in decreasing order of importance, are : the tertiary sector (essentially the merchandizing of products imported from Eastern countries, the banking services, transport and technical support) and the industrial sector (essentially extraction and transformation of raw materials). As for the shape of engagement in the industrialized countries, implantations in eastern countries are especially oriented toward the tertiary sector and are owned in totality by parent companies (100% involvement). On the other hand, involvements in developing countries take only a small share in their activities.

\* The developing country model: it is characterized by the fact that FDI are generally achieved in other developing countries and mainly in the oil sector. These investments are the fact of big enterprises. Co-enterprises are the major modality in this model. This kind of engagement is noticed for the first wave of FDI coming from Hong Kong, Brazil, Singapore, India, South Korea, Taiwan, Mexico, Argentina and Venezuela as well as for the second wave originating from Colombia, Indonesia, Philippines and Thailand.

#### **4. Setting up the new indicator**

In this section, we propose a new indicator of internationalization to quantify the degree of internationalization of transnational firms. This indicator allows a new ranking of such firms, taking into account their global strategy.

Before defining our new indicator, let's have a brief discussion on the principal indicators used in the literature.

The OECD's indicator: It is defined on a scale from 1 to 10<sup>15</sup>. For instance a firm, whose investments which are coming from outside are less than 10% of the total investments, has an indicator between 2 and 3. Because of its qualitative characteristic, it is difficult to use this indicator to rank the internationalization of firms.

The UNCTAD's indicator: Since 1995 the UNCTAD has begun to rank the top transnational corporations based on their foreign assets<sup>16</sup>. For instance, the annual world investment report gives the ranking for the top 100 firms from the developed countries.

For a given firm  $i$ , this indicator is defined as

$$\frac{\sum_{j=1}^3 R_{i,j}}{3}$$

Where

\*  $R_{i,1}$  denotes the abroad sale rate.

\*  $R_{i,2}$  denotes the abroad job rate.

\*  $R_{i,3}$  denotes the abroad asset rate.

We think that the major weakness of this indicator comes from the fact that it conjugates both supply (labour and capital) and demand factors (sales). This indicator is somehow unstable in the sense that the rank obtained changes considerably with time. Defined as an average, this indicator is sensitive to outliers. Actually this indicator gives no idea about how global a firm is. For instance, some American corporations focus most of their activities on home regions, nevertheless they are well ranked.

Herfindhal's indicator: it denotes by  $X_i$  (resp.  $X_{i,j}$ ) the amount of a quantified activity of a firm  $i$  (resp. in a region or a country  $j$ ).  $X_i$  could, for instance, be the global assets, sales, number of employees or of subscribers etc...

$$(1) \text{ The simple Herfindhal's indicator: } \sum_{j=1}^n \left( \frac{X_{i,j}}{X_i} \right)^2$$

It is defined, for a given firm  $i$ , by using the formula above where  $n$  denotes the number of countries of possible establishments. This indicator is not satisfac-

(15) *PME et Mondialisation*, 2 vols. (Paris: OCDE, 1997), vol. 1: *Rapport de Synthèse*.

(16) United Nation Conference on Trade and Development (UNCTAD), «World Investment Report 1995: Transnational Corporations and Competitiveness».

tory because it supposes that all markets have the same importance. Actually it doesn't distinguish between firms established in one country and others established in the whole market.

$$(2) \text{ The generalized Herfindhal's indicator: } \frac{n}{\sum_{j=1}^n \left( \frac{X_{i,j}}{X_i} \right)^2 \left( \frac{GDP_j}{GDP} \right)} \quad (1)$$

Still using the same notations as before, the Generalized Herfindal's indicator is defined as above, where GDP (resp. GDP<sub>j</sub>) denotes the Gross Domestic Product of the world (resp. the country j). We observe that the range of the generalized Herfindhal indicator could be very large without any reference values (see Figure 7). Even though the generalized Herfindhal indicator takes into account the proportionality between the foreign activity rates of the firm i,  $\frac{X_{i,j}}{X_i}$  and the economic weight of the host country  $\frac{GDP_j}{GDP}$ , it does not consider the distribution of the sector of activity throughout the world.

The new indicator: We consider that the world is divided into 7 regions as follow: region 1: Western Europe, region 2: Eastern Europe, region 3: North America, region 4: Central and South America, region 5: Asia, Region 6: Africa, region 7: Middle East. We recall that  $X_i^k$  denotes the total amount of a quantified activity of a firm I, where  $X_{i,j}^k$  is the total amount of the quantified activity of a subsidiary in the country j of the region k.

$$X_i^k = \sum_j X_{i,j}^k$$

By  $X^k$  we denote the total amount of the quantified activity of all firms in the region k

$$X^k = \sum_i X_i^k$$

X denotes the total amount of the quantified activity of all firms with the same activity in the world

$$X = \sum_{k=1}^7 X^k = \sum_{k=1}^7 \sum_i \sum_j X_{i,j}^k$$



region k and  $\tau_k = \frac{X^k}{X}$  as the sector activity weight of the region k in the world.

We obtain the following two series:

$\tau_k$	$\tau_1$	$\tau_2$	...	$\tau_7$
$\tau_{k,i}$	$\tau_{1,i}$	$\tau_{2,i}$	...	$\tau_{7,i}$

For a given firm i, the new indicator is defined as the absolute value of the correlation coefficient of the two last series, defined by the following standard formula:

$$\rho_i = \left| \frac{\sum_{k=1}^7 (\tau_k - \bar{\tau})(\tau_{k,i} - \bar{\tau}_i)}{\sqrt{\sum_{k=1}^7 (\tau_k - \bar{\tau})^2} \sqrt{\sum_{k=1}^7 (\tau_{k,i} - \bar{\tau}_i)^2}} \right| \quad (2)$$

This indicator measures how much the dispersion of the activities of a given firm throughout the world is linearly correlated with the sector activity dispersion throughout the world.

This indicator gives an idea about the globalization strategy of a given firm, and could allow for a more realistic ranking of firms operating in the same sector or even in different sectors.

## 5. Empirical study

### a. Computing the New Indicator and a comparison with the Herfindhal indicator

As mentioned in the introduction, this section is devoted to an empirical validation of the new indicator. We concentrate our study on a sample of 34 corporations operating in the telecommunication sector<sup>17</sup>. Table 1 below gives the distribution of the number of subscribers by millions for 34 corporations located in different regions. The world is divided into 7 regions as follows:

Western Europe: W.E.; Eastern Europe: E.E.; Middle East: M.E.; Asia: A.; Central and South America: C.S.A; North America: N.A.; Africa: Af.

(17) Peter Cursen and Jason Whalley, «Measuring Internationalisation in the Mobile Telecommunications Industry,» *International Business Review*, vol. 15, no. 6 (September 2006).

**Table 1**  
**Proportionate subscribers by region (31 December 2005)**

Firms	W.E.	E.E.	M.E.	A.	C.S.A.	N.A.	Af.
Vodafone	108.534	6.880	-	29.785	-	22.785	11.332
America Movil	-	-	-	-	89.611	0.024	-
Deutsche Telekom	62.262	1.366	-	-	-	21.690	0.100
France Télécom	57.627	6.966	0.264	0.01	1.522	-	5.555
Telefonica	23.239	-	-	0.006	46.829	-	1.199
Mobile TeleSystems	-	58.579	-	0.495	-	-	-
Telecom Italia	-	2.179	-	18.790	-	-	-
Sprint Nextel	-	-	-	-	0.493	44.287	-
VimpelCom	-	43.355	-	0.950	-	-	-
Telenor	7.293	21.064	-	14.242	-	-	-
Verizon Comms	5.470	-	-	-	3.251	28.482	-
TeliaSonera	12.370	10.353	11.498	1.262	-	-	0.295
NTT	-	-	-	33.975	-	-	-
Singapore Telecom	-	-	-	30.698	-	-	-
O <sub>2</sub>	27.417	-	-	-	-	-	-
Orascom	-	-	0.894	14.218	-	-	9.512
KPN	20.821	-	-	-	-	-	-
Vodacom	-	-	-	-	-	-	20.123
sK Telecom	-	-	-	19.423	-	-	-
MTN	-	-	-	-	-	-	18.294
Hutchison Wham- poa	9.789	-	0.652	6.735	-	-	0.034
Portugal Telecom	5.312	-	-	0.082	9.299	-	1.634
Turkcell Holding	-	0.749	14.515	0.220	-	-	-
Vivendi Malaysia	9.300	-	-	-	-	-	5.051
Telekom Malaysia	-	-	-	13.704	-	-	0.141
Alltel	1.024	-	-	-	0.245	10.662	-
Tele2	8.413	2.648	-	-	-	-	-
TDC	9.987	-	0.039	-	-	-	-
MTC (incl.Celtel)	-	-	-	4.010	-	-	5.330
Telekom Austria	3.680	5.210	-	-	-	-	-
Millicom Interna- tional	-	-	-	2.330	3.022	-	1.640
OTE	2.988	2.861	0.289	-	-	-	-
Etisalat	-	-	5.315	-	-	-	0.418
Investcom	0.065	-	1.452	-	-	-	2.234

We compute the new indicator (N.I.) for the 34 corporations using equation (2) and the generalized Herfindhal indicator (H.I.) using equation (1). The next table shows the firms' ranking based on each indicator:

**Table 2**  
**New and Herfindhal indicator**

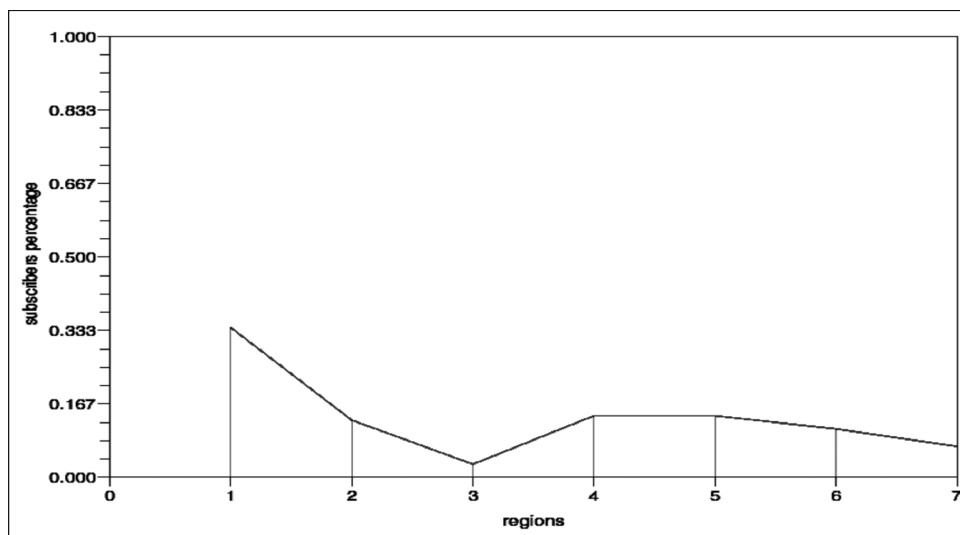
Firms	N.I. rank	H.I. rank	N.I.	H.I.
Alltel	27	23	0,033766603	1,283074027
America Movil	34	24	0,007875853	1,182248375 ←
Deutsche Telekom	7	6	0,862220045	15,85008814
Etisalat	15	25	0,517393257	1,115330094 ←
France Telecom	6	4	0,897474958	85,09780241 ←
Hutchison	9	21	0,80627349	1,460664139
Investcom	13	18	0,554334103	1,684604964
KPN	3	2	0,902699711	5001,146332
Millicom	25	22	0,118919567	1,345350505
Mobile Telesystems	31	15	0,02173751	2,471634413
MTC	12	17	0,593422794	1,686079048
MTNc	21	29	0,314019157	0,810082898
NTT	29	33	0,023995968	0,223818373
O2	2	1	0,902699711	5001,146332
Orascomi	23	30	0,19850149	0,597471624
OTE	11	7	0,67197653	10,94218386
Portugal Telecom	17	13	0,460314653	3,074085445
Singapore Telecom	30	34	0,023995968	0,223818373
SK- Tlecom	28	32	0,023995968	0,223818373
Sprint - Nextel	24	27	0,119485321	1,048862531
TDC	4	3	0,901338306	4652,696828
Telecom Italia	8	9	0,806882594	7,086980381
Tele2J	5	5	0,895881075	42,47959916
Telecom Malaysia	33	31	0,020858136	0,228356355
Telefonica	18	20	0,441771055	1,594377621
Telekom Austria	14	8	0,547865645	7,099322158
Telenor	22	19	0,284914007	1,662526162
teliaSonera	19	11	0,334075662	6,762135625
Turkcell Holding	16	26	0,493030847	1,095187806
Verizon Comms	26	16	0,058793526	1,731108297 ←
Vimpel- Comp	32	14	0,021438761	2,53151639
Vivendi-Universal	10	12	0,693648005	6,534401273
Vodacom	20	28	0,314019157	0,810082898
Vodafone	1	10	0,912160429	6,925090218 ←

Note that in most cases the rank given by the new indicator (N.I.) is close to the one given by Herfindhal indicator (H.I.); however, some of them (marked by ←) are very different, for instance: America Movil, Etisalat, Mobile-telecommunications and Vodafone. Next, we treat these examples separately.

First, we plot the diagram of the distribution of subscribers of all firms

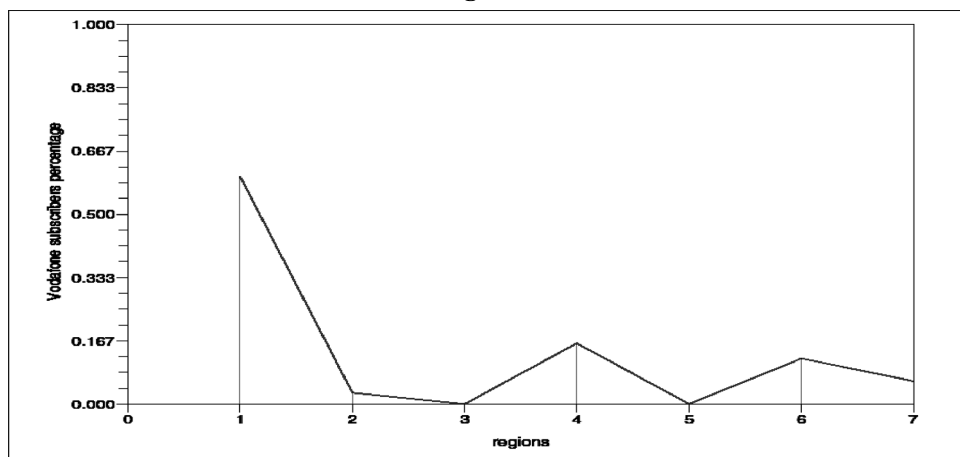
throughout the world (Figure 1), where regions are marked in the same order as in the table1 (1, 2,..., 7). We will use this diagram as a reference one. In fact, we compare this diagram to those of marked firms to have a visual idea of how much each distribution of subscribers of such firms is correlated with the world distribution.

**Figure 1**



The next figure (Figure 2) describes how Vodafone’s subscribers are distributed throughout the world. We can see the good correlation to the world distribution of subscribers (figure 1). This justifies the top position given to this firm according to the new indicator, while it is ranked in the 10th position according to Herfindhal indicator.

**Figure 2**



Moreover, if we consider the Mobile-teleystems firm, it is ranked in the 31st position according to the new indicator and in the 15<sup>th</sup> position according to the Herfindhal one. It is clear that the distribution of the subscribers of this firm (Figure 3) is far away from the subscribers' distribution throughout the world (Figure 1). And so, we can consider that Mobile-teleystems has a regional strategy rather than a global one.

**Figure 3**

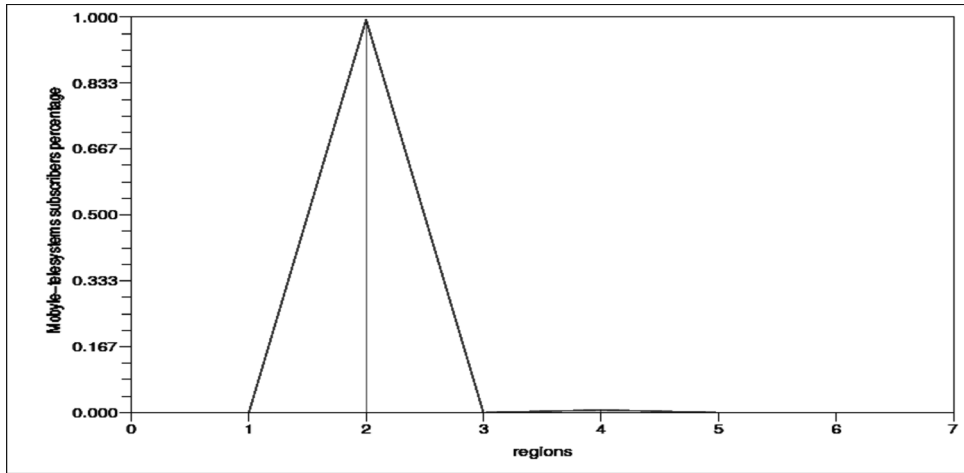
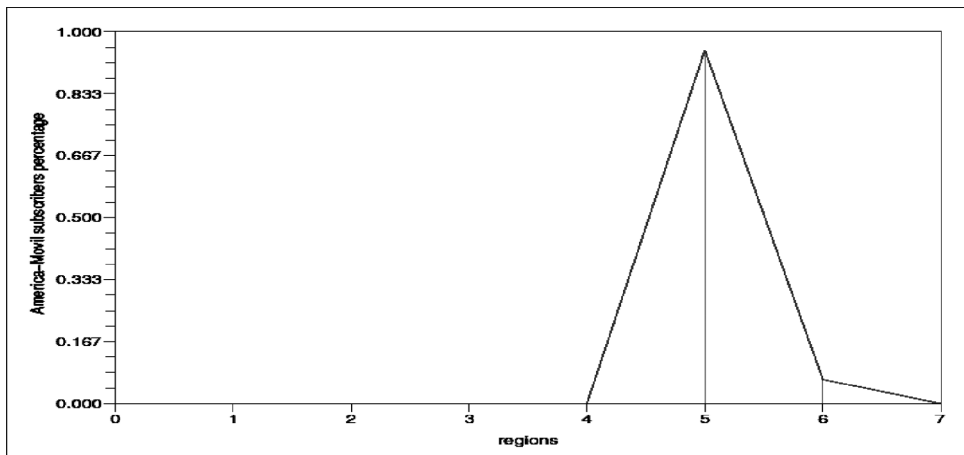


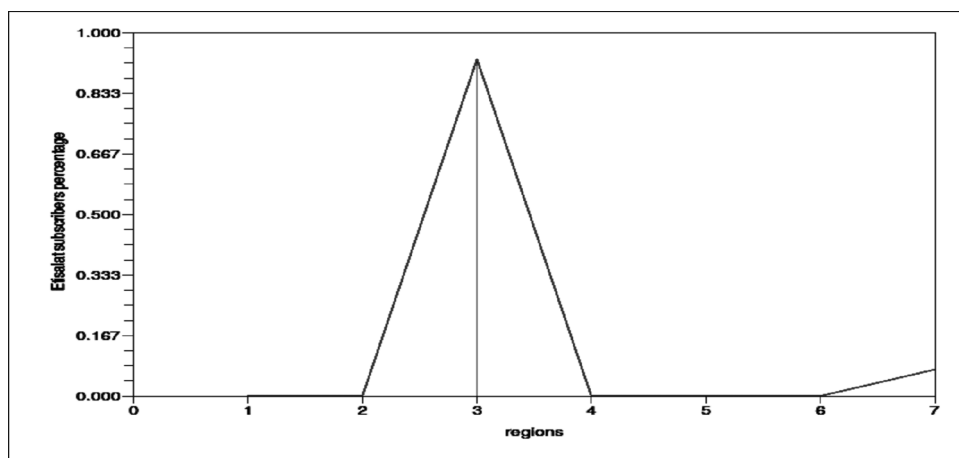
Figure 4 describes the subscribers' distribution of America-Movil, where it is clear that most of its activity is localized in Central and South America (region 5 in the figure). Therefore America- Movil has no global strategy which justifies its last position according to the new indicator while it is ranked 24th based on the Herfindhal indicator.

**Figure 4**



In the next figure (Figure 5) we consider Etisalat Corporation ranked in the 15th position by the new indicator and in the 25<sup>th</sup> position by the Herfindhal indicator. This medium position with respect to the new indicator is justified by the fact that this corporation adopts an internationalization strategy consisting in investing more in regions where the level of competition is not high.

Figure 5



### b. Robustness of indicators

In this paragraph we aim at proving that the new indicator (N.I.) is more stable than the Herfindhal one (H.I.). We begin by ranking firms according to the new indicator, by using subsidiaries data, and then compare with the ranking already obtained by using subscribers data (see table 4). Subsidiaries data are collected in the following table:

**Table 3**  
**Number of subsidiaries by region**

Firms	W.E	E.E.	M.E.	A.	C.S.A.	N.A.	Af.
Vodafone	16	2	0	6	0	1	7
France tel	11	2	1	1	2	0	10
Tlfonica	2	1	4	4	14	0	4
MTC	0	0	4	0	0	0	14
Telia Sonera	7	3	0	2	0	0	1
Milicom Itern	0	0	1	4	5	0	7
Hutch- Whampoa	6	0	0	7	0	0	1
Telenor	5	3	0	7	0	0	0
Tele2J	13	2	0	0	0	0	0
America Movil	0	0	0	0	13	1	0

to be continued

continued

Deutsche Telekom	8	4	2	0	0	1	1
Orascom	0	0	3	7	0	0	5
Etisalat	0	0	0	0	0	0	8
MTN	0	0	1	0	0	0	10
TDC	9	0	2	0	0	0	0
Investcom	1	0	0	0	0	0	5
Portugal Telecom	1	0	0	2	1	0	4
Telekom Malaysia	0	0	0	6	0	0	2
NTT	0	0	1	7	0	0	0
OTE	1	5	0	0	0	0	0
Singapore Telecom	0	0	0	7	0	0	0
Sprint Nextel	0	0	1	0	5	2	0
Telecom Italia	1	0	4	0	5	0	0
Turkcell Holding	0	2	0	1	0	0	0
Mobile TeleSystems	0	3	0	3	0	0	0
Alltel	2	0	0	0	2	1	0
Telekom Austria	3	2	0	0	0	0	0
Verizon Comms	1	0	0	0	2	2	0
Vivendi Universal	1	0	0	0	0	0	4
Vodacom	0	0	0	0	0	0	5
O2	4	0	0	0	0	0	0
VimpleCom	0	2	0	2	0	0	0
KPN	3	0	0	0	0	0	0
SK Telecom	0	0	0	3	0	0	0

**Table 4**  
**New indicator ranking based on subscribers and on subsidiaries**

Firms	Rank subsidiaries. Numb.	Rank subs.numb.
Alltel	30	27
America Movil	31	34
Deutsche Telekom	17	7
Etisalat	22	15
France Telecom	1	6
Hutchison- Whampoa	4	9
Investcom	15	13
KPN	7	3
Millicom Itern	10	25
Mobile TeleSystems	32	31
MTC	20	12
MTN	11	21

to be continued

continued

NTT	27	29
O2	6	2
Orascom	16	23
OTE	25	11
Portugal Telecom	3	17
Singapore Telecom	28	30
SK- Tlecom	29	28
Sprint - Nextel	23	24
TDC	8	4
Tele2	9	8
Telecom Italia	34	5
Tlfonica	26	33
Telekom Austria	21	18
Telecom Malaysia	19	14
Telenor	13	22
Telia Sonera	18	19
Turkcell Holding	14	16
Verizon Comms	24	26
VimpelCom	33	32
Vivendi-Universal	5	10
Vodacom	12	20
Vodafone	2	1

We consider the two rankings as two series for which the linear correlation coefficient is  $\tilde{r} = 0.66$ . We interpret this good correlation as a good stability of the new indicator when changing the data. This confirms the fact that the number of subscribers of a firm is naturally correlated with its number of subsidiaries.

Next we make the same test of robustness for the generalized Herfindhal indicator. We collect Herfindhal ranking of firms, by using both subsidiaries data and subscribers data, in the following table.

**Table 5**  
**Herfindhal indicator ranking based on subscribers and on subsidiaries**

Firms	Rank by subsidiaries	Rank by subscribers
Alltel	19	23
America Movil	32	24
Deutsche Telekom	10	6
Etisalat	18	25
France Telecom	1	4

to be continued



continued

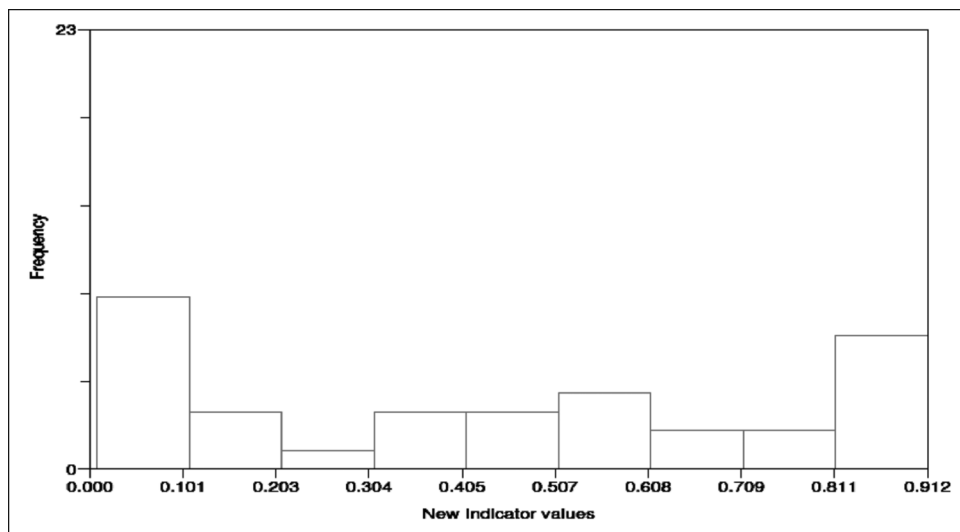
Hutchison- Whampoa	6	21
Investcom	11	18
KPN	21	2
Millicom Itern	5	22
Mobile TeleSystems	25	15
MTC	15	17
MTN	22	29
NTT	27	33
O2	20	1
Orascom	9	30
OTE	31	7
Portugal Telecom	4	13
Singapore Telecom	28	34
SK- Tlecom	29	32
Sprint - Nextel	33	27
TDC	16	3
Tele2J	13	9
Telcom Italia	24	5
Tlfonica	2	31
Telekom Austria	17	20
Telecom Malaysia	14	8
Telenor	8	19
Telia Sonera	7	11
Turkcell Holding	30	26
Verizon Comms	34	16
VimpelCom	26	14
Vivendi-Universal	12	12
Vodacom	23	28
Vodafone	3	

The linear correlation coefficient of the last two series is  $\tilde{\rho} = 0.24$ . Compared to what we get when dealing with the new indicator ( $\tilde{\rho} = 0.66$ ), we claim that it is more stable than the generalized Herfindhal one.

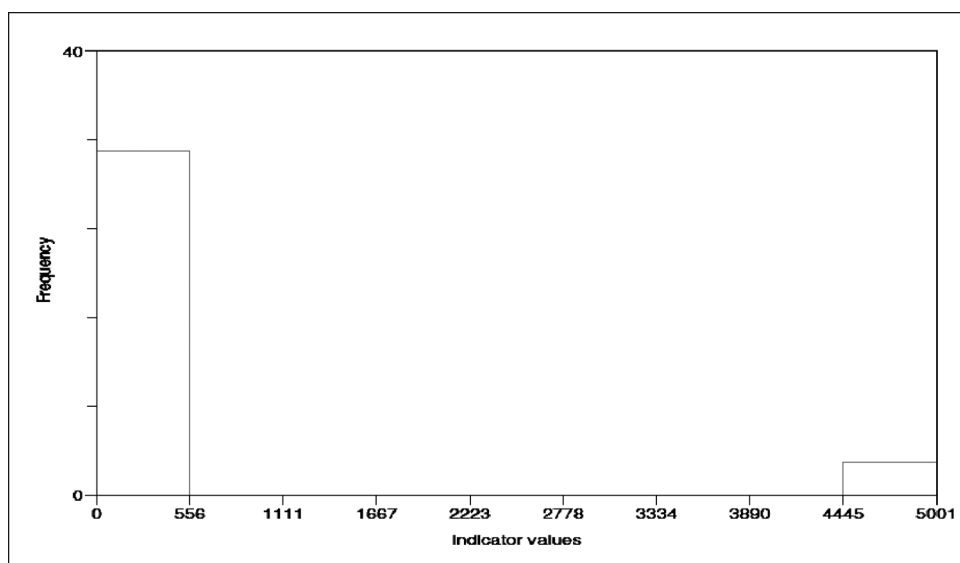
In addition, if we consider the statistical distribution of the generalized Herfindhal indicator of firms, we note that its range is too large, which makes its statistical analysis difficult. (See Figure 7).

In contrast, the new indicator distribution has the interval  $[0, 1]$  as a smaller and fixed range for all data. (See Figure 6). This confirms our claim about the stability of the new indicator.

**Figure 6**  
**New Indicator Distribution**



**Figure 7**  
**Herfindahl Indicator Distribution**



## Conclusion

The effects of globalization in terms of business exchanges and financial interdependence constitute a factor of crisis propagation. Thus, a financial crisis might have international repercussions. Consequently, if a financial crisis initially hits

only financial markets, its propagation leads to negative effects on the real economy, resulting in an economic crisis or even a recession. Furthermore, a financial crisis hitting only some countries might spread contagiously and become international. Such an international crisis might have several consequences for both developed countries and developing countries.

Internationalization of firms is a strategy characterizing large economies which show an economic and financial robustness, allowing them to defend and protect all of the economy in case of a crisis. Possibility of bankruptcy of this type of firms is low as they are less vulnerable than national firms. A crisis which hits a unique country calls for the support of multinationals which find themselves in the obligation of participating in its rescue operation.

In so far as the current economic and financial crisis is concerned, it had no major effects on policies of DFI, since these investments are not responsible for the turmoil. Nevertheless, some general national measures (rescue plans, economic revival programs) adopted to respond to the crisis risk having indirect effects on the flow of DFI and over the activity of TNCs. Contributing to stabilize, even improve, the principal economic determinants of these investments, they might have a positive effect over inflows DFI. However, many fear that they might lead to a certain investment-oriented protectionism by favoring national investment over foreign investment, or by dissuading foreign investment in order to preserve national economy's capital.

This paper attempts to theoretically and empirically contribute to the issue of measuring internationalization of firms. A new indicator is proposed. Our empirical specifications reveal the superiority of our index in comparison to the generalized Herfindhal index, based on the nature of the firm itself, experimental data and robustness.

### Additional References

- Benaroya, François et Édouard Bourcieu. «Mondialisation des Grands groupes: De Nouveaux indicateurs.» *Economie et Statistique*: nos. 363-365, 2003.
- Chandler, Alfred D. «The Growth of the Transnational Industrial Firm in the United States and the United Kingdom: A Comparative Analysis.» *Economic History Review*: vol. 33, no. 3, August 1980.
- Dunning, John H. «The Eclectic Paradigm in an Age of Alliance Capitalism.» *Journal of Business Studies*: Third Quarter, 1995, p. 463.
- \_\_\_\_\_. «The Eclectic Paradigm in an Age of International Production: A Restatement and Some Possible Extensions.» *Journal of International Business Studies*: Spring 1998, pp. 3-4.
- \_\_\_\_\_. «The Eclectic (OLI) Paradigm of International Production: Past, Present and Future.» *International Journal of the Economics of Business*: vol. 8, no. 2, 2001, pp. 176-177.

- \_\_\_\_\_. «International Business in a Changing World Environment.» in: *Multinationals, Technology and Competitiveness*. London: Unwin Hyman Ltd., 1988.
- \_\_\_\_\_ and Rajneesh Narula. «Globalization and New Realities for Multinational Enterprise-developing Host Country Interaction.» University of Oslo (Norway) 1998.
- \_\_\_\_\_ and Sarianna M. Lundan. *Multinational Enterprises and the Global Economy*. Reading, MA: Addison Wesley, 1993.
- Hirschmann, Albert O. *National Power and the Structure of Foreign Trade*. Berkeley, CA: University of California Press, 1945.
- Horstmann, Ignatius J. and James R. Markusen. «Endogenous Markets Structures in International Trade.» *Journal of International Economics*: 1992.
- The Global Economic Crisis: Systemic Failures and Multilateral Remedies*. New York and Geneva: United Nations Conference on Trade and Development (UNCTAD), 2009.
- «Global Financial Stability Report.» FMI: October 2009.
- Porter, Michael E. *The Competition Advantage of Nations*. London: Macmillan, 1990.
- \_\_\_\_\_. «L'Avantage Concurrentiel des Nations.» [Inter Editions] (1993).
- \_\_\_\_\_. «Clusters and Competitions: New Agendas for Companies, Governments and Institutions.» Harvard Business School (Cambridge), Working paper, no. 98-080, 1998.
- \_\_\_\_\_. «The Role of Location in Competition.» *Journal of Economics of Business*: vol. 1, no. 1, 1994, pp. 35-39.
- \_\_\_\_\_, Panlcaj Ghewat and Richard A. Rawlinson. «Patterns of International Coalition Activity.» in: Michael E. Porter, *Competition in Global Industries*. Harvard: Harvard Business School Press, 1986.
- World Investment Report*. New York; Geneva: United Nations Conference on Trade and Development (UNCTAD), 2009.