Autistic science

"I do not believe it can be hoped that cybernetics alone will provide,
in a more or less distant future, the solution to the triple enigma of life,
conscience and thought."
Louis de Broglie

There are two epistemic caesuras with consequences which have yet to be evaluated: the breaking off of Economy from Philosophy and the banishing of Metaphysics from the citadel of knowledge. There is no doubt on the cause. Rationalization and illuminist secularization have constituted the explosive mixture for the pairing of heterodox conceptualizations. If somewhat brutal yet with method, the combinatory function of nature has been diluted in order to force the creative self-referentiality. From extrovert relationing to introvert relativism this constituted the falling from completitude and universalism to fragmentarism and exceptionalism. It is this process which created the savants that cannot communicate with each other and the experiments that only explain themselves.

This is how a financier got to wonder at the existence of supracontexts beside the determinism of transmission mechanisms, an accountant to be fascinated at the amount of freedom available by turning to epistemology beyond the sclerotic normative of the account, a statistician to proclaim his happiness when entering the living universe of macro economy, an informatician to beam with delight loading his feedbacks with new sense as a learning process a.s.o.

The model of self-sufficient sciences is the ultimate image of the defying of nature, the only one sufficient to itself through functional complementarity and the tolerance of diversity. The Economy, by rupturing the ideatic texture it has with Philosophy, has given up the contextual justifying of its functions and bet everything on efficiency. Problems have been reformulated within the strict guidelines of a ceteris paribus type of rationalization and the solutions became abundant as long as they counted exclusively on externalities. The solutions did not cost the economy nothing when the absolute creditor was situated around here and there of rationalization.

The simple organizing of the contents of knowledge, fragmentary in most part, creates the illusion of touching on the pattern of science. The persistence in this illusion, comformiting because it eliminated reflexive dependencies and legitimizes the autarchy of thought, has pushed the architect – as we can see – to draw just the brick, this being magically conferred with the function to design the building. Knowledge and Science have become deposit banks. The investment in synthesis, unification, reconstruction, as well as in revelation, perspective, complexity and the preeminence of open and self organizing systems has been blocked and become derisory. In the absence of this operation the Economy remains at most a Baconian Sylva Sylvarum.

The braking off from Philosophy meant for the Economy less doubt on the goals but also a lesser understanding of the consequences of reaching them. The ultimate cause has replaced the primary cause. From the domestic needs that define man the move was made exclusively towards the artificial multiplication of the needs that dehumanize the world. The abundance as a standard of performance has turned the economy into the perfect goal and man into a consumable mean. Rationalization does not need sentiments for being complete, as efficiency being a gene of economy is incompatible with social equity. Economy has earned its right in the citadel of self-referential sciences, but humanization has lost a chance to keep the natural virtue of the options.

While Economy without the company of Philosophy wanted to prove it can do everything, including dispensing of man, Philosophy without Metaphysics braved probing the world by fragments, losing the perspective and blocking the explanation. The excommunication of Metaphysics, as a reflex of the triumph of the rational, has transformed Philosophy into extensive grammar, when it wasn't allowed to be a mild rhetoric. The break-up with Metaphysics meant for Philosophy the banishment from among immortals. Economy without Philosophy has renounced man, Philosophy without Metaphysics has given up life. One became a science of mortification and the other has become a ritual of exhumation.

Sacrificially, the Economy has buried itself in the market and Philosophy has extinguished its aura of wisdom. Both have fallen pray to rationalization. The Economy has defeated itself by monetizing sentiments, Philosophy has lost its vocation in the labyrinth of text. The marketing specialist prostrates without any doubts to the abstract demand, the management specialist believes blindly in (and does not question!) the production function. The philosopher has broken his mirror in thousands of pieces.

The signs of coming back to the natural condition are thin. The Economy persists in formalization and Philosophy isolated itself in words. Remarrying them in their present state would really be a failure. To have a hope of fertility the pairing of the Economy and the Philosophy reborn as Metaphysic is the solution. The particular knowledge contained in the fragments of Economic Science must be integrated in the real Economy in order to have the correct vision – for being complete – on the social nature of economy. Which is a rational expression of a necessity to act legitimized by an essentially anthropic theory.

Marin Dinu

Contents

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Revizie text: Gabriela Ochiană
Tehnoredactare computerizată: Nicoleta Bobocea
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The Connection between Ethical Procedures and Business Development

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Abstract. *The development of affairs and the intensification of the competition on the market have led to the fact that the success cannot be anymore obtained as easy as before, nowadays it can be obtained only by observing some ethical constraints. But the possibilities of auto regulation in ethics are reduced. So that it is imperiously necessary to make efforts of regulating in order to assure behaviors and moral interactions. There have no relevance the "good" or "ethical" intentions, nor the "moral quality" itself, but the best results of the firm and the efficiency of their achievement. From the ethics of intentions one must go to the ethics of results and to the creation of a specific ethos, capable of unleashing some epidemics of positive behaviors.*

Key words: ethics of business; moral failure of manegement; ethics of intentions; ethical constraints; epidemics of positive behaviors.

The question whether ethical procedures are – or should be – at the base of a firm's activity and development has lately preoccupied – or not – the ideologists. This is because, historically, the economical activity started as a system built on a strong, moral base. It is only after the needs of the society began to be satisfied by the merchandise producers and later, when the local request could no longer be covered by the existing offer, that producers gradually "lost their souls". Thus, a progressive loss of interest in spiritual reasoning occurred, though it used to condition the economical activity in the past. But, while the competition began to modify its views and procedures, as a consequence of an increase in labor resources and the involvement of politics in economy, some people with a sense of reality became themselves receptive to the ethical dimensions of their own activities. Also, once the status of shareholders was separated from the administrative duties, less people have arguments for rejecting the ethical constraints that justify their behavior.

This separation, also known as the managers' revolution, proved that an approach of ethics was necessary in the business domain, as well as institutionalizing moral in firms. Some of the consequences of this revolution were the weakness and the lack of normative references in economical life, which clearly affect the performance of the firm. The changing of firms into stock societies and turning management into a profession led to the end of a social class that used to rely its daily actions on honest work and temperance. Another social category took its place, one that earns his living not so much through its own effort, but through the inertia of financial mechanisms, based on stock exchange operations. This is the reason why this new class of influence sustains its decisions and actions by embracing a new kind of ethics, completely different from the socially accepted one. Moreover, some managers consider the term of ethics not only to be obsolete, but a word that must be banished from economy. In their minds, the continuous rush for wealth and power is what assures a firm's development and future achievements.

The incapacity of understanding the new coordinates of the competition's behavior and a defective productive system started to raise an alarm. It is my conclusion that

inefficiency is, most of the times, a proof of moral failure of the firm's management, rather than a secondary consequence of the corporate style of leadership.

If we accept the fact that man himself is a resource of awareness, than rejecting the idea that a person can't take note of the surrounding context is not justifiable. Contrarily, a person such as this one may use the situational factors in favor to one's interests, maximizing one's gain.

The individual behavior is the result of an interaction between the individual's own values and principles and the constraints of opportunities. When, as a result, the behavior is inadequate to the terms of business, that economical system, more precisely marketing, becomes immoral. Taking into account that his possibilities of auto regularization at the ethic level are reduced, the need comes for efforts to regulate it in order to ensure moral behaviors and interactions. But the norms elaborated for this purpose can produce the desired effects only if they are included in an ethical project, which is at the basis of the firm's development and if they make reference to a certain situational morality, and not to morality in general. Beside this, the regulations, which are imposed, must be conceived in such a way so that they permit to the appointed entities a certain freedom in what concerns the choice of the methods to be used for the fulfillment of their specific objectives.

The solutions characterized by rigidity, strictness, promoted by the "purists of the market", do not protect better the participants correlated with the regularizing economic agent than the incentives oriented towards the market. If the morality norms are uniform for all the firms belonging to a certain domain and if they have a substantial economic potential, this makes them more efficient in what concerns the incorrectness' limitation, but the costs for their application are insignificant. We have noticed that identical standards can force the firms to use methods, which are unreasonably expensive, and if their financial resources are different, they arrive at the point where they find themselves in an unequal position in relation with the imposed measures. Also, the technology proper for a certain firm may not be adequate for the situation in another firm, so that the control over the operations executed by it won't be realized at a satisfying level.

If the procedures are followed, they will eliminate the financial incentives, which stimulate the limited companies to respect exactly the legal procedures and to improve their controlling technology, without jeopardizing the possibilities of continuing the activity. In the situation in which the regulation and control measures are related to the economic effects registered by the entity that applies them, often the consequence is the elimination from the market of the small competitors, a fact that arises the cost of the economic agents' regulation of conduct and diminishes the social prosperity.

If the decisional factor, which brings under regulation a certain activity sector, adopts the moralizing perspective and stresses-particularly to correct his image – the ethical reference points, the economist evaluates the respective norms from a materialist perspective and focuses his efforts to avoid the costs of the exaggerated regulations. Often what determines the institution commissioned with the regulation and control prerogatives of the economic agents' conduct cannot be included in the "ethic of intentions" category, but it is rather a stratagem meant to demonstrate the desire of assuming responsibilities concerning the market. But from an economic point of view, the "good" or "ethical" intentions have no relevance, neither the "moral quality", in itself, of the activities performed by one firm or another, but the good results obtained and the efficiency with which they have been accomplished.

In a first analysis, one could accept the argument that the ethics of result is preferable over ethics of intentions, especially if these have been acquired though incentives, and not under compulsion. The firms, which create for themselves a specific ethos, beginning with the relaxed managerial style, continuing with an self-controlled behavior of the employees and ending with the emphatic treatment applied to the partners, registers a true defalcation of a superior economic reason from which its customers, shareholders and employees derive profit. It is sure that their adherence to a message generated and anchored in the territory of the business' ethics, capable of engendering epidemics of positive behavior, depends on its source's reputation.

Only exceptional men, on an aspect or another, can induce by the social connections maintained by the energy they dispose of, by the knowledge, enthusiasm and by their personality a performed change into the coordinates in which the activity of the limited companies takes place. But this potential hold by some individuals is kept under the heavy flag of the situational determinations, in which if formerly one could encounter scruples' remains, now it reigns the ostentation that emerges from a morality oriented towards the easy, quick and much.

The existence of a firm is nothing but the following a commonplace objective: earning money by delivering products or by providing services. To be lead by such a personal interest means to use a natural resource for the development of the business, because the material interest represents – in the economics – a stronger and more logical factor of intensifying the productive labor than many other motivator elements.

But if one chases with obstinacy only the mentioned objective, that stops to be so attractive after a time, the incomings of any firm diminish, because the company offers products or services but trust. Or, if a company cannot

offer sufficient trust, cannot bring the production and sales volume to a scale economy. So, the economic agent, which does not fulfill, through his decisions, his partners' expectations towards him, he might get some financial benefits for a time. But then all these diminish to disappearance as his trust and moral behavior will diminish, too. And in this aspect of the microeconomics' activity does not matter the technology used, because also the computers might be programmed to act immorally too, and, in antithesis, we may affirm that their utilizaton does not guarantee the adopting of an adequate economical behavior.

The firms are more often considerated, by their owners, a way of sustenance, a guarantor of the financial independence, a symbol of wealth and of social condition. Yet today it is highly necessary that firms be also an economical and moral entity, because the terms of competition, also the terms of the company buoyancy, have significantly modified. Because of the prevalence of the demand over the supply and because of the complex relationship between the producers and the consumers, the utility of the product itself cannot assure the market success of the product, no matter how high this utility might be. The conditions of the success are: the brand of the product, the manner of its presentation, its sale and the guarantee of its functionality. All these conditions bring the consumer's trust, necessary to choose a particular product in spite of another one, so that somebody who does not have a moral behavior will be rejected by the clients, no matter what else he might offer them.

In a previous period of time it might be said that the frontiers between the economical and the ethical performance were and had to be unequivocal and, in consequence, the concerns in morality took place outside the sphere of business logic and of economy. Nowadays, to assert the necessity of morality in business is not a proof of an Utopian spirit, and to militate for it does not equalize with dedicating oneself to any pompous but no useful projects. On the contrary, if we evaluate how much the economic activity influences peoples' way of life in general, we can formulate a situation of choice with an equivocal answer: the ethical notions should be used only in subtle judgments, and in this case these notions become moral toys, or they should be considered instruments, utilizable in decisions concerning organization of economic agents' activity.

It is for sure that it is a gain for all the economic agents and also consumers if, in the managers' minds, moral finds its place. Only this way they may have an adequate, modern and innovating behavior. Although their technical and economic facts are the same, after we reconsider their principles in the relationship with the suppliers, the customers and their employees, the managers have a more accentuated receptivity to the needs and the objectives of their party and their desire to accumulate wealth and power on the market doesn't remain a purpose in itself. This way, this natural desire, common to "homo oeconomicus" from everywhere, and – frankly speaking – necessary to economical and social progress, is manifested less aggressively and in a more attenuated way.

In a responsible management of a business at a macroeconomic level, it is more than foolishness the ignoring of competitives' manifestations, no matter of what kind these might be. As it is not benefic neither the acceptance of some of competitors' moral poverty nor the disgust towards their moral weaknesses to rule, overwhelming the correlated decision-makers' economic judgment. Yet, it is highly necessary that they refer their decisions primarily to the well-known criteria of economical efficiency, without overlooking the necessity of respecting the ethical imperatives in their facts. Or, we may also say that ethical procedures – like commendable intentions, precisely respecting the promises and the politeness in business – are indispensable, but not sufficient, components of the commercial transactions. These have to be appreciated as they draw after them the foreseen economical results.

As we all know, the social behavior does not become spontaneously civilized, but after joint educational and coercitive actions. It happens the same in business, because the business behavior does not become ethical in an independent way and it does not become manifest with sufficient poignancy. The economical market system is far to be ethical in its kind and it has no capacity of self-adjustment on this plan. To become ethical, it has to attach to the idea of material earnings (idea followed by all the economic agents) a constant reglementation effort in order to create favorable conditions to a compulsory manifestation of some moral behaviors and interactions, also in order to settle the limits of tolerating the deviations from the moral laws and principles, locally, nationally or universally valid. These kinds of limits are necessary especially for the nations with organic vocation for tolerance.

Nowadays, when more and more economical resources are hard to be obtained, when the competition is harsh and it is hard to survive, imposing some moral coordinates in the economical activity is a burden to supply and also to maintain the propensities to a rational development of the managed entities.

Institutionalizing some elements of ethics in business has exceeded the theoretical desideratum after the countries, members of OECD, approved the principles of corporations' management. After the International Organization of the National Securities Commission had accepted these principles, some of them became rules,

pretending to be taken into consideration by the firms with shares dealt on the market. But the regulations of the White Charter, of the Corporate Management offers incentives only for accomplishment of the firm and its shareholders' goals, and the regulations of the National Securities Commission impose protection standards only to those who invest in securities and regulations for that dealings on the market be fair. Or, even if we apply in everything all the five crucial constituent parts of the Corporate Governance, we cannot talk about a satisfactory penetration of ethics in business. These elements were meant to assure only the integrity, the functionality and into the activity of these firms.

Applying the demands of the Corporate Governance aims to oblige the firms to "lose weight" in order to "make muscles", because, without "muscles", the foreign investors have no interest in paying less attention – through legislation – to the conditions that permit their access into the firms and in paying more attention to the conditions that permit them to invade the firms.

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Agent-based Computational Economics: A New Border of Economic Research

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Abstract. *Recent advances in analytical and computational tools are permitting new approaches to the quantitative study of economies. One such approach is Agent-based Computational Economics (ACE), the computational study of economic processes modeled as dynamic systems of interacting agents. We explore the methodology, the objectives, the potential advantages and disadvantages of ACE and, finally, we state that the ACE is a frontier of economic research that can determine a true revolution for Economics of 21st century exactly as neoclassical economists put at the end of 19th century the basis of development for economic theory of 20th century.*

Key words: agent-based computational economics; endogenous interactions; decentralized market processes; agent-oriented programming.

Clasificare JEL: B4,C6,C7,D4,D5,D6,D8,L1

1. Introduction

Economists have grappled with the modeling of economic systems for hundreds of years. Nevertheless, the Walrasian equilibrium model devised by the nineteenth-century French economist Leon Walras (1834-1910) still remains the fundamental paradigm that frames the way many economists think about this issue. Competitive models directly adopt the paradigm. Imperfectly competitive models typically adopt the paradigm as a benchmark of coordination success. Although often critiqued for its excessive abstraction and lack of empirical salience, the paradigm has persisted.

As detailed by Katzner (1989) and Takayama (1985), Walrasian equilibrium in modern day form is a precisely formulated set of conditions under which feasible allocations of goods and services can be price-supported in an economic system organized on the basis of decentralized markets with private ownership of productive resources. These conditions postulate the existence of a finite number of price-taking profit-maximizing firms who produce goods and services of known type and quality, a finite number of consumers with exogenously determined preferences who maximize

their utility of consumption taking prices and dividend payments as given, and a Walrasian Auctioneer (or equivalent clearinghouse construct) that determines prices to ensure each market clears.[1] Assuming consumer non satiation, the First Welfare Theorem guarantees that every Walrasian equilibrium allocation is Pareto efficient.

The most salient structural characteristic of Walrasian equilibrium is its strong dependence on the Walrasian Auctioneer pricing mechanism, a coordination device that eliminates the possibility of strategic behavior. All agent interactions are passively mediated through payment systems; face-to-face personal interactions are not permitted. Prices and dividend payments constitute the only links among consumers and firms prior to actual trades. Since consumers take prices and dividend payments as given aspects of their decision problems, outside of their control, their decision problems reduce to simple optimization problems with no perceived dependence on the actions of other agents. A similar observation holds for the decision problems faced by the price-taking firms. The equilibrium values for the linking price and dividend variables are determined by market clearing conditions imposed through the Walrasian Auctioneer pricing mechanism; they are not determined by the actions of consumers, firms, or any other agency supposed to actually reside within the economy.

Walrasian equilibrium is an elegant affirmative answer to a logically posed issue: can efficient allocations be supported through decentralized market prices? It does not address, and was not meant to address, how production, pricing, and trade actually take place in real-world economies through various forms of procurement processes.

What, specifically, is standard meant by "procurement processes" in the business world? As discussed at length by Mackie-Mason and Wellman (2006), customers and suppliers must identify what goods and services they wish to buy and sell, in what volume, and at what prices. Potential trade partners must be identified, offers to buy and sell must be prepared and transmitted, and received offers must be compared and evaluated. Specific trade partners must be selected, possibly with further negotiation to determine contract provisions, and transactions and payment processing must be carried out. Finally, customer and supplier relationships involving longer-term commitments must be managed.

As carefully detailed by Fisher (1983) and Takayama (1985, Chapters 2-3), economists have not been able to find empirically compelling sufficient conditions guaranteeing existence of Walrasian equilibriums, let alone uniqueness, stability, and rapid speed of convergence, even for relatively simple modeling of market economies. For extensions of the Walrasian framework to dynamic open-ended economies, such as overlapping generations economies, multiple equilibriums commonly occur and the Pareto efficiency of these equilibriums is no longer guaranteed.[2] The explicit consideration of procurement processes would therefore appear to be critically important for understanding how numerous market economies have managed in practice to exhibit reasonably coordinated behavior over time. As eloquently expressed by Fisher (1983, p. 16):

"The theory of value is not satisfactory without a description of the adjustment processes that are applicable to the economy and of the way in which individual agents adjust to disequilibrium. In this sense, stability analysis is of far more than merely technical interest. It is the first step in the reformulation of the theory of value."

A natural way to proceed is to examine what happens in a standard Walrasian model if the Walrasian Auctioneer pricing mechanism is removed and if prices and quantities are instead required to be set entirely through the procurement actions of the firms and consumers themselves. Not surprisingly, this "small" perturbation of the Walrasian model turns out to be anything but small. Even a minimalist attempt to complete the resulting model leads to analytical difficulty or even intractability. As elaborated by numerous commentators, the modeler must now come to grips with challenging issues such as asymmetric information, strategic interaction, expectation formation on the basis of limited information, mutual learning, social norms, transaction costs, externalities, market power, predation, collusion, and the possibility of coordination failure (convergence to a Pareto-dominated equilibrium).[3] The prevalence of market protocols, rationing rules, antitrust legislation, and other types of institutions in real-world economies is now better understood as a potentially critical aspect of procurement, the scaffolding needed to ensure orderly economic process.

Over time, increasingly sophisticated tools are permitting economic modelers to incorporate procurement processes in increasingly compelling ways. Some of these tools involve advances in logical deduction and some involve advances in computational power.[4]

This paper is meant to be an introductory discussion of a potentially fruitful computational development, Agent-based Computational Economics (ACE). Exploiting the growing capabilities of computers, ACE is the computational study of economic processes modeled as dynamic systems of interacting agents. Here

"agent" refers broadly to bundled data and behavioral methods representing an entity constituting part of a computationally constructed world. Examples of possible agents include individuals (e.g., consumers, workers), social groupings (e.g., families, firms, government agencies), institutions (e.g., markets, regulatory systems), biological entities (e.g., crops, livestock, forests), and physical entities (e.g., infrastructure, weather, and geographical regions). Thus, agents can range from active data-gathering decision-makers with sophisticated learning capabilities to passive world features with no cognitive functioning. Moreover, agents can be composed of other agents, thus permitting hierarchical constructions. For example, a firm might be composed of workers and managers.

2. The methodology of ACE research

A system is typically defined to be complex if it exhibits the following two properties (Flake, 1998):

- The system is composed of interacting units;
- The system exhibits emergent properties, that is, properties arising from the interactions of the units that are not properties of the individual units themselves.

Agreement on the definition of a complex adaptive system has proved to be more difficult to achieve. The range of possible definitions offered by commentators includes the following three nested characterizations:

Definition 1: A complex adaptive system is a complex system that includes reactive units, i.e., units capable of exhibiting systematically different attributes in reaction to changed environmental conditions.[5]

Definition 2: A complex adaptive system is a complex system that includes goal-directed units, i.e., units that are reactive and that direct at least some of their reactions towards the achievement of built-in (or evolved) goals.

Definition 3: A complex adaptive system is a complex system that includes planner units, i.e., units that are goal-directed and that attempt to exert some degree of control over their environment to facilitate achievement of these goals.

The ACE methodology is a culture-dish approach to the study of economic systems viewed as complex adaptive systems in the sense of Definition 1, at a minimum, and often in the stronger sense of Definition 2 or Definition 3. As in a culture-dish laboratory experiment, the ACE modeler starts by computationally constructing an economic world comprising multiple interacting agents (units). The modeler then steps back to observe the development of the world over time.

The agents in an ACE model can include economic entities as well as social, biological, and physical entities (e.g., families, crops, and weather). Each agent is an encapsulated piece of software that includes data together with behavioral methods that act on these data. Some of these data and methods are designated as publicly accessible to all other agents, some are designated as private and hence not accessible by any other agents, and some are designated as protected from access by all but a specified sub set of other agents. Agents can communicate with each other through their public and protected methods.

The ACE modeler specifies the initial state of an economic system by specifying each agent's initial data and behavioral methods and the degree of accessibility of these data and methods to other agents. An agent's methods can include socially instituted behavioral methods (e.g., antitrust laws, market protocols) as well as private behavioral methods. Examples of the latter include production and pricing strategies, learning algorithms for updating strategies, and methods for changing methods (e.g., methods for switching from one learning algorithm to another). The resulting ACE model must be dynamically complete. This means the modeled economic system must be able to develop over time solely on the basis of agent interactions, without further interventions from the modeler.

In the real world, all calculations have real cost consequences because they must be carried out by some agency actually residing in the world. ACE modeling forces the modeler to respect this constraint. An ACE model is essentially a collection of algorithms (procedures) that have been encapsulated into the methods of software entities called "agents." Algorithms encapsulated into the methods of a particular agent can only be implemented using the particular information, reasoning tools, time, and physical resources available to that agent. This encapsulation into agents is done in an attempt to achieve a more transparent and realistic representation of real-world systems involving multiple distributed entities with limited information and computational capabilities.

3. The objectives of ACE research

Current ACE research divides roughly into four strands differentiated by objective. One primary objective is empirical understanding: why have particular global regularities evolved and persisted, despite the absence of centralized planning and control? ACE researchers pursuing this objective seek causal explanations

grounded in the repeated interactions of agents operating in realistically rendered worlds. Ideally, the agents should have the same flexibility of action in their worlds as their corresponding entities have in the real world. In particular, the cognitive agents should be free to behave in accordance with their own beliefs, preferences, institutions, and physical circumstances without the external imposition of equilibrium conditions. The key issue is whether particular types of observed global regularities can be reliably generated from particular types of agent-based worlds, what Epstein and Axtell (1996) refer to as the "generative" approach to science.

A second primary objective is normative understanding: how can agent-based models be used as laboratories for the discovery of good economic designs? ACE researchers pursuing this objective are interested in evaluating whether designs proposed for economic policies, institutions, and processes will result in socially desirable system performance over time. The general approach is akin to filling a bucket with water to determine if it leaks. An agent-based world is a construction that captures the salient aspects of an economic system operating under the design. The world is then populated with privately motivated agents with learning capabilities and allowed to develop over time. The key issue is the extent to which the resulting world outcomes are efficient, fair, and orderly, despite attempts by agents to gain individual advantage through strategic behavior.

A third primary objective is qualitative insight and theory generation: how can economic systems be more fully understood through a systematic examination of their potential dynamical behaviors under alternatively specified initial conditions? Such understanding would help to clarify not only why certain global outcomes have regularly been observed but also why others have not. A quintessential example is the old but still unresolved concern of economists such as Smith (1937), Schumpeter (1934), and Hayek (1948): what are the self-organizing capabilities of decentralized market economies? For the latter issue, the typical approach is to construct an agent-based world that captures key aspects of decentralized market economies (circular flow, limited information, strategic pricing,...), introduce privately motivated traders with learning capabilities, and let the world develop over time. The key concern is the extent to which coordination of trade activities emerges and persists as the traders collectively learn how to make their production and pricing decisions.

A fourth primary objective is methodological advancement : how best to provide ACE researchers with the methods and tools they need to undertake the rigorous study of economic systems through controlled computational experiments? To produce compelling analyses, ACE researchers need to model the salient structural, institutional, and behavioral characteristics of economic systems. They need to formulate interesting theoretical propositions about their models, evaluate the logical validity of these propositions by means of carefully crafted experimental designs, and condense and report information from their experiments in a clear and compelling manner. Finally, they need to test their experimentally-generated theories against real-world data. ACE researchers are exploring a variety of ways to meet these requirements ranging from careful consideration of methodological principles to the practical development of programming, visualization, and validation tools.[6]

4. Advantages and disadvantages of ACE research

ACE can be applied to a broad spectrum of economic systems ranging from micro to macro in scope. This application has both advantages and disadvantages relative to more standard modeling approaches.

On the plus side, as in industrial organization theory (Tirole, 2003), agents in ACE models can be represented as interactive goal-directed entities, strategically aware of both competitive and cooperative possibilities with other agents. As in the extensive-form market game work of researchers such as Albin and Foley (1992), Rubinstein and Wolinsky (1990), and Shubik (1991, Chapter 15), market protocols and other institutions constraining agent interactions can constitute important explicit aspects of the modeled economic processes. As in the behavioral game theory work of researchers such as Camerer (2003), agents can learn, i.e., change their behavior based on previous experience; and this learning can be calibrated to what actual people are observed to do in real-world or controlled laboratory settings. Moreover, as in work by Gintis (2000) that blends aspects of evolutionary game theory with cultural evolution, the beliefs, preferences, behaviors, and interaction patterns of the agents can vary endogenously over time.

One key departure of ACE modeling from more standard approaches is that events are driven solely by agent interactions once initial conditions have been specified. Thus, rather than focusing on the equilibrium states of a system, the idea is to watch and see if some form of equilibrium develops over time. The objective is to acquire a better understanding of a system's entire phase portrait, i.e., all possible equilibria together with

corresponding basins of attraction. An advantage of this focus on process rather than on equilibrium is that modeling can proceed even if equilibria are computationally intractable or non-existent.

A second key departure presenting a potential advantage is the increased facility provided by agent-based tools for agents to engage in flexible social communication. This means that agents can communicate with other agents at event-driven times using messages that they, themselves, have adaptively scripted.

However, it is frequently claimed that the most important advantage of ACE modeling relative to more standard modeling approaches is that agent-based tools facilitate the design of agents with relatively more autonomy; see Jennings (2000). Autonomy, for humans, means a capacity for self-governance. What does it mean for computational agents? Here is how an "autonomous agent" is defined by a leading expert in artificial intelligence, Stan Franklin (1997a):

"An autonomous agent is a system situated within and part of an environment that senses that environment and acts on it, over time, in pursuit of its own agenda and so as to effect what it senses in the future."

Clearly the standard neoclassical budget-constrained consumer who selects a sequence of purchases to maximize her expected lifetime utility could be said to satisfy this definition in some sense. Consequently, the important issue is not whether agent-based tools permit the modeling of agents with autonomy, per se, but rather the degree to which they usefully facilitate the modeling of agents exhibiting substantially more autonomy than permitted by standard modeling approaches.

What degree of agent autonomy, then, do agent-based tools permit? In any purely mathematical model, including any ACE model in which agents do not have access to "true" random numbers, the actions of an agent are ultimately determined by the conditions of the agent's world at the time of the agent's conception. A fundamental issue, dubbed the First AI Debate by Franklin (1997b, Chapter 5), is whether or not the same holds true for humans. In particular, is Penrose (1989) correct when he eloquently argues there is something fundamentally non-computational about human thought, something that intrinsically prevents the algorithmic representation of human cognitive and social behaviors?

Lacking a definitive answer to this question, ACE researchers argue more pragmatically that agent-based tools facilitate the modeling of cognitive agents with more realistic social and learning capabilities (hence more autonomy) than one finds in traditional Homo economicus. These capabilities include: social communication skills; the ability to learn about one's environment from various sources, such as gathered information, past experiences, social mimicry, and deliberate experimentation with new ideas; the ability to form and maintain social interaction patterns (e.g., trade networks); the ability to develop shared perceptions (e.g., commonly accepted market protocols); the ability to alter beliefs and preferences as an outcome of learning; and the ability to exert at least some local control over the timing and type of actions taken within the world in an attempt to satisfy built in (or evolved) needs, drives, and goals. A potentially important aspect of all of these modeled capabilities is that they can be based in part on the private internal methods of an agent, i.e., internal processes that are hidden from the view of all other entities residing in the agent's world. This effectively renders an agent both unpredictable and uncontrollable relative to its world.

In addition, an agent can introduce structural changes in its methods over time on the basis of experience. For example, it can have a method for systematically introducing structural changes in its current learning method so that it learns to learn over time. Thus, agents can socially construct distinct persistent personalities.

Agent-based tools also facilitate the modeling of social and biological aspects of economic systems thought to be important for autonomous behavior. For example, agents can be represented as embodied (e.g., sighted) entities with the ability to move from place to place in general spatial landscapes. Agents can also be endowed with "genomes" permitting the study of economic systems with genetically-based reproduction and with evolution of biological populations. For extensive discussion and illustration of agent-based models incorporating such features, see Belew and Mitchell (1996), Epstein and Axtell (1996), and Holland (1995).

What are the disadvantages of ACE relative to more standard modeling approaches? One drawback is that ACE modeling requires the construction of dynamically complete economic models. That is, starting from initial conditions, the model must permit and fully support the playing out of agent interactions over time without further intervention from the modeler. This completeness requires detailed initial specifications for agent data and methods determining structural attributes, institutional arrangements, and behavioral dispositions. If agent interactions induce sufficiently strong positive feedbacks, small changes in these initial specifications could radically affect the types of outcomes that result. Consequently, intensive experimentation must often be conducted over a wide array of plausible initial

specifications for ACE models if robust prediction is to be achieved.[7] Moreover, it is not clear how well ACE models will be able to scale up to provide empirically and practically useful models of large-scale systems with many thousands of agents.

Another drawback is the difficulty of validating ACE model outcomes against empirical data. ACE experiments generate outcome distributions for theoretical economic systems with explicitly articulated micro-foundations. Often these outcome distributions have a multi-peaked form suggesting multiple equilibria rather than a central-tendency form permitting simple point predictions. In contrast, the real world is a single time-series realization arising from a poorly understood data generating process. Even if an ACE model were to accurately embody this real-world data generating process, it might be impossible to verify this accuracy using standard statistical procedures. For example, an empirically observed outcome might be a low-probability event lying in a relatively small peak of the outcome distribution for this true data-generating process, or in a thin tail of this distribution.

5. Conclusions

The defining characteristic of ACE models is their constructive grounding in the interactions of agents, broadly defined to include economic, social, biological, and physical entities. The state of a modeled system at each point in time is given by the internal data and methods of the agents that currently constitute the system. Starting from an initially specified system state, the motion of the state through time is determined by endogenously generated agent interactions.

This agent-based dynamical description, cast at a less abstract level than standard equation-based economic models, increases the transparency and clarity of the modeling process. A researcher can proceed directly from empirical observations on the structural conditions, institutional arrangements, and behavioral dispositions of a real-world economic system to a computational modeling of the system. Moreover, the emphasis on process rather than on equilibrium solution techniques helps to ensure that empirical understanding and creative conjecture remain the primary prerequisites for useful model design.

That said, ACE modeling is surely a complement, not a substitute, for analytical and statistical modeling approaches. As seen in the work by Sargent (1993), ACE models can be used to evaluate economic theories developed using these more standard tools. Can agents indeed learn to coordinate on the types of equilibria identified in these theories and, if so, how? If there are multiple possible equilibria, which equilibrium (if any) will turn out to be the dominant attractor, and why? ACE models can also be used to evaluate the robustness of these theories to relaxations of their assumptions, such as common knowledge, rational expectations, and perfect capital markets. A key question in this regard is the extent to which learning, institutions, and evolutionary forces might substitute for the high degree of individual rationality assumed in standard economic theories.

More generally, the use of ACE models could facilitate the development and experimental evaluation of integrated theories that build on theory and data from many different fields of social science. With ACE tools, economists can address growth, distribution, and welfare issues in a comprehensive manner encompassing a wide range of pertinent economic, social, political, and psychological factors. It is particularly intriguing to reexamine the broadly envisioned theories of earlier economists such as Adam Smith (1937), Joseph Schumpeter (1934), John Maynard Keynes (1965), and Friedrich von Hayek (1948), and to consider how these theories might now be more fully addressed in quantitative terms.

Another potentially important aspect of the ACE methodology is pedagogical. ACE models can be implemented by computational laboratories that facilitate and encourage the systematic experimental exploration of complex economic processes. Students can formulate experimental designs to investigate interesting propositions of their own devising, with immediate feedback and with no original programming required. This permits teachers and students to take an inductive open-ended approach to learning. Exercises can be assigned for which outcomes are not known in advance, giving students an exciting introduction to creative research. The modular form of the underlying computational laboratory software also permits students with programming backgrounds to modify and extend the laboratory features with relative ease.

A number of requirements must be met, however, if the potential of ACE for scientific research is to be realized. ACE researchers need to focus on issues of importance for understanding economic systems. They need to construct models that capture the salient aspects of these issues, and to use these models to formulate clearly articulated theories regarding possible issue resolutions. They need to evaluate these theories systematically by means of multiple controlled experiments with captured seed values to ensure

replicability by other researchers using possibly other platforms, and to report summaries of their theoretical findings in a transparent and rigorous form. Finally, they need to test their theoretical findings against real-world data in ways that permit empirically supported theories to cumulate over time, with each researcher's work building appropriately on the work that has gone before.

Meeting all of these requirements is not an easy task. One possible way to facilitate the task is interdisciplinary collaboration. Recent efforts to advance collaborative research have been encouraging. For example, Barreteau (2003) reports favorably on efforts to promote a companion modeling approach to critical policy issues such as management of renewable resources. The companion modeling approach is an iterative participatory process involving stakeholders, regulatory agencies, and researchers from multiple disciplines in a repeated looping through a three-stage cycle: field work and data analysis, model design, and computational experiments. Agent-based modeling and role-playing games constitute important aspects of this process. The objective is the management of complex problems through a continuous learning process rather than the delivery of definitive problem solutions.

Realistically, however, communication across disciplinary lines can be difficult, particularly if the individuals attempting the collaboration have little or no cross-disciplinary training. Economists and other social scientists interested in agent-based modeling should therefore ideally acquire basic programming, statistical, and mathematical skills together with suitable training in their desired application areas. Of these requirements, programming skills remain by far the most problematic for economists because few graduate economic programs currently have computer programming requirements.

Finally, we can state that the ACE is a frontier of economic research that can determine a true revolution for Economics of 21st century exactly as neoclassical economists put at the end of 19th century the basis of development for economic theory of 20th century.

Notes

(1) The colorful term"Walrasian Auctioneer" was first introduced by Leijonhufvud (1967).

(2) See, for example, Pingle and Tesfatsion (1991,1998a,b).

(3) See, for example, Akerlof (2002), Albin and Foley (1992), Arrow (1987), Bowles and Gintis (2000), Colander (1996), Feiwel (1985), Hoover (1992), Howitt (1990), Kirman (1997), Klemperer (2002a,b), and Leijonhufvud (1996).

(4) See, for example, Albin (1998), Anderson et al. (1988), Arthur et al. (1997), Axelrod (1997), Brock et al. (1991), Clark (1997), Day and Chen (1993), Durlauf and Young (2001), Gigerenzer and Selten (2001), Gintis (2000), Judd (1998), Krugman (1996), Nelson (1995), Nelson and Winter (1982), Prescott (1996), Roth (2002), Sargent (1993), Schelling (1978), Shubik (1991), Simon (1982), Witt (1993), and Young (1998).

(5) For example, this definition includes simple Darwinian systems for which each unit has a rigidly structured behavioural rule as well as a "fitness" attribute measuring the performance of this unit relative to the average performance of other units in the current unit population. A unit ceases to function if it has sufficiently low fitness; otherwise it reproduces (makes copies of itself) in proportion to its fitness. If the initial unit population exhibits diverse behaviours across units, then the fitness attribute of each unit will change systematically in response to changes in the composition of the unit population.

(6) See, in particular, the contributions by Arthur (2006), Axelrod(2006), Brenner (2006), Dibble (2006), Duffy (2006), Epstein (2006), Howitt (2006), Judd (2006).

(7) This point is discussed at some length by Judd (2006).

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Financial Securities Investments Analysis and Administration of Active Portfolio in Indeterminate Situations

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Abstract. *This article deals the problems of investments in securities. The purpose of this study is risk optimization and determination within a portfolio of risk value criteria when investments in financial titles are made in condition of undetermined situations. At the end, answers merge into questions mark. This provokes for reflection.*

Key words: indeterminate situations; return; risk; asymmetry; attitude towards risk.

1. The investments in securities. The determination of the individual titles and profitability

The investment represents the reason for many surprising actions for the one that owes the capital and is willing to gain. The investment in financial titles has a peculiar feature due to the volatility of the gains on relatively short terms and to the desire of the share holders to maximize their fortune.

The profitability of an action is given by the currency variation during its possession and by the distributed dividend so the share owners will be directly interested in its evolution and in the profit repartition for the dividends as it has to ensure a balance between their own resources used for development and the ones used for the remuneration of the capital possessions.

There was an old interest towards the concept of risk and the forms it can take. To present the risk as a common event would be a flagrant approach mistake. The existence of risk induces a series of internal manifestations, specific for the human subject psychology. If we wanted to characterize a situation, we would definitely make an appeal to the notion of risk.

B. Jaquillat and B. Solnik in „Les marchés financières et la gestion du portefeuille" define risk as follows:

- the sacrifice of an immediate advantage or absence of an immediate consumption in exchange for future advantages;
- the loss of a certain and immediate advantage related to a real good or a service consumption for a future and uncertain advantage, by investing in movable values;
- the incertitude regarding the value of a financial good that will be registered at a future date.

The behavior of the human subject toward risk occurrence is surprising. The reactions can be most of the time contradictory.

We were always trying to establish means of protection, of covering the risk. Why? Because many of us direct our actions towards the future, where the presence of risk is certain.

The subject's human profile influence his decisions of assuming the risk. The complex human nature is full of

contradictions and reactions many times impossible to understand. Maybe, that is why the science assigned the title of rational behavior for the participants to the economic and social life. Is there an irrational behavior as well? Of course there is, but the determining factors are divers: education, culture, religion, and environment are only a few of them.

Maybe the most beautiful description of risk can be found in the syntagm „The one who does not risk risks the most".

2. CAPM unifactorial model of investment in risky financial assets and the assets without risk

This model aims at optimizing the decision of investment in financial titles. The study of investment in financial assets shows that the analysis of the titles portfolio is realized using the Markowitz model that allows, after correlating two by two all the existing assets in portfolio, the determination of the portfolio with an absolute minimal variation. Markowitz's model allows us also to determine the efficiency frontier, which groups the portfolios which represents the best profitability for a certain risk.

Although slow and requiring a very large amount of information, this is the first method which allows the financial analysis of the titles in the portfolio taking into account the existing correlation between them. Thus, this method allows us to realize an optimum portfolio starting with a series of hypothesis like: we realize an investment of all the available funds; the operations short sales are not permitted; the adjusted profitability of the portfolio depending on risk is the objective of the investor. By forbidding the short sales we understand the fact that negative weight of the titles are not permitted in the portfolio, in other words you cannot sell titles you do not owe. To determine the investment opportunities we need to go through the following stages: the portfolio with an absolute minimal variance is determined; the titles weight of the portfolio is determined; the portfolios are classified in legal and illegal; by applying the principle of dominance the frontier of efficiency is determined, meaning that between two portfolios that have the same risk, the portfolio with the highest profitability is chosen, or that between two portfolios that have the same profitability it is chosen the one with the minimum risk. Thus, determining the optimum line of action involves a division of the possible solutions ensemble in two sets that comprise the efficient solutions and the dominant solutions followed by the determination of the efficient solution that maximizes the utility function of the investor and that has as parameters the portfolio profitability and risk.

According to Markwowitz's model for a portfolio formed of two titles, the associated variance can be calculated as follows:

If the profitability of two titles is independent then:

$$Var(R_P) = P_A^2 \text{ x } Var(R_A) + P_B^2 \text{ x } Var(R_B)$$

If the profitability of two titles is independent then:

$$Var(R_P) = P_A^2 \text{ x } Var(R_A) + P_B^2 \text{ x } Var(R_B) + 2P_A \text{ x } P_B \text{ x } Cov(R_A, R_B)$$

with

$$Cov(R_A, R_B) = \sum_{i=1}^{n} P_i[R_{Ai} - E(R_A)][R_{Bi} - E(R_B)].$$

However, the very large amount of necessary information to apply the model, respectively a number of dispersions equal to the number of considered title (n) and a number of covariance equal to n (n-1/2), determined the development of this model and led to the appearance of a simplified model for the portfolio analysis by Sharpe.

This proposes a new method of financial assets evaluation by objective criteria of the financial market; thus he proposes an unifactorial model which assumes that the profitability of any financial title is in a linear relationship with a macroeconomic factor. The amount of necessary information in this model is much lower being equal with 3n+2. This model eliminates the grouping of titles in the portfolio 2 by 2 and offers the possibility of an individual grouping depending on a chosen macroeconomic factor, usually this being identified with the medium profitability of the market. The expected profitability is influenced by two parameters: a position coefficient and a volatility index next to a macroeconomic factor. The title risk consists, according to Sharpe's theory, of two parts, respectively the systematic risk due to the capital market as a whole and explained by the dependence with the macroeconomic factor, and the risk specific for each title which can be removed by diversification.

The simplified equation of the market model without considering the residual influences is:

$$R_T = \beta \times R_M + \alpha$$

Where:

R_M - is the average profitability of the market or the variation of a macroeconomic factor.

β -is the volatility coefficient that quantifies the

relation between the evolution of the individual profitability of the title and the evolution of the average profitability on the market;

$$\beta = \frac{Cov(R_T \times R_M)}{Var(R_M)}$$

α - a coefficient equal to the individual profitability in the hypothetical situation when the profitability average rate on the market is zero.

Starting from the model extended with the residual influences we demonstrate the relation among the total risk, the systematic risk and the specific risk.

$$R_T = \beta \times R_M + \alpha + \varepsilon$$

$$\text{Var}(R_T) = \beta^2 Var(R_M) + Var(\varepsilon)$$

$$\sigma^2(R_T) = \beta^2 \times \sigma^2(R_M) + \sigma^2(\varepsilon)$$

$\sigma^2(R_T)$ = Total Risk

$\beta^2 \times \sigma^2(R_M)$ = Systematic Risk

$\sigma^2(\varepsilon)$ = Specific Risk.

This model, also known under the name of diagonal model, gave the possibility for a consequent development of the CAPM model, which sets the existence of the possibility for an investment on the capital market with assets having zero risk and a characteristic profitability, usually the bonds issued by the state. These models approach the issue of the portfolio, wishing to determine both the optimal proportion of the titles and the influence of a macroeconomic factor, considered on their level of profitability and risk. CAPM originated in the examination of the investors' behavior in a hypothetical model of economy, where they are operating only for a period. Actually, the investors operate for several periods, and that is why in the empiric examination of the CAPM using data from the capital markets it is necessary to make certain hypothesis with a presumption character. One of the basic hypothesis is that beta remains constant in time. This is not a reasonably enough measure, because the relative risk of the cash-flows is little possible to remain constant in time, without variations.

For the first time, the CAPM model was presented in its classical version by Sharpe (1964), followed by Lintner's comments (1965) and Mossin (1966, 1973).

The CAPM hypothesis:

The first fundamental hypothesis is now that the investors are concerned with the hoped profitability, closely connected with the risk associated to this.

Secondly, there is a set of traditional hypothesis related to the perfection of the capital market:

- there are no transition costs and assets which are not perfectly dividable;
- dividends are not taxed and plus values;
- lots of purchasers and vendors arise on the market, and non of them can influence the prices;
- All the investors can get loans at the rate of the interest without risk;
- All the investors can find any necessary information for a correct evaluation of the assets without charge;
- The period of the investment is the same for all the investors, the decisions for the investments are taken at the same time;
- All the investors have the same expectations about the future performances of the titles. This means that they agree with the hoped profitability, the dispersions and the associated co-variations. This hypothesis is known under the name of „idealistic certitude" hypothesis.

By introducing the asset without risk within the portfolio, several new elements are introduced:

- the rate of the interest without risk (Rf)
- the risk bonus, which is made up of two components:

a) the systematic risk $\left(\frac{E_M - R_f}{\sigma_M}\right)$

b) the specific risk (ε_i).

The CAPM model has the indisputable merit of identifying the two components of the normal profitability of all risky title.

For various portfolios: CML (capital market line)

$$E_p = R_f + \frac{E_M - R_f}{\sigma_M} \times \sigma_p$$

E_p – the profitability hope of the portfolio.

For individual titles: SML (security market line)

$$E_i = R_f + (E_M - R_f) \times \beta_i$$

E_i – the profitability hope of the a „i" title.

3. Optimizing the risk determination within a portfolio–risk value criterion

We can consider that the risk value is estimation for an interval of trust given to as much as we can sell of our portfolio for a given period.

To determine this value we need the following data: the present prices of all the assets in the portfolio, their volatility, as well as the correlation among them.

If within a portfolio we know the volatilities for all the assets in our portfolio and the correlation coefficient among them, we can calculate the risk value for the entire portfolio.

If the volatility of the „i" asset is σ_i and the correlation coefficient of the i asset with article j is ρ_{ij}, then the risk value of a portfolio made up of n assets owing Δ_i of the i asset is:

$$-\alpha(1-c)\delta_t^{\frac{1}{2}}\sqrt{\sum_{j=1}^{n}\sum_{i=1}^{n}\Delta_i\Delta_j\sigma_i\sigma_j\rho_{ij}}\ .$$

The risk value can also be used to measure the performances of a portfolio starting with the relation:

$$\frac{\text{The daily profit or loss}}{\text{The daily risk value}}\ .$$

4. Choosing investments in financial titles for undetermined situations

In such cases it is impossible to appreciate the probability of realizing an event, and that is why we shall classify the events in two categories, favorable and unfavorable events. The investor has subjective criteria, and in this case his attitude towards risk is relevant.

The attitude of the human subjects towards risk divides them in two categories:

- pro-risk;
- against risk.

The pro risk type is the one who assumes a risk in exchange for remuneration according to the assumed risk.

The against risk type is the one who tries to diminish his risk all the time.

Minimizing the risk represents one of the fundamental purposes of the assets portfolio management and allows an optimization of the capital holdings according to the attitude of the investor towards risk. Therefore the utility function was defined as a function expressing the relative interest of an investor for the different levels of enrichment. The absolute level of the utility is a totally abstract measure.

Von Neuman-Morgenstern's comment

Von Neuman-Morgenstern calculates the first derivate of the expected utility in uncertainty conditions. They assumed that, generally, the investors choose lotteries, where lottery means a variable with specific possible incomes associated with probabilities.

This approach was criticized because it starts from the assumption that the agents know (used in the sense that they guess) the probabilities to realize the incomes. Therefore we are in the presence of a game of chance where there are probable objectives that can be assumed. The probabilities are known and have an objective character.

The critic aims at the fact that we can not specify the probability of the distributions because the investors cannot characterize the choices like a lottery.

Savage's comment

Savage states on the expected utility that it takes the form of a choice, having mostly the characteristic of a probable state than that of a lottery. Unlike von Neuman-Morgenstern, for Savage the probabilities are obtained, rather than data with a strong subjective character.

What is specific for Savage's approach is the idea according to which if the agents' preferences regarding a future probable state are dominated by some axioms, then they have a representation of the expected utility according to their convictions.

Savage's approach, starting with this situation, is actually immune to the objections which stipulated the fact that the investors do not know the probabilities.
Savage states that if the agents are able to choose then they behave as if they had already known the probabilities, which are actually subjective and differentiated.

Friedman and Savage's comment

Friedman and Savage emphasized the relation between the investors' behavior towards risk and the mathematic symbol for the second derivate of the utility function.

The utility function for an investor who dislikes risk has a down oriented concavity. The second derivate for this utility function is negative.

$$\frac{d^2u(w)}{dw} < 0$$

In other words, the marginal utility of an investor's richness who dislikes risk decreases according to the increase of the respective investor's income.

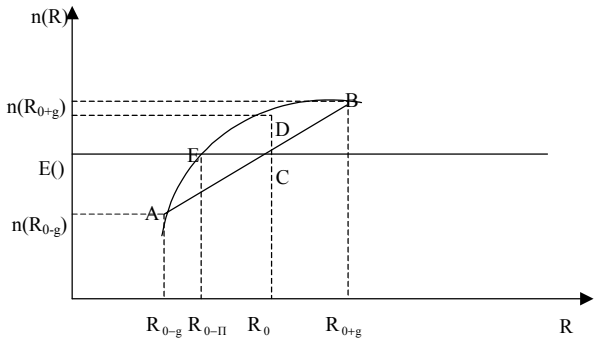

Figure 1. *The utility function for an investor who dislikes risk*

In the diagram we have:

R_0 – the investor's initial richness

g – the investor's probable gain

$R_{0-\Pi}$ – the moment when the investor's hoped utility equals the hoped utility of the lottery.

For an investor who likes the risk, the utility function has an up oriented concavity. The second derivate for this utility function is positive.

The marginal utility of the investor's richness who likes the risk is increasing, this investor giving an extra utility to each unit gained when he is richer.

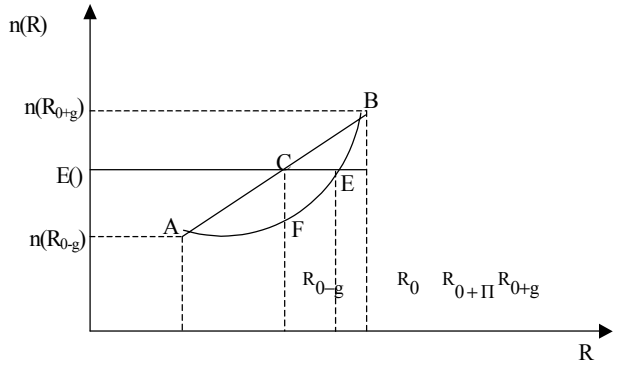

Figure 2. *The utility function for an investor who likes risk*

Therefore it is obvious that the investment analysis made by the capital owner will consider both the economic-financial situation of the economic organization where he wants to invest and his attitude towards risk, in other words the features of his own utility function.

To evaluate investments we use a series of criteria arisen especially from the subjects' attitude towards risk. These criteria are:

- *Laplace's criterion*, which considers that possible states have the same occurrence probability and who uses the arithmetic average as a calculus instrument of the possible results. We shall choose the decision that maximizes the arithmetic average.
- *Wald's criterion (minimax).* This criterion encourages a cautious attitude towards risk, choosing a minimization of the maximal losses previewed as the right decision.
- *Maximax criterion.* This criterion encourages an expansive attitude towards risk, choosing the decision that maximizes the gain by comparing the biggest values.
- *Hurwicz's criterion* starts from the necessity of associating some probabilities of realizing the optimist and the pessimist scenario in such a way as to result a sure event.
- *Savage's criterion,* which recommends the determination of the "regret" that corresponds to the difference between the most favorable case and the particular case.
- *Choosing the criteria* consists of comparing all the other criteria and choosing the decision that appears selected most of the times.

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Fiscal Federalism

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Abstract. *The central budget of a country collects only a fraction of the total fiscal revenues and executes only o fraction of the national public expenditures, the rest of the revenues and expenditures becoming the responsability of subnational governments. The economist Charles Tiebout developed a theoretical model which although makes an imperfect description of the reality, shows that people's mobility is being influenced by tax rates and the amount of state/local expenditures. Thus, he suggests that the degree of responsibility that can be appointed to the local budgets should subscribe to the tax – benefits ratio, the extend of the positive externalities and the scale economies of public goods. Also, the issue of revenues distribution among communities is being raised, being identified three kinds of grants used by the public authorities: matching grants, block grants and conditional block grants. In the concept of fiscal federalism there can be found a limited analogy between national public finance theory and international public finance theory, with the international taxation as the pivotal element.*

Key words: optimal fiscal federalism; the Tiebout Model; intergovernmental grants; international taxation.

Fiscal federalism *describes a system of taxes, on one side, and public expenditures, on the other side, where the responsabilities of collecting the revenues and of the expenditures is divided between different levels of government.*

1. Fiscal federalism at national level

At country states level, there are different levels of government, starting from the national ones to the smallest local units of government. We have, for example, *the national level* (or federal, for the federal states) and *local level,* depending on the size of a country and its political and administrative structure.

According to this system of organization, national governments assist subnational governments to the equitable and harmonious distribution of public goods and the fiscal burden, and also to the regulation and control of externalities.

A very important feature of public finance is *the optimal fiscal federalism*, where the question of what kind of activities should be performed at federal level and which ones at state/local level is being raised. It is more convenient that some services are the responsability of state and local authorities, because it ensures a better connection of the real needs to the offered services, leading in the end to increasing the efficiency of providing public goods and services. On the other hand, it is not wrong to assert that in some circumstances fiscal federalism may not serve the best national interest. The disadvantages are displayed by the possibility of emerging problems regarding the reaching to the final beneficiary of some key public

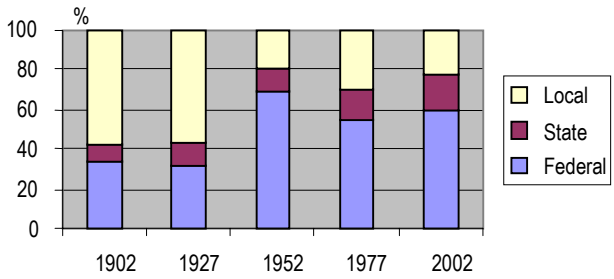
services. In the end, the great challenge is represented by the development of a transparent funding system for the subnational administrations.

1.1. Fiscal federalism in The United States of America

From the historical point of view, the federal government of The United States of America played a relatively limited role in many aspects of the economical and social live. As it can be observed from the below figure, in 1902 the federal government represented only 34% of the total governmental expenditures (federal, state and local), while to the local and state governments were appointed 58% and 8%, respectively. *The federal government* was restricted to expenditures for *national defence, external relationships, postal services. State and local governments* were held responsabile for *education, police, public roads, social security, medical care, hospitals,* etc. Different levels of government were operating in their area of action, and rarely interfering with one another. The expenditures of state and local administrations were mainly financed from their own resurces. Less than 1% of their revenues came from budgetary grants.

The situation changed dramatically in the next 50 years. In 1953, the federal government represented 69% of the total expenditures and the local and state governments 20% and 11%, respectively. Moreover, 10% of the state and local authorities' revenues came from grants. This shift was due to three *factors.* First of all, in 1913 it was permitted to the federal government *to tax individual's income,* which was forbidden until then by the Constitution. Secondly, in 1930 were launched several *programs as a response to the Great Depression of 1929-1933.* There were initiated several projects that simply changed the relationship between the different levels of government. Budgetary grants increased exponentially and many projects, as the motorway project, were financed by the federal government, but were locally administrated. And not least, the government introduced *programs of assistance and social security,* of which the most important *The Social Security Program for Helping Elderly People and The Budgetary Grants System, which aim was to encourage each state to provide social assistance to elderly, blind people or with other disabilities.*

The fraction of public expenditures, at federal, state and local level, in all the public expenditures, remained relatively constant in the last 50 years. Financing at federal level increased, especially due to the introduction in 1960 of several social programs, that were financially suported both by federal and state governments. Today, federal budgetary grants account for approximately 20% of the revenues of the local and state authorities, each.



Source: Gruber, (2005), "*Public Finance and Public Policy",* figure 10-1, p. 249.

Figure 1. *The shift of fiscal federalism (% of total governmental expenditures)*

The revenue sources and the categories of expenditures for the state and local administrations vary very mucy from the ones of the federal administration.

- For the expenditures, at *state and local* level, the largest expenditures are the ones with *education,* followed by *medical care and citizens' safty.* On the other hand, the largest *federal* spendings are with *medical care, social security and national defence.* The federal government role in financing education is very small.
- For the revenues, *the states* collect for their budget only 17% of their revenues from income tax, while this category is the main revenue source for the *federal* adminstration. An important revenue source at *local* level is represented by *the property tax,* levied on land and bildings.

1.2. Fiscal federalism in countries all over the world

Compared with other developed countries, subnational governments of the USA collect revenues in a greater proportion and also spend o greater fraction of the total budgetary expenditures than other countries. A recent study conducted by the member states of the OECD (Gruber, 2005, p. 250), shortly presented in the adjacent table, shows that the average of the *revenues* collected at the subnational budgets, in the year 2001, was 22% of the total budgetary resources. As for the expenditures, the differences are less obvious, with an average of expenditures of the subnationale budgets for OECD of 32%, compared with 40% in the United States.

Expenditures/revenues of the state/local governments in total expenditures/revenues (2001)

Table 1

	Expenditures (%)	Revenues (%)
Greece	5	3.7
Portugal	12.8	8.3
France	18.6	13.1
Norway	38.8	20.3
United States	40	40.4
Danmark	57.8	34.6
OECD average	32.2	21.9

Source: Gruber, Jonathan, (2005). "*Public Finance and Public Policy",* table 10-1, p. 250.

A high level of centralization is recorded in many countries, for example in Mexic, Austria, Norway, first of all because local authorities do not have the legal rights to levy taxes on citizens, this rights being designated to the central authority.

In Romania, fiscal federalism took place at the begining of the 1990s, but, in fact, begun to function starting with 1998, along with the new Local Public Finance Law. This law gave legislative rights to local budgets equal with to ones of the state budget. This way the aim was the consolidation of the local fiscal autonomy, by clarifying and extending the local control of the revenues, expenditures and the budgetary process. With regard to the revenues, there have been a few amendments which reduced the new legislation's benefits. In 1999, the state budget law reinstalled grants and in 2002 the state budget law inserted grants for education, roads and residences.

In recent years, an amplification of the fiscal federalism process was recorded all over the world. In America, intense efforts, that intended to transfer the control and the financing responsabilities of the public programs, have been carried out. In countries like Hungary, Italy, Koreea, Mexic and Spain efforts have been carried out to transfer the responsabilities to the local level even for medical care, education, social security. Consequently, in many countries, local budgets' expenditures increased, most of the times financed from central budget's grants.

1.3. Optimal fiscal federalism according to the Tiebout Model

In 1956, the economist Charles Tiebout tried to find those elements that define the reach of the optimal level with respect to providing private goods and services and that lack the providing of public goods and services. One of the detected element was *competition*, the lack of it leading to an inefficient outcome (Tiebout, 1956, pp. 416-424).

Tiebout stressed out that the situation changes if public goods are provided to the population by the local authorities (cities, towns) or the state authorities. He asserts that, in this case, the competition increases, because each individual has the power of decision. If he doesn't like the goods provided by a town, he can easily move to another, without this affecting his life. He went as far to affirm that, in some circumstances, public goods can be provided locally with maximum efficiency. The same principle which states that private goods reach the optimal level when the market is characterized by fair competition can also be applied for public goods. The towns that don't ensure an efficient level of this goods may find themselves in the situation of losing their inhabitants, who will be looking for new towns that can ensure the maximum of their efficiency.

Although the model is interesting, applying it into practice faces o series of difficulties. Moreover, it shouldn't be neglected the fact that the model is based on a number of hypothesis that are not in agreement with reality, for example *the perfect mobility of individuals, financing public goods with a fixed-sum tax, the assumption that public goods do not have externalities.*

In practice, it is very difficult for an individual who established himself in a community to move. Maybe the most unrealistic hypothesis is that individuals have all the information with respect to the benefits provided by the local administrations or the information with respect to the taxes each individual has to pay. Additionally, for the Tiebout Model to be applied, each person should have the possibility to choose freely from many towns the one that satisfies him concerning public goods and services. Plus, the model supposes the existence of a large number of towns, in which individuals can group themselves according to their similar preferences. However, it is impossible for a population to be divided in groups that have the same preferences.

Concerning the second hypothesis, financing public goods with a fixed-sum tax, regardless of the income, spendings or the wealth of the taxpayer, this from of taxation is seen as being extremely inequitable, because it doesn't take into account the contributive situation of each taxpayer, being rarely used for financing budgetary expenditures. In 1990, the British prime minister Margaret Thatcher tried to introduce a fixed-sum tax, and the result was street demonstrations, which led to the Thatcher's Government resign.

Furthermore, it is assumed that public goods affect only that town, without producing any effect on the vicinity, a fact totally wrong. O series of public goods generate externalities, as for example *the police*, meaning that if the police department from a city is not well organized, the criminal activity may extend to the nearby towns, *public road maintenance,* meaning that if the streets from a town are unpolished, then the drivers from nearby towns can suffer damages when they are passing through. And maybe the most relevant exemple of public goods with externalities is *education,* because the entire population of a country benefits from educated citizens.

Although the Tiebout Model makes an imperfect description of the reality, it is still true that *people's mobility* is being *influenced by tax rates and the amount of state/ local expenditures.* If the assumption regarding the population's behavior is a correct one, the next step is finding a principle by which a local authority can guide itself when providing public goods and services.

The Model states that *the degree of responsibility* that can be appointed to the local budgets is commanded by the following *three factors:*

1. *Tax – benefits ratio.* This ratio reflects the perception of the residents concerning the correlation between the taxes they pay and the public goods and services that they in the end receive. *The goods that reflect the highest tax – benefits ratio,* as local roads, should be provieded at this level. Property taxes, the main revenue at local level, if they are considerable, represent important sources used for increasing roads' quality, from which the residents of that town will still benefit. *Goods with a weaker tax – benefits ratio,* as social benefits for people with low income, should be the responsabilty of federal or state authorities. If the residents of a town can see the direct benefits they acquire from paying the fiscal obligations to the local budget, especially in the form of property taxes, they will be willing to pay them in the future. But if the connection is not perceived, they will move to a town that levies lower property taxes. Besides, if the local authorities introduced a social security program, individuals with high income would like to leave the town, moving somewhere else where there isn't such a program and therefore the local authority levies smaller property taxes on its citizens.

2. *The extend of the positive externalities.* If goods and services provided in a public manner affect in a considerable degree other communities, then the responsability for these goods should be designated to the superior forms of government (federal or state).

3. *The scale economies of public goods.* Goods, such as national defence, have great scale economies and can not be efficiently provided at local levels.

Analysing these factors, Tiebout concluded that at local level expenditures should focus on programs with little externalities and lower scale economies, for example road maintenance, garbage collection, keeping the streets clean. Local communities must have a limited role in providing public goods that are based on distribution (as social programs) and that have large scale economies (national defence).

1.4. Revenue distribution among communities and categories of tools used

The Tiebout Model gives a general framework for the approach of one of the most important problems of fiscal federalism: if there should be a distribution of revenues among communities. In a perfect world, there shouldn't be any distribution of revenues among local budgets. Each community has created an efficient structure for providing public goods and any distributing process leads to a decrease of the efficiency. Taking into consideration that the reality isn't a perfect one, there are two arguments in favor of distributing revenues among the communities with high income/expenditures and the ones with lower income/ expenditures: *the failure of the Tiebout Model* and *the presence of externalities.*

The assistance granted at state level is partly based on the differences between the income per person and the tax rates. Federal and state assistance expands at local level of government in order to provide the needed public goods and services. The government is often called to assist the authorities at lower levels, which can not alone adjust their budget. The states also resort to federal subsidies in order to withstand the budgetary problems. The process is applied on a large scale and is called *fiscal equalization.*

A particularity of the public federal authority in America is that it doesn't use grants for fiscal equalization, this process being however used within the states for the local authorities' financial support.

National assistance is extended to communities level, as we previously reported, also because of the externalities. For example, a town may wish to build an industrial plant, in the vicinity of another town, the latter being affected be the pollution resulted. The national or state government can interfere, exercising its regulatory power, requiring for the implementation of antipollution measures or for establishing the industrial plant somewhere else.

The national government assists and subsidizes states and towns with grants. There are three sorts of grants (tools) used by the authorities, as followed:

- *Matching Grants.* These make a correlation between the amount of grants transferred to local communities and the amount of present expenditures for providing public goods. For example, matching grants of one to one ratio for education mean one dollar funding from federal budget for each dollar spent for education at state or local level. Correlative ratios vary mainly between 0.01 and 1.
- *Block Grants.* In this case, the money are simply transferred to local communities, without constraining the way this money can be spent.
- *Conditional Block Grants.* The assigned money to local communities are aimed to be used only in a particular manner.

A great part of the ideea of granting national assistance to subnational political entities may establish the foundation for an international fiscal federalism, in an international public finance system framework.

2. Fiscal federalism at regional and international level

2.1. Analogy with the national federalism

A limited analogy between national public finance theory and international public finance theory can be found in the concept of *fiscal federalism.* This issue has resemblances in countries that record shortage in the

balance of payment and receive structural adjustment loans from international organizations. It can be said that a form of fiscal federalism operates within the assistance system granted to the national governments by the international organizations or within the international agreements for pollution control, as is the case for Montreal Protocol, which regulates the emission of substances that damage the ozon layer and the climate.

This fact suggests that, at international level, some economical and environmental problems, as common goods[1] management and environment protection, should mainly be the responsabiliy of particular international organizations, like The United Nations.

The more the form of government that executes the expenditures is in the same time the entity in charge with collecting the needed resources, the more efficient the operative decisions are. This would mean for the international organizations to possess independent instruments in order to obtain resources for funding the programs that are wished to be implemented.

2.2. Implementation of the international taxation – a necessity for an optimal fiscal federalism

Notwithstanding, to be able to talk about fiscal federalism at international level, first it has to be defined *the general framework of international public finance,* a relatively new and intensely debated among academicians and economists concept. Of all the general framework's elements[2], like *market failure, revenue distribution's equity, macroeconomic stabilization, the political process, international organizations, international taxation and international common goods, taxation* is the pivotal element of an efficient international finance system. At national level, collecting public revenues is done on compulsory and regular basis, elements of critical significance that lack however from the international organization's system that grants assistance. They take their revenues on voluntary basis, this system proving inefficient most of the time. To define the concept of *international taxation,* at least the following elements should be considered: *defining the taxation base, determine the tax rates, methodes of collecting revenues, the conditions that need to be accomplished before enforcing a convention or a treaty, the penalties for disregarding the conditions and the withdrawal proceedings.*

To ensure enforcement of taxes at international scale, the most important feature is, inevitably, of political nature. State countries hold on very much to their sovereignty and are not immediately eager to submit to an international authority. International taxation confronts itself with a series of political obstacles, but the opportunities are enormous. At national level, many of the present fiscal system components were once impracticable, and in the United States, as we mention before, taxes on individual's income were considered unconstitutional. The resistance to changes will continue to put its mark also on the international taxation system, but the long term trend of the political attitude with respect to funding some objectives is a positive one. It seems that the implementation of an international taxation system is only a matter of time. At least theoretically, approximately all countries expressed their agreement regarding a mandatory regulated contribution to the international organizations' budget. A positive example in this regard is the one of the European Union, where there is already implemented in practice a harmonized regional system of taxation and the European Union has a limited economical jurisdiction over the national governments in the same manner as The Federal Government of the United States of America has jurisdiction over state governments.

3. Final considerations

In any country, the central budget collects only a fraction of the total fiscal revenues and executes only o fraction of the national public expenditures. The rest of the revenues and expenditures become the responsability of subnational governments, for exemple state and local ones. Carrying out a comparison with other developed countries, the United States designate a large responsability to the subnational governments.

It can also be discussed about fiscal federalism at international level, its defining and implementation having as the starting point the fiscal features of the national level. Because many countries from all over the world face imbalances, they should be assisted with the help of grants, in the same way state or local authorities benefit from such subsidies. While matching grants are the best way of encouraging a particular behavior for the subnational governments, for maximizing the community's welfare the most advised are the unconditional block grants. If we add to all of this the fact that there are externalities, positive or negative ones, that affect the whole population, a certain fraction of a country's revenues should be collected at international organizations' level on compulsory basis, for the development of the global interest programs and for internalizing of externalities

Notes

(1) Physical elements outside the national jurisdiction. Goods, for example fishing in international waters, exploitation of marine and flying space for shipping and flying, Antarctica and the Southern waters of the Ocean, the geostationary orbit and the electromagnetic spectrum, are suggested to be included in The United Nations Programs.

(2) As they were identified by Ruben P. Mendez (1992) in his book *„International Public Finance – A New Perspective on Global Relations",* Oxford University Press.

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Usage of Option Contracts for Foreign Exchange Risk Management

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Abstract. *Today in Romania, in the context of the liberalization of the capital account and under a floating exchange rate (official is a managed floating currency regime established by National Bank of Romania) the foreign exchange rate is very volatile. In consequence the financial institutions, corporations and, especially, the importers and exporters have to deal with a big exposition of currency risk related with their activities. Financial institutions and corporations today must adopt new roles in order to compete successfully in the explosively evolving foreign exchange markets. The methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before.*

The objective of our paper is to provide the techniques and insights needed to pinpoint opportunities and control risks. We will present the most modern practical methods for managing the currency risk: option strategies (spread, strangle, straddle, etc). Also we will present the advantage, the disadvantage and our opinions related with the use of currency derivatives instruments (especially currency strategies options), making a comparative analysis.

Key words: foreign exchange rate; manage currency risk; currency derivatives (futures, options); currency option strategies (call, put, spread, straddle, strangle).

1. Introduction

The deepening of globalization process has led to an increase in foreign exchange transactions in international financial markets. This has determined a higher volatility of exchange rates, and, implicitly, an increased foreign exchange risk.

There are many types of risks, but only few of them can bring losses as large as foreign exchange risk. In these conditions, the development of new modern and effective methods for managing foreign exchange risk becomes a great necessity for the players in international financial activity.

At the present, in Romanian economy the foreign exchange risk become more important than ever. The capital account liberalization[1] and the NBR's intent to intervene rarely in the forex market[2] have created the conditions for bigger fluctuations of exchange rate. These fluctuations affect the activity of companies involved in international trade and the activity of banks holding assets and liabilities in different currencies. In conclusion, the capital account liberalization and the floating exchange regime enhance the risk of capital inflows and outflows.

Also, foreign exchange risk management is influenced by high volatility of EUR/USD quotations in international market and by reduced availability of hedging instruments in Romanian financial market. In order to increase the effectiveness of foreign exchange risk management Romanian specialists are interested in adopting instruments, indicators, methods, and techniques used in international practice.

International practice consacrated a wide range of instruments, indicators, methods, and techniques to identify, measure and hedge foreign exchange risk, from the simplest and the less costly to the most complicated and the costliest, but with enhanced performances.

In this article we will discuse about the most modern methods to manage (to headge) the foreign exchange risk: currency options.

The essence of hedging is to transfer risk from the firm, that is exposed to risk but which would rather not be, to that witch is not exposed, but witch assumes some exposure to risk for some fee (Jacque, 1996). From the mid-80s the use of financial derivatives became widespread, especially among large companies in countries with developed financial markets. However, some authors (Mallin, Ow-Yong, Reynolds, 2001) admit that still there is a shortage of information about foreign exchange risk management (headging) through derivatives.

There are two main types of hedging: internal and external. Internal hedging minimizes the amount of currency bought or sold in foreign exchange transactions. This can be achieved by appropriate pricing (in domestic currency, for example) by leading and lagging receipts and payments to match currency inflows and outflows, and by netting remaining currency receipts and liabilities (Bennett, p.70). Internal analysis allows the firm to reduce foreign exchange exposure using its own resources. External hedging uses foreign exchange hedging instruments. Most popular ones are forward and futures contracts, swaps and options.

2. Use of option strategies for managing the currency risk

The decisions to assume some risks and to avoid others, the option to use some management instruments and not to use the others bring the success of failure of a management team in a corporate or financial institution. Fluctuations in foreign exchange rates can have a major impact on a company's financial results, but with a more dynamic financial management approach, these risks can be reduced and the yields improved. The methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before. The *financial derivative products* (options and futures contracts) are the most modern instruments for managing market risk (foreign exchange risk, interest rate risk, stock price risk). They are instruments that change the cash flows of a portfolio. This transformation of cash flows alters fluctuations in the market value of a portfolio. Among the wide range of modern instruments used to manage foreign exchange risk, we focus in this paper on currency options.

Currency options are one of the best ways for corporations or individuals to hedge against adverse movements in exchange rates. The simplest type of currency options are: *CALL and PUT*. One of the attractions of options is that they can be used to create a *very wide range of payoff patterns* (referred as strategies options like: strangles, straddles, spreads, back spreads, butterfly, condor, etc.).

Using options and futures, whether separately or in combination, can offer countless trading opportunities. Whether the contents will prove to be the best strategies and follow-up steps will depend on the knowledge of the market, the risk-carrying ability and trading objectives.

For be very efficiently in the market is necessary to follow same simple steps[3]:

First: Determine the Market Outlook.

That means to establish if are we generally bullish, bearish, or undecided on future market moves?

Second: Determine the Volatility Outlook.

That means to establish do we feel that volatility will rise, fall, or are you undecided?

Third: Determine the "Best" Strike Price.

By analyzing the market and volatility outlook further we should be able to select the option strike that provides the best opportunity. We can do this by calculating a few "What-If" scenarios.

The forth: we must also consider margin requirements, commission costs, taxes and execution costs, as well as other possible factors.

The fifth: we may be able to transform a trade with just one transaction, the resulting position can contain options at strikes that may or may not be appropriate for your new outlook.

On the next table – there are suggesting strategies to use when "Initiating a Market Position." For use strategies options, in Table 1 is necessary we Look Up the Corresponding Strategy whether we are initiating a position or trying to follow up a current position, line up the correct row and column on the proper table to find a strategy that will help us make the most of our outlook.

Initiating a market position

Table 1

Market type	Bullish	Bearish	Undecided
Volatility rising	- Long Call - Call Ratio Backspread	- Long Put - Put Ratio Backspread	- Long Streaddle - Long Strangle
Volatility falling	- Short Put - Call Ratio Spread	- Short Call - Put Ratio Spread	- Short Streaddle - Short Strangle
Volatility undecided	Long Futures - Bull Spread	- Short Futures - Bear Spread	- Box / Conversion

Source: Chicago Mercantile Exchange, Strategy Futures & Options Guide, 2004.

From multiple strategies options used by companies or financial institutions, in this paper we will present:

A) Simple type currency options:

A.1) CALL

A.2) PUT

B) Ones of the most used strategies options in forex market:

B.1) SPREAD (BULL SPREAD and BEAR SPREAD)

B.2) COMBINATION (STRADDLE, STRANGLE, STRIP and STRAPS)

Currency Option is a "contract giving the right, not the obligation, to buy or sell a specific quantity of one foreign currency in exchange for another at a fixed price; called the Exercise Price or Strike Price. The buyer of a currency option pays a premium to the seller. There are two types of option expirations - American-style and European-style. American-style options are exercisable on any date up to the contract expiration date; in contrast, European style options only can be exercised at specific future dates."(www. http://en.wikipedia.org)

Currency options may be quoted in one of two ways: American-terms, in which a currency is quoted in terms of the US dollar per unit of foreign currency; and European-terms (inverse terms), in which the dollar is quoted in terms of units of foreign currency per dollar. The same logic can be applied to currency pairs in which the US dollar is not one of the currencies. Either currency can be expressed in terms of the other.

Example: *Suppose a Suisse manufacturing firm is expecting to be paid $200,000 for a piece of electronic equipment to be delivered in 90 days. If the exchange rate goes down over the next 90 days the Suisse firm will lose money, but if the rate goes up then the Suisse firm will make a profit. The firm can purchase an option (the right to sell part or all of their expected income for Suisse franc at a given rate near today's rate) to mitigate their risk of exchange rate fluctuation over the 90 days. Conversely another party may wish to have the reverse option for a similar reason. A market maker will buy and sell these options with the aim of making a profit while not incurring too much risk.*

A) simple type currency options

A.1) CALL

A.2) PUT

There are two types of options from the point of view of the rights that convey:

A.1) *Currency CALL:* An option which gives the option buyer the right to purchase (go long) a particular currency at a specific rate. If the buyer exercises the call option, he will acquire a long currency position and someone who has sold an option will be assigned a short currency position at the same time.

A.2) *Currency PUT:* An option which gives the option buyer the right to sell (go short) a currency and someone who has sold an option will be assigned a long currency position at the same time.

These types of strategies are illustrated in Figure 1.

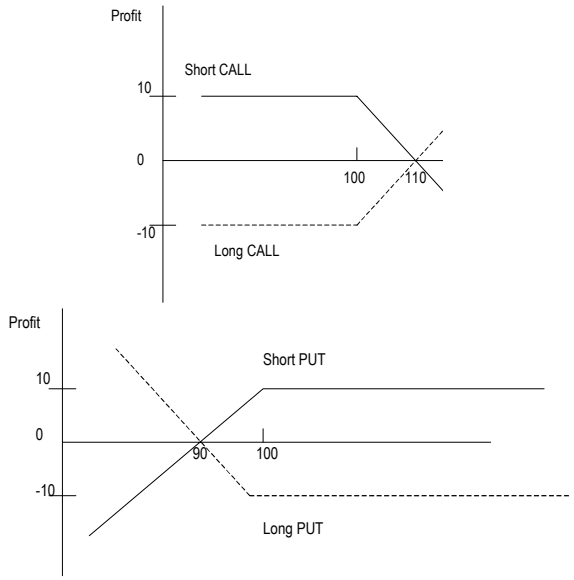

Figure 1. *The symple type currency strategies*

We use these strategies options in following situations like in table no.2

Strategies used in simple type currency options

Table 2

	CALL	PUT
LONG	Increase anticipation of currency	Decrease anticipation of currency
SHORT	Decrease anticipation of currency	Increase anticipation of currency

Source: www. learnmoney.com

What does each of the option types of trades do for our position? The tables no. 3 and 4 give us the answers.

Risc profile

Table 3

RISK	FORWARDS		CALLS		PUTS	
	Attitude	RISK	Attitude	RISK	Attitude	RISK
BOUGHT	BULLISH	HIGH	BULLISH	LOW	BEARISH	LOW
SOLD	BEARISH	HIGH	BEARISH	HIGH	BULLISH	HIGH

Limitations

Table 4

LIMITATIONS	BOUGHT	SOLD
PROFIT	UNLIMITED	LIMITED
LOSS	LIMITED	UNLIMITED

In every foreign exchange transaction, one currency is purchased and another currency is sold. Consequently, every currency option is both a call and a put. An option to buy Australian dollars against United States dollars is both an Australian dollar call and a United States dollar put. Conversely, an option to sell Australian dollars against United States dollars is an Australian dollar put and United States dollar call. The advantage of the options is that they can be combined and result o lot of number of strategies options which can offer a better protection and many choises for rising investors'benefits.

B) the most used strategies options in forex market:

SPREAD (BULL SPREAD and BEAR SPREAD)

COMBINATION (STRADDLE, STRANGLE, STRIP and STRAPS)

B.1) SPREAD

A spread is an option trading strategy that involves taking a position in two or more options of the same type (example two or more calls or two or more puts).

Spread option trading strategies can be created with either all calls or all puts, and be bullish or bearish.

A family of currency spreads involving:

- options of the same currency,
- same expiration month,
- different strike prices.

The call with the lower strike price will always be purchased at a price greater than the offsetting premium received from writing the call with the higher strike price.

The put with the higher strike price will always be purchased at a price greater than the offsetting premium received from writing the put with the lower strike price.

B.1.1) BULL SPREAD is one of the most popular type of spread and it can be created by:

- buying a call option on a currency *with a certain strike price (E_1) and*
- selling a call option on the same currency with a higher strike price (E_2)
- both options have the same expiration date
- price of purchased call option (C_1) is higher than price of writing call (C_2).

Both the buy and the sell sides of this spread are opening transactions, and are always the same number of contracts. *This is a BULL CALL SPREAD.* The strategy is illustrated in Figure 2.

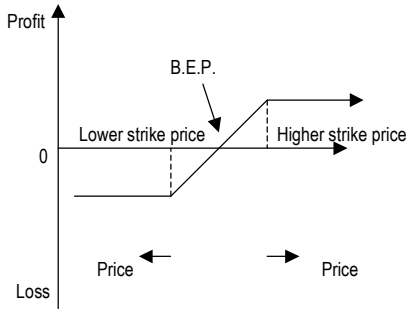

Figure 2. *Bull Call Spred Strategies*

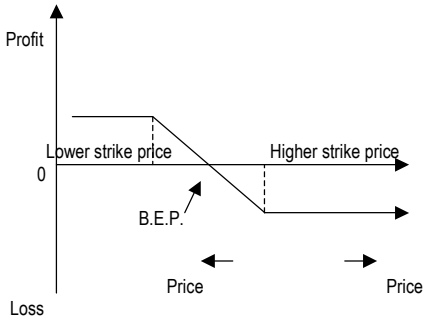

Figure 3. *Bear Put Spread Strategies*

Suppose that the E_1 is the strike price of the call bought, E_2 is the strike price of the call option sold and S is the price on the expiration date of the options. The Table 5 shows the total payoff that will be realized from bull spread in different circumstances.

Option strategies circumstances

Table 5

PAYOFF din BULL SPREAD			
Currency Price Range	Payoff from Long Call Options	Payoff from Short Call Options	Total Payoff
$S \le E_1$	0	0	0
$E_1 < S < E_2$	$S-E_1$	0	$S - E_1$
$S \ge E_2$	$S-E_1$	E_2-S	$E_2 - E_1$

The profit from the whole strategy is the sum of the profits given by the call options and is indicated by the solid line. The profit in figure 2 is calculated by subtracting the initial investment (Net Debit Paid) from payoff.

The maximum profit for this spread will generally occur as the underlying currency price rises above the higher strike price, and both options expire in-the-money. The investor can exercise the long call, buy currency at its lower strike price, and sell that currency at the written call's higher strike price if assigned an exercise notice. This will be the case no matter how high the underlying stock has risen in price.

Maximum loss for this spread will generally occur as the underlying currency price declines below the lower strike price. If both options expire out-of-the-money with no value, the entire net debit paid for the spread will be lost.

BULL SPREAD can also be created by:

- buying a put option with a low strike price (E_1) and
- selling a put with a high strike price (E_2).

This is a bull put spread. Unlike the bull call spread, bull put spread involve a positive cash flow to the trader up front (ignoring margin requirements) and a payoff that is either negative or zero.

B.1.2) BEAR SPREAD can be created by:

- buying a put option on a currency with a certain strike price (E_2) and
- selling a put option on the same currency with a lower strike price (E_1)
- both options have the same expiration date
- price of writing put option (C_1) is lower than price of purchased put (C_2).

Both the buy and the sell sides of this spread are opening transactions, and are always the same number of contracts. This is a bear put spread. The strategy is illustrated in Figure 3.

The maximum profit for this spread will generally occur as the underlying stock price declines below the lower strike price, and both options expire in-the-money. This will be the case no matter how low the underlying stock has declined in price.

Maximum loss for this spread will generally occur as underlying stock price rises above the higher strike price. If both options expire out-of-the-money with no value, the entire net debit paid for the spread will be lost.

BEAR SPREAD can also be created by:

- buying a call option with a high strike price (E_2) and
- selling a call with a low strike price (E_1).

A bear call spread involves an initial cash inflow (when margin requirements are ignored), because the price of call sold is greater than the price of the call purchased.

	BEAR put SPREAD
Construction	Short put X + Long put Y
Break-Even-Point (BEP)	Strike Price of Purchased Put - Net Debit Paid
Maximum profit	Limited to: Difference Between Strike Prices - Net Debit Paid
Maximum loss	Limited to: Net Debit Paid

Like bull spreads, bear spreads limit both the upside profit potential and the downside risk

B.2) COMBINATION

A combination is an option trading strategy that involves taking a position in both calls and on the same underlying asset. The most used combinations are: straddles, strips, straps and strangles.

B.2.1) STRADDLE is one the most popular combination and it involves:

- buying a call and a put on the same currency;
- the same strike price (E);
- the some expiration date.

This is a long straddle strategy option.

In this way, an investor can take advantage of any sudden movement in the particular currency price regardless of direction. This strategy might be employed before earnings or FDA approval notice is about to be in the news.

The strategy is illustrated in Figure 4.

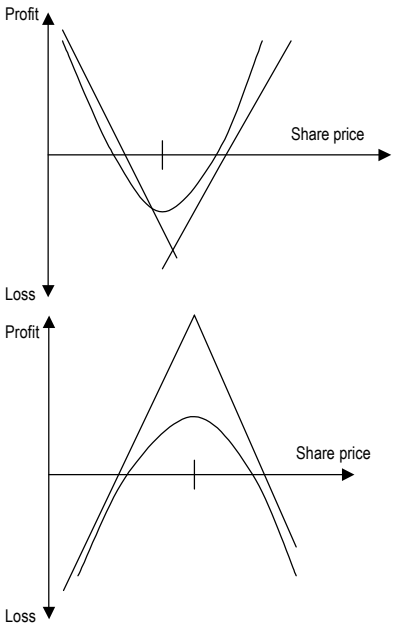

Figure 4. *Long and Short Straddle Strategies*

If the currency price is close to the strike price at expiration of the option, the long straddle leads to a loss. If there is a sufficiently large move in either direction, a significant profit will result.

Suppose that the E is the strike price of the call and put options and S is the price on the expiration date of the options. The Table 6 shows the total payoff that will be realized from straddle strategy.

Stradde strategy payoff

Table 6

PAYOFF FROM A STRADDLE			
Currency Price Range	Payoff from Call	Payoff from Put	Total Payoff
S≤E	0	E-S	E-S
S>E	S-E	0	S-E

A straddle is appropriate when a trader is expecting a large move in a currency price but doesn't know in which direction the move will be.

A short straddle or top straddle or straddle write is the reverse position of long straddle or bottom straddle or straddle purchase. A short straddle is created by:

- selling a call and a put on the same currency;
- the same exercise price;
- the same expiration date.

It is a highly risky strategy. If the price of the expiration date is close to the strike price, a significant profit results. However, the loss arising from a large move in either direction is unlimited.

B.2.2) STRANGLE (called sometimes bottom vertical combination) is created by:

- buying a call and a put a on the same currency;
- the different strike price;
- the some expiration date;
- the call strike price (E_2) is higher than the put strike price (E_1).

This is a long strangle strategy option.

A strangle is a similar strategy to a straddle. The trader is betting that there will be a large price move but is uncertain wheter it will be an increase or decrease. The currency price has to move father in a strangle strategy than in a straddle for the trader to make a profit. However, the downside risk if the currency price ends up at a central value is less with a strangle.

The strategy is illustrated in Figure 5.

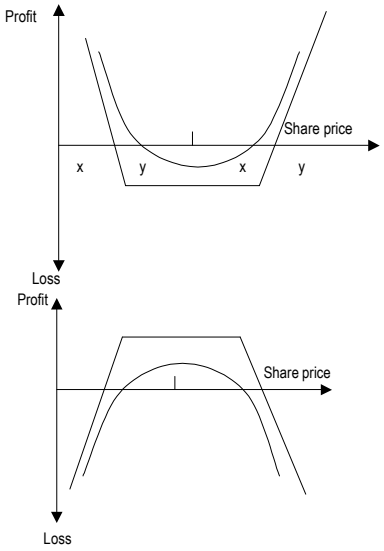

Figure 5. *Long and Short Strangle Strategies*

Suppose that the E_1 is the strike price of the put, E_2 is the strike price of the call option and S is the price on the expiration date of the options. The Table 7 shows the total payoff that will be realized from strangle strategy.

Strangle strategie payoff

Table 7

PAYOFF FROM A STRANGLE			
Currency Price Range	Payoff from Call	Payoff from Put	Total Payoff
$S \leq E_1$	0	E_1-S	E_1-S
$E_1 < S < E_2$	0	0	0
$S \geq E_2$	S-E_2	0	S-E_2

Strangles may be appropriate strategies when an investor believes that a currency is likely to make a substantial move in either direction. While the long strangle has theoretically unlimited potential and limited risk, it should not be viewed as a low risk strategy. Options can lose their value very quickly, and in the case of a strangle, there is a substantial amount of erosion of time value as compared to the purchase of a put or call.

The opposite of a long strangle is the short strangle (top vertical combination).

The short strangle is created by:

- selling a call and a put on the same currency;
- the different strike price;
- the some expiration date;
- the call strike price (E_2) is higher than the put strike price (E_1).

The short strangle can be apropiate for a trader who feels that large stock price moves are unlikely. However, like the sale of straddle, it is a strategy involving unlimited potential loss to the trader.

B.2.3) STRIPS and STRAPS

STRIPS	STRAPS
- 1 Long CALL +	- 1 Long PUT +
- 2 Long PUT	- 2 Long CALL
- the same exercice price	- the same exercice price
- the same date of payment	- the same date of payment

3. Conclusions

Today, the methods, instruments and techniques used to manage foreign exchange risk are more complex than ever before.

Among the most modern practical methods for managing the currency risk the use of financial derivate instruments (curre ncy swap, forward, futures and options) in the rising value of companies and financial institutions.

In Romanian market, the derivatives are traded on Romanian Commodity Exchange from Bucharest and Financial-Monetary Commodity Exchange from Sibiu.

More, as a result of capital account liberalization, traders can perform transactions with derivatives on international markets where the liquidity is thousands times greater than liquidity in domestic market.

The foreign exchange risk will exist even after the EMU accession (the main currencies traded are EUR, USD, JPY and yuan).

In our opinion, the volatility in forex markets is going to increase as the globalization process deepens. The foreign exchange risk will disappear only when a single currency will be used around the world, if this ever happen.

We consider that the following elements must be taken into consideration to improve the quality of exchange rates forecasts:

- "hot money" inflows/outflows in conditions of capital account liberalization
- disinflation policy adopted by NBR
- current account deficit
- remittances from Romanians working abroad
- monetary policy of FED and European Central Bank.

Notes

(1) Starting 1stSeptember 2006, the foreigner investors have had access to T-bills issued by Romanian government. In the past, they could buy T-bills only with NBR's authorization that imposed restrictions. The NBR's restrictions aimed to avoid shocks in foreign exchange market. At present, the lack of NBR's restrictions contributes to the increase in probability that shocks incur in foreign exchange market with negative impact on the activity of institutions which use foreign currency (www.bnro.ro)

(2) NBR maintains a controlled floating exchange rate for RON; NBR is not yet prepared for a free exchange rate regime because of current account deficit and risk of "hot money" inflow.

(3) Chicago Mercantile Exchange, Strategy Futures & Options Guide, 2004 (www.cme.com)

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Commercial Power of Asia

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Abstract. *The present paper, based on a detailed analysis of the main statistical foreign trade indicators of the emerging economies of the Eastern and South-Eastern Asia, outlines a series of characteristics of the foreign trade flows of the analysed economies from the '50 up to the present. The accent is set on the period 1995-2006, which emphasizes two moments of crisis of the Asian trade: 1997-1998 and 2001. At the level of the analysed economies, it can be remarked a tendency of continuous growth of the share of the intra-regional trade flows in the total trade flows, mainly due to their participation in regional trade agreements, to the strenghtening of the regional production networks, to the role of China as engine of economic growth in the whole region and even at global level. On product category, the manufactures have the greatest share in the merchandise exports of the Asian emerging economies (especially office and telecom equipment, integrated circuits, automotive products, textiles and clothing, etc.). While China surpassed the share of the Asian tigers of the first generation in the world trade in 2001 and that of Japan in 2004, the scenario presented in this paper indicates the surpass in 2007 of the share of Germany (second place in the world trade in 2005), the surpass of the share of the Asian tigers of the first generation in 2009, and the surpass of the share of the group of the 8 Asian tigers and that of the USA as well in 2012. In the following decades, China might become the strongest world economy at the global level, but only if the sustainable development and the eradication of the social inequities will become* de facto *priorities of the Chinese officials. The actual negative externalities (costs) of the Chinese economic growth, transferred on the environment and the society, will be object to another analyse.*

Key words: emerging economies; Asian tigers; trade flows; trade balance; normalized trade balance; export-import ratio; trade openness; export propensity; Grubel-Lloyd index; relocation of the production capacities; inter- and intra-regional trade; comparative advantage; industrial competitiveness; foreign direct investments (FDI); capital flows; financial crisis; currency depreciation.

1. Evolution of the trade flows of Asia during 1950-2006. The role of the emerging economies in the Asia's trade

Starting from similar levels of economical development in the 50's, Asia, Latin America and Africa began to outdistance from each other, Asia becoming gradually the region with the fastest rates of economical growth. The economical growth was sustained by the foreign direct investments (FDI) and the foreign trade, on the background of the macroeconomical stability, an attractive business environment (especially through the legal framework, the low labour costs, the continuous development of the infrastructure) in several countries of the region, especially from East and South-East Asia.

In comparison with Asia, there were many factors that continued to influence negatively the majority of the African economies: the unfavourable geographical and demographical conditions, inadequate macroeconomical conditions, political instability and conflicts, the distance from the main markets, the huge transport costs, the poor infrastructure, the debt burden. Lacking inflows of capital, Africa was deprived from the advantages of generation of jobs, technology transfer, management competences. In addition, the great majority of the African countries continued to export mainly commodities having low (with the exception of fuels) and fluctuating prices.

Continuing with the comparisons, one of the main obstacles for the development of the economies in Latin America was the gradual growth of the indebtness in the '70s, associated with a long period of import substitution ('50-'70), followed by the debt crisis in the '80s.

The first cycle of the expansion of the capital flows to the developing countries lasted 10 years (1970-1980) and had as target Latin America, having as basis loans offered by official bilateral and multilateral creditors and to a lesser extent flows of FDI. Later, the place of the offical lending was taken by the private lending. After the debt crisis of the countries of Latin America in the '80s, followed the second cycle of capital flows in the '90s, having as target developing countries of Latin America and East Asia as well. Asia started to receive a growing amount of capital flows in the second half of the '80s, as they offered attractive alternatives to the stagnant economies of Latin America(UNCTAD, 2003, pp. 31-37), fact that was reflected in the development of their foreign trade. The expansion of the capital flows in Asia, especially FDI in the second half of the '80s and in the '90s, played a major role in the regional development.

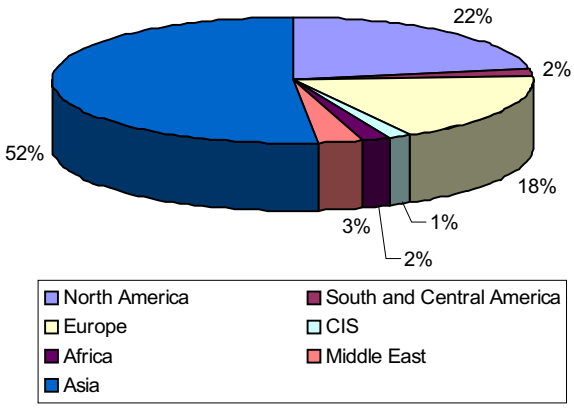
An unexpected growth of the interest rates in the USA and the political uncertainty generated another financial crisis, this time in Mexico, in 1994, crisis that expanded to Argentina and contributed to almost the halving of the capital inflows. This led to the impetus of the investments in East Asia. The great differences among the interest rates in East Asia, on the one hand, and those in Japan and USA, on the other hand, prompted the international banks to concentrate a great part of their short term loans in Asia. The second cycle of the expansion of the capital flows ended in 1997-1998, together with the "capital flight" (the Asian financial crysis), phenomenon similar to that of Latin America in the '80s. At the moment, we can assert that we assist at the third cycle of expansion of capital flows, especially under the form of FDI, directed especially towards East and South-East Asia, on the basis of the sustained economical growth. In 2005, the region represented 12% of the world GDP, contributing with 26% to the world GDP growth (UNCTAD, 2006, pp. 50-59, p. 45).

The relocation of the productive capacities in Asia, especially in the emerging economies, followed by the development of the Asian tigers from the first and the second generation and the transformation of China in the motor of the whole Asian economy, represented an unprecedented spur for the trade flows.

The share of Asia in the world merchandise trade recorded a remarkable growth beginning with the '50s. The share of the exports grew from 13.1% in 1953 (out of which 8.4% represented by Asian economies without Australia, New Zeeland and Japan) to 19.1% in 1983 (out of which 9.7% the Asian economies without Australia, New Zeeland and Japan), reaching 26.1% in 2003 (out of which 18.5% the developing Asia) and 27.4% in 2005 (out of which 20.2% the developing Asia). By imports, the weight of Asia in the total imports evolved from 15.1% in 1953 (out of which 11% the developing Asia), 18.5% in 1983 (out of which 10.4% the developing Asia), 23.1% in 2003 (out of which 16.7% the developing Asia) and 24.7% in 2005 (WTO, 2006, pp. 28-29) (out of which 18.4% the developing Asia), Asia holding the second position in the world trade, after Europe. In parallel with these evolutions (the growth of the weight of the developing Asian economies in the world exports, as well as in the world imports, the gradual diminishing of the weight of Japan, Australia and New Zeeland in the world trade flows), the weight of Latin America and Africa in the world trade recorded a descending trend. In the world exports, the weight of Latin America declined from 10.5% in 1953 (superior to the developing Asia) to 4.4% in 1983, 3% in 2003, reaching 3.5% in 2005. The weight of Africa declined from 6.5% in 1983 to 4.5% in 1983, 2.4% in 2003, reaching 2.9% in 2005. The import situation was similar. The weight of Latin America in the world imports declined from 9.3% in 1953 to 3.8% in 1983, 2.5% in 2003, to 2.8% in 2005, while the weight of Africa in the world imports declined from 7% in 1953, 4.6% in 1983, 2.1% in 2003 and 2.4% in 2005 (WTO, 2006, pp. 28-29).

As for the inter- and intra-regional trade of Asia, there is a continuous growing trend of the weight of the intra-regional trade flows, the main reasons being the participation in regional trade agreements (intensified especially after 1993: Association of the South-East Asian Nations – ASEAN, Asia-Pacific Economical Cooperation – APEC, South Asia Association for Regional Cooperation – SAARC), as well as the role of China as engine for the whole region. In 1990, 42.1% of the trade flows were intra-regional, in 2001 the weight of the intra-regional trade flows was 48.2%, and in 2005, almost 52% of the Asian trade developed on an intra-regional basis.

The trade with North America has a weight of almost 22% in the total (comparing with 28.3% in 1990 and 25.1% in 2001), and that with Europe, almost 18% of the total. Middle East is the least dependent region on the trade with Asia (only 7.6% of its trade is related to Asia).



Source: World Trade Organization, "International Trade Statistics", 2006, p. 37.

Figure 1. *Intra- and inter-regional trade of Asia, 2005*

Until the '90s, Japan and the Asian tigers[1] had the greatest contribution to the development of the Asian trade flows. The Asian tigers of the first generation recorded a sustained growth during 1960-1990. The exports grew rapidly, the pace of investment was accelerate, surpassing, on the average, 20% of GDP in the period 1960-1990. Although the initial option was the import substitution (all the analysed economies, with the exception of Hong Kong-China passed through a stage of import substitution), the governments opted for the opening and the support of the exports. Normally, the protection of the internal market from the external competition generates a tendency towards the curbing of the exports, as the internal companies choose as target the internal market, not the external, where the competition is very harsh. But this tendency was not recorded in East Asia, because of the exchange rate policy and the stimulating and promoting of the exports (exemption from the customs duty, access to the foreign exchange, etc.). Starting with the '80s, China has been giving an impetus to the growth of the whole region. The own growth was sustained by the foreign direct investments and foreign trade, on the background of an attractive business environment (laws, labour costs, infrastructure). An important role was played by the free trade zones, export processing zones, special economic zones[2] (SEZ), national economic and technological development zones (NETDZ), industrial parks.

The growth rate of the Asian tigers slowed down and the instability rose in the '90s, reflecting the upsurge-decline cycles, associated with the unstable capital flows. China and India, with closer economies, were not influenced negatively by the external shocks, continuing their development.

While China surpassed the share of the Asian tigers of the second generation in the world trade in 2001, and the weight of Japan in 2004, the scenarios presented in this paper will show that China will surpass the weight of Germany (the occupant of the second position in the world trade in 2005) in 2007, that of the Asian tigers of the first generation in 2009 and that of the whole group of the Asian tigers and that of the USA in 2012.

In order to give an explanation to these evolutions (the changing of the role of China from insignificant until the '80s to that of engine of the trade flows in Asia, the dynamics of the Asian tigers of first generation during 1960-1990, comparatively with the actual period, and the dynamics of the Asian tigers of second generation in the '80s and '90s, in comparison with the present), there is a need for a short return in the past. I will start with the presentation of *the case of China.*

The strategy of the Chinese government during 1950-1962 was centred upon the development of the heavy industry, intensive in capital (especially because of the necessity of the import of equipment and technology), while the Chinese economy had as basis the agriculture and recorded a lack of capital. In 1949, the total value of the production (industry and agriculture) was of 46,6 mld. Yuan, and the GDP/inhabitants was of 66,1 Yuan. The agriculture represented 60% of GDP, the industry 30%, out of which the heavy industry represented 7,9%. Almost 90% of the population worked in the rural regions (Liu et al., 2000, p. 11, pp. 16-17).

There are many motivations (unfortunately, not social ones, that would have been preferable) for having chosen the heavy industry as a priority.

Many developing countries tried after the second world war to "burn" a series of development stages, in order to become rapidly industrialized economies. Moreover, China found itself in a delicate situation, as at that time it was in conflict with the national party Kuomintang of Taiwan. In addition, the support for the North Korean Government during the "war of the two Koreas" (1950-1953) led to the economical isolation of China and a trade embargo. That was the reason for developing independent industrial structures.

The population lived especially in the rural regions, in poverty, and the demand could not sustain the development of the consumption goods industry (light industry), and the subsequent capital accumulation would have been too slow in order to generate enough financial resources for the development of the heavy industry.

The methods chosen from the government to support the heavy industry had as basis: low interest rates, preferential credits for the main industries, low nominal wages, low (administrated) prices for energy and row materials, low prices for agricultural goods, goods and services of first necessity. Trade was state monopoly, and industry was highly protected. The human resources from the urban areas were socially protected, in order to spur the industrial development.

The second five-years plan (1958-1962) had as basis an extensive program of reforms, initiated by Mao Zedong – "the great leap forward" – having as main goal the simultaneous development of the industry and agriculture, but the result was dramatic: economic disaster, penury of foodstuff, death of at least 20 million Chinese people.

The adopted measures led to the inefficient allocation of resources, lack of competition, insufficient stimulus for the labour force, generating the failure of the strategy of "the great leap forward" of Mao Zedong in 1962.

During 1966-1969, all the persons opposing Mao Zedong were persecuted by the Red Guards. In 1968 was launched the cult of personality, strengthening the position of the communist dictator. It followed the cultural revolution (1969-1976), in 1976 being arrested "the gang of four".

In 1978, the reforms were a necessity, as during 1949-1976 ("Mao era"), the gaps between China and other developing countries had deepened, the penury of consumption goods had increased, hundred of millions of peasants were menaced with hunger, and the whole economy was on the brink of ruin. In the same period, the four Asian tigers of the first generation had developed rapidly.

In comparison with the Chinese strategy, that of the South Korea, Singapore, Hong Kong-China and Taiwan was different and led to different results. The strategy of the comparative advantage adopted by the first group of the recently industrialized economies of East Asia consists of a system of prices that reflect the supply and demand, as well as the rarity of production factors in the economy.

The four economies started in the '50s from a low level of industrialization, the GDP/inhabitants being around 100 USD. With the exception of Hong Kong-China, all resorted to a strategy of import substitution. These economies confronted themselves with the rarity of capital and relative abundance of the labour force, which led to the centring upon the development of the light industry (food, textile, glass, etc.).

In the South Korea, the process of the industrialization was launched in 1961; during 1961-1971, the industrial policy was sectorally neutral, but the export of manufactures intensive in labour force was intensely promoted. Starting with 1971, there were chosen 6 priority-industries: steel, ship, machinery and equipment, electronics, petrochemical, metallurgy. The subsidized credit was largely used, the policy of the subsidized and directioned credit being supported by Japan as well. The oil shocks of the '70s led to the abandoning of the initial industrial policy and to trade and financial sector liberalising. The chaebols[3] were further strengthened.

Japan, as well as other developed countries that were changing the economic structure in favour of the industries intensive in capital and technology, resorted to the relocation of the industries intensive in labour force in other countries of Asia, leading to the diversifying of the exports intensive in labour force of the recipient countries. During 1961-1973, the average growing rate of the GDP of *Taiwan* was over 10%, while the average growth rate of the industrial production surpassed 18%. The share of the industry in the economy reached 43.8%, while the weight of the industrial products in the exports reached 84.6%. Comparatively, the weight of the industry in the GDP of China grew slowly, from 19.52% in 1952 to 28.30% in 1957, 32.79% in 1962, 36.41% in 1965, 40.97% in 1970, 46.02% in 1975 and 49.40% in 1978 (Liu et al., 2000, p. 52, pp. 84-85).

Taiwan, supported by the USA, recorded especially after 1960 a spectacular development. After the giving up of the policy of import substitution (1953-1957), the government started to stimulate 5 sectors (plastics, synthetic fibers, electronics components, textiles and clothing, watches) and the exports. In 1965, Taiwan was more developed than South Korea and had better human resources. During 1973-1980, the light industry was threated by the new competitors, the investors chose China as preferred destination, and the oil shocks affected the national economy as well. After 1981, the accent was set on high technology and modernisation (World Bank Policy Reseach Report, 1993, p. 85, pp. 131-133), the number of the small and medium-sized enterprises (SMEs) with activities in the field of production of high-tech products has been growing, the weight of the high value-added products in the exports has been growing as well, but the small dimensions of the companies was a weakness, in the context of the intensifying of the international competition.

In Taiwan, the share of the light industry in the total value of the manufactured products diminished from 75.2% in 1952 to 44.25% in 1990. The weight of the heavy industry grew from 24.8% to 55.75% in the same period. The financial policies of the repressing of the interest rates and the controling of the exchange rates were given up, being chosen the policy of the liberalization (in fact, the interest rates and the exchange rates should reflect the rarity of the resources).

Singapore chose at an initial stage the industrialization intensive in labour force, based on the imports substitution (1959-1965), followed by the stage of the industrialization intensive in labour force, oriented towards exports (1966-1973), then by the industrialization based on quality and technology (1973-1978), economic restructuring (1979-1984) and diversification (Soon, Tan, 1993, pp. 3-8).

During 1965-1980, the exports of the *South Korea* grew with an average of 27,2%, and in the period 1980-1990, with 12.9%. Comparatively, in the same periods, the exports of Hong Kong-China grew with 9.1%, respectively 6.2%, while the exports of Singapore grew with 4.7%, respectively 8.6%, and the exports of Taiwan grew with 18.9%, respectively 10.3% (Haque et al., 1995, pp. 139-141).

In the four above-mentioned economies, the capital accumulation grew, in parallel with the growth of the labour costs. Gradually, the balance of the comparative advantage began to incline in the favour of the industries intensive in capital and technology, in detriment of the industries intensive in labour force.

That is why China, as well as the four Asian tigers of the first generation (to a lesser extent Hong Kong-China) chose interventionist policies, but China generated a distorsioned economic system, while the governments of the Asian tigers adopted development strategies based on the comparative advantage, in an undistorted economic system (where prices, based on the equilibrum between supply and demand, reflecting the relative rarity of resources in the economy are stable; goods circulate according to the market laws, being not allocated on an administrative base; the producer respects the rules of the market, the maximization of the profit being obtained through the reduction of the costs and the rising of the turnover, not by a position of monopoly or subsidies).

The Asian tigers of the second generation, having abundant natural resources, set the accent on agriculture and the mining sector. In *Malaysia*, in 1957, the exports of

tin and natural rubber represented 1/3 of the GDP. The period of the import substitution (1950-1970) was followed by the period of the combination of the import substitution with the export promotion (1971-1985), followed by adjustment and liberalisation. *Indonesia* used intervention policies during 1948-1966, the economic power being concentrated in hands of some groups of exporters. In 1967, the GDP/ inhabitants was 50 USD, and 60% of the population lived in extreme poverty (The World Bank, 1993, p. 23). A big oil exporter, Indonesia was advantaged by the terms of trade during the two oil shocks. The trials of the government to develop industries like ferrous metallurgy, plastics, petrochemicals on basis of subsidised credits and protective commercial policies failed. The external orientation followed only after 1986. *Thailand*, in its turn, passed from exports based on resources (1955-1970) to import substitution (1971-1980) and export promotion (after 1980). In *India*, the trade openness and liberalisation started in 1991, which explains the more modest results of its foreign trade.

The results recorded by the emerging economies of Asia (especially by Singapore, Taiwan, South Korea, Malaysia) is due to the evolution of their industrial competitiveness as well. In the hierarchy realised by the United Nations Industrial Development Organisation (UNIDO), Singapore occupied the first position in 1990, as well as in 2000. Taiwan and South Korea occupied the 9th and respectively the 10th position, having advanced 9 and respectively 13 places during 1980-2000. Unlike Singapore, which had as basis the participation in international production networks, South Korea and Taiwan built their own internal capacities, without relying only on FDI. Malaysia occupied the 15th position in 2000, in comparison with the 23rd position in 1990 and the 50th position in 1980.

Changes in the hierarchy of the countries/territories* after the index of the performance of the industrial competitiveness(4)

Table 1

Place Year 2000	Economy	Changes in the hierarchy (number of places) 1990-2000	1980-1990	1980-2000
1	Singapore	0	1	1
6	Japan	-2	1	-1
9	Taiwan	6	3	9
10	South Korea	8	5	13
15	Malaysia	8	17	25
23	Thailand	9	15	24
24	China	2	13	15
25	Philippine	18	-1	17
27	Hong Kong-China	-7	-4	-11
38	Indonesia	16	21	37
40	India	-4	2	-2

*The United Nations Industrial Development Organization analyses a group of 93 countries and territories

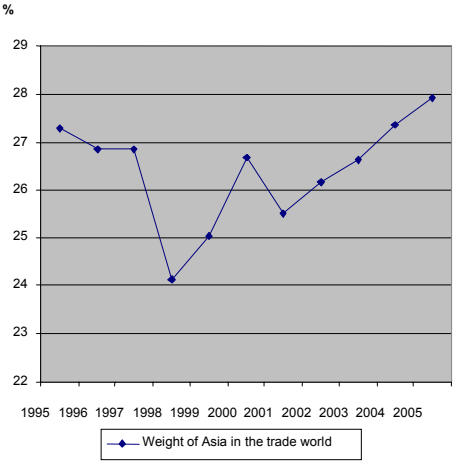
Source: UNIDO – Industrial Development Report, 2003, p. 162.

As a general rule, the success of the Asian tigers, China, and, partially, of India after 1991 was generated by the development of the exports through the participation in the global production networks, either by building up own local capacities, or by attracting the FDI oriented towards exports. In time, the building of the local capacities and FDI became complementary.

The participation of the emerging economies in the World Trade Organization (WTO) led gradually to the diminishing of the trade barriers, for exports and for imports as well. For example, in the case of China, member of the WTO since December 2001, the average customs duty was reduced from 15.3% in 2001 to 9.9% in 2006; for the agricultural products, the reduction was from 23.2% to 15.2%, and for the industrial products, the reduction was from 14.8% to 9%. China adopted new rules in order to liberalize the trade with services (banking, insurance, telecommunications, constructions, distribution, legal services, tourism, transports). There were liberalised 100 types of services, 62.5% of the 160 types of services being classified according to the WTO criteria, almost the average level of the developed countries. In the field of the protection of the intellectual property rights, there were amended all the laws and rules, in order to harmonise these with the provisions of the TRIPS Agreement. After the suspending of the negotiations of the Doha Round in July 2006, China continued the discussions and the opinion exchange with the USA, EU, Brasil, India and other countries and groups of countries, underlining the necessity of the restarting of the dialogue.

2. Evolution of the foreign trade of the Asian emerging economies during 1995-2006. Perspectives

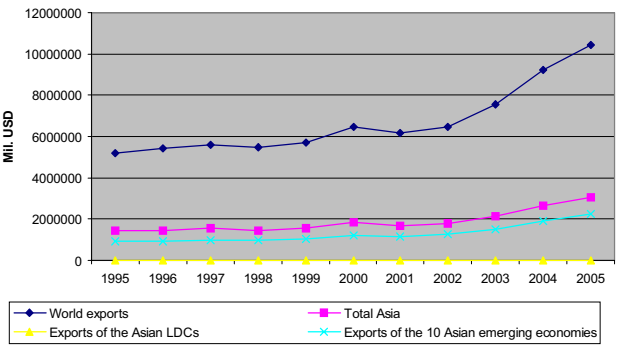
The weight of Asia in the world trade oscillated strongly during 1995-2001, underlining two moments of crisis: 1997/ 1998 and 2001, after that recording a continuous growth.



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 2. *Evolution of the weight of Asia in the world merchandise trade (1995-2005)*

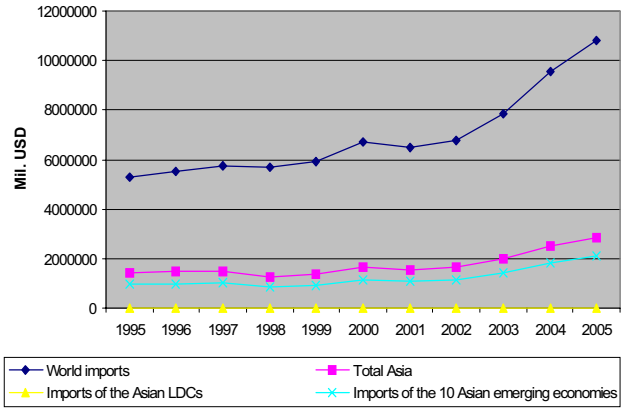
The crisis of 1997/1998 was felt mostly at the regional level, while that of 2001 had a strong global impact, the factors that contributed to these crises having a different nature.



* 12 least developed countries Asia (13 minus Timor Leste)

Source: World Trade Organization, "International Trade Statistics", 2006, data processing.

Figure 3. *Evolution of exports – world, Asia, Asian emerging economies, Asian least developed countries (LDCs)* - value (1995-2005)*



* 12 least developed countries Asia (13 minus Timor Leste)

Source: World Trade Organization, "International Trade Statistics", 2006, data processing.

Figure 4. *Evolution of imports – world, Asia, Asian emerging economies, Asian least developed countries (LDCs)* - value (1995-2005)*

The diminishing of the trade flows of the Asian tigers in 1997-1998 was due to the financial crisis. The first signs of the crisis were apparent in May 1997, when an attack over the Thai baht (the national currency of Thailand) was rejected by a concerted action of the national banks of the region. The crisis burst out on the 2nd of July 1997, by a similar attack on the baht. The uncertainty about the exchange rate of the currency of Thailand led to a massive withdrawal of foreign capital from the banks. The massive withdrawal was possible because Thailand had just introduced rules for the liberalizing of the financial system, one of the provisions being the simplification of the procedures for the withdrawal of the foreign capital. The distrust of the investors grew up, being followed by a wave of capital withdrawals from South Korea, Indonesia, Malaysia, phenomenon followed by the collapse of the national currencies of these countries. The panic reached even Russia and Brasil.

While the net capital inflows in the affected economies were 6.3% of the GDP in 1995, 5.8% of the GDP in 1996, the net capital outflows in the countries affected by the crisis were 2% of the GDP in 1997 and 5.2% of the GDP in 1998 (Krueger, 2004).

The Asian financial crisis was accompanied by two rounds of currency depreciations:

- the Thai baht, the Malaysian ringgit, the Philippines peso and the Indonesian rupia;
- the Singapore dollar, the Hong Kong-China dollar, the Taiwan dollar and the South Korean won.

In 1996, the FDI in the East Asia were about 100 milliard USD, contributing to the creation of 20 million jobs, jobs which disappeared after the financial crisis of 1997-1998.

The sudden depreciation of the local currencies led to the bankruptcy of many companies and financial institutions having assets expressed in national currency and liabilities expressed in USD. These bankruptcies, in their turn, generated unemployment, the import demand decreased, leading to the depression. The phenomenon of the "capital flight" increased. The biggest capital outflows were recorded in Indonesia, Thailand, South Korea, Malaysia, Philippines.

Analysing the data from the report on the international trade statistics from 2000, elaborated by the World Trade Organization (WTO), it results that in 1998 the weight of the Asian tigers in the world exports of the manufactures reached 15.38% of the total, in comparison with 16.54% in 1997, due to the decrease of the exports at the regional level, in parallel with the increase of the value of exports of the manufactures with 1.3% at the global level. The largest decreases of the manufacture exports value were recorded in Singapore (11.28%), Taiwan (8.61%), Hong Kong-China (6.65%), Thailand (4.63%), while the exports of Malaysia decreased with 4.19%, those of Indonesia with 4.18% (after another reduction with 11.98% in 1997 in comparison with 1996), and those of South Korea decreased with 3.41%.

As for the imports of manufactures, the trend was descending as well. The imports decreased for all the 8

Asian tigers in 1998 in comparison with 1997: with 38.04% for South Korea, 37.86% for Indonesia, 31.95% for Thailand, 25.34% for Malaysia, 21.48% for Singapore, 17.42% for Philippines, 11.13% for Hong Kong-China, 4.04% for Taiwan. In the cases of Hong Kong-China and Indonesia, the imports continued to decrease in 1999 as well, for Indonesia the reduction being substantial: 35.52% (1999 in comparison with 1998).

The weight of the Asian tigers in the world exports of *machinery and equipments* decreased from 36.1% in 1996 to 35.05% in 1997, reaching 31.58% in 1998. The imports decreased more accelerated than the exports. For Hong Kong-China, Indonesia and Philippines, the value of the imports continued to decrease in 1999 as well. With the exception of Taiwan, which recorded a continuous increase of imports in the analysed period, no other Asian tiger could reach in 1999 the level of the imports of 1996.

In the field of *office and telecom equipment*, the weight of the Asian tigers in the world exports declined from 17.39% in 1996, to 17.15% in 1997, reaching 15.98% in 1998. The exports increased for all the Asian tigers in 1999, but the weightin the world exports in 1999 (17.14%) was under the level of the period before the financial crisis. The decreases were larger in the case of imports. In 1997, only the imports of Indonesia decreased, but in 1998, excepting Taiwan, all the Asian tigers recorded decreases. The imports of Indonesia decreased with 67.93%, those of Thailand with 26.01%, those of Singapore with 18.23%, those of Malaysia with 10.02%. The definitive imports of Hong Kong-China and Singapore decreased dramatically, with over 27%.

The weight of the Asian tigers in the world exports of *textiles* diminished from 30.85% in 1996 to 30.34% in 1997, reaching 27.65% in 1998. The exports of Indonesia, Singapore, Malaysia had already decreased in 1997. In the case of Indonesia, the reduction was substantial: 20.46%. But in 1998, the exports of Indonesia increased with 4.61%, while all the other Asian tigers recorded decreases: 30.76% for Singapore, 15.43% for South Korea, 15.25% for Malaysia, 14.84% for Philippines, 12.87% for Thailand, 12.63% for Taiwan, 10.7% for Hong Kong-China.

In the field of *clothing*, in 1997-1998 the Asian tigers recorded decreases as well. Malaysia, Philippines, Taiwan and Thailand continued this trend in 1999, too. The reduction of the share of the Asian tigers in the world exports of clothing, from 33.68% in 1990, to 26.13% in 1996 and 23.83% in 1997 can be explained as well by the increase of the share of China, from 8.95% in 1990, to 15.25% in 1996 and 17.45% in 1997.

The negative impact of the financial crisis was generally greater on imports than on exports. This can be explained by the devaluation of the currencies of the Asian tigers, the imports being discouraged, and the exports being stimulated. The decreases of the exports can be explained by the negative effects on the whole economy. The most affected were Indonesia, Thailand, Malaysia, South Korea.

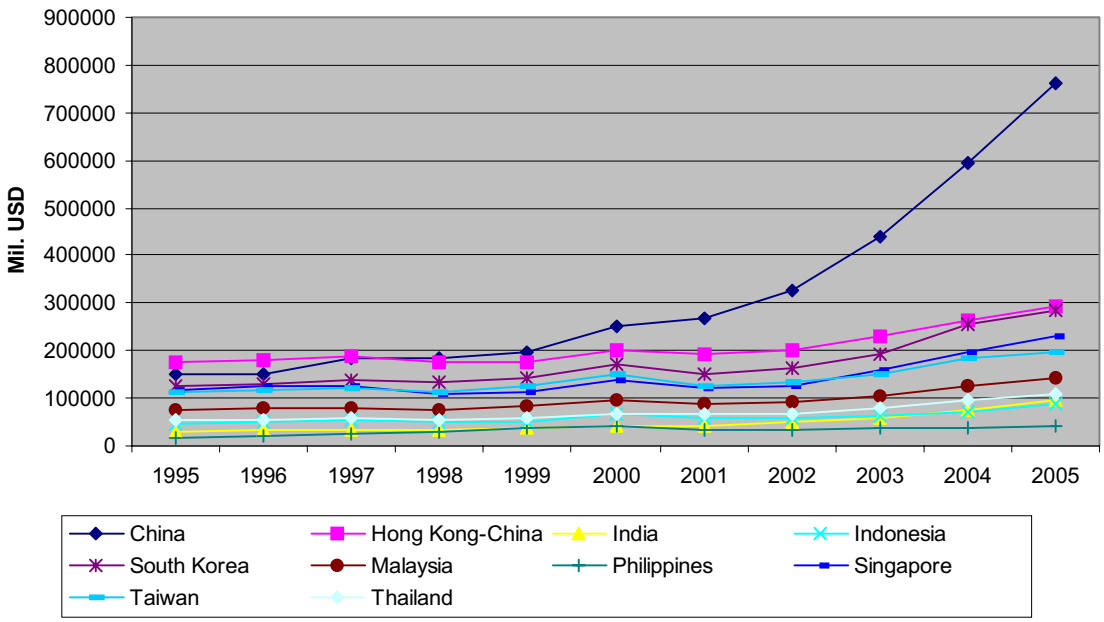
Analysing in short the factors that led to the *unfavourable evolution of the trade of the Asian tigers during 2001-2002*, these are:

- the drop of the demand for the products in the field of the information technology, sector with a great weightin their foreign trade;
- the slowing down of the rhythm of the economic activity in the EU, Japan and the USA (Japan and the USA being important trade partners of these economies);
- the events of the 11th of September 2001, leading to the disruption and undermining of the confidence in the global business environment.

In 2001, the value of the exports of merchandise of Asia decreased with 9%, while the value of imports declined with 7%. China recorded growth of the exports and imports as well, one of the factors being the relocation of many production capacities in China.

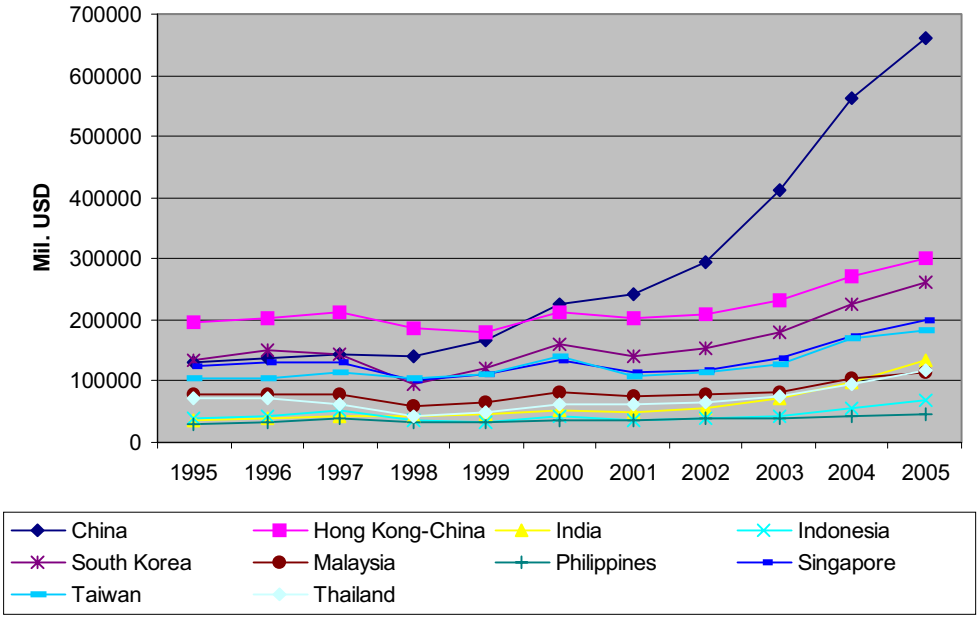
The weight of the Asian tigers in the world exports of manufactures dropped from 17.21% in 2000 to 15.92% in 2001 (a reduction with 1.29 percentage points), the weight of India decreased from 0.74% in 2000 to 0.73% in 2001 (a reduction with only 0.01 percentage points), while the weight of China grew from 4.69% in 2000 to 5.22% in 2001 (increase with 0.53 percentage points). The substantial reduction of the weight of the Asian tigers in the total was mainly due to the reduction of the value of exports. The value of exports of the South Korea decreased with 25%, that of Taiwan with 21%, that of Indonesia with 18%, that of Philippines with 17%, that of Singapore with 16%, Malaysia with 14%, Thailand with 13%. Substantial reductions were recorded at imports as well. In 2002, the weight of the Asian tigers in the world manufactures exports reached 16.18%, a level below that of 2000, but higher that of 2001. The weight of China reached 6.21% of the total.

For the *office and telecom equipment*, the weight of the Asian tigers in the total exports decreased from 35.83% in 2000 to 34.82% in 2001. The weightrecorded in 2002 was higher than that of 2000, reaching 37.86%, on the background of the global recovery of the world economy. The weight of China recorded a continuous growth, from 4.53% in 2000, to 6.24% in 2001 and 9.01% in 2002.



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 5. *Evolution of the merchandise exports of the Asian emerging economies (1995-2005)*



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

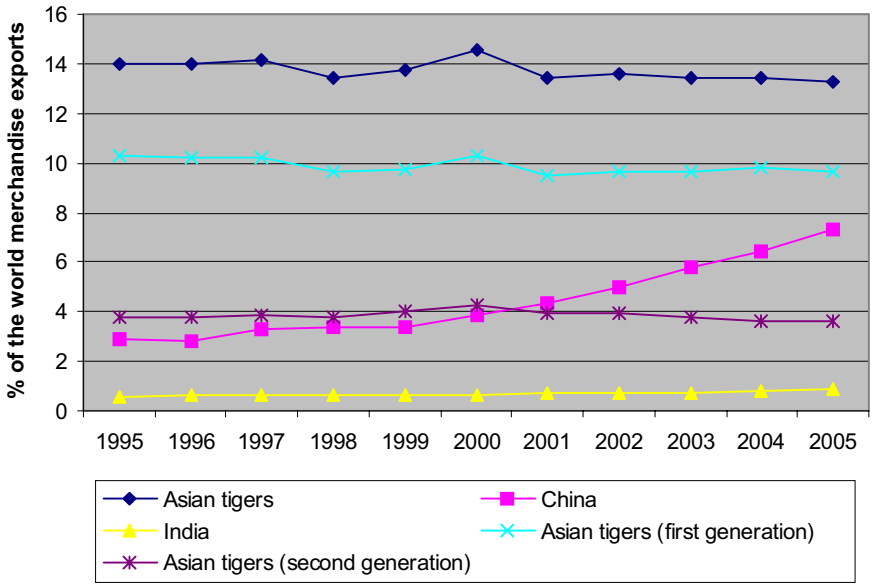
Figure 6. *Evolution of the merchandise imports of the Asian emerging economies (1995-2005)*

Among the analysed economies, the most spectaculous evolution was that of China, which surpassed South Korea and Hong Kong-China at exports, as well as at imports.

In the hierarchy of the main exporters at the global level in 2005, China had the third position, with a weight of 7.3% of the world exports, after Germany and the USA. In 1995-1997, the exports of Hong Kong-China were over those of China, but since 1998 until the present, China was the main exporter among the emerging economies, in 2004 surpassing Japan as well, becoming the main Asian exporter. Hong Kong-China occupied in 2005 the 11th position, with a weight of 2.8% of the total, South Korea the 12th position (2.7% of the total), Singapore the 14th position (2.2% of the total), Taiwan the 16th position (1.9% of the total), Malaysia the 19th position (1.4% of the total), Thailand the 25th place, India the 29th place, Indonesia the 31st place, and Philippines the 44th place. Among these, increases with over 20% in 2005 in comparison with 2004 were recorded by China (28%), India (26%), Indonesia (22%).

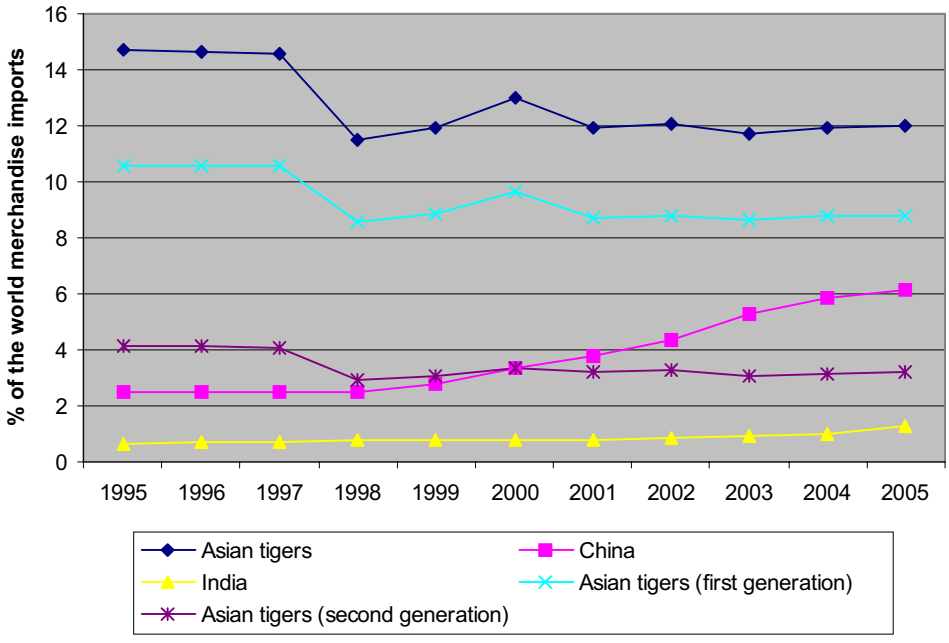
At the imports, the hierarchy is similar: China had the third position, after the USA and Germany, with a weight of 6.1% of the world imports. In 1995, China followed Hong Kong-China and South Korea, among the emerging economies. In 1998, it surpassed South Korea, in 2000 surpassed Hong Kong-China, becoming the main importing emerging economy of Asia. In 2003 surpassed Japan, becoming the first importing economy of Asia. Hong-Kong-China had the 11th place in 2005, with a weight of 2.8% of the total, South Korea the 13th place (2.4% of the total), Singapore the 15th place (1.9% of the total), Taiwan the 16th place (1.7% of the total). India had the 17th position (1.3% of the total), Thailand the 22nd, Malaysia the 24th, Indonesia the 31st, Philippines the 40th. Among these, increases with over 20% at the merchandise imports in 2005 in comparison with 2004 were registered by India (39%), Thailand (25%), Indonesia (27%).

In 2006, the volume of the trade of China (exports plus imports) reached 1,760 milliard USD, the third place in the world trade after USA and Germany. The Chinese authorities forecast that in the following 2 years China will occupy the second place after the USA. The trade surplus of China reached 177.5 milliard USD in 2006, with 74% higher than in 2005 (101.88 milliard USD).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 7. *Evolution of the weight of the Asian tigers, China and India in the world merchandise exports (1995-2005)*



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

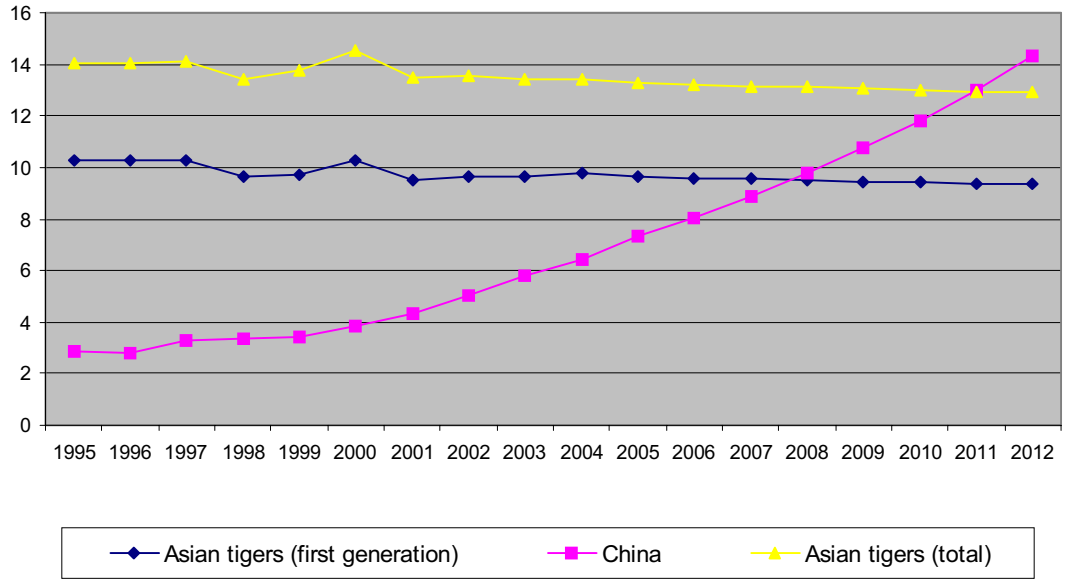
Figure 8. *Evolution of the weight of the Asian tigers, China and India in the world merchandise imports (1995-2005)*

Together, the 10 analysed emerging economies had in 2005 a weight of about 21.5% of the world merchandise exports and 19.4% of the world merchandise imports.

The Asian tigers had in 2005 a weight of 13.25% of the *world merchandise exports*, a lower level than that of 14.01% of 1995. The diminishing of the weight of the Asian tigers in the world merchandise exports was due to the two crises: 1997-1998 and 2001 and to the continuous growth of the weight of China in the world trade, from 2.88% in 1995 to 7.3% in 2005. The Asian tigers of the first generation still have a larger share in the world exports than China, but the group of the Asian tigers of the second generation was surpassed by China in 2001. At *imports*, the situation is similar. The weight of the Asian tigers in the world trade diminished from about 14.7% in 1995 to under 12% in 2005, the main factors being those mentioned in the case of exports, plus the growth of the weight of the USA in the world imports from 14.58% in 1995 to 16.07% in 2005. The weight of China in the world imports recorded a strong growth as well: from 2.5% in 1995 to 6.12% in 2005, in 2000 having surpassed the group of the Asian tigers of the second generation as weightin the world imports.

It is interesting to analyse the *evolution of the exports of China and of the Asian tigers* in the near future, taking into account the following scenario:

- the growth rate of the exports during 1995-2005 projects itself over the next period;
- the growth rate of the exports of China is of minimum 18.4536% yearly in the following period (the average growth rate of 1995-2005);
- the growth rate of the exports of the Asian tigers of the first generation is of 7.1168% (the average growth rate of 1995-2005);
- the growth rate of the exports of the group of the 8 Asian tigers is of 7.1579% (the average growth rate of 1995-2005);
- the growth rate of the world exports is of 7.5643% (the average growth rate of 1995-2005).



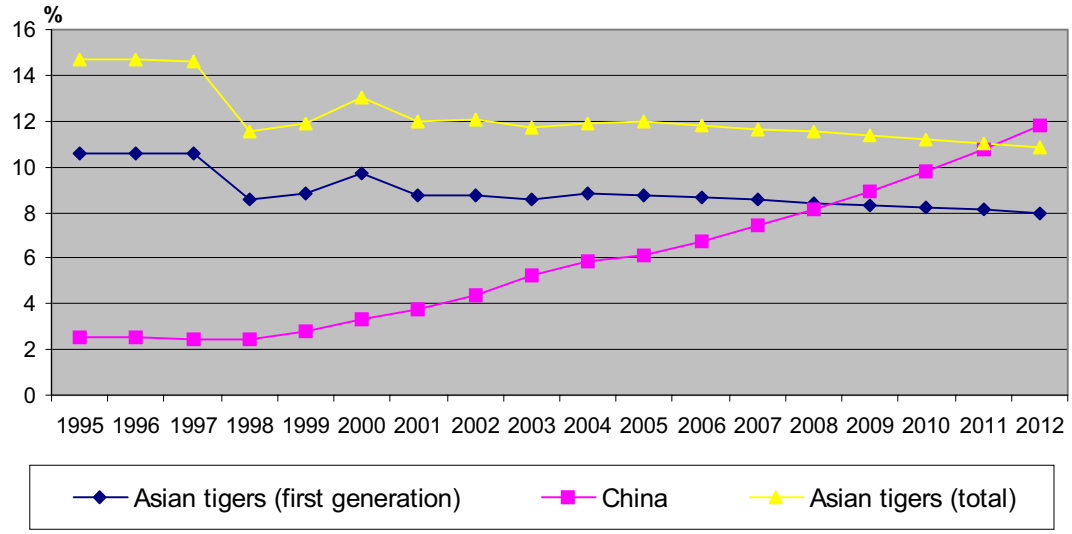
Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 9. *Evolution of the weight of China, of the Asian tigers of the first generation and of the Asian tigers as a group in the world merchandise exports (1995-2012)*

According to the above-mentioned scenario, in 2008, the weight of China in the world merchandise exports will surpass the weight of the Asian tigers of the first generation, and in 2011 will surpass the weight of the group of the 8 Asian tigers.

At *imports*, taking into account the following scenario, it comes out that the weight of China in the world merchandise imports will surpass the weight of the Asian tigers of first generation in 2009 and that of the whole group of the Asian tigers in 2012:

- the growth rate of the imports during 1995-2005 projects itself over the next period;
- the growth rate of the imports of China is of minimum 18.2962% yearly in the following period (the average growth rate of 1995-2005);
- the growth rate of the imports of the Asian tigers of the first generation is of 6.2665% (the average growth rate of 1995-2005);
- the growth rate of the imports of the group of the 8 Asian tigers is of 6.1641% (the average growth rate of 1995-2005);
- the growth rate of the world imports is of 7.6634% (the average growth rate of 1995-2005).

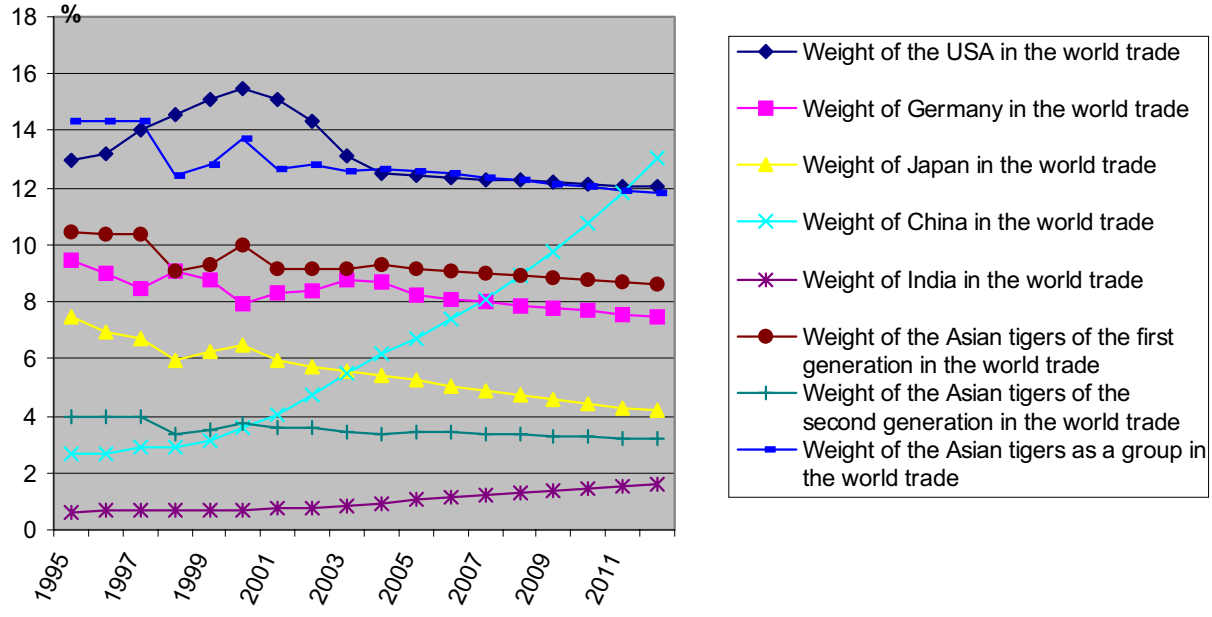


Source: World Trade Organization, „International Trade Statistics", 2006, Data processing.

Figure 10. *Evolution of the weight of China, of the Asian tigers of the first generation and of the Asian tigers as a group in the world merchandise imports (1995-2012)*

Further, it will be taken into account the following scenario at the level of the world merchandise trade:

- the growth rate of the world trade during 1995-2005 projects itself over the next period;
- the growth rate of the world trade is of 7.6143% yearly in the following period (the average growth rate of 1995-2005);
- the growth rate of the trade of China is of 18.3026% yearly in the following period (the average growth rate of 1995-2005);
- the yearly growth rate of the trade of the Asian tigers of the first generation is of 6.6655% in the following period (the average growth rate of 1995-2005);
- the yearly growth rate of the trade of the Asian tigers of the second generation is of 6.5212% in the following period (the average growth rate of 1995-2005);
- the yearly growth rate of the trade of the USA is of 7.1009% in the following period (the average growth rate of 1995-2005);
- the yearly growth rate of the trade of Germany is of 6.1450% in the following period (the average growth rate of 1995-2005);
- the yearly growth rate of the trade of Japan is of 4.1717% in the following period (the average growth rate of 1995-2005);



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 11. *Evolution of the weight of USA, Germany, Japan, China, India and of the Asian tigers in the world merchandise trade (1995-2012)*

The chart from above underlines that China surpassed the weight of the Asian tigers of the first generation in the world trade in 2001 and that of Japan in 2004, the scenario indicating the surpass of the weight of Germany (second place in the world trade in 2005) in 2007, the surpass of the weight of the Asian tigers of the first generation in 2009, and the surpass of the weight of the group of the 8 Asian tigers and that of the USA as well in 2012.

The chart underlines the following aspects as well:

- during 1997-1999, the trade of the USA and that of the Asian tigers had opposite evolutions ("image in the mirror"): while the Asian financial crisis determined the diminishing of the weight of the Asian tigers in the world trade, the weight of the USA grew; the same remark can be made about the evolution of the trade of Germany in comparison with that of the Asian tigers;
- the crisis from 2001 influenced negatively the weight of the USA and that of the Asian tigers in the world trade as well; by contrast, the weight of China, India and Germany continued to grow, showing that the sector of the information technology does not have the most weightin their trade;
- the share of the USA, Germany and that of the Asian tigers in the world trade diminished during the period 1995-2005;
- the most accelerated decrease was recorded by Japan, reflecting the evolution of its economy in the latest decade (the weight of 2005 being at the level of 70% of that of 1995);
- during 1995-2005, the share of China in the world merchandise trade grew of 2.5 times, while the share of India grew of 1.7 times.

The following arguments will sustain the previous scenario.

On the 21st of July 2005, China chose a controled floating of its currency, with a strong impact on other currencies, as well as on other markets like the bond market and the commodities market. On the basis of the trade balance excedent, the governor of the Central Bank, Zhou Xiaochuan, announced the posibility of the continuation of the revaluation of the yuan (RMB). A greater flexibility of the currency will make possible the use of its policies for economic goals. The effects of the revaluation of the yuan may be absorbed by the exporters, by lower profit margins, in order to let the prices at the actual levels and not to determine inflationary pressures.

Taking into account the declarations of the Chinese authorities, the exports will record lower growth rates, and the imports higher growth rates, but, at the level of the total trade, there will be no major changes. The trade surplus was of 177.5 milliard USD in 2006. The Trade Minister of China, Bo Xilai, announced in January 2007 the launching of strategies in order to encourage the imports and restrict the exports, for the diminishing of the trade surplus, surplus that worries economies like the USA and the EU, with record deficits in the trade relations with China. But why does the Germany's surplus not worry anybody, as it grew from 59 milliard USD in 1995 to 196 milliard USD in 2005?

The trade Minister intends to rectructure the sector, by the reduction of the exports intensive in energy and small value added. In 2006, there was launched a package of industrial and fiscal policies for curbing the exports of energy consuming products (especially processing exports), products with a weight of almost 50% in the trade surplus, but with low profit margins. In order to stimulate the imports, the government intends to relax the restrictions and grant fiscal and financial incentives for necessary imports (energy, resources, new technologies and equipments), while the exports of the central and western regions will be further encouraged. The effects of these measures will not be reflected on the short term, that is why in 2007-2008 the surplus will grow further, but at a slower pace.

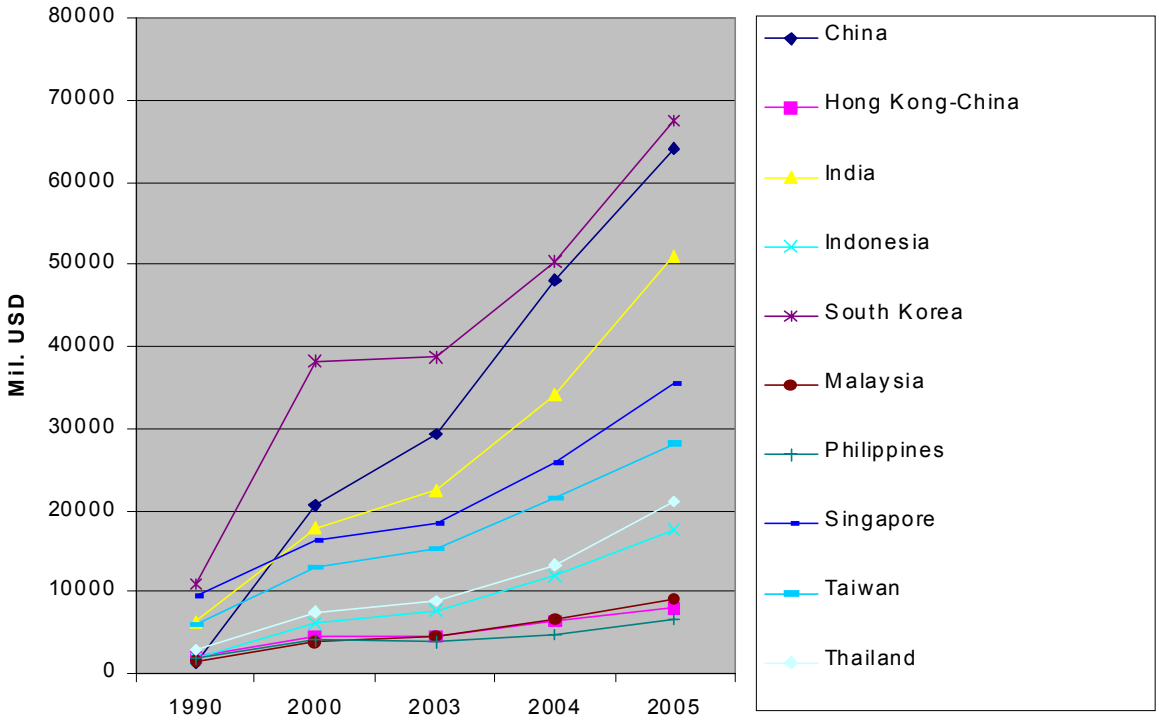
The Chinese authorities underline some problems, like the low profit of the Chinese companies and the small number of the Chinese trade marks. In the hierarchy of the best 500 international marks, only 4 are Chinese, in comparison with 249 of the USA, 46 of France, 45 of Japan. The competitive capacity of the Chinese companies is smaller than that of the transnational companies. Comparing the strongest 500 international companies with the strongest 500 Chinese companies, in 2005, the rate of total revenues of the two cathegories was 12:1, that of the total profit was 14:1, and that of the total assets was 17:1.

The growth rates of the exports and imports of the Asian tigers will have the same trend. On the one hand, the trade dependency of the Asian tigers of China is very strong, on the other hand, the Asian tigers of the first generation, which have the highest weightin the trade of the Asian tigers (72.6% from exports and 73% from imports), are dependent on the import of commodities, and they will further import natural resources.

During 1995-2005, the average growth rate of the exports and imports of the analysed economies (10.02%, respectively 9.17%) surpassed the average growth rate of the global level (7.56% and respectively 7.66%), the average growth rate of Asia (8.25% and respectively 8.20%), the average growth rate of North America (5.83% and respectively 8.67%), the average growth rate of the Central America (9.69% and respectively 6.12%), of Europe (6.68% and respectively 7.12%); nevertheless, the group of CIS countries, Africa, Middle East recorded higher growth rates (12.97% for exports and 10.28% for imports of the CIS, 11.40% for exports of Africa, 15.54% for exports and 9.67% for imports of the Middle East). The growth rates

recorded by the economies of CIS, Middle East and some African countries can be explained by the evolution of the natural resources trade and the evolution of prices as well.

According to the data of "Key World Energy Statistics 2006", issued by the International Agency for Energy, in the hierarchy of the main 10 oil exporters in 2004, there was no one of the analysed economy, but in the hierarchy of the imports, China occupied the 3rd position after the USA and Japan, with 5.5% of the total, South Korea had the 4th position, with 5.1% of the total, India the 6th position, with 4.3% of the total. In 2005, in the field of natural gas, in the hierarchy of the main 10 exporters there were Indonesia, with 4.26% of the total (place 7), after Russia, Canada, Norway, Algeria, Holland, Turkmenistan, while Malaysia was on the 8th place (3.8% of the total). At the imports, the South Korea had the 8th position, with 3.5% of the total. In the field of coal, in the hierarchy of the main exporters in 2005, Indonesia had the 2nd position (14% of the total), China had the 5th position (9.3% of the total; China was the first coal producer in 2005), while in the hierarchy of the main importers, there were South Korea (9.9% of the total, second position after Japan), Taiwan (7.8%, 3rd position), India (4.8% of the total, 6th position), China (3.2% of the total, 8th position).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 12. *Evolution of the imports of fuel of the Asian emerging economies (1990-2005)*

That is why the Asian tigers of the first generation, lacking natural resources, had to import them and to specialize in the field of the manufactures and services, while the Asian tigers of the second generation resorted to the export of products with a lower degree of processing. India and China, although have varied resources, have to import resources as well, for the productive consumption and for the consumption of the population, too.

According to the UNIDO Report, "Industrial Development Report 2005", in the hierarchy of the countries/territories after the export of manufactures/ inhabitants (there were taken in analysis 65 countries and territories), in 2002, Singapore had the 1st position (33,106 USD/inhabitants), Taiwan the 12th position (6,564 USD/ inhabitants), Malaysia the 21st position (4,121 USD/ inhabitants), South Korea the 25th position (3,591 USD/ inhabitants), Hong Kong-China the 27th position (3,212 USD/inhabitants), Thailand the 43rd position (870 USD/ inhabitants), Philippines the 53rd position (482 USD/ inhabitants). China and Indonesia, outside the hierarchy of the 65 countries and territories, recorded a value under 300 USD/inhabitants, 20 positions afterwards coming India.

Processing the data of the World Trade Organization (WTO) and Asian Development Bank (ADB), in the hierarchy of the emerging economies after the export of manufactures/inhabitants, in 2005 on the first place was Singapore, followed by Hong Kong-China (there were taken into consideration the re-exports as well), Taiwan, South Korea, Malaysia, Thailand (all of them over the world

average of 1,133 USD/inhabitant), followed by China, Philippines, Indonesia and India (below the world average).

Export of manufactures/population (USD)

Table 2

	1990	2000	2005
World	454	774	1133
China	39	173	536
Hong-Kong-China	13261	28882	40567
India	15	34	63
Indonesia	50	171	183
South Korea	1414	3611	5346
Malaysia	874	3360	4013
Philippines	92	456	431
Singapore	12292	29274	42575
Taiwan	3066	6330	7542
Thailand	261	829	1302

Sources: World Trade Organization – "International Trade Statistics", 2006 and Asian Development Bank – "Key Indicators of Developing Asian and Pacific Countries", 2004, 2005, 2006 (data processing).

Among the analysed economies, Hong Kong-China, China, South Korea and Taiwan have a weight of the manufactures exports in their exports of over 90% (95.8%, 91.9%, 90.7% and respectively 90,7%), Philippines and Singapore have a weight of over 80% (89% and respectively 80.6%), Thailand and Malaysia a weight of over 70% (76.6% and respectively 74.4%), the lowest level being recorded in India (69.4%) and Indonesia (46.9%). At the global level, the share of the manufactures exports in the world exports is of 72%.

The report on the industrial development of the ONUDI of 2005 (pp. 157-160) indicates a growing trend of the weight of the medium and high technology products in the total exports of manufactures of the analysed economies (with the exception of Hong-Kong-China), the highest rates being recorded by the Asian tigers of the first generation (with the exception of Hong-Kong-China): over 70%, the Asian tigers of the second generation (with the exception of Indonesia): over 60%. Although with a growing trend, the weight of the medium and high technology products in the exports of China and India is of 46% and respectively 20% of their total exports.

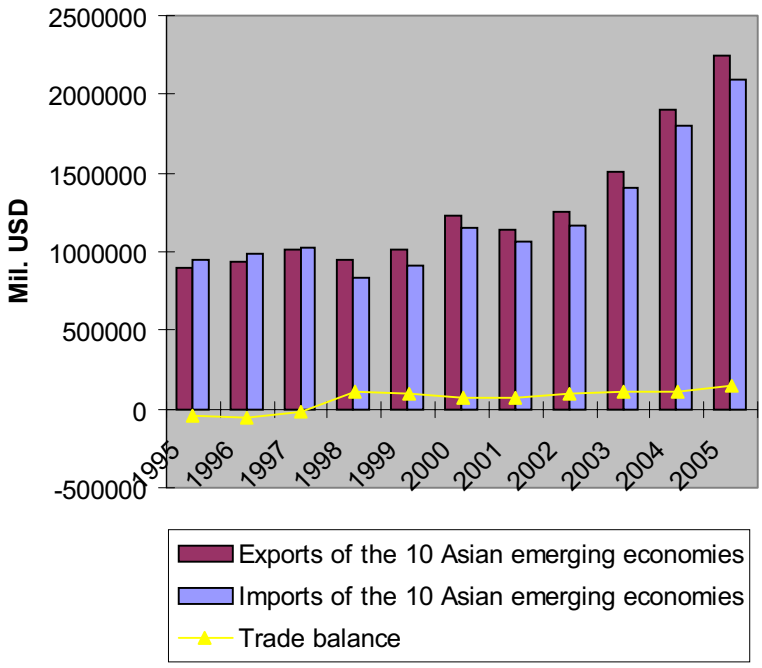
3. Analyse of the evolution of the foreign trade indicators of the Asian emerging economies during 1995-2005 (trade balance, normalized trade balance, exports-imports-ratio, index of exports-imports-ratio, trade openness, export propensity, Grubel-Lloyd index)

The characteristics presented before will be emphasized in this section through *charts having as basis several indicators*.

- Trade balance

$BC = X - M$

(X = exports; M = imports);

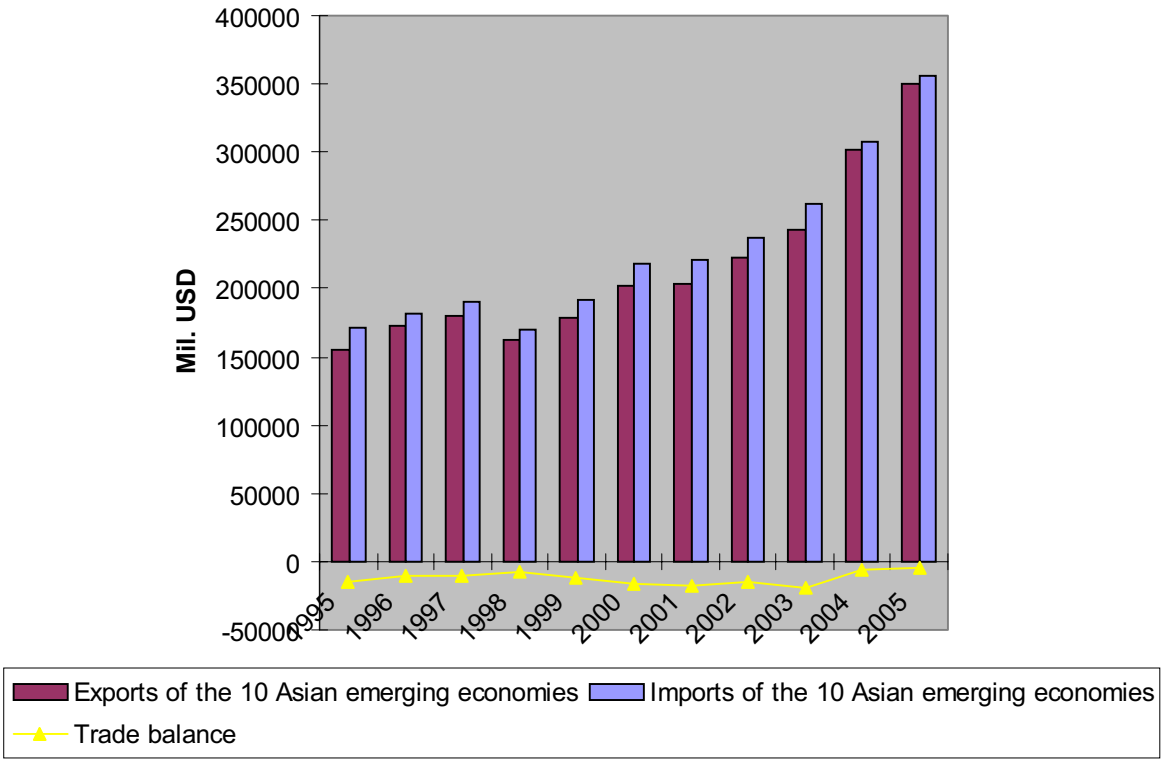


Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 13. *Merchandise trade balance of the Asian emerging economies (1995-2005)*

Negative in 1995-1997, the merchandise trade balance of the group of the emerging economies recorded positive values during 1998-2005, reaching a maximum of almost 151 milliard USD in 2005, due in principal to the surplus of China of over 100 milliard USD. China, Indonesia and Taiwan recorded surpluses in the whole interval 1995-2005. India, Hong Kong-China and Philippines recorded the largest deficits, while the trade balances of South Korea, Malaysia and Singapore recorded positive values after 1997. Thailand had a negative balance in the whole interval 1998-2004. During 1995-2005, the trade balance of the group of the 13 least developed countries of Asia was negative, the deficit becoming larger between 2003-2005. Among the other economies of Asia, Papua New Guinea and Vietnam recorded remarkable results: Papua New Guinea had a positive trade balance in the whole period 1995-2005, and Vietnam, although with a negative balance, had an average growth rate of the exports that surpassed that of China.

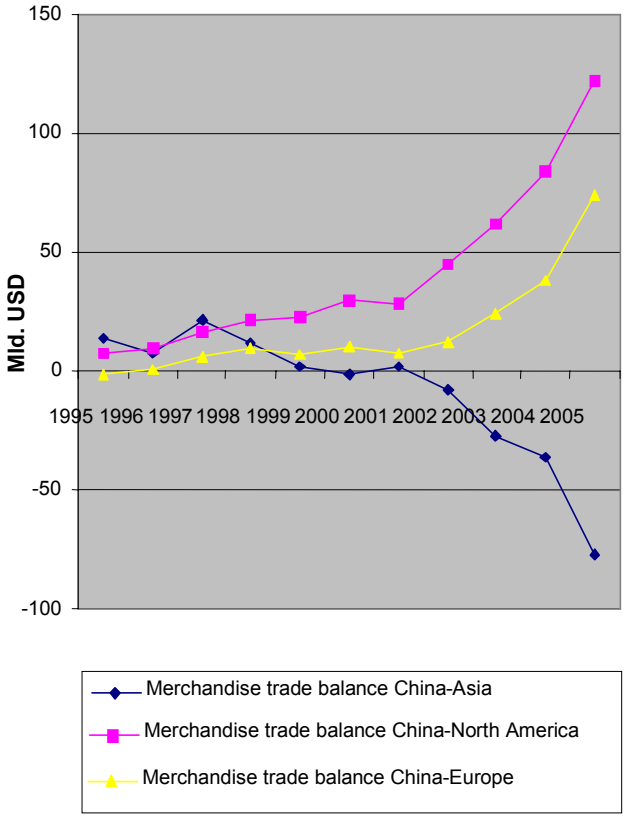
The services trade balance of the group of analysed economies was negative during 1995-2005, the deficit having a decreasing trend. Among the 10 economies, only Hong Kong-China and Singapore have positive balances, but the services play a major role in their economies, the weight of the services in the GDP being 87% in the case of Hong Kong-China and 67.4% in the case of Singapore. For the other 8 economies, the share of the services in the GDP varies between 73.6% (Taiwan) and 40.3% (China).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

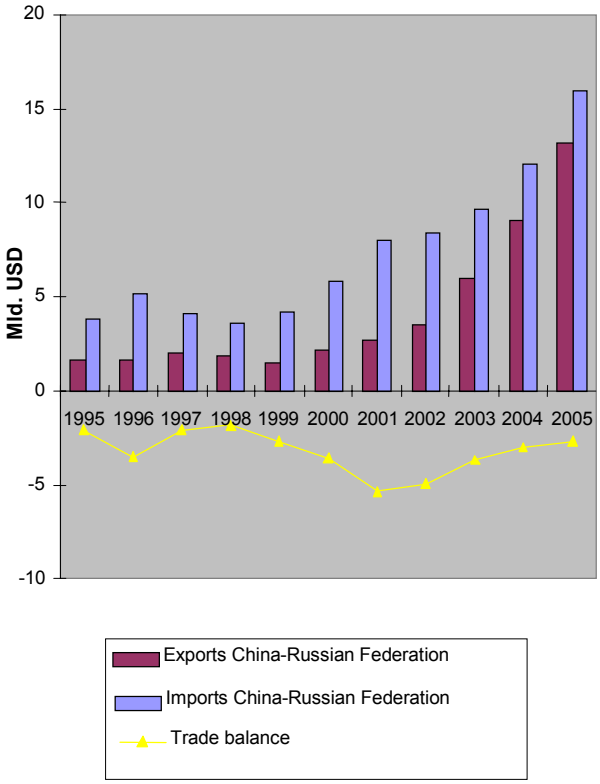
Figure 14. *Commercial services trade balance of the Asian emerging economies (1995-2005)*

Analysing the evolution of the merchandise trade balance of China, in relation with the regions where the main trade partners come from (the USA, Japan, Hong Kong-China, South Korea, Taiwan, Germany, Singapore, Malaysia, Russia, Holland), it comes out that the trade deficit with Asia, which replaced the excedent of before 2000, deepened, the deficit growing from -7.6 milliard USD in 2002 to -27.1 milliard USD in 2003, -36.3 milliard USD in 2004, to -77 milliard USD in 2005. In parallel, the excedents recorded in the trade flows with North America and Europe have been growing, the excedent with the North America evolving from 7.5 milliard USD in 1995 to 122 milliard USD (growth of 16.3 times or with 1527%). The excedent with Europe grew from 0.9 milliard USD in 1996 to 74.2 milliard USD in 2005 (growth of 82.44 times or with 8144.44%).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 15. *Merchandise trade balances: China-Asia, China-North America, China-Europe (1995-2005)*



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 16. *Merchandise trade balance China-Russian Federation (1995-2005)*

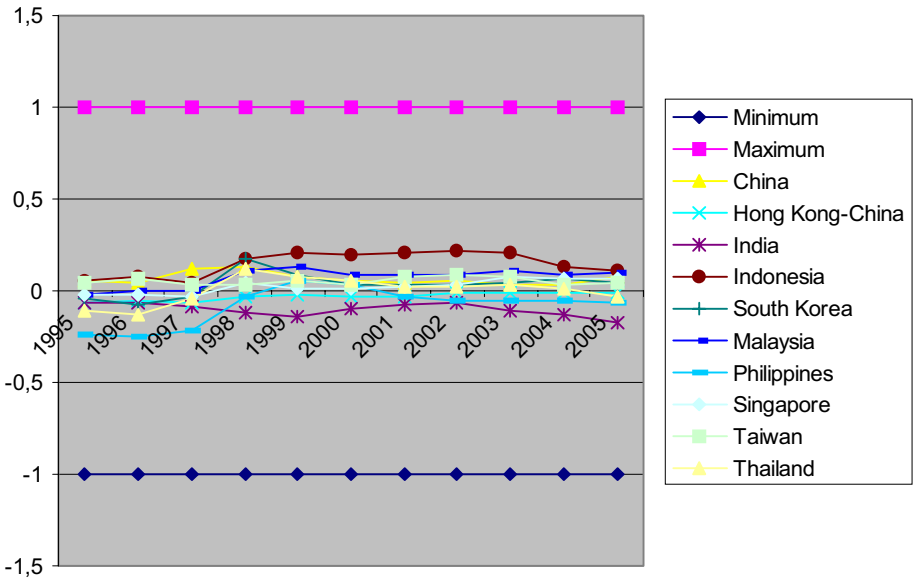
On the other hand, the evolution of the trade flows between China and Russia is very interesting, evolution having as basis the imports of commodities from Russia and the strategic bilateral relations.

While the year 2006 was oficially "The year of Russia in China", year 2007 is "The year of China in Russia". The Sino-Russian agreement of good neighbourhood, friendship and co-operation intensified the relations in fields like politics, economics, science and technology. At the beginning of the month of November 2006, during the week of promotion of the bilateral investments, China and Russia signed in Beijing 8 agreements in order to spur the investments, trade and technical co-operation (including here the production of automotives, development of the infrastructure, mining, wood and glass processing, etc.). The Chinese government estimates that the volume of the bilateral trade will reach 60-80 milliard USD until 2010, and the total Chinese investments in Russia will reach the level of 12 milliard USD until 2020.

It is interesting to mention as well that Russia and China are members of the Shanghai Co-operation Agreement (SCO). The SCO is an intergovernmental organization, created on the 15th of June 2001 in Shanghai by China, Russia, Kazakhstan, Kyrgystan, Tadjikistan and Uzbekistan, having as main goals the fight against terrorism, religious extremism and separatism. It must be mentioned as well that the USA did not obtain the status of observer in the SCO, and, on the other hand, the members of the SCO require the USA the withdrawal of the troops from the territory of any member state of the organization.

The normalized trade balance, indicator of the comparative advantage of an economy and, at the same time, indicator of the sign of the trade balance (positive or with surplus, negative or with deficit). The values of the normalized trade balance are between -1 (meaning no comparative advantage) and +1 (complete comparative advantage). The formula can be broken down on groups of products.

$$BCN = \frac{X - M}{X + M}$$



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 17. *Normalized trade balance, values between -1 and 1 (1995-2005)*

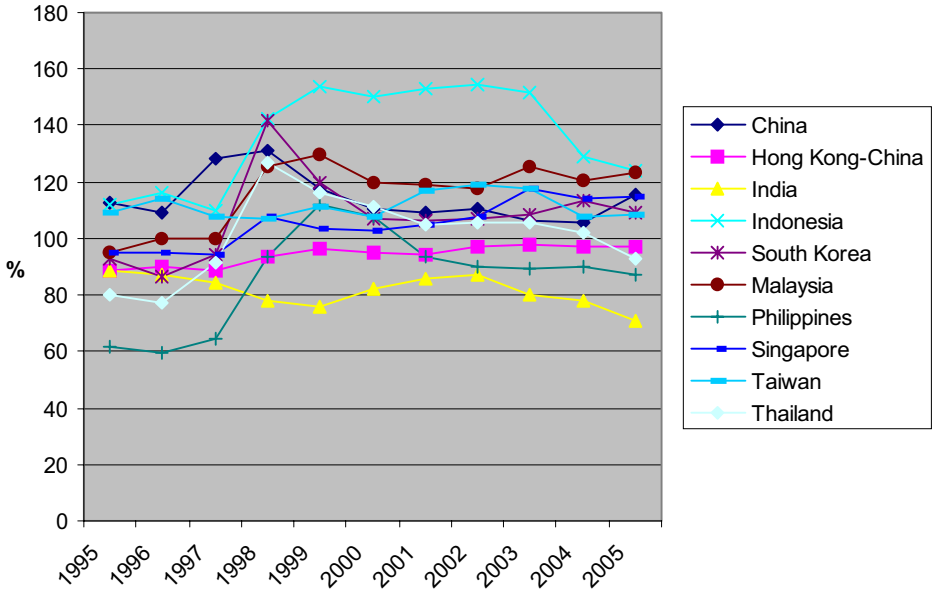
The normalized trade balance indicates, on the one hand, the results reflected by the trade balance, and, in addition, the comparative advantage of an economy.

China, Indonesia and Taiwan had positive balances during 1995-2005. India, Hong Kong-China and Philippines recorded the largest deficits, while South Korea, Malaysia and Singapore had positive values after 1997. Thailand had a positive trade balance during 1998-2004.

As an average for the whole period, Indonesia has the highest comparative advantage among the analysed economies, while India has the lowest comparative advantage. Among the two extremes, there are, in a decreasing order: Malaysia, China, Taiwan, South Korea, Singapore, Thailand, Hong Kong-China, Philippines.

The exports-imports-ratio indicates, on the one hand, which share of the imports can be paid through exports, and, on the other hand, a surplus or a deficit of the trade balance (values < 100% indicate a deficit, 100% indicates a perfect equilibrum, while values > 100% indicate an excedent).

$$GA = \frac{X}{M} x100 \text{ (percent)}$$



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 18. *Exports-imports-ratio (1995-2005)*

Analysing the evolution of the exports-imports-ratio, there can be underlined the following trends:

- China, Indonesia and Taiwan recorded in the whole period 1995-2005 results > 100%, indicating positive balances, Indonesia recording even values over those recorded by China and Taiwan in 1996, 1998-2005. The highest values recorded by China were in 1997-1998 and 2005, the highest values recorded by Indonesia were in the period 1999-2002, and the highest values recorded by Taiwan were in the period 2001-2003;
- South Korea, Malaysia and Singapore recorded since 1998 positive balances, recording in the whole period 1998-2005 exports-imports-ratios > 100%. South Korea recorded the highest value in 1998, Malaysia in 1998-1999 and 2003, and Singapore in 1998, 2003-2005;
- Philippines recorded negative trade balances in the whole period, with the exception of 1999-2000, while Thailand recorded positive balances in 1998-2004, although the exports-imports-ratio had a decreasing trend after 1999;
- Hong Kong-China and India recorded in the whole period 1995-2005 negative trade balances, the fluctuations and deficits of India being larger than those of Hong Kong-China.

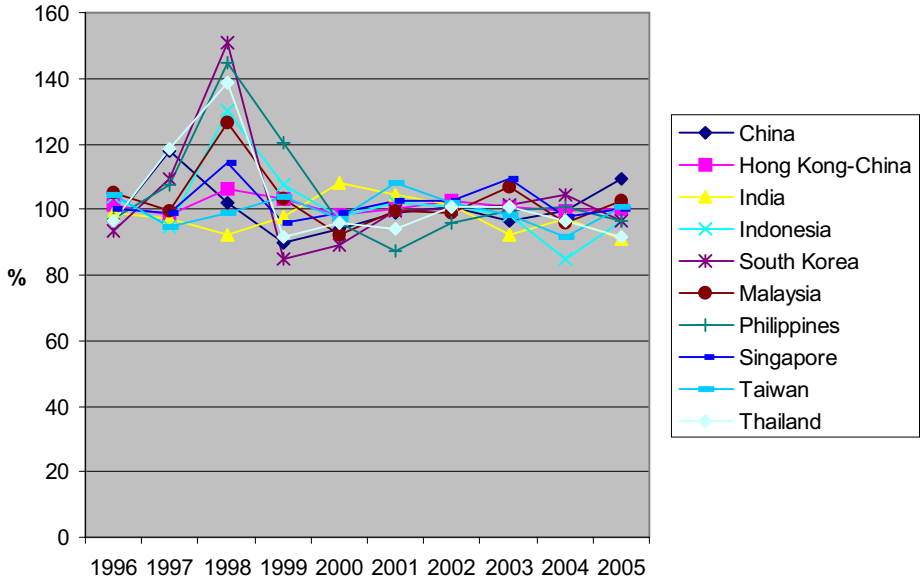
Index of the exports-imports-ratio (indicator of dynamics, indicating the yearly evolution of the exports-imports-ratio)

$$IGA = \frac{GA1}{GA0} = \frac{X1}{M1} : \frac{X0}{M0} = \frac{X1}{M1} x \frac{M0}{X0} = \cdot$$

$$= \frac{X1}{X0} x \frac{M0}{M1} = \frac{X1}{X0} : \frac{M1}{M0} = \frac{I^X 1/0}{I^M 1/0}$$

>100% - either an increase of the excedent, or the transition from a deficit to an excedent, or the diminishing of the deficit;

<100% - either the diminishing of the excedent, or the increase of the deficit, or the degradation of the balance (transition from a positive to a negative trade balance).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 19. *Index of exports-imports-ratio (1995-2005)*

China, Indonesia and Taiwan, with positive balances in the whole period 1995-2005, recorded values over 100%, as well as values of under 100%, indicating years when the excedent grew or diminished.

Hong Kong-China and India recorded in the whole period negative balances, the values over 100% indicating the increase of the deficit, the values under 100% indicating the decrease of the deficit.

It should be underlined that the highest variations of the index of the exports-imports-ratio were recorded in the period 1996-1999, especially for South Korea, Philippines, Indonesia, Malaysia.

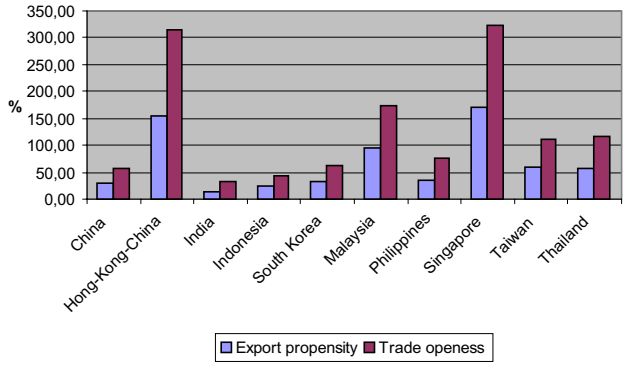
Further, there will be underlined *the trade openness and the export propensity* of the emerging economies of Asia, using the following formulas:

- Trade openness:

$$GDE = \frac{X + M}{PIB} x\ 100 \text{ (percent)}$$

- Export propensity:

$$IE = \frac{X}{PIB} x100 \text{ (percentage).}$$



Sources: World Trade Organization – "International Trade Statistics", 2006, Asian Development Bank – "Key Indicators of Developing Asian and Pacific Countries", 2006, www.apec.org, data processing.

Figure 20. *Trade openness and export propensity of the Asian emerging economies, 2005*

The highest values were recorded by Singapore and Hong Kong-China, for the both indicators (export propensity with values of over 150% and trade openness with values of over 300%), the main factor being the high weight of the re-exports in their foreign trade, as well as the liberal trade policies. Malaysia, Taiwan and Thailand follow in the hierarchy, before South Korea and Philippines, the latest positions being occupied by China, Indonesia and India. The explanation in the case of China, Indonesia and India, populous countries, is the high internal consumption. In addition, in the case of Indonesia, it is reflected the insignificant participation in regional production networks.

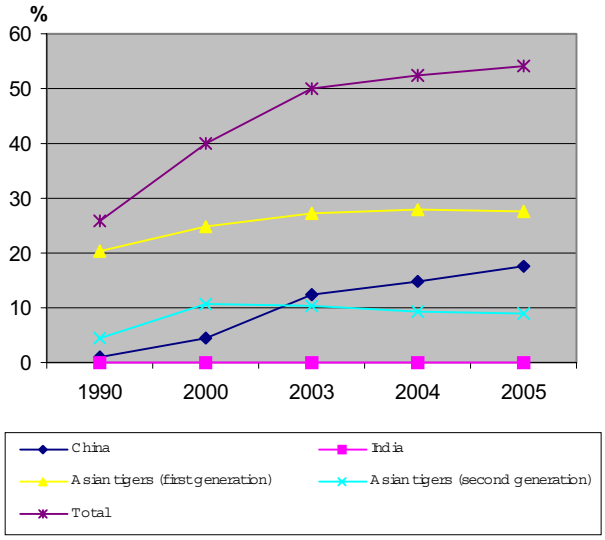
4. Asian foreign trade on product category. The role of the emerging economies

In 2005, the most part of the exports of the Asian economies was represented by manufactures: 83.1%, a higher share than that of 1990 (79.1%), but lower than that of 2000 (84.2%). The cathegory of machinery and transport equipment had a weight of 48.6% of the Asian exports (in comparison with 43.2% in 1990 and 51.2% in 2000), out of which the office and telecom equipment had a weight of 25.2% of the total (in comparison with 18.6% in 1990 and 27.5% in 2000), and the automotive products had a share of 7% of the total (in comparison with 9.7% in 1990 and 6.9% in 2000). The chemicals had a share of 7.4% of the Asian exports (in comparison with 4.6% in 1990 and 6.1% in 2000). The weight of the textiles in the total Asian exports was 3.4% in 2005, while in 1990 was of 5% and in 2000 of 4.2%, and the weight of the clothing in the Asian exports was of 4.7% in 2005, in comparison with 6.4% in 1990 and 5.5% in 2000. In conclusion, comparing the data of 2005 with the data of 1990, it can be noticed that the weight of the machinery and transport equipment (due to the growth of the exports of office and telecom equipment, in parallel with the diminishing of the weight of the automotive products), and that of chemicals was higher in 2005 than in 1990, but the weight of the textiles and that of clothing recorded a decreasing trend.

It is interesting to notice that the share of Asia in the world merchandise exports was of 27.4% of the total, the weight of the manufactures being of 31.6% of the total, that of iron and steel of 26.5% of the total, that of the chemicals of 18.5% of the total, that of machinery and transport equipment of 35.1% of the total (the office and telecom equipment had a weight of 54.9% of the world exports and the integrated circuits a weight of 66%), that of textiles of 46.7% of the total and that of clothing of 47.7% of the total.

The exports of the office and telecom equipment have a weight of 25.2% of the total merchandise exports and 18.3% of the total merchandise imports of Asia, while the weightin the trade of manufactures of Asia is even higher: 30.3% of the total manufactures exports and 27.3% of the total manufactures imports. Asia holds the first position at the exports, as well as at the imports of office and telecom equipment.

The share of the emerging economies of Asia in the total exports of office and telecom equipment evoluated from 25.98% in 1990 to 40.13% in 2000, and 54.30% in 2005. India has the lowest weight (under 0.8% in 2005), while China has the highest weight (17.7%), having surpassed even the weight of the Asian tigers of the second generation as a group (almost 9% of the total). The Asian tigers of the first generation as a group have a weight of 27.5% of the total.



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 21. *Evolution of the weight of China, India and Asian tigers in the world exports of office and telecom equipment (1990, 2000, 2003, 2004, 2005)*

Applying the Grubel-Lloyd index on the emerging economies for the trade with office and telecom equipment, it comes out the following table:

Evolution of the Grubel-Lloyd index applied to the trade of office and telecom equipment of the Asian emerging economies (1990, 2000, 2003, 2004, 2005)

Table 3

	1990	2000	2003	2004	2005
China	0,87	0,99	0,90	0,86	0,83
Hong Kong-China	0,98	0,91	0,97	0,97	0,99
India	0,43	0,30	0,24	0,19	0,17
Indonesia	0,24	0,18	0,34	0,43	0,47
South Korea	0,70	0,73	0,67	0,60	0,62
Malaysia	0,82	0,76	0,82	0,82	0,82
Philippines	0,95	0,65	0,85	0,94	0,90
Singapore	0,82	0,85	0,82	0,84	0,84
Taiwan	0,69	0,80	0,78	0,79	0,81
Thailand	0,99	0,86	0,86	0,89	0,89

Source: World Trade Organization, „International Trade Statistics", 2006, Data processing.

The Grubel-Lloyd index is an indicator of the intra-industry trade, having values between 0 (indicating a lack of the superposition of the trade) and 1 or 100% (indicating a perfect superposition of the trade). For the Asian economies, the index underlines the different specialization in a certain stage of the production process (or the vertical intra-industrial specialization):

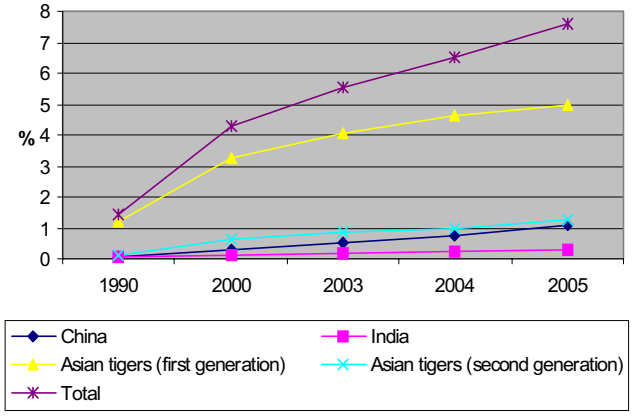
$$IGL = 1 - \frac{|Xtk - Mtk|}{(Xtk + Mtk)}$$

(Xtk represents the export of the country t of the product k, and Mtk represents the import of the country t of the product k).

For Hong Kong-China and Philippines, the superposition is almost perfect; values of over 0.8 are recorded by Thailand, Singapore, China, Malaysia, Taiwan. A lower vertical intra-industrial specialization is recorded by South Korea and Indonesia, the lowest level being that of India, which reflects the less intense participation of these countries in the regional production networks.

The automotive products have a share of 7% of the exports of Asia and 3.2% of the imports, the weightin the manufactures trade being higher: 8.4% of the exports and 4.7% of the imports.

The automotive industry is better developed in South Korea, which has a weight of 4% of the world exports, followed at distance by China, with 1.09% of the world exports. With the exception of South Korea, the Asian tigers do not have an active participation in the automotive industry, fact that is reflected by their exports as well. The Asian tigers have a weight of 4.97% of the world exports (4.1% being the contribution of South Korea), while the Asian tigers of the second generation have a weight of 1.26% of the total. Nevertheless, it should be underlined that the exports have a growing trend.



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 22. *Evolution of the weight of China, India and Asian tigers in the world exports of automotive products (1990, 2000, 2003, 2004, 2005)*

A high degree of vertical intra-industrial specialization can be remarked in the cases of Taiwan, China, Philippines, with values of over 0.8; Hong Kong-China, Singapore and Thailand recod values of over 0.7, followed by India and Indonesia. The lowest values are recorded ba Malaysia and South Korea, but from different reasons: South Korea produces and exports automobiles, producing components as well, while Malaysia produces and exports mainly components.

Evolution of the Grubel-Lloyd index applied to the trade of automotive products of the Asian emerging economies (1990, 2000, 2003, 2004, 2005)

Table 4

	1990	2000	2003	2004	2005
China	0,25	0,59	0,44	0,61	0,85
Hong Kong-China	0,53	0,52	0,78	0,75	0,78
India	0,86	0,73	0,67	0,69	0,67
Indonesia	0,03	0,33	0,49	0,52	0,57
South Korea	0,58	0,21	0,23	0,19	0,20
Malaysia	0,17	0,29	0,31	0,33	0,35
Philippines	0,08	0,75	0,99	0,80	0,80
Singapore	0,39	0,44	0,72	0,74	0,78
Taiwan	0,49	0,91	0,92	0,94	0,98
Thailand	0,08	0,93	0,91	0,82	0,70

Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

As a case study of the automotive industry in Asia, it will be presented the case of China.

The automobile industry of China recorded three development stages: a close market (before the '80), the creation of the joint-ventures ('80-'90) and the period after the WTO accession (after December 2001).

In 1980, China produced 5,418 vehicles and imported 19,570 (UNCTAD, 2005, p. 171), the models being made by copying the existent models, with no business relation between the local producers and the foreign companies.

In the second stage, the internal market, highly protected, generated the conditions for the creation of the joint-venture companies.

Before the WTO accession of China, the local industry was dominated by the joint-venture companies. In 2000, there were 13 producers, out of which 8 were joint-ventures and 5 were local producers (FAW Red Flag, Tianjin Xiali and three assembling plants). These produced 12 marks, out of which 10 were foreign and 2 were local. The market weight of the joint-venture companies was over 85%. In 2002, the number of the models reached 200, representing 40 marks, the new models representing 60% of the market.

The FDI were oriented towards the market, the main motivation being the local production in order to avoid the excesive tariffar and non-tariffar obstacles. In 2000, there were exported 52 units, there were imported 21,620 units, there were produced 605,000 units and sold 617,000 units, the exports representing only 0.086% of the production. Shanghai Santana and FAW Jetta produced 100,000 units, but the prices were 4-5 times higher that those of the international markets. The market price was about 5,000 USD, but the price in China was almost 160,000 RMB (over 20,000 USD).

In 2000, the model with the highest market weight was Santana (produced by Shanghai Volkswagen). The model had been launched on the international market in 1971, but it was produced in China for the first time in 1985 (after 14 years). Jetta, launched on the international market in 1985, was produced in China in 1992 (after 7 years). Fukang had been produced for the first time in 1991, but in China was produced beginning with 1996 (after 5 years). Alto was produced in China in 1991 (after 7 years), and Xiali in 1986 (after 6 years).

In the third stage, after December 2001, the co-operation between the multinational and local companies was intensified. The multinational companies set the accent on the extension of the investments, the introduction of new models, in parallel with the reduction of the prices.

Firstly, having to choose between: leaving China and starting to export, on the one hand, and improving the production basis, the technologies and equipments, on the other hand, the multinational companies chose the second option. The main motivations were: the still high non-tariffar obstacles; the distance between the country of origin (mainly countries of Europe and North America) and China; the high costs that would have been generated by the production delocalization in other countries of Asia (eg.: Vietnam).

Secondly, the companies of Japan and South Korea continued to export, the strategy being explained by the small distance between these countries and China and the gradual reduction of the Chinese trade obstacles. Nevertheless, companies like Toyota, Renault-Nissan and Hyundai started to invest in China, in order to benefit from the direct presence on the market.

The competition became more and more intense in China, which generated a continuous change of the market weights of different companies. For example, the market weight of VW recorded a reduction of the market weight from 50% in 2000 to 35% in 2002.

The options for the local companies were either the creation of joint-ventures with more multinational companies, or the intensification of the co-operation and imports of technology.

In 2004, the 6 local producers (Tianjin Xiali – belonging to FAW, Chery – belonging to SAIC, Geely Group, FAW, Hafei, Huachen) had a market weight of 18.12% of the total, while the joint-ventures had a market weight of 81.88% of the total. The local companies chose to create joint-ventures, as only starting from a production of several million vehicles is the individual production profitable. In addition, the process of developing independent production capacities is considered complete after at least two production cycles, the production of two models lasting 4-5 years (the minimum learning period).

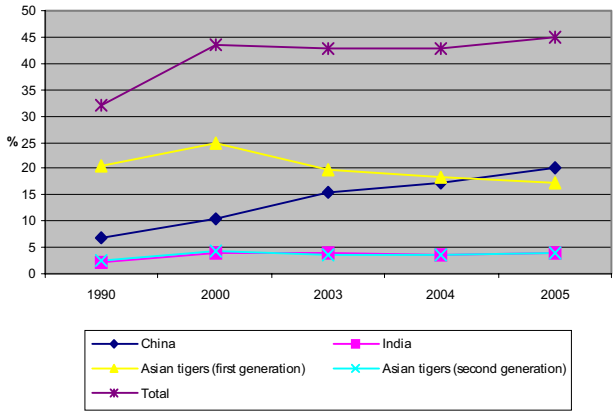
Thanks to the joint-ventures, China's auto production has tripled in five years. Between 2001 and 2005, output grew on a year-on-year average of 20.75 percent.

In 2006, China overtook Japan to become the world's second largest market for new vehicles, next only to the United States, registering sales of 7.22 million units, up 25.13 percent year-on-year, according to the China Association of Automobile Manufacturers (CAAM). China's automakers produced 7.28 million vehicles in 2006, up 27.32 percent over the previous year, making the country the third largest auto producer in the world (behind the United States and Japan).

China has now realized a basic balance between auto imports and exports. China's auto industry exported a total of 340,000 vehicles in 2006, an increase of 96 percent from 173,000 in 2005, according to Xinhua news Agency, citing the commerce ministry. The exports represented 4.7% of the production in 2006, in comparison with 0.086% in 2000. For the time being, the developing markets of the Middle East, Eastern Europe, Latin America, Africa and Southeast Asia will remain the primary focus, in addition to the domestic market.

The textiles had in 2005 a weight of 3.4% of the merchandise exports of Asia and 2.1% of the merchandise imports, the weightin the manufactures trade being of 4.1% of the exports and 3.2% of the imports. Asia is the first textiles exporter and the second textiles importer, after Europe.

The emerging economies of Asia had in 2005 a weight of 45.12% of the world exports, comparing with the weight of 32% in 1990. This evolution has as basis the gradual liberalization of the trade with textiles and clothing, which had beed governed until the 31st of December 1994 by the Multifibre Agreement; the liberalization took place gradually, in three consecutive stages (1st of January 1995, 1st of January 1998 and 1st of January 2002) (Sută, 2000, pp. 351-352).



Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Figure 23. *Evolution of the weight of China, India and Asian tigers in the world exports of textiles (1990, 2000, 2003, 2004, 2005)*

The evolution of the exports of China is remarkable, as its share in the world exports grew from 6.9% in 1990 to 20.23% in 2005. After the abolishment of import contingents, its weightin the world trade will continue to grow. In 2005, the textiles exports of China surpassed the textiles exports of the Asian tigers of the first generation, and the textiles exports of India surpassed in the same year the textiles exports of the Asian tigers of the second generation.

After 1990, the trade excedent of China with textiles has been growing, reflecting the evolution of the Grubel-Lloyd index as well (diminishing). By contrast, a very strong vertical intra-industrial specialization can be remarked in the case of Hong Kong-China (perfect superposition of the exports over the imports), and in the case of Singapore (0.94). Values of over 0.8 are recorded by Malaysia and Thailand, in contrast with Taiwan, Indonesia, Philippines, India and South Korea.

Evolution of the Grubel-Lloyd index applied to the trade of textiles of the Asian emerging economies (1990, 2000, 2003, 2004, 2005)

Table 5

	1990	2000	2003	2004	2005
China	0,85	0,89	0,69	0,63	0,55
Hong Kong-China	0,89	0,99	0,99	0,99	1,00
India	0,20	0,18	0,28	0,33	0,42
Indonesia	0,77	0,53	0,37	0,38	0,36
South Korea	0,49	0,42	0,45	0,48	0,51
Malaysia	0,53	0,93	0,90	0,88	0,84
Philippines	0,25	0,38	0,40	0,42	0,39
Singapore	0,67	0,83	0,96	0,96	0,94
Taiwan	0,28	0,22	0,23	0,22	0,21
Thailand	0,98	0,91	0,86	0,84	0,84

Source: World Trade Organization, "International Trade Statistics", 2006, Data processing.

Conclusions

Starting from similar levels of economical development in the 50's, Asia, Latin America and Africa began to outdistance from each other, Asia becoming gradually the region with the fastest rates of economical growth (especially countries of East and South-East Asia), on the background of the growth of the FDI and foreign trade. The macroeconomic stability generated growing inflows of FDI, in search of efficiency and market (China, India, the Asian tigers) or resources (especially Malaysia, Indonesia, Thailand, Philippines), which generated adopting of new technologies and the growth of the labour productivity.

Recording a growing trend after the '50, the weight of Asia in the world trade oscillated strongly during 1995-2001, underlining two moments of crisis: 1997/1998 and 2001, after that recording a continuous growth, at the moment occupying the second position as weightin the world trade, after Europe.

As for the inter- and intra-regional trade of Asia, there is a continuous growing trend of the share of the intra-regional trade flows, the main reasons being the participation in regional trade agreements (intensified especially after 1993: Association of the South-East Asian Nations – ASEAN, Asia-Pacific Economical Cooperation – APEC, South Asia Association for Regional Cooperation – SAARC), as well as the role of China as engine for the whole region. In 1990, 42.1% of the trade flows were intra-regional, in 2001 the weight of the intra-regional trade flows was 48.2%, and in 2005, almost 52% of the Asian trade developed on an intra-regional basis.

China has been recording an impressive evolution of the foreign trade after the '80: it surpassed the weight of the Asian tigers of the second generation in the world trade in 2001 and the weight of Japan in the world trade in 2004, the forecasts indicating the surpassing of Germany in 2007, the surpassing of the Asian tigers of the first generation in 2009 and the surpassing of the Asian tigers as a whole and that of the USA in 2012.

Analysing the evolution of the trade balance of the Asian emerging economies, it comes out that the merchandise trade is strongly positive, while the services balance is negative, which reflects that the services still play a secondary role for these economies (Hong-Kong-China and Singapore have positive services balances, the services playing a major role in their economies: the contribution of services to the GDP is 87% for Hong Kong-China and 67.4% for Singapore).

Analysing the trade openness and the export propensity, it comes out that most of the Asian emerging countries record high values for these indicators. The highest values were recorded by Singapore and Hong Kong-China, for the both indicators (export propensity with values of over 150% and trade openness with values of over 300%), the main factor being the high weight of the re-exports in their foreign trade, as well as the liberal trade policies. Malaysia, Taiwan and Thailand follow in the hierarchy, before South Korea and Philippines, the latest

positions being occupied by China, Indonesia and India. The explanation in the case of China, Indonesia and India, populous countries, is the high internal consumption. In addition, in the case of Indonesia, it is reflected the insignificant participation in regional production networks, and a lower degree of vertical intra-industrial specialization.

Another indicator for the vertical intra-industrial specialization is Grubel-Lloyd index, the results being different for different categories of products.

In 2005, the merchandise exports had a share of 83.1% in the Asian exports. Among the analysed economies, Hong Kong-China, China, South Korea and Taiwan have a weight of over 90% in their exports (95.8%, 91.9%, 90.7% and respectively 90.7%), Philippines and Singapore a weight of over 80% (89% and 80.6%), Thailand and Malaysia a weight of over 70% (76.6% and 74.4%), the lowest values being recorded by India (69.4%) and Indonesia (46.9%). At the global level, the share of the merchandise exports in the total exports is of 72%.

The exports of the office and telecom equipment have a share of 25.2% of the total merchandise exports and 18.3% of the total merchandise imports of Asia, while the weightin the trade of manufactures of Asia is even higher: 30.3% of the total manufactures exports and 27.3% of the total manufactures imports. Asia holds the first position at the exports, as well as at the imports of office and telecom equipment.

Analysing the values of the Grubel-Lloyd index, for Hong Kong-China and Philippines, the superposition of exports over imports is almost perfect; values of over 0.8 are recorded by Thailand, Singapore, China, Malaysia, Taiwan. A lower vertical intra-industrial specialization is recorded by South Korea and Indonesia, the lowest level being that of India, which reflects the less intense participation of these countries in the regional production networks.

The automotive products have a share of 7% of the exports of Asia and 3.2% of the imports, the weightin the manufactures trade being higher: 8.4% of the exports and 4.7% of the imports.

The automotive industry is better developed in South Korea, which has a weight of 4% of the world exports, followed at distance by China, with 1.09% of the world exports. With the exception of South Korea, the Asian tigers do not have an active participation in the automotive industry, fact that is reflected by their exports as well. The Asian tigers have a weight of 4.97% of the world exports (4.1% being the contribution of South Korea), while the Asian tigers of the second generation have a weight of 1.26% of the total. Nevertheless, it should be underlined that the exports have a growing trend.

A high degree of vertical intra-industrial specialization can be remarked in the cases of Taiwan, China, Philippines, with values of over 0.8; Hong Kong-China, Singapore and Thailand recod values of over 0.7, followed by India and Indonesia. The lowest values are recorded by Malaysia and South Korea, but from different reasons: South Korea produces and exports automobiles, producing components as well, while Malaysia produces and exports mainly components.

The textiles had in 2005 a share of 3.4% of the merchandise exports of Asia and 2.1% of the merchandise imports, the weightin the manufactures trade being of 4.1% of the exports and 3.2% of the imports. Asia is the first textiles exporter and the second textiles importer, after Europe.

After 1990, the trade excedent of China with textiles has been growing, reflecting the evolution of the Grubel-Lloyd index as well (diminishing). By contrast, a very strong vertical intra-industrial specialization can be remarked in the case of Hong Kong-China (perfect superposition of the exports over the imports), and in the case of Singapore (0.94). Values of over 0.8 are recorded by Malaysia and Thailand, in contrast with Taiwan, Indonesia, Philippines, India and South Korea.

Thus, the trade flows of the analysed economies, dynamic ones, are strongly influenced by their participation in regional production networks, due to a regional „wheel-center-spokes" structure (the central role being played by China) and by the participation in regional trade agreements, fact that reflects itself in the continuous growth of the share of the intra-regional trade flows in the total trade flows.

Notes

(1) According to the World Bank and the International Monetary Fund, the Asian emerging economies are the Asian tigers (South Korea, Hong Kong-China, Singapore, Taiwan – or the Asian tigers of the first generation and Malysia, Indonesia, Thailand, Philippines – or the Asian tigers of the second generation) plus China and India.

(2) The success of the special economic zones of China (Guangdong, Fujian, etc.) is mainly attributed to the development of the infrastructure, the free movement of the capital and technology, the flexibility of the wages, the lack of the customs duties at the import of commodities, the absence of restrictions at the remittance of the incomes of the foreign investors.

(3) The chaebols or the conglomerates of companies, grouped around a main company, came into being in South Korea in the '20-'30s, while the country was under Japanese occupation, the Koreans developing the system after the gain of the independence, too. The companies form a complex structure, owning shares in the other companies, a chaebol grouping companies from different industries and having a centralized management structure.

(4) The index of the performance of the industrial competitiveness is a composite index, having as basis 4 variables: the manufactures value added/inhabitants (the basis index, reflecting the degree of the industrialization of a country); the exports of manufactures/inhabitants; the intensity of the industrialization (measured as manufactures value-added / GDP and the weight of the activities of medium and high-technology in the manufactures value-added) the "quality" of the exports (the weight of the manufactures exports in the total exports and the weight of the medium and high-technology products in the manufactures exports). (UNIDO (2003), *Industrial Development Report*, p. 159)

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