

# NOWY SĄCZ ACADEMIC REVIEW

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# NOWY SĄCZ ACADEMIC REVIEW

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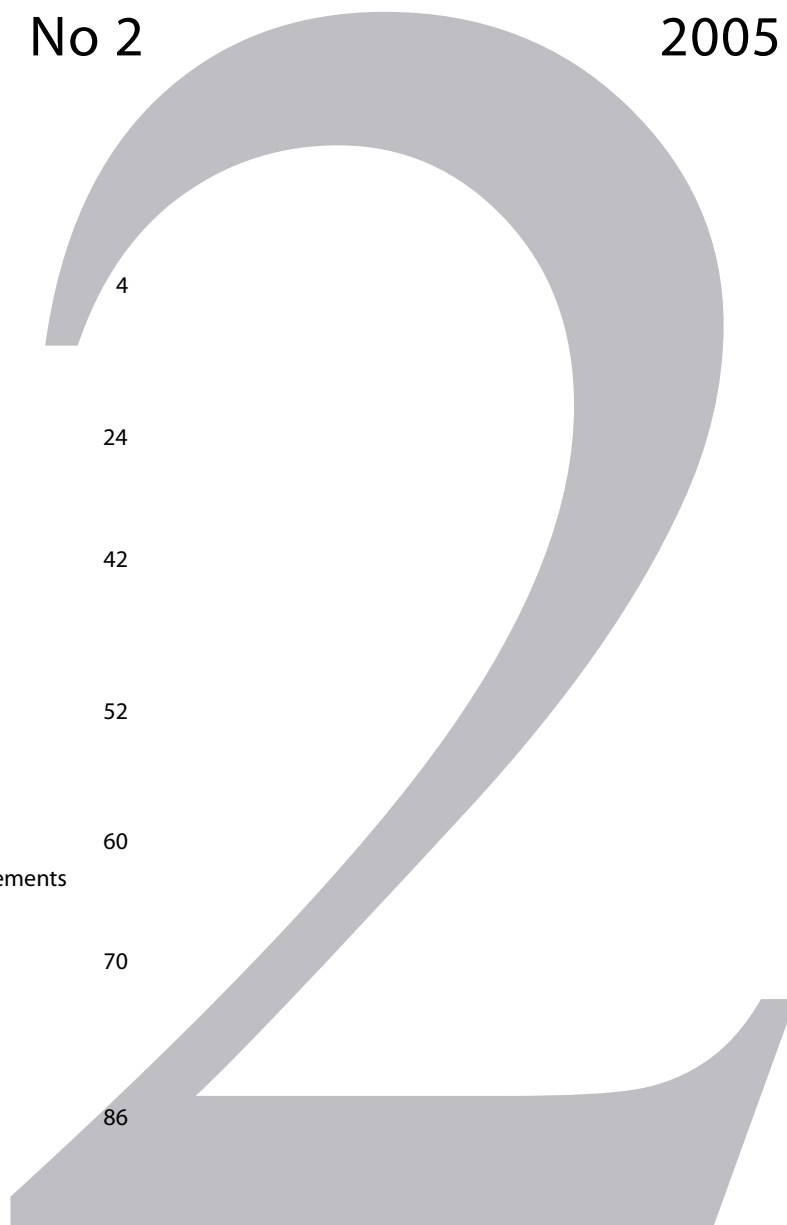
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Jerzy Dietl

Wyzsza Szkoła Biznesu  
– National-Louis University  
in Nowy Sącz

# Expansion of Marketing Activities and Marketing as a Field of Science and Education Subject

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## Introduction

Marketing is permeating all facets of life, not only economic but non-economic aspects as well. It is therefore worthwhile to consider determinants and directions of its development and, with this background, to attempt to answer two questions, namely:

- Does this expansion elevate marketing as a science?
- What are the consequences of this expansion when examining marketing from an educational perspective?

## 1. Basic determinants and directions of the development of marketing

The expansion of marketing can be seen both in the increased share of marketing costs in a product as well as in the value-added chain of the product. Therefore, the increasing trend in employing production factors in marketing activities, including a significant part of intellectual capital, will continue.

Not attempting to provide an exhaustive list of the reasons for this expansion, we can point to the following:

- diversification of products and shortening of their life cycles;
- an increased share of services (IT in particular) in GDP, which facilitates product differentiation;
- customization not only in the consumer goods market but mainly in the industrial market;
- computerization of society and the economy as a result of the development of new information technologies (new economy marketing such as e-business and e-marketing) and the communications and transactions that take place in the electronic market space;

- delocalization of manufacturing,, which brings a significant growth of intra-company sales;
- consumer attitude of society resulting not only from increased standards of living and increased product and service options available but also from a post-modern orientation of consumption;
- market globalization, including its role in increasing brand significance and value;
- technological advancement in the field of communications with potential customers and aggressive forms of such communications;
- an increasing role of marketing in various aspects of non-economic activity.

The onset of the new millennium encourages the consideration of new challenges and brings forth questions, which if we are able to face them and use them, may provide an opportunity for further development. While not aspiring to exhaust this topic, I would like to express my opinion in the form of several theses, followed by an attempt at justifying each of them.

### **The increased influence of marketing on business decisions**

Firstly, we can expect organizations' specific functional areas to become blurred, including the marketing function. This will be connected with the flattening of organizational structures, decentralizing of the decision-making process, developing horizontal computer connections between these areas, and increasing the significance of interdisciplinary employee teams. Thus, it will be more difficult to precisely isolate the marketing activities despite the growth of their significance, since marketing goals will be accepted and implemented within all organizational functions (Dietl 1999,11-21).

Integration of functional areas of business will appear in modern organizations, and even more in organizations in the future. The position of the manager (in particular at the middle management level) will disappear and will be replaced by a team leader who will be appointed by the team. On one hand, marketing approaches and goals will be accepted within various functional areas of business. However, on the other hand, as emphasized before, it will be more difficult to explicitly isolate the area of marketing activities. Therefore, marketing goals will be accepted and implemented throughout all organizational functions.

Marketing will provide more and more factors to be considered for decisions concerning the effective allocation of economic assets that are at the business's disposal or that can be obtained by the business. The form of interest in the environment becomes expanded in reference to time, space, subject and object. More and more often, the goal is not only to facilitate and accelerate the adaptation process but also to create new target markets with the use of effective change management. The role of marketing in business will grow and its cognitive and application value will come from its interdisciplinary characteristic with a need for a strong reliance on economics and the use of various research methods.

### **Globalization and its influence**

Secondly, marketing will become a more and more significant element of global strategic thinking.

Internationalization and globalization of companies will become more common even among small and medium-sized enterprises. The distinction between local and international marketing is no longer valid. It is difficult to make marketing decisions neglecting to consider the realities of the globalization processes.

Conversion and compression of geographic space will decrease the role of where the enterprise is situated, including the location of the workplace and residence. One can manage even a big company without leaving one's own home. This situation brings inherent consequences for marketing. I will focus on the most important ones.

The market environment of the business is being formulated anew. Even for small businesses, not only is their area of operation increasing significantly, but so is the market's structure, due to an increased co-dependence between substitute and complementary products. The scope of the geographic area examined for factors affecting marketing decisions is expanding. There is an important increase in a need for information about potential market partners that often operate in distant regional markets.

A large variability of research objects will appear due to the dynamic nature of the environmental factors. There will be an increase in the significance of a diversification strategy that will cover both products and markets. As a result, frequent changes in strategic areas of business will occur as well as a diversification of the network in which the given organization operates. Creating and managing customer relations (transactional marketing) is becoming essential. It is becoming more and more important to analyze costs, and more widely profitability, in systems of brands, products, market segments, separate market channels or even individual customers. Creating databases and processing information on the market is becoming of key importance. Telemarketing will develop significantly. A deep individualization of marketing (micromarketing) will take place even within the global marketplace.

Undoubtedly, all these phenomena will make it more important to accurately identify the location for marketing activities in the global market (a globally uniform and locally diversified marketing strategy). It will be necessary to coordinate these activities and functional areas of business globally.

Business internationalization and globalization are no longer solely a characteristic of huge corporations. Besides, presently, 'the location of each element of the company value chain or separate types of activity' takes place in those countries 'in which they bring the highest added value' (Koźmiński 1999, 68). An international network of various connections is being created that encompasses both units of transnational corporations and small businesses cooperating with them. Delocalization of manufacturing and mass customization are becoming more and more common on the international scale.

Even companies which have used the market niche strategy from the onset of their operations must become international since their growth and success depends on the multiplication of their profit earned in the market niche in the global market (Simon 2001). Finally, liberalization, which is an inherent feature of the globalization process, increases competition with companies with a local range that have so far been benefiting from a shallow spatial monopoly. The international market is starting to include companies which may not have been willing to go international. All of this is developing marketing activities (Dietl 2000, *Marketing...*, 30-33).

Internationalization of companies and, consequently of marketing, necessitates a need to consider various market differences, not only economic ones but also cultural (cultural risk), institutional (institutional risk) and political variables (political risk) (Jędralska 1998; Romanowska 1999). Therefore, the interdisciplinary nature of marketing increases.

### **The influence of marketing research**

Results of marketing research will play an increased role in the decision-making process. There are several reasons for this. There is more access to raw and processed data combined with decreasing costs of its collection and analysis. The marketing research market is developing dynamically and it is adapting not only to organizational needs but is also generating its own demand. This is caused by, among others, the reduction in transaction costs, benefits reaped due to market globalization, and an increased quality (usefulness) of these services. At the organizational level, decisions based on marketing criteria are multiplying. An example given here may include the need for all personnel to accept and identify with marketing goals. It is caused mainly by the necessity to develop a value-added chain to a product. As a result, marketing costs in the final price are high. Consequently, cost advantages to the company can be generated to a considerable degree through increasing the efficiency of marketing activities. Moreover, new products which are based on high-end technologies usually require an increased share of marketing in their cost structures. This can be seen, for instance, with online companies whose promotion costs are very high. This increased outlay of capital for marketing indicates a need to consider the issue of analyzing marketing costs and, consequently, rationalizing them together with a closer cooperation with specialists in managerial accounting.

We can mention here an important criticism directed at marketing, namely the fact that its costs are too high in comparison with its results. This criticism often regards the expenditure on brand advertising or, in general, on promotion that does not bring expected results (Thomas 1994, 6). It is emphasized that as little as 18% of promotional activities worldwide bring a profit. In particular, very expensive national TV advertising is considered a waste of money since, due to the number of TV channels available, viewers simply switch from the channel that is showing commercials (*Philip Kotler...* 2004, 127).

### **The growing area of marketing applicability**

The areas where marketing is applicable are growing and this constitutes an important

aspect of the development of marketing. This was previously mentioned during the discussion concerning internationalization of marketing. To complement these considerations we can point to several circumstances.

The development of service marketing is taking place and it is more intense than the marketing of goods. In particular, this refers to those services that cover all information sectors.

The leading role of intellectual capital, the development of 'knowledge-based enterprises' as well as the above-mentioned increased importance of services, generate a need to develop 'marketing of intellectual assets' e.g., research results, know-how, intellectual capital, company's marketing contacts and all its other intangible assets. All of these not only strengthen the company's potential in a given market but may also become product(s) for the expansion of the company based on 'intellectual products marketing.' This makes the consideration of cultural differences even more important for marketing as multiculturalism is a characteristic feature of knowledge-based enterprises.

Marketing refers more and more to certain values of a symbolic nature. For example, globalization of a market presence is executed through a brand which is often connected with the globalization of a value-added chain and way of thinking, which requires an understanding of cultural diversities (Govindarajan, Gubta 2000). Although marketing of standard products and global brands is developing, their positioning requires the following to be taken into consideration:

- market niches and local conditions;
- different attitude to products in given countries and regions;
- different distribution systems;
- different cultures and national communities (Altkorn 2000, 19-31; 1999, *Strategia...*, Domański 2000, 69-76).

This requires 'pro-consumerist oriented adaptation strategies', thus creating new areas of marketing activities (Altkorn 1999, *Sity...*, 22-32).

'Marketing of participation in the value-added chain of the product' becomes more and more important. It is becoming the basis of a differentiation strategy or even a distinctive differentiation in a portfolio of offered products. More and more organizations participate in creating the links in this chain. It creates conditions for various forms of cooperation and partner marketing (Fonfara 1999). Marketing of institutions that support flow streams in marketing channels e.g., banking services, advertising agencies, market research, etc., is developing considerably.

We can witness a huge development of industrial marketing. Several conditions for this expansion may be mentioned here:

- manufacturers not only produce but operate in the field of product and brand development (Thomas 2000);



- there is an increase in inter-sectoral exchange and within multinational corporations;
- there is a drop in transactional costs – delocalization of production;
- distance does not pose a barrier to various forms of cooperation;
- there is a decrease in the importance of contracts that are substituted by fulfilling commitments – in the above-mentioned partner marketing (Thomas 2000);
- extension of the value-added chain of the product is taking place;
- various forms of indirect marketing are developing.

More and more, marketing is used to evaluate the effective allocation of economic resources, which maximizes the rate of return on capital. Improving the global market facilitates the forces that affect and change companies. Marketing of 'procuring and allocating economic resources - production factors' such as intellectual capital is developing.

The importance of marketing is becoming greater for non-profit organizations. For example:

- 'idea marketing' developed by various social institutions;
- 'regional marketing' (territorial marketing);
- 'marketing of transnational instruments' (ecology, battling terrorism, etc) and many others.

It is worth noting at this point the danger of marketing expanding beyond the sphere of market regulation. Marketing will be stripped of economic aspects, in particular its role in the adaptation process will be limited. Obviously, to promote some idea promotional techniques utilizing social engineering can be used. Nevertheless, the fact that one borrows some method does not mean that new a cognitive field is created. <sup>1</sup>

Worldwide trends of economic liberalization, privatization, reduction in state protection, and decentralization, create a need for marketing both in activities that have so far been financed by the state and those of non-profit organizations which are becoming more and more commercialized. Good examples here include the health care or education sectors as well as agencies of local government.

As the scope of marketing has broadened, so too have the non-economic factors which must be considered when making strategic and even operational decisions (environment marketing). This is expressed in a significant growth of research that takes into account space, subject, object, time and method.

As mentioned earlier, a significant broadening of the market's spacial scope that should be monitored and analyzed is taking place. This is a consequence of the market globalization process and its conditions, in particular those that generate intensified competition. We should point out that there is an increased mobility of production factors and a growing

significance of those factors that are characterized by high mobility, namely intellectual and financial capital.

It is also worth emphasizing that the region itself requires marketing activities that provide for its growth. This creates the basis for the development of the previously mentioned regional or territorial marketing. The future community of various cultures and regions will require more and more strategic marketing and operational decisions that will cover various areas (e.g., tourism, attracting investment, and infrastructure).

The expansion of the scope of research objects is primarily a result of the changes in an organization's strategic goals resulting from a diversification of its operations and its structural forms. The need for more frequent product differentiation, combined with an extension of the value-added chain, market development, and increasing changes in its own portfolio, have considerably widened the product offerings (assortment) and markets covered by the analysis. This interest spreads to the issue of the increasing number of substitutes which can threaten the enterprise or, sometimes, stimulate its expansion.

Even global strategies and strategic areas of standard products must be supported by an individualized view of target markets, which is necessitated by mass customization and the process of production delocalization. It is possible, while preserving economies of scale, to completely change products for a number of reasons, including individualized shopping via the Internet, multiple market niches, as well as to actively segment the market taking into consideration diversified consumption styles (lifestyle marketing), resulting from, among others, the emergence of the new structures, etc. Obviously, the shift in companies' focus from goods to services also generates new research areas.

In a company's operations, it is becoming necessary to make operational decisions that are adjusted to rapidly changing consumer preferences. In order to ensure its competitive advantage, an efficient organization requires knowledge of various links (knowledge links). This can be achieved by:

- firstly, through various and often interdisciplinary research carried out by the company or commissioned to specialized agencies. This enables so-called knowledge-based marketing, which is being implemented more and more often;
- secondly, through gained experience (the experience – learning curve of the organization) the firm's intellectual capital increases, which facilitates the development of experience-based marketing.

The acceleration of changes occurring in the environment as well as market globalization require that a bigger consideration be given to phenomena of a macroeconomic nature and their impact on the adaptation process and creation of the target market than was done in previous marketing research.

Finally, it is essential to point out that the development of research creates a significant increase in the number of options and combinations for allocating production factors as well as intangible company assets (e.g., brand, intellectual capital). The number of

companies that specialize in this allocation in the global market is growing rapidly. Besides, huge corporations in developed countries are moving a significant part of their economic assets to these areas of the global market where they obtain extreme productivity. This situation not only offers a new perspective for marketing research but also calls for a deeper economic analysis of such research.

New directions in the interest of marketing research subjects bring important challenges. The number and diversity of a company's or organization's stakeholders are growing. This includes not only customers, viewed from the perspective of supply and demand chains, but also relations, often of a non-economic nature, among other groups of stakeholders. (Schary, Skjøtt-Larsen 2002; Thomas 2000, 4; Kenna 1991). A network of strategic stakeholders is emerging whose mutual influence creates a marketing network (Kotler 2005, 13). It requires an analysis of the company's environment to go beyond economic factors to include such aspects as the company's image and its corporate responsibility.

The shift in research focus to competitive analysis and an increased importance of determining the factors involved in the decision making process that would ensure a competitive advantage require a development of comparative studies of:

- organizations of real or potential competitors;
- organizations considered as models in part or as a whole (benchmarking);
- customers (customer relations marketing);
- business strategic areas and
- markets.

We can add that an expansion of affiliate companies, various forms of cooperation, strategic alliances, selling products of other companies, mergers and acquisitions, joint ventures, international subcontracting, licensing and partner marketing create an increased demand for enlarging the subject scope of marketing research (for more on contemporary cooperation between companies see Jędralska 1998; Romanowska 1999; Sulejewicz 1997; Zaorska 1998). The expansion of direct marketing will go in the same direction, including a more and more common personalized selling of products at home and work (personal sales marketing - network marketing), telemarketing, and online sales.

The increased demand for marketing research indicated above is reflected in the methodological tools used for this marketing research. Undoubtedly, the development of information technology offers an essential advantage and provides the required support. However, we must point out the increasing problems resulting from:

- the need for dynamic approaches;
- an increasing discontinuity of changes in the environment;
- a multitude of described variables;
- an increased importance of non-economic factors;

- a necessity of an advanced disaggregation of the phenomena and processes under analysis;
- limited possibilities of quantification of various factors, which restricts the scope to qualitative research only, in which measurement of the results is often not reliable.

Not questioning the development of marketing research, it seems that intuition, general knowledge, skills and entrepreneurial spirit will still be the fundamental conditions for making accurate marketing decisions.

### **The time factor**

Time is playing an increasingly important role in marketing. I believe that to justify this thesis we should point to three circumstances.

First of all, the importance of long-range thinking is growing (i.e. strategic decisions). More and more environmental variables that used to be considered stable have to be taken now into account when making decisions since changes to these variables are accelerating. This includes such variables as technology, spread of the demonstration effect, lifestyles, human migrations, changes in the economic situation, etc. The duration of economic depreciation has shortened considerably. More and more often changes in the environment are discontinuous, which increases the uncertainty of business and restricts the ability to make predictions based on linear extrapolation. The apparent paradox is the fact that it is the acceleration of environmental changes that increases the importance of strategic marketing decisions aimed at the effective allocation of economic resources. We have to agree, however, that when the company's environment is unstable, the company is geared towards the process of short-term adaptable decisions.

Secondly, time has become an essential production factor in operational activities. A company's success depends on accelerating decisions and anticipating changes in its environment. One can agree with the statement that each consecutive time period is more valuable than the previous one (Toffler 1996). Here are a few examples that demonstrate this. There has been a significant increase in the mobility of production factors and an increase in the importance of those factors which are, by nature, highly mobile e.g., intellectual capital of the business. The progressing liberalization process accelerates mobility and a virtually free delocalization of production parts becomes possible. Specialization is becoming more and more flexible. The diffusion of technology internationally is also occurring faster and faster. All of this makes 'the operational perfection' of the company more dependent on information provided in real time.

Thirdly, a more dynamic approach to the business environment, in particular to competition, is expected. For example, it is not enough to strive for competitive advantage based on appropriate positioning of the company with a static approach to the variables of competition. Therefore, Porter's static model of competition needs to be made dynamic due to the rapid changes in relationships between Porter's forces of competition as well as to note the importance of changes occurring in the organization and which are expressed

in the 'experience curve' (Porter 1992). Thus, is it necessary to go beyond the adaptation process through active operations based on a company's competence, capabilities and resources (by using marketing in change management). Of importance here is also a strategy based on active corporate learning (among others a synergic effect coming from a skillful use of the slope in the experience curve) (Skat-Rordam 1999).

### **The Organization's inter-relationships**

The increasing significance of the network in which the organization operates or on which it is dependent constitutes an important challenge for marketing operations. I believe that we can point to three phenomena that develop and prove this thesis.

First of all, distribution of goods and services is increasingly conducted through an integrated network not only in the consumer market but the industrial market as well. The following characteristics of these trade channels are of importance for our consideration :

- the affiliated nature of companies or similar chain organizations of individual sellers;
- the internationalization expressed mainly by territorial expansion (mega-retailers);
- the various forms of concentration aiming at the domination of the global (regional) market of a product range characterized by a clearly defined quality standard and directed at a specific target market which is often consolidated or even created through the strategy of a given organization;
- the actions clearly aimed at gaining competitive advantage in the market channel as a supplier or, in particular, as a consumer;
- competitive advantage is strengthened by an increased use of trade organization brands and integration relations in the market channel, in particular vertical ones towards suppliers – producers, both contractual and corporate (e.g., capital shares);
- a clear influence on the acceleration of the spread of the demonstration effect on the global market scale, developing global strategies based on standard products and adoption of these products by final users.

All of these factors are important for marketing. The role of trade organizations in the definition of target markets and active creation of product offerings for these markets is growing considerably. Marketing activities of intermediary participants of the channel, producers in particular, must be directed at obtaining entry to a given trade channel as well as conducting an effective marketing strategy through the agency of and in cooperation with a trade organization. Market success of the product/service offering requires not only adjusting it to the demands of end users but it is becoming essential to integrate it appropriately into the product range offered by the trade organization network. It is necessary for a company to ensure that its offerings can be adapted to the requirements of an integrated trading chain with regards to the quantity and other delivery terms, as well as customization that enables it to adjust the chain's offerings to local conditions.

Secondly, numerous phenomena influencing or accompanying market globalization, such as an increased mobility of production factors, global communications, conversion and compression of time and distance, liberalization of market entries and exits, etc., cause a more perfect allocation of economic resources and consequently, territorial dispersion of production factors. In developed market democracies, two types of corporations play an increasingly important role, namely 'knowledge-based corporations' which are at the forefront of innovation (new products) and the organizations which focus on organizing production and distribution. This means that marketing plays an increasingly important role in these organizations since it is responsible for the effective allocation of economic resources. The marketing focus of the remaining corporations, including Polish companies, should be shifted to concentrating on the entry strategy to the chain of 'production and distribution organizations on the global market scale.' In order to gain a strong negotiation position it is necessary to obtain electronic information which would facilitate preparation of an offering based on cost advantages in relation to other offerings coming from the global market. Obviously, a high flexibility of specialization and low costs of production adjustment will be very helpful here. It naturally necessitates internationalization of the company and entering into various strategic alliances.

Thirdly, an advanced market structuralization is taking place. Companies operate in a more and more dense network of various relationships and dependencies. Modern marketing must also be directed at creating an image of a company 'friendly' to its environment. What is needed here is cooperation with the subjects of this environment (strategic stakeholders).

#### **The increased importance of the value-added chain**

There is a marked increase in the importance of the elements of the value-added chain for the diversification of the company's offerings. Thus, they become an intrinsic means of operational influence on the market and thus they expand marketing. Moreover, the role of the substitute effect is growing, which increases the required effectiveness of using other operational elements (marketing-mix), such as the customization of the market offering.

The increasing significance of the value-added chain of the product creates an opportunity to gain a competitive advantage. Polish companies do not seem to be able to use global strategies based on standard products. One cannot expect much market success based on new products. I believe, however, that an imitation strategy complemented by innovations within the value-added chain creates a certain opportunity. We need to bear in mind, however, that lowering the quality of only one of the elements of this chain results in market rejection. Modern technological advancement, in particular in reference to information, restricts the importance of the production scale. It is becoming possible to customize by introducing insignificant final changes to the product and its commercialization. This offers ample opportunity for small and medium-sized enterprises in particular, which in Poland are characterized by high innovation and expansion. Additionally, at present, customization is not cost-intensive during the production process.

However, participation in the value-added chain is considerably labor-intensive due to a high percentage of services in the product, which enables an organization to gain a cost advantage in our situation. Undoubtedly, this direction of activity often requires adapting to local market demands and using a growing market segmentation which is not common in nature and is characterized by bigger and bigger variability. Small companies are better than large ones at providing flexible product and service offerings that are adjusted to the needs of individual customers as well as personalized relationships with these customers.

It is increasingly important to manage all elements contributing to the product's value, such as procurement logistics related to suppliers and sales using electronic methods. The increased significance of managing these elements is becoming more important as is analyzing market dynamics in very short periods (product attribute trade-off analysis) (Thomas 2000, 2). It requires excellent operational management with a marketing orientation that integrates all company's functions as well as the use of cutting-edge marketing technologies. Philip Kotler mentions integrated marketing. 'All actions must be coordinated keeping the customer in mind.' We can distinguish two levels of these actions. The first one is marketing actions conducted by the marketing department (function). The other refers to activities carried out by other departments (functions) of the company which should also be customer-oriented (Kotler 2005, 22-23).

The flattening of organizational structures and the disappearance of specific functional areas within a business resulting from the decentralization of decision-making, mentioned previously, increases the number of individual decisions based on marketing criteria.

#### **The new entrepreneur**

The multiple market niches strategy poses a huge opportunity, in particular for the young generation of entrepreneurs and managers. Despite the fact that this strategy is based on a narrow definition of the target market, as a result of multiplication of market niches in the global market, this strategy may allow for a significant development of the company and enable it to gain economies of scale. Moreover, it enables a gradual development following a capture of further niches in local markets. It allows companies to start expansion activities with limited financial resources. However, intellectual capital is crucial here due to the need for constant innovation, internationalization, and direct contact with customers in distant local markets. This strategy can be used by innovative entrepreneurs who formulate ambitious goals, provide strong leadership, have confidence in their own strengths, and who adopt a strong global orientation from the start and are able to select and motivate their employees appropriately (Simon 2001).

#### **The importance of cost advantages**

There will be an increase in the importance of activities aimed at gaining cost advantages and developing the associated areas of a business to realize such advantages. I believe that, despite various difficulties, liberalization of the world's economy will continue. It will undoubtedly make gaining a cost advantage based on cheap labor more difficult.



Besides, differences in pay levels between Poland and developed market democracies will be getting smaller. I believe that together with the afore-mentioned increasing mobility of production factors and decreasing costs of changes in production and transportation, barriers for Polish companies to gain cost advantages will grow.

Despite these problems, our reserves are still considerable. To use them, the following is needed:

- numerous improvements and changes in companies' management and organization;
- a bigger use of the benefits resulting from a sharp slope in the company's learning curve;
- a focus on those elements of the value-added chain that are characterized by low costs;
- adopting costs as the basic criterion in allocation of economic resources, which will sometimes necessitate moving some resources to other countries;
- basing marketing activities more on information about costs, in particular in product cross sections and strategic areas of business.

To sum up these considerations on the conditions and directions of the development of marketing, I would like to emphasize that market globalization and Poland's accession to the European Union pose a vital opportunity for the development of organizations that are characterized by a willingness to increase the quality of their intellectual capital, entrepreneurial spirit, innovation and marketing orientation. It will require, however, overcoming the weak aspects of Polish companies which may include mainly short-term thinking, insufficient development of the company's intellectual capital, sometimes inaccurately defined target markets that often are not a starting point for developing business, lack of appreciation for and inability to manage change, a limited tendency to innovate and to save by investment, limited internationalization, insufficient access to production factors, sometimes low quality of managerial and entrepreneurial staff, and finally, the previously mentioned fairly ineffective attempt to gain cost advantages.<sup>2</sup>

## **2. Marketing as a field of science and an academic subject**

I do not think that one can formulate theses in the field of marketing that could be regarded as theories since no original marketing methods and research techniques have been developed and the scope of marketing is difficult to define. Challenges facing modern economic life, or more broadly, social life, increase the difficulties with isolating marketing as a field of science. Therefore, one of the conditions for its development, both relating to research and practical application, is to forego the ambition to isolate marketing as a science and acknowledge its interdisciplinary character and the lack of its own methodological basis. We can also add that subjective value judgments are often made in marketing. They are 'non-scientific' since one cannot prove whether a given judgment is true or false based on facts and evidence drawn from logic.



Marketing is helpful in making decisions on the allocation of economic resources that ensure the long term development of the organization and its competitive advantage. Marketing is also beneficial for actions that facilitate the adaptation process as well as the development of the target market in order to fulfill the objectives set forth in the organization's mission.

The roots of marketing do not come from management but from economics, even if it serves non-profit organizations<sup>3</sup>. Marketing must use a stronger foothold in economics, in particular in the area related to market organization and competition (industrial organization).<sup>4</sup> A review of marketing literature as well as research conducted in Poland, as reflected in, among others doctoral and habilitation dissertations, only confirms my beliefs in this matter. There are, however, studies referring to marketing in sociology, psychology and law, but it is difficult to find such studies that refer to management, at least in the scope in which it can be defined as a science separate from economics.

The interdisciplinary characteristic of marketing poses a vital challenge for the educational system. Teaching marketing will only be appropriate if this educational system is characterized by an integrated knowledge presented in the system. Since marketing has not developed its own general theories and research methods, it must continuously rely on other disciplines. This interdisciplinary character poses a considerable challenge not only for the way and content of the knowledge taught, but also for the preparation of learners which should enable them to acquire this knowledge.

Marketing is an area of activity which is mostly but not always economic in nature. On one hand, the scope of activity is continually broadening, while on the other hand, it is becoming more and more difficult to define its boundaries e.g., disappearance of clearly-defined functional areas of business, mentioned previously. Thus, a question arises: 'Is it still marketing or is it already finance management, strategic management, industrial organization or maybe business law?' Moreover, like in any other human activity, marketing may be infiltrated by various disciplines. For instance, is a study concerning perception of advertising or developing a pro-environmental awareness in the society within the scope of marketing or psychology? (Dietl 2000, *Some remarks...*, 63-67).

A sectoral or industry division in marketing is not methodologically or cognitively justified. I have raised this issue because, having reviewed detailed curricula of several dozen universities (primarily non-state ones), I realized how deep the sectoral (industry) division is ingrained in the economy. There is no separate marketing of 'services', 'marketing of agricultural products', 'tourism marketing', 'ecological marketing', 'Internet marketing', 'mass media marketing', 'marketing in banking', 'industrial marketing', 'marketing for SMEs' or 'marketing for medical services', just to mention a few course names, sometimes regarded as leading courses in a given specialization<sup>5</sup>. A more detailed analysis of the contents of these courses shows that they describe a given area of economic activity and add some knowledge of marketing principles and methods.

Specialization based on sectors or industries is only justified if it facilitates answering three questions, namely:

- What phenomena and processes should be known in order to define goals and make marketing decisions?
- What operational activities, in particular strategic ones, must be undertaken?
- What research methods and techniques should be used?

In each case a definition of the place and time conditions is required. If a certain sectoral or industry bias is justified, then a general course in marketing should be supplemented with examples, case studies, projects and simulations based in a given area of activity. Thus, it would be a marketing course adjusted to a given area of activity but not separate marketing characteristics for this activity since no such thing exists.

What does this imply for undertaking research in the field of marketing in a broad sense? It is necessary to establish if the research goal is to increase knowledge in a given sector or industry or to provide information for allocation decisions. In the former case, such a study should be considered as referring to the area of science covering a given sector or industry. Such a study would only use knowledge or experience gained through marketing research. Here are a few examples. 'Influencing the market of the organization in order to contain environmental damage.' Such approaches to operational activities can be covered by the concept of the marketing-mix and from the long-range perspective, by various marketing strategies. However, the intellectual substance of this study would be not the knowledge of marketing but ecology, or even better, of an analysis of costs and benefits of the expenditures on environmental protection. However, the same topic may be formulated by setting a different research goal e.g., 'The use of short- and long-term marketing activities in the organization's market in order to contain environmental damage.' It would then be a study from a marketing perspective. The knowledge of the sector is needed only to select accurate information and define conditions. It would allow for an appropriate selection of operational and strategic activities for particular conditions of place and time, which may comprise an acceptable intellectual input for the study. It could also be based on historical data e.g., verification of the marketing activities used so far.

Another example is 'Changes in banks' retail services in order to increase their competitive advantage.' This economic topic from the area of banking obviously requires some knowledge of marketing e.g., in reference to the development of banking products or a competitive analysis. However, the intellectual input refers to economics and banking. A similar topic with perhaps a more marketing slant would be 'Effective changes in the bank's retail services in the consumer market.' Similar to the example above, it would be necessary to obtain information on the development of banking products, banking techniques and functioning of a bank as an enterprise. The basic intellectual effort, however, refers to answering the question 'what will the separate consumer segments reactions be to various combinations of banking services?' and using this information to suggest effective marketing activities. As everyone is aware, interest in the business environment is growing with the perspective of time, space, subject and object. It poses an important challenge for educating future managers. The following must be done to a greater degree:

- taking into consideration the feedback from other business functions, in particular from its financial function in marketing decisions as well as in teaching<sup>6</sup>;
- integrating and coordinating teaching content and a significant reduction in the number of lecture hours, which is now too high;
- using such means and methods of active education which examine reasons for and effects of marketing decisions in reference to the whole adaptation process of the organization and creation and development of its target market.

Marketing, in reference to research, education and practical activities, covers more and more content and uses methods from such fields as strategic management, change management or industrial organization. I believe that two problems must be emphasized here:

Firstly, there is a fear that despite the growth of the significance of marketing for business, it may be absorbed by other, afore-mentioned fields of research and education. Therefore, it is worth discussing this issue.

Secondly, there is a possibility that marketing will be pushed towards operational activities whereas it should also, or even, mostly, be based on long-term thinking.

I believe that the two issues raised above create a real dilemma for undertaking research and for evaluating its scientific value. Namely, we have to agree that it will be difficult to formulate research topics narrowed down to the specific area of marketing if they are based on empirical data describing behavior of economic entities (their adaptation process). It will become more and more difficult to focus the analysis only on the functional area of marketing. Undoubtedly, this analysis will be wider, however; the researcher will be exposed to various pitfalls resulting from the convergence of separate functional areas of the company and the feedback between them. For instance, due to a lengthening of the value-added chain of a product, together with accelerating changes, the ratio of marketing costs to general costs as well as the importance of marketing investments is increasing even in a short period of time. Consequently, even for the research of marketing activities of a company, it will be difficult to separate it from the issue of company cash flow, its costs, activities directed to attract capital, etc.

A significant part of marketing studies is related to particular elements of the marketing-mix. It turns out that the time compression phenomenon together with the need to include into the reasoning process several environmental variables, which used to be taken as fixed, have considerably broadened the scope of the analysis. Thus, it is becoming more and more difficult to conduct an analysis based on the simplifying principle of 'ceteris paribus.'

It must be emphasized that whereas in the economic activity it is possible to determine a marketing mission, in non-economic areas it might not be so explicit. The former is always oriented on gaining a competitive advantage through a possibly permanent attraction of customers (creation and development of the target market), in order to maximize the

growth of the market value of an organization. In a non-economic activity, these goals are not always identical despite the attempts in literature to establish that they are.

Moreover, while in economic activity, the so-called marketing orientation, in particular, strategic marketing, was preceded by production orientation and orientation on product and sales, in non-profit organizations the purpose of their creation was serving beneficiaries for whom a given organization was created (marketing orientation). Naturally, these organizations do not always fulfill their tasks. Undoubtedly, marketing research and activities facilitate the implementation of tasks for non-profit organizations. It does not mean, however, a full transfer of marketing from the economic activity into the non-economic one. Of concern there is an attempt to separate these activities from their conditions resulting from the process of the organization's adaptation to a market situation. It may create a danger of associating marketing only with certain techniques of attracting an audience.

Therefore, applying marketing principles in non-economic activities increases its importance for modern society; however, it also restricts the scope of its original features (Dietl 2004, 15-20).

In conclusion, it is worth emphasizing that marketing has developed from economics, not from management. The theories of imperfect competition and monopolistic competition lie at the foundation of the development of this branch of science (Chamberlin 1937, 1993; Robinson 1948). Essentially, it is always concerned with improving the adaptation process of the organization (sector) and gaining competitive advantage through various activities geared mainly towards competition on quality. Of course, marketing, even in conditions of applying global strategies, works in the disaggregated form. It facilitates a development or even a creation of target markets within a niche or a market segment. Therefore, the marketing researcher must take into consideration non-economic variables to a much larger extent than the economist. It poses a vital challenge and difficulty with qualifying research. Here are a few examples. Can research on consumer consumption and behavior based on non-economic motives be considered as marketing or economic research? Should it rather be considered as belonging to sociology or applied psychology? Can a study on perception of advertising be considered marketing research or it is closer to psychology?

Without doubt, modern marketing opens new and ample fields of research; however, it is its interdisciplinary nature and the scope of interest that is difficult to delineate that pose key threats to research in this field.

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**(Footnotes)**

<sup>1</sup> To illustrate this, I have quoted two definitions of idea marketing:

- it is based on 'using marketing methods and techniques in order to communicate to society (...) messages whose implementation, by conditioning the desired social, economic, cultural and moral transformations, leads to humanization of living'
- 'a set of actions which by using marketing instruments popularize socially important messages and win them audience acceptance and, consequently, facilitate their implementation in order to bring about socio-economic, cultural and moral transformations that humanize living' (Seneszyn 1999, 4). In the first definition marketing is limited to methods and techniques which are borrowed from other fields. The second definition refers to communication rather than marketing.

<sup>2</sup> A still insufficient internationalization of Polish managers is emphasized among other problems.

They do not often have skills related to problem-solving, communications, developing one's knowledge (learning) and team work. All of these skills are of vital importance from the perspective of challenges posed by the global market (Kozmiński 2004, 13-18).

<sup>3</sup> We have to admit, however, that the concept of the 'target market' and influencing this market through marketing comes under the behavioral theory of the enterprise. However, the traditional theory of the enterprise (according to neoclassic economics) was limited to normative statements resulting from the method of allocating economic resources at the company's disposal through pricing.

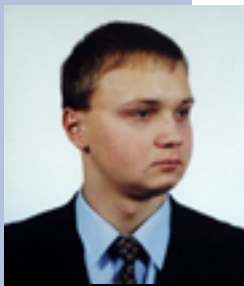
<sup>4</sup> We have to acknowledge that marketing encompasses mainly demand management, although I do not share the opinion that it is 'a science of demand management' (Philip Kotler odpowiada... 2004,18). As early as 1973, Philip Kotler conducted a marketing classification of demand (Kotler 1973, 42-49) and came to the conclusion that depending on the nature of the demand, we had to develop different forms of marketing: persuasive, changing the supply structure, stimulating, producer-oriented or final user-oriented, synchronizing demand in time, conservative and marketing that cools demand.

<sup>5</sup> Philip Kotler states: 'I do not claim at all that each type of market (communications, industrial and services) requires a completely different framework' (Philip Kotler odpowiada, 2004, 20).

<sup>6</sup> Unfortunately, both in teaching and in practical activities we (in Poland as well as other countries) are far from coordinating marketing with other functions of the organization (**coordinated marketing**). It is exceptional for marketing literature to cover an analysis of marketing costs, value of marketing assets and an influence of marketing on increasing a firm's value. The book by P. Doyle (*Marketing wartości*. Felberg SJA, Warszawa 2003) can be considered of particular value in this matter. People who work in marketing have a limited knowledge of finance despite the fact that marketing provides basic information for making investment decisions. The same may be said about specialists in finance, who, in general, are not interested in marketing and are not willing to analyze financial results of a company in relation to the market success of its products, brand, price dynamics, etc.

Total Quality Management (TQM) focuses mainly on the production department while a growing responsibility of marketing is active here since TQM can only be effective in the 'customer-oriented culture'. (Thomas 1994,6)





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## An Overview of Contemporary Theories of Fertility

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### Introduction

The idea of “demographic transition” does not belong to one author only. Numerous precursors dealt with that term in population research [Laundry 1945, Thompson 1929, Blaker 1949]. Nowadays, that theory is analyzed, verified, and in most cases, authors refer it to a particular country, society or ethnic group [Kazmer and Konrad 2001, Lesthaeghe and Neels 2001, Kurkiewicz 1998]. The demographic transition deals with changes in the level of reproduction. The transition process starts from the modern society with a high level of fertility and mortality and goes to the industrial society described by a low level of fertility and high mortality.

The last twenty-five years of the 20<sup>th</sup> century showed that a new trend appeared. The changes refer to the societies of highly developed countries. Firstly, birth rates were beneath the replacement level; secondly, death rates declined. The analysis of the new situation let demographers; D.J. van de Kaa [1987] and R. Lesthaeghe [1991] describe and formulate the foundations of a model, which they called the Second Demographic Transition model (the STD model).

Nowadays, demographers, economists as well as statisticians analyze and describe changes in the level of fertility in numerous countries [Entwisle et al. 1982, Alfonso 2000, Kurkiewicz 1992, Kohler et al. 2003, Pinnelli and de Rose 2001]. Lappegård [2000] in his work focuses on a pattern of fertility, both in regard to the timing of the first childbirth and the number of children born in Norway. Andersson [2000] describes trends and childbearing in neighboring Norway and Sweden. Many studies deal with fertility determinants. Gupta and Mahy [2003] examine whether increased years of schooling have a consistent impact on delayed childbearing in sub-Saharan Africa; Vikat [2004] employs a longitudinal register data set to analyze the impact of women’s economic activity and earnings on childbearing. There are studies, which refer to population and its changes in demographic literature as well. Schoen [2002] presents the concept that high proportion of rural population is also a



source of significant population growth. Ediev [2001] presents trends and projects Russian population since 1897 to the end of 21st century.

Many scientists such as demographers, sociologists, psychologists and economists, as well as governments of many countries, have been trying to find an answer to the following question: what factors determine population growth? It is very important to recognize, gather and describe major behavior of individuals because the number of individuals with respect to sex and group of age determines many aspects of economy such as medical care, pension scheme or education. The number of births and deaths considerably influences population growth. The conclusion seems to be obvious. Once we determine what factors have an impact on the level of fertility and level of mortality, we will be able to define the determinants of population growth. It is known that the factors that determine the level of fertility and mortality differ from one society to another.

The study consists of two parts. The first section focuses on demographic transition models that describe changes in population growth. The changes are brought about by fluctuations in the level of birth and death rates within many generations, from high rates to low rates. The second part describes the following theories of fertility: the hypothesis of R.A. Easterlin, the theory of fertility decline formulated by J. C. Caldwell and, finally, the theory of new home economics elaborated by G.S. Becker. These theories have made a generous contribution to demography and to fertility studies specifically. The fertility theories have focused on determinants of fertility changes. The authors of these theories have tried to formulate and describe social, economic, cultural, anthropological and geographical factors affecting the level of fertility. In most cases their analyses refer to a particular society or ethnic group.

## **1. Demographic transition models**

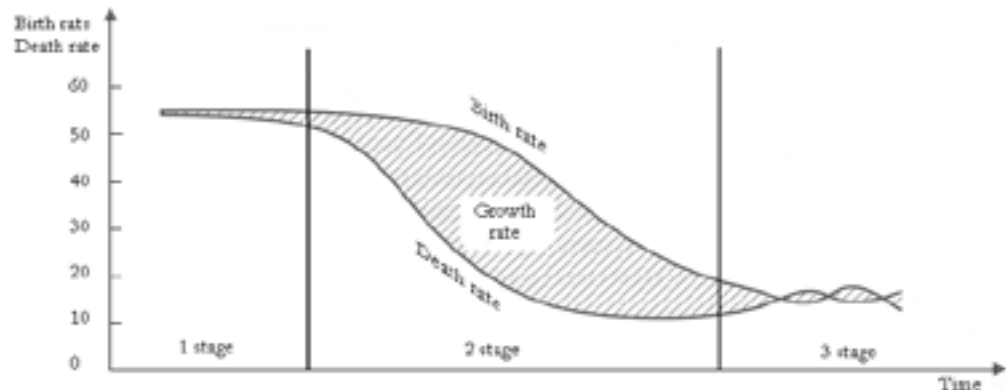
The concept of demographic stages was first presented by A. Laundry, [1909] whereas the author who formulated and described the demographic stages was C. P. Blaker [1949]. K. Davis [1945] was the first who applied the term of "demographic transition". Demographic transition models tend to explain transformations that focus on shifting from high birth and death rates to low birth and death rates. The transition began in the 18th century in developed countries and it continues nowadays. Less developed countries began the transition later and are still in the midst of earlier stages of the model.

There are two known demographic transition models. The first is composed of three stages while the other – most approved – consists of four stages. Both models are based on the changes in crude birth rates and crude death rates over time.

### **1.1 Three- and four-stage demographic transition models**

The most overall demographic transition model amounts to three stages (Graph 1.1). The authors who follow the three-stage demographic transition model are A. Laundry [1934] and F. Notestein [1945].

Graph 1.1 Demographic transition model (three-stage)



Source: Description based on J. Z. Holzer, *Demografia*, PWE, Warszawa 2003.

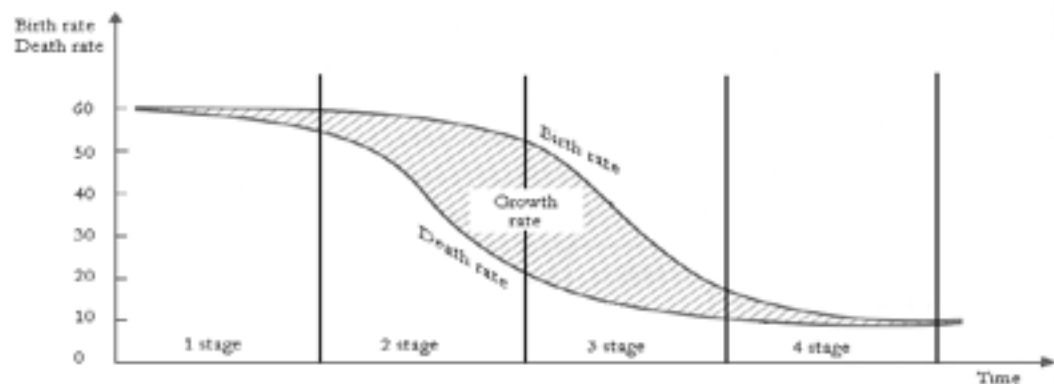
The characteristic features of the three-stage demographic transition models are high level of fertility and mortality in the first stage, the stage of transition with declining birth and death rates and family planning in the third stage. The first phase is typical of traditional societies, where there is no birth control. The third phase is attributed to modern societies with conscious birth control [Holzer 2003, Kurkiewicz 1998, Kotowska 1999]. The most common demographic transition model is composed of four stages (Graph 1.2). That model is more appropriate to show changes in population growth. Moreover, it allows understanding the transition between stages regarding more details [Holzer 2003, Kurkiewicz 1998, Kotowska 1999, Montgomery 2004, Sommestad and Malmberg 2000, Cieślak 1992].

The first phase of the model distinguishes a very high level of birth and death rates. It is possible that the level of fertility is equal to the level of mortality, or the level of mortality even exceeds the level of fertility. The reasons for high birth rates are lack of family planning, religious beliefs and considering children as an economic asset (each child being treated as an investment – an additional pair of hands to work in agriculture). The determinants of high level of death rates are lack of clean water and sanitation, lack of education, health care at a very low level, famine, wars and a big number of rats as a source of diseases. The number of children born by a woman aged 15-49 comes to six and an average life span is less than 45 years. The population growth is very slow and fluctuating. This stage refers to the economic development of Britain as it was in the 18<sup>th</sup> century and to the least economically developed countries nowadays.

The second phase is characterized by declining death rates as a result of improved medical care. Birth rates are still high because it is more difficult to change people's habits, attitudes and consciousness with respect to reproduction than provide medical care or sanitation. Death rates fall as a result of improved health care (vaccinations), improved quality of water and sanitation, improved production, storage and transport of food. The number of children per a woman at a reproductive age (between 15-49 years) is from 4.5 to 6 and an average

life span ranges from 45 to 65 years. The population begins to rise steadily. That stage links countries like Bangladesh and Nigeria today or Britain of the 19<sup>th</sup> century.

Graph 1.2 Demographic transition model (four-stage)



Source: Description based on M. Cieślak, (ed.), *Demografia: metody analizy i prognozowania*, PWN, Warszawa 1992.

In the third phase birthrates fall faster than death rates. The decline of birth rates is a result of the following factors: family planning and changes which apply to the status of women, higher standard of living and low level of infant mortality. Moreover, mechanization and new agricultural tools and machines reduce the demand for workers. The maximum birthrate appears between the second and the third phase. The number of children born by a woman aged 15-49 ranges from 3 to 4.5 and an average life span is between 55 and 65 years. The population rises. This phase was typical for Britain at the end of 19<sup>th</sup> and beginning of 20<sup>th</sup> century and for China and Brazil today.

In the fourth phase the level of fertility reaches the level of mortality. Owing to widespread medical and social care intensity of mortality reaches low values. The number of births is below 2.5 children per a woman between 15-49 and an average life span is longer than 65 years. This stage refers, for instance, to the USA, Sweden, Japan and Britain today.

It is obvious that the above-described model cannot be applied to each society and has its limitations. First of all, it can be observed that birth rates fall below death rates in many countries like Sweden, Germany or Poland today. This results in population decline, which could suggest that there is a need to add a fifth stage to the four ones analyzed above. Secondly, the analyzed model could suggest that all countries and societies go through the same four stages in the same period of time. Still it is rather unlikely. The major factor is the economic and social potential of the analyzed countries. Countries like Singapore [Cheung 1989] or Malaysia [Peng 2002] are being squashed as they develop at a much faster rate than the early-industrialized countries did. Then, countries with a high level of immigration, the USA [Fehr et al. 2003], Australia or Canada did not go through the early stages of the presented model because population growth was fed by immigrants. Finally,

even though the decline of death rates seems to be a consequence of industrialization, it is, in my opinion a result of improved and easily accessible health care, sanitation and higher standard of life.

## 1.2 The second demographic transition model

D. J. Van de Kaa [1991] formulated foundations of the theory of the Second Demographic Transition (the STD). The theory is based on an analysis of changes in marital attitudes and fertility patterns among European countries. Nowadays, numerous demographers and social scientists relate to this theory in their studies [Surkyn and Lesthaeghe 2002, Atoh et al. 2004, van de Kaa 2002, Leiwen 2002] The major assumptions of the SDT can be divided into four groups: marriage, fertility, contraception and lifestyle [Kotowska 1999, Kurkiewicz 1998]. The major symptoms of the SDT with respect to the 'marriage' variable are: postponement of marriage, an increase in the age of the first marriage (from 23.0 years in 1990 to 23.7 years in 2000 in Poland<sup>1</sup>), prevalence of nonmarital cohabitation (so-called LAT, Living-Apart-Together unions), an increase in the number of divorces (from 27.0 thousand in 1993 to 45.0 thousand in 2002 in Poland) and an increase in the number of couples with one child (the first birth in total live births increased from 40.0 in 1990 to 48.0 percent in 2000; the average order of birth dropped from 2.11 to 1.90 between 1990 and 2000 in Poland).

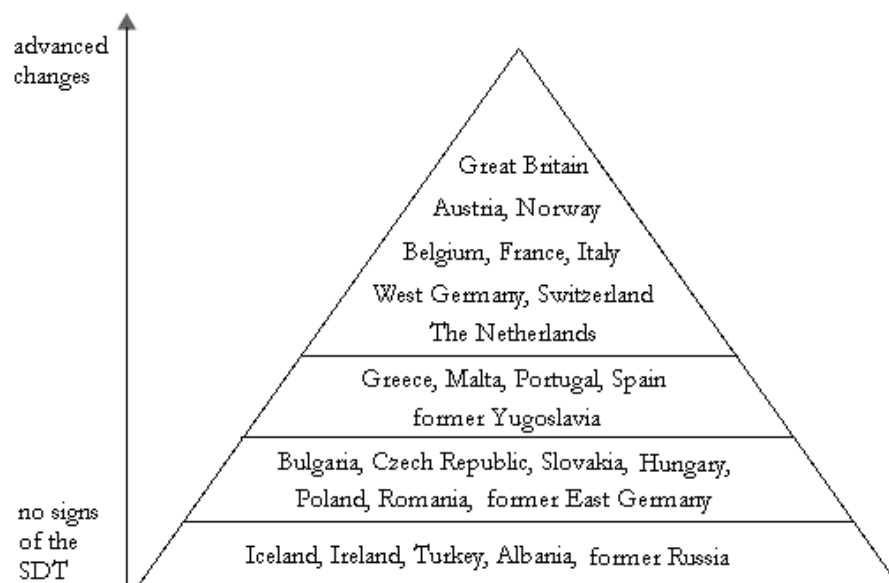
The changes in 'fertility' field are as follows: declining fertility near-replacement level or beneath replacement level which influences population growth, changing fertility pattern which is expressed by two factors: first – the age of having the first child increased, second – maximum fertility moved from one age group to another (from the group of age between 20-24 years to the group of age between 25-29 years in Poland), increased the number of nonmarital births which is a result of increasing Living-Apart-Together unions [Snauwaert et al. 1998] (the nonmarital births doubled, from 6.0 to 12.0 percent in total live births between 1990 and 2000 in Poland).

The crucial evidence as to the area of 'contraception' is widespread accessibility to contraception and birth control methods. It helps parents to plan the optimal moment for conceiving a child and to decide on the number of children they wish to have.

The last group of symptoms of the SDT pertains to the changes of lifestyle that determine mortality level; especially to women aged 18-60 and men aged 18-65 as well as a diet and physical effort.

All the above-mentioned changes have taken place in European countries but the progress of changes differs from one country to another. Table 1.1 shows countries with the advanced SDT and countries which are still in the process of changes from primitive to modern reproduction.

Table 1.1 The Second Demographic Transition – progress of changes among European countries.



Source: Description based on J. Kurkiewicz, *Modele przemian płodności w wybranych krajach europejskich w świetle koncepcji drugiego przejścia demograficznego*, Zeszyty Naukowe AE, nr 131, Kraków 1998.

The newest investigation on the SDT was launched from 1999 to 2001. The European Values Study (EVS) was a well-established network of moral, religious, societal, political, economic and social attitudes, goals, beliefs and values of mass publics in Europe to explore similarities, differences, and changes in these orientations. The investigation covered 33 European countries Austria, Byelorussia, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxemburg, Latvia, Malta, Northern Ireland, the Netherlands, Poland, Portugal, Romania, Russia, Spain, Sweden, Slovakia, Slovenia, Turkey, and the Ukraine. An important goal of the most recent investigation was to examine whether the emerging concept of one common European cultural identity had an empirical basis [Luijckx et al. 2003]. The outcome of the European Values Study was presented in the work of J. Surkyn and R. Lesthaeghe [2002]. According to the authors, single living, premarital cohabitation and progression to parenthood within cohabiting unions have steadily gained ground in Europe. These symptoms of the SDT occurred in many regions of Europe such as Scandinavia during the 1960s, Western Europe in the 1970s, the Iberian populations in the mid-1980s and apparently expanded to central Europe. The main conclusions of the investigation conducted by J. Surkyn and R. Lesthaeghe are presented in the following way. First of all, childless cohabitants are not conformists in the values referring to secularization, ethics, civil morality, egalitarianism, anti-authoritarianism, expressive values in a work and socialization, tolerance, world orientation etc. Secondly, married parents who had never cohabited have the lowest nonconformist score of all. Finally, married parents who had cohabited are always more

nonconformist than their counterparts who never cohabited. This suggests that earlier cohabitation experience has a lasting effect operating in the non-conformist direction. The authors indicated that single living is associated with very high non-conformist people.

## 2. Fertility theories

The level of fertility is affected by many determinants. The major source of changes could be social, economic, cultural, anthropological or geographical [Josipovič 2003] factors, which influence the level of births in a given society. The one theory, which would link socio-economic transitions with changes of fertility, has not been formulated yet. On the other hand, fertility theories have the same core component – they all describe changes in the level of fertility. The theories presented below respond to the question referring to changes in the level of births. The main field for differentiation among them is the source of changes.

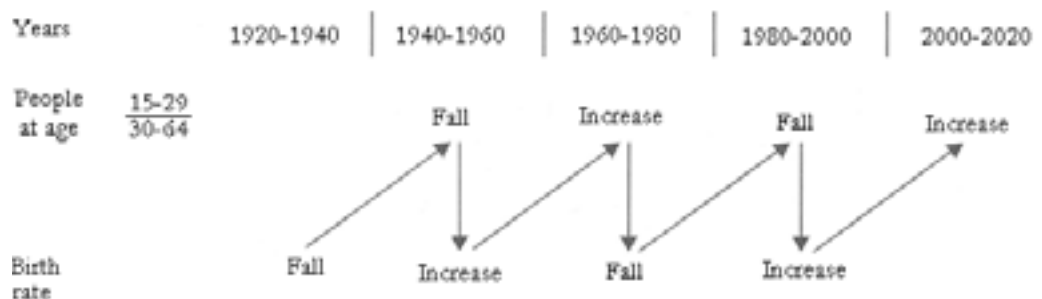
### 2.1 The Easterlin Hypothesis

The demographic transition models presented above suggest the decline of fertility from high levels in pre-industrial civilizations to low levels in postindustrial societies. Nowadays, most of developed countries have experienced fertility decline and one of the possible scenarios is a constant but low fertility level in the future.

The Easterlin hypothesis points out a link between fertility level and relative cohort size. The analyzed relationship is determined by the level of current or potential income of young people and their material aspirations.

The model is based on a cyclical pattern of fertility supported by socio-economic mechanism. Namely, a small cohort size (in comparison to the previous generation) creates better conditions in terms of labor market opportunities and high wages. It allows the cohort to realize the desired fertility. On the other hand, constraining desired fertility and postponement of fertility and marriage are the result of less desirable economic conditions when the cohort is large relatively to the parental generation. (Kurkiewicz 1998, Cieślak 1992)

Table 1.2 Cyclical pattern of fertility.



Source: Description based on J. Z. Holzer, *Demografia*, PWE, Warszawa 2003.

A cyclical pattern of fertility is based on a concept of Kuznets cycle, a cycle of economic activity lasting between 15 and 20 years. [Schön 2004] The Kuznets cycle is strictly related to investment in housing and building, capital formation, income and real estate markets.

There are two versions of the Easterlin hypothesis. One version assumes that fertility is a result of relative income, the second deals with a dynamic process where the past level of fertility is negatively correlated with the current fertility level. [Bonneuil 1990 in: Waldorf and Franklin 2002]

The Easterlin hypothesis is widely accepted in social science literature. Macunovich (1998) in her empirical tests based on aggregate North American data proves supporting evidence in the majority of these studies. However, this model fails to match the pattern in the United States fertility data after 1954 [McNown and Rajbhandary 2003]. The Easterlin effect is restrained among European countries by social and institutional features affecting influence of relative cohort size on fertility. High rate of female labor force is the most important feature, which reduces an impact of relative cohort size on fertility. This factor is connected with social security programs widespread in the United States, but not existing in European countries. Besides, the second factor is a degree of trust in government's financial support. However, it is very difficult to measure its impact on the analyzed phenomenon [Pampel 1993].

The analytical technique and the period covered can be the crucial factors while testing the Easterlin hypothesis evidence in populations. Artzrouni and Easterlin [Macunovich, 1998] applied the OLS technique (ordinary least squares technique) to Danish population data covering the period from 1951 to 1981. The analysis indicates a significant positive relationship between total fertility rate (TFR) and relative cohort size, whereas Wright [Macunovich, 1998] verified this concept between 1950 and 1985 applying Granger causality test. The author came up with an inversed relationship between these two variables.

Moreover, it is evident that the structure of population by age and sex, regional differences across a country, prevalent religion can determine rejection or acceptance of the Easterlin hypothesis.

Waldorf and Franklin [2002] tested the Easterlin hypothesis with respect to regional differences in Italy. Their variables comprised the fertility norms and values across the space and movements between labor markets. The study provides three findings. First, space-time is a very important and significant variable in regional analysis. Second, fertility within one region has an impact on the neighboring regions and thus cannot be ignored in any fertility study. Third, the effects of relative cohort size on the level of fertility vary between regions and time periods.

## **2.2 The fertility decline theory**

The fertility decline theory was formulated by J.C. Caldwell in 1982. His aim was to construct a model of the African society, which would be able to generate ideas about



changes in sexual behavior. Given this, a model can explain population and fertility pattern. Furthermore, Caldwell, his wife and collaborators conducted investigations on fertility behavior in the Asiatic populations. His investigation shows that there is a contrast between the African and Eurasian sexuality. The African system is internally coherent and evolves around lineage organization based on reproduction and descent. The polygamy and divorce are common because a conjugal bond is emotionally very weak. Both a husband and wife retain links with their natal lineages and share few mutual interests. Having different economic responsibilities, the conjugal household is not a unit for economic purposes. Typically, a wife and children form an entity whose interests are opposed to that of a husband, a father. [Heald 1995]

By contrast, the Eurasian system, which focuses on inheritance, seeks for ways to control marriage and female sexual behavior. In addition, this system is based on mortality and theology, whereas the African system does not locate the aspects of sexual behavior in the center of their moral and social systems. What is more, most of sub-Saharan societies do not consider premarital or extramarital sex as an immoral activity. The sexual relationship is not a subject of moral control and sex is seen as an otherworldly activity. Consistently, a large majority of the African countries note total fertility rates between six and seven children per woman. [McDevitt 1998] Besides, sex is seen as a service which a woman contributes to a man in return for cash or support. It is difficult to recognize prostitution in Africa in the same way as in the West where sex has always a potentially commercial aspect. [Heald 1995]

The central point of the Caldwell theory is the transfer of goods, money, and services between generations. This stream is called 'supporting flow'. Furthermore, his theory states that any economic activity should be followed by social goals. An economic success and satisfaction are not possible without a social element. What is more, Caldwell says that fertility decline is not affected by the level of economic development of a country or the level of industrialization. He claims that economic growth is accelerated by fertility decline. It is evident that the level of economic development influences the fertility. The case of the Polish population shows that TFR (total fertility rate) was 2.3 children per woman in 1980 and moved towards 1.2 in 2003<sup>2</sup>. The changes in decline of TFR were accompanied by the changes in economic background of Poland, the transition from the communism to a free market economy. It is evident that the level of economic development stimulates changes in fertility behavior.

Caldwell discussed two types of society with respect to changes in the level of fertility. First, a society with symptoms of fertility reduction and second, a society without symptoms of fertility decline. The level of fertility and family size are determined by economic and social benefits. When there are no economic stimuli to restrain reproduction, children can be a source of trouble for parents. The level of reproduction and family size are mainly determined by the costs of living and by advantages of having children. [Holzer 2003]

The lineage organizations and inheritance can refer to many different sexual behaviors that take place in the African societies. First of all, it is a greater sexual access to women.



There are many East African people such as the Nuer, the Gisu, the Luo for whom it is not a dishonor to commit adultery with a brother's wife, and no compensation can be demanded. On the contrary, for the Iteso in Kenya, it is seen as disgrace and violation of the husband's individual rights. Besides, a cult of ancestors does not have to be strictly linked with lineage reproduction and continuity. The Gisu are Bantu-speaking agriculturists living in Kenya and Uganda. In their religious system no cult is devoted to any particular ancestors. They postulate recycling of life force that they call *bulamu*. The life force of the dead returns to a newborn child. [Heald 1995]

### 2.3 The New Home Economics theory

The Becker's model is known as the New Home Economics theory and is based on family and household [Ferber and Birnbaum 1977, Headey 1993, Grossbard-Shechtman 2001, Katz 1997]. This economic theory of fertility links many variables such as income and expenditure, quality of children, constraints in terms of time and opportunity cost with respect to births. Opportunities are connected strictly with better education, better food and buying more goods.

The Becker's model provides parents utility function depending on their consumption and utility of a child. Parents make choices between utility of durable goods (consumption) and utility of children (satisfaction). Consumption and number of relatives within generations is called a dynasty utility function. Welfare of all generations is closely related to the above mentioned variables, such as consumption, income and number of relatives in a dynasty. It is obvious that the heads of generations tend to maximize a dynasty utility function. On the other hand, maximization requires an equilibrium between the marginal benefit of an additional child and the net costs of producing a child. The costs are determined by the life-span earnings of children, bringing up the children and the parents' investment in human capital. The Author states that the costs of bringing up descendants are constant over the time. Assuming the constant level of the costs the Becker's theory says that the level of fertility depends on the interest rates (positively), time preference factor (positively), degree of altruism (positively), and growth of net costs between generations (negatively) [Becker 1988].

There were many studies dealing with a negative relationship between the level of education and the number of children. Analyses meet many limitations; the studies are limited to visual inspection and, therefore, conclusions based on the correlation analysis cannot find a casual link between variables. These works do not consider relationship between fertility and its determinants. Finally, many studies apply the regression models, but although these analyses contribute a lot, they attempt to make correlation equal causality. [Diebolt and Doliger 2005]

The Granger's causality test was applied to French population data for all above-mentioned inconveniences. The test showed the level of education affected that fertility decline significantly. Low fertility rates go with an increase in woman labor force participation. Women changed their behavior under the influence of new possibilities

of investment and opportunities related to education and labor market. What is more, changes in sexual behavior of women should be perpetuated by the changes in economic role of women. This phenomenon can be referred to the young couples that decide not to have children in order to increase the standard of living or to maintain it at a high level.

## Conclusions

The above-presented theories focus on determinants and variables affecting the level of fertility in populations. The major aim of these theories is to explain changes in the level of fertility, whereas the assumptions and approaches are different.

The Easterlin's theory deals with the level of fertility and changes in relative income. The assumptions are verified among developed countries and they are referred to the whole population. (macro scale)

The Caldwell's considerations are connected with changes in the level of fertility and type of economy among peasant societies. Caldwell verified his theory in the African and Asiatic countries. He focuses on family level (micro scale) and intergeneration flow.

The Becker's approach refers the level of fertility to women's labor market opportunities connected with the level of education. The major parts of his theory are changes in an economic role of women and mostly are referred to the young people. The author provides an intergeneration maximization of welfare utility function.

Reliability of the theories depends on analysis technique, demographic rates applied in the analysis, economic background of a country and structure of population.

Nowadays, the most important is the theory of the SDT. This model is crucial because we still do not know the final outcomes of changes in the level of fertility caused by demographic fluctuations. What seems essential is that changes began among the Scandinavian populations in the 50's and spread very fast throughout the western Europe in the 60's and to southern Europe in the 70's. Firstly, the changes are permanent and irreversible. Secondly, the changes referred to the marital fertility at the beginning and then to marriage (dissolution and cohabitation instead of marriage). So far, population studies and research have not formulated a new compact theory. The studies and analyses did not present a coherent set of direct and indirect determinants of demographic changes. That part is still a subject of analyses and investigation. According to Kotowska [1999] we can hardly speak about the theory of the SDT but rather about its initial approach.

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**(Footnotes)**

<sup>1</sup> Rates based on Polish Population Office data.

<sup>2</sup> Rates based on Polish Statistical Office data.







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## Differently Fundamental – Micro-structural Approach to Determining PLN/EUR Central Rate for ERM II

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### Introduction

An attempt to join the European Monetary System is definitely one of the greatest challenges that authorities in charge of economic policy in Poland will face this decade. It has even become more challenging recently when (in some European countries being already members of Eurosystem) nostalgia for national currencies has suddenly risen and, on the other hand, the new government in Poland is not conspicuously enthusiastic about the idea either. Admittedly, the expectations were much ahead of what the eurozone has delivered. There are many reasons for this.

First, it is difficult to succeed with one monetary policy and several fiscal policies. The single monetary policy must be applied to very different economies and deal with divergent economic cycles, divergent inflation and economic growth rates. Before the year 2000, such countries as Italy periodically allowed the lira to depreciate against the mark in order to regain competitiveness with other European economies. Now, devaluation is not an option any more. This is one of the reasons why, although never publicly endorse the idea, some Italian politicians (R. Maroni) repeatedly express concern about the long-term sustainability of the euro. Blaming euro for national problems happens occasionally in other European countries (Greece and Portugal). A poll taken in May 2005 (for Stern magazine)<sup>1</sup> suggests that 56 % of Germans opt for bringing back the Deutsche mark.

Second, introducing euro was to force European countries to liberalize their economies. In some countries (France and Germany), however, liberalization was opposed by voters and trade unions and is still extremely unpopular. This counteracts economic reforms that were supposed to be implemented in order to improve economic flexibility. The consequences show in the statistics: unemployment in the eurozone for years has stayed high and growth is lagging behind this of the main benchmark country – USA.

Another obstacle is that monetary union requires a political union in the long

run. But rejection of the constitution in France and Holland raises doubts about Europe's commitment to further political union.

To sum up, as Scott McNeally states: "the eurozone is trapped in an environment in which monetary policy has become disfunc, fiscal policy unsustainable and national economies remain too inflexible to adjust to globalization or the recent EU's enlargement"<sup>2</sup>.

All this, however, does not mean that the common currency is reversible. First, the Maastricht treaty that established the currency has no withdrawal provision. Besides, the country that wished to withdraw would be exposed to the risk of higher interest rates and reluctance of foreigners to invest, in general greater political risk.. As O. Issing<sup>3</sup> (chief economist of ECB) said "a debt itself that is denominated in euro is a disincentive that is strong enough for such a country to leave". He also warned that members wanting to leave the eurozone would commit "economic suicide".

On the other hand, euro has been a great success. Traveling within the 12 countries has become much easier, companies are not exposed to exchange rate risk any more and avoiding the transaction costs directly translates into faster growth. S. Edwards and I. Magendzo (Edwards 2003) analyzed whether "common currency" countries have outperformed countries that have a currency of their own and showed that the former ones have lower inflation and higher growth (higher volatility though) than countries with domestic currencies.

As the paragraph above highlights the financial unification of Europe is still a work in progress. In Poland, joining the eurozone is still one of the government's priorities. But, there are also a number of steep hurdles. First, reaching a high degree of convergence with the euro zone countries is a precondition for the country to be admitted to the ERM II. There are four convergence conditions to be met. They are related to: public debt, budget deficit, inflation level and the level of long-term interest rates. Paradoxically, the need to meet the convergence criteria may appear to be one of the major benefits from joining the eurozone, much more important than billions of euros that a country like Poland can absorb from European Union's structural funds. It may simply impose the necessary fiscal and monetary discipline and prevent politicians from tinkering with the economy.

What immediately precedes entering ERM II however is the need to determine central PLN/EUR exchange rate. In A. Wojtyna's opinion, "the choice of the central rate will be extremely difficult. There is neither a theoretical model nor empirical research that may suggest how to find the equilibrium rate" (Wojtyna 2003).

This paper attempts to provide a solution to the problem. It presents a theoretical framework as well as a mathematical model that can be implemented and generate adequate equilibrium PLN/EUR exchange rate. According to the ECB (ECB 2002) "it is important to set a central parity that corresponds to the best possible assessment of current economic fundamentals, knowing that this will not prejudge the ultimate conversion rate". On the other hand, rejecting market spot rates and market-based forecasts just on the ground that they do not converge with some fundamentals

seems too arbitrary a solution. Thus, anticipating future spot rates (attempted in this paper), although tantamount to solving only a part of the problem, appears to be a good starting point for setting the central exchange rate. In fact, we will never know where the equilibrium rate is until it is market tested. This is where the ERM II comes in handy. It is designed as an ultimate test of the consistency of a central parity with a long-term fundamental equilibrium. The main intention of creating the ERM II was to “offer a meaningful framework for combining nominal and real convergence and should therefore not be seen as a mere anti-chamber before the adoption of the euro” (ECB 2002). On the contrary, the process of finding the equilibrium exchange rate will greatly be facilitated, as A. Koronowski acknowledges (Koronowski 2003). Apart from providing credibility (ECB supervision), supporting instruments that make the test feasible (Very Short Term Facilities), enforcing macroeconomic policy discipline (need to fulfill the fiscal and monetary convergence criteria), the fact of setting a central rate *per se* is significant as it triggers the very well known in finance mean reverting behavior conducive to the exchange rate stabilization (Williamson 2000). The fact of setting the central rate is reflected in the traders’ expectations and shows through the futures rates that are less volatile than the spot rates. Besides, once the central rate weathers the “purgatory” as the ERM II is often called, the conversion rate may not have to be exactly equal to the central rate.

### 1. Fundamental Forward Rate Model

Futures market analysis is the starting point for building the model. There are two major rates that are analyzed. Forward rate is basically determined by the difference in interest rates home and abroad. Any departure from the interest rate parity is noticed by arbitrageurs who drive it close to theoretical forward rate. The future spot rate, however, is hardly predictable and badly correlated with the forward rate. Hence, one of the major assumptions of the paper is that the market forward rate is significantly warped by arbitrageurs’ activity. If their influence was filtered out, the forward rate would reflect the fundamental signals that really affect the market expectations with regard to future exchange rates.

Therefore, there are two informed, influential groups of traders on the market: arbitrageurs (group A) whose behavior is somewhat automatic and driven by interest rate parity and fundamental traders (group F) – here belong commercial traders who use the futures market for hedging but also all the traders who refer to wider than just interest rate differential range of information. The abstract future rate that they have in mind is the Fundamental Forward Rate. The market forward rate is actually stretched between two extremes: one being the theoretical rate (reference point for arbitrageurs), the other – fundamental forward rate known to fundamental traders. Where exactly the fundamental rate is and how strong the both forces are is a subject of the research. The main problem is how to measure the degree and direction of the activity of both kinds of traders. This was established by analyzing historical data from the Warsaw Stock Exchange and then the Chicago Mercantile Exchange.

## 2. The market microstructure

In some markets unsolicited reports that incorporate information about their microstructure (Lyons 2002, O'Hara 1995) have appeared for some time providing researcher as well as traders themselves with valuable data. Commitment of Traders Reports (Rockefeller 2002) published weekly by Commodity Futures Trading Commission is one of the examples. The traders are classified either as "commercials" or "non-commercials"<sup>4</sup>. All of a trader's reported futures positions in a commodity are classified as commercial if the trader uses futures contracts in that particular commodity for hedging. A trading entity generally is classified as a „commercial" by filing a statement with the Commission (on CFTC Form 40) that it is commercially engaged in business activities hedged by the use of the futures or option markets. Traders of both categories stipulate from 70 to 90% of the market. The others are called "nonreportable positions" and these are the traders who only occasionally are involved in trading.

Table 1: An example of Commitment of Traders' Report (June 13, 2000).

Wheat - Chicago Board of Trade							Reportable Positions as of 06/13/00		
NON-COMMERCIALS			COMMERCIAL		TOTAL		NONREPORTABLE POSITIONS		
LONG	SHORT	SPREADING	LONG	SHORT	LONG	SHORT	LONG	SHORT	
(CONTRACTS OF 5,000 BUSHEL)				OPEN INTEREST: 132,258					
COMMITMENTS									
23,191	29,74	17,964	51,732	61,646	92,887	109,35	39,371	22,908	
CHANGES FROM 06/06/00 (CHANGE IN OPEN INTEREST: 1,652)									
-1,627	-664	-1,407	3,071	5,534	37	3,463	1,615	-1,811	
PERCENT OF OPEN INTEREST FOR EACH CATEGORY OF TRADERS									
17.5	22.5	13.6	39.1	46.6	70.2	82.7	29.8	17.3	
NUMBER OF TRADERS IN EACH CATEGORY (TOTAL TRADERS: 277)									
94	79	68	59	55	200	175			

Source: [www.cftc.gov/cftc/cftccotreports.htm](http://www.cftc.gov/cftc/cftccotreports.htm)

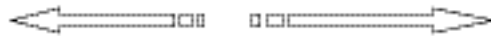
Unfortunately so far such reports have been published by commodity exchanges only. They are weekly reports that provide aggregate information. Still, it is an important tool that may be useful for predicting price changes.

### 3. Two forces and two types of traders in the futures market

The main assumption of the paper is that the market forward rate is located between two values: the theoretical value (represented by the A traders) and the fundamental value (represented by the F traders). The main problem is how to measure the degree and direction of the activity of both kinds of traders. We hypothesized that how the forward rate diverges from its theoretical value may be an indication of the degree and direction (see the arrows below) of the activity of both kinds of traders.

There are two possible situations.

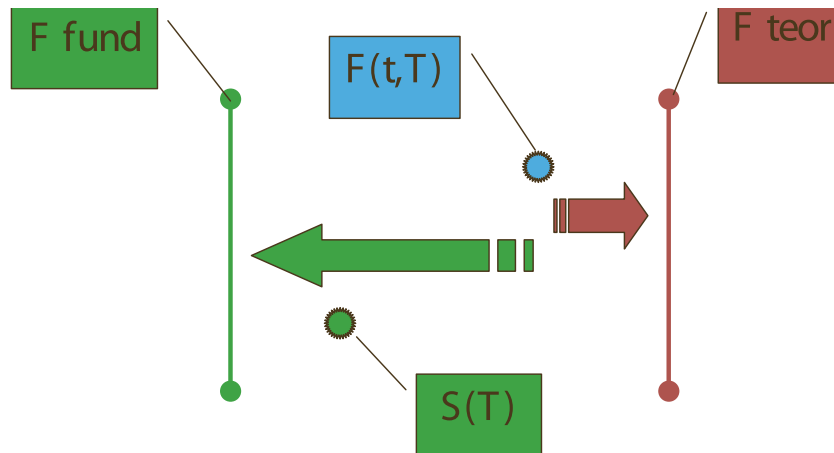
$$(1) \quad F^{fund}(t,T) < F(t,T) < F^{teor}(t,T)$$



$$(2) \quad F^{fund}(t,T) > F(t,T) > F^{teor}(t,T)$$

The situation expressed by inequalities (1) means F traders expect that  $S_T < F^{teor}(t,T)$ . Simultaneously, the opposite force (2) suggests that  $S_T > F^{teor}(t,T)$ .

The value of the forward rate that is lower than the theoretical one implies that the future spot rate will also be lower, and vice versa. This is illustrated below.



The formula (3) below is a natural consequence of this reasoning.

$$(3) \quad F^{fund}(t,T) = F^{teor}(t,T) + a \times (F(t,T) - F^{teor}(t,T)) \times p$$

where:

$a, p$  – (temporarily unknown) correctional values.

We hypothesized that the model (3) enabled us to determine the direction in which the future spot rates will change. The relationships (4) and (5) must be verified in order to prove that.

$$(4) \quad F(t, T) < F^{teor}(t, T) \Rightarrow S_T < F^{teor}(t, T)$$

$$(5) \quad F(t, T) > F^{teor}(t, T) \Rightarrow S_T > F^{teor}(t, T).$$

The sample that was chosen included all PLN/EUR futures rates with one-month maturities traded on the Warsaw Stock Exchange between the years 1999 – 2003. The theoretical rates were calculated with WIBOR and EURO LIBOR 1M values. It appears that (4) and (5) were proven accurate in 70% of the cases.

In addition to this, correlation between  $F(t, T) - F^{teor}(t, T)$  and  $S_T - F^{teor}(t, T)$  was found to be significant. This may indicate that not only the direction but also the extent to which the two forces affect the futures rate could be extracted from the data.

The Polish futures market is not extremely liquid. Hence, there was a need to test the hypothesis elsewhere. Another round of research was conducted with Euro FX futures contracts traded on the Chicago Mercantile Exchange. This time positive results, meaning that (4) and (5) do work, stipulate 65% of the cases.

However, equation (3) previously derived must be modified. The  $F(t, T) - F^{teor}(t, T)$  values do not change proportionally to  $S_T - F^{teor}(t, T)$  values. Besides, the linear model could generate negative values of the forward rates. This observation paves the way for a new version of the model (3) as shown in (6).

$$(6) \quad F^{fund}(t, T) = F^{teor}(t, T) + a \times \text{sgn}(F(t, T) - F^{teor}(t, T)) \times |F(t, T) - F^{teor}(t, T)|^q$$

#### 4. Calibration of the model

Parameters  $a, q$  were calibrated by maximizing the correlation between  $F(t, T) - F^{teor}(t, T)$  and  $F(t, T) - S_T$ . Simultaneously, the  $F^{fund}(t, T) - S_T$  difference is minimized.

Gradually, the assumption concerning only two groups of traders was relaxed. Uninformed traders (the model by Glosten and Milgrom that shows the relationship between bid-ask spread and the activity of the uninformed traders is used) were also incorporated into the model.

Finally, the Fundamental Forward Rate model has two components. The predicted values of the exchange rate lie between the  $F_+^{fund}(t, T)$  and  $F_-^{fund}(t, T)$  (see the two equations below). The  $a$  and  $q$  parameters are established by calibrating the model on historical data.

$$F_+^{fund}(t, T) = F^{teor}(t, T) + a \times \text{sgn}(F(t, T) - F^{teor}(t, T)) \times |F(t, T) - F^{teor}(t, T)|^q \times (1 + \eta)$$

$$F_-^{fund}(t, T) = F^{teor}(t, T) + a \times \text{sgn}(F(t, T) - F^{teor}(t, T)) \times |F(t, T) - F^{teor}(t, T)|^q \times (1 - \eta)$$

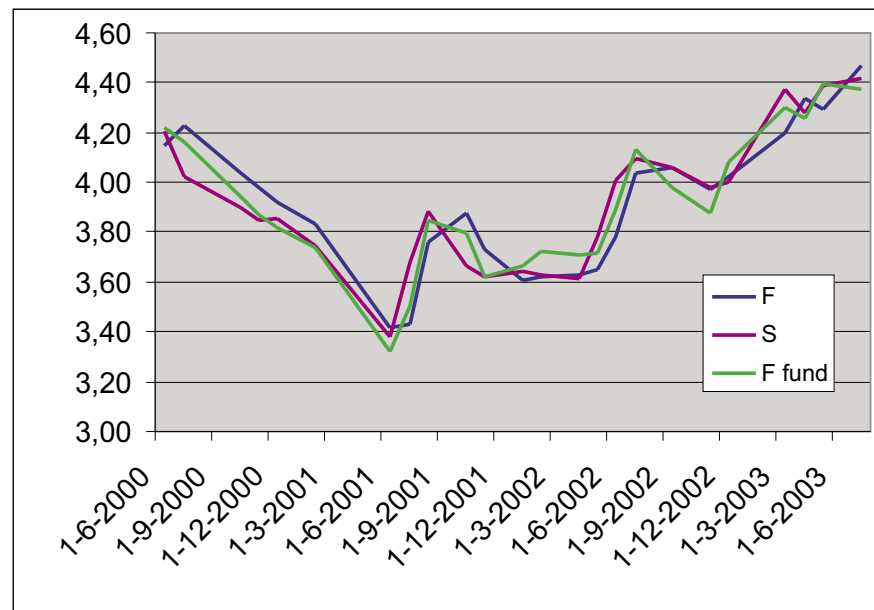
where  $\eta$  represents the number of uninformed traders. It is derived from either publicly available Trader Commitment Reports or an analysis of the bid-ask spread.

## 5. Using the model to predict future exchange rates

The model can be used to predict the values of fundamental forward rates and (indirectly) the future spot rates as well. Yet, it must be emphasized that the calculations are based on information available at time  $t$ . It is natural that new information arriving in the period  $(T-t)$  may gradually change the prediction.

The model was calibrated on three-year data sequences, starting July 1999. The parameters determined after each calibration complement the model. It is a typical one step prediction with a one month horizon<sup>5</sup>. As it can be seen below the values generated by the model are good predictions of future spot rates.

**Figure 2:** Prediction of the future spot PLN/EUR rate generated by FFR model



The quality of the prediction was verified through a set of statistical tests, such as MAE and Wilcoxon test. Two benchmarks were used for comparison : futures rates and the prediction generated by neural networks. The  $\pm 2,25\%$  band allowed by ERM II was another benchmark – 71% of the values generated by the model fall into the band. In general, the values generated by the model were significantly better than all the other benchmark values.



## Conclusions

To sum up, the procedure of accessing the euro zone involves setting a central PLN/EUR rate. The rate must be carefully chosen so the market rate would fit in  $\pm 2,25\%$  band around it while the central rate is being tested in the ERM II. The question that has not been answered yet is how to determine the central rate.

The model that has been presented in the paper proves efficient in predicting exchange rates. The only drawback is that some of the data necessary to feed the model are not easily available.

This paper, hence, should be considered only a small step in a promising line of research. It provides a valuable insight into how expectations with regard to future spot rates are formed in the futures market.

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#### **(Footnotes)**

<sup>1</sup> Cf: Floyd Norris, "A new villain emerges in Europe: the euro" in: International Herald Tribune, June 8, 2005

<sup>2</sup> Scott McNealy, "Is the euro forever?" in: Financial Times, June 8, 2005

<sup>3</sup> Scott McNealy, "Is the euro forever?" op.cit.

<sup>4</sup> Cf: [www.cftc.gov/cftccotreports.htm](http://www.cftc.gov/cftccotreports.htm)

<sup>5</sup> Example: Prediction for 25 January 2002 spot rate is given by (6). The parameters have been calibrated on historical data.  $F^{fund}(t, T) = 3,5456 + 0,12 \times (|3,61 - 3,5456|)^{(1/200)} = 3,66$  The value of theoretical forward rate (on 31 December 2001) is 3.5456 since 1M Wibor and Euro Libor were 0.1208 and 0.0333 and spot rate on this day was 3.52. The actual spot rate (on 25 January 2002) was 3.64 (please compare it to the prediction of 3.66).