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Market Behaviour under Micro-Macro Imbalances

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*In order to improve something – you need to be able to change it,
To change this – you need to be able to understand it,
To understand this – you need to be able to measure it,
And what will be measured – can be considered to have been done.*

Peter Drucker

1.1. Introduction

The most important message for achieving the effectiveness of any business activity, like all human activities, is its optimization. This is due to the general laws of nature, where the principles of minimum energy, the shortest path of light or the highest energy efficiency of prey hunting by predators do govern events observed on a daily basis. In economics, we are happy to use the analogy-based conclusions and to build metaphorical cognitive models, either justified or not, that are based on natural sciences. In theory, the physicalist approach for economic phenomena, based on the optimization of the function of the purpose of action has appeared, which has its deep justification, especially for measurable or possible to monetize processes. Moreover, mathematical models for the description of economic activities, based on the results of operational research (linear, nonlinear, Data Development Analysis – DEA, queue systems – QoS or Monte Carlo simulations) make

a widely used instrument set for conscious management, and one of the central issues of management theory. Le Châtelier moved the rule of contradiction directly from chemistry to describe behaviour in economics. Its content (corresponding to economic applications) can be reduced to the following sentence: *The economic system, which is deviated from its equilibrium, takes measures to minimize the effects of the disturbance of the current state.* This is the main idea of negative feedback in human activity. If a person steps on someone's foot, then the one being stepped will impulsively move it back. This action minimizes the pain resulting from the action that disturbed previous well-being.

One of the most useful approaches to the issue of economic optimization is the use of negative feedback when making management decisions controlling behaviours, processes, and entire business projects. This is the foundation of economic optimization, which is worth paying special attention to in any crisis situations. This is particularly true for market behaviour, where a delicate balance is the result of a set of non-zero-sum games between suppliers of goods and consumers, played under conditions set by the environment (Gospodarek, 2020). Regardless of the economic situation prevailing now and here on the market and the type of product, *you can only consume as much as can be produced*, even having a mountain of money. This is the content of the common law on general balance (Debreu, 1959). This balance can be disturbed by the actions of both the environment and the player, offering the allocation of goods at his disposal.

The issue of general self-organization of the market is an example of the search for optimal solutions for a set of double games against an environment with a non-zero sum (Gospodarek, 2018a). The negative feedback becomes a key defence tool, leading to reduction of the intention-behaviour gap associated with the effects of allocation of some good or game rule in the environment, and above all the effects of adverse consequences for the player. Both macro and micro behaviours can be considered in this respect. In the case of macro ones, there are market phenomena, subject to fluctuations according to the economic situation. In some part, these may be reactions to the business cycles, but in other part, to violent deviation from the dynamic equilibrium position, caused by excessive impulses. In this way, crisis situations arise, which on a macro scale require long-term actions and the involvement of significant resources in the global supply chain to restore stability of the market.

An example of macro action which disrupts the micro-macro balance are tax changes in the environment. Any change can be treated as a multiplayer game which can be reduced to a system of coupled double games against the environment (the whole group of micro objects affected by the tax is playing against the state which is taking away some part of their income). The strategy of the state is to obtain the highest possible revenue, while the micro strategy is to minimize the burden. There is a fairly thin line of tribute acceptance by the micro sphere and the unrestrained intention of the macro side to take *ad hoc* as much as possible, preferably immediately. The environment, where both the macro and micro sides are active, sets the rules of the market game, defining what is a positive solution, for which it is worth taking action. In the environment, there are economic measures of profitability and efficiency of action, which are objective restrictions on prize in such a game. If the tax is

100%, then no one will produce, because the profitability of the action would then be zero. If it is minimal, the natural reaction of the micro side is the increasing of production, because it pays off, but it is possible until the market balance of supply and demand is reached (constraints imposed by the environment in advance). This phenomenon can be graphically represented by a Laffer's curve (Figure 1.1) which has a local maximum due to its continuity. The shape of the curve from Figure 1 does not necessarily have to be symmetrical. Depending on the tax on the given good, country and economic situation, the function graph can be asymmetrical (oblique), with a maximum shifted either toward low tax rates or high rates.

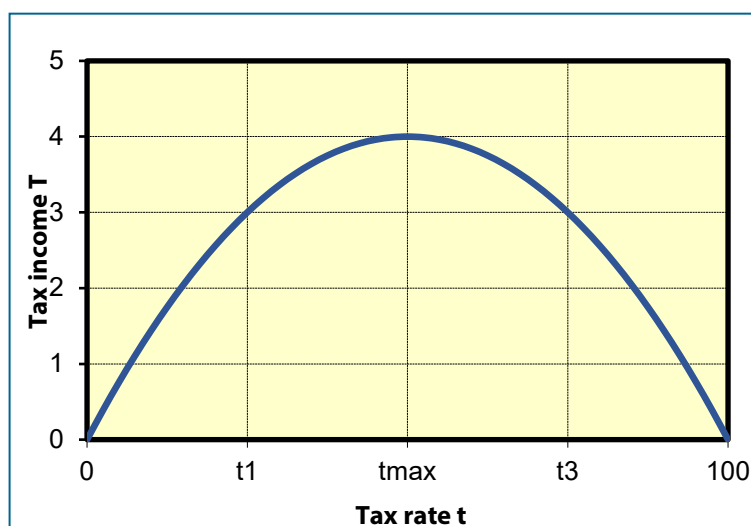


Figure 1.1. Market behaviour for variable rate of income tax (Laffer's curve)

Source: based on (Gahvari, 1989).

The Laffer's curve is well known in economics, although not necessarily to authorities and politicians. Therefore, strange tax changes are emerging, upsetting the market, increasing the grey economy, tax crime and optimization activities, in line with the above-mentioned rule of contradiction. Each example, whether it is an increase in excise duty or income tax, generates a strong negative feedback action on the micro-level. It is worth recalling at this point the quote from Reagan: *If it moves tax it. If its keeps moving, regulate it. And if it stops moving – subsidize it* (Brainy Quote, n.d.). These are macro actions, against which the micro object must find a recipe for further functioning on the market being characterized by a dynamic unstable balance.

The model of market behaviour on a macro scale, corresponding to rapid changes in the micro scale, causing crisis deviation from the position of micro-macro equilibrium, may be the economic cycle phase.

Figure 1.2 presents optimal market behaviour depending on the market situation. These are typical defensive reactions catalogued in graphical form, suggested to investors in order to protect their capital. Unfortunately, this calendar does not say anything about

the current market situation. It only shows some indicator trends, from which you can infer what is happening, what are good practices, and make some decisions in advance. Certainly, you can derive a general paradigm of market behaviour: *Buy when it is cheap, sell when it is expensive*. But is this entirely true in crisis conditions? It is no longer so simple and obvious. You can buy a lot of goods cheaply and stay with them for a long time. This is the market risk.

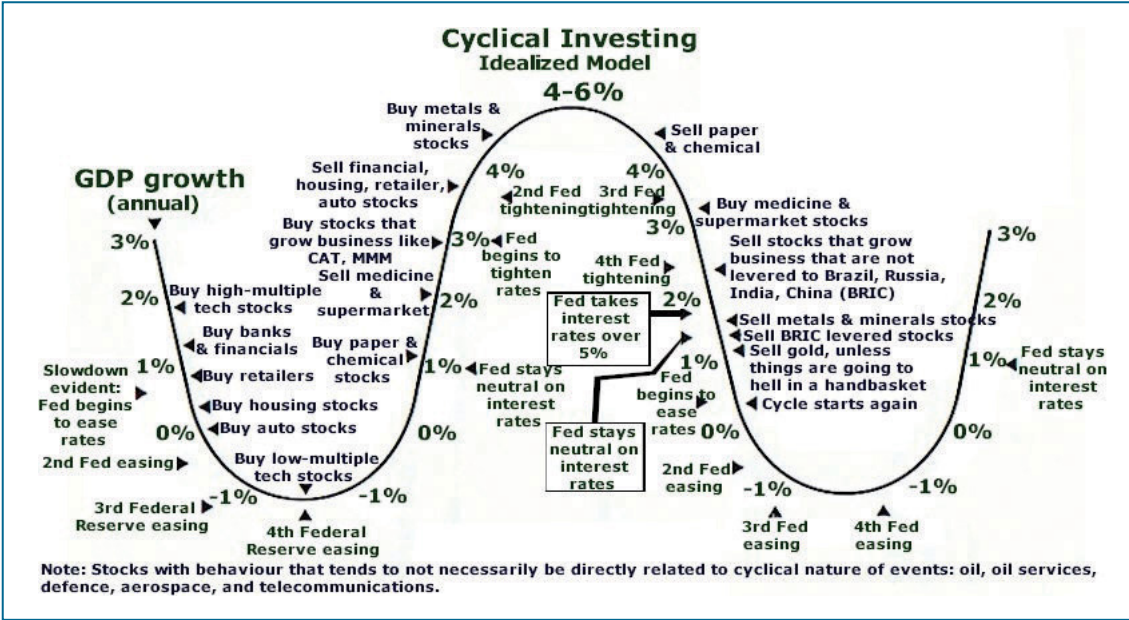


Figure 1.2. Cyclical Investing

Source: <http://www.sectormarketwatch.com/mainpageimages/cyclicalpic.jpg>

In order to find out what awaits a potential business player in the near future, you need to find a forecast model that offers indicators that can anticipate the economic situation. These include the Purchasing Manager’s Index (PMI), supported by IHS Markit (S&P Global, n.d.) The PMI index is the weighted average of the group of purchase indicators affecting the size of production, number of new orders, employment, etc. The source data comes from managers responsible for purchasing in industrial organizations, which have a significant impact on GDP in 50 countries. Therefore, it precedes the business cycle and is very valuable from the point of view of the behaviours suggested by the economic calendar. The PMI can theoretically take values from 0 to 100 (in practice usually between 40 and 60 points). Values higher than 50 points indicate an increase in economic activity in the sector under consideration, and below its decrease.¹

¹ S&P PMI global for Poland in August 2022 fell to 40.9, suggesting a large decrease in production and consequently GNP in about 3–4 months. This is the lowest reading since 2020, while the maximum observed value of June 2021 was 59.4. This marks the beginning of recession and crisis (Bankier.pl, 2023; Trading Economics, 2023).

Presently, in the domestic and European market we observe microscale activities consisting in securing capital, suspending investment and purchase of valuable goods, cost restrictions, withhold of cost-intensive projects, etc. These are micro-responses to macro signals, which are based on negative feedback.

1.2. Micro Behaviour Resulting from Macro Market Disturbances

As already mentioned above, the environment and macro players have a significant impact on micro-actions. The first and in principle the base model illustrating such relations (influence) is the model of adaptive behaviours of optimization of the organization management structure in accordance with the theory of contingency (Burns & Stalker, 1961; Gospodarek, 2012) (Figure 1.3). The model starts to work when the type of environment (e.g., market, sector) is determined, and whether it can be treated as stable or variable. If it is variable, is it predictable or unpredictable (stochastic). For a given type of response, a specific management model will be effective (Figure 1.3).

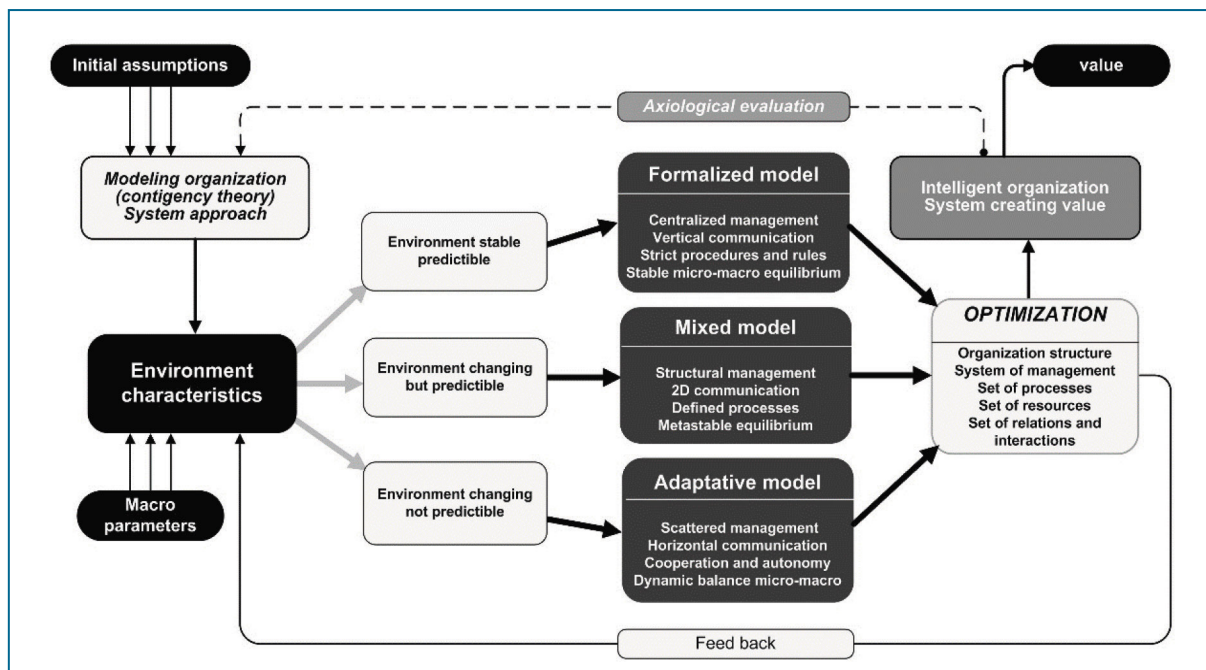


Figure 1.3. Adaptive structuring of organization management according to the theory of contingency

Source: (Gospodarek, 2012).

In crisis situations, as easy to predict, the environment becomes completely unpredictable. In order to cope with the disruptive stochastic impulses from the macro side, the organization must adopt a highly adaptive reaction form in the micro-scale. This applies

to its market behaviours, process maps, value chain and local supply chain. The micro-macro balance is then dynamic and only *ad hoc* actions and emerging strategies can effectively adjust the actions to match the micro-macro balance according to the Le Chatelier principle.

Two elements of the organization become then the variables: the local supply chain and the value chain. The local supply chain is responsible for the flexibility of logistics (especially the external one) and its costs. The optimization of this element of the organization's operation in correlation with the market situation is a critical requirement. The global supply chain always provides the resources necessary for business, but in crisis conditions there appear mainly logistical, protectionist and financial impediments. Modify the local supply chain that is always embedded in the global one (Gospodarek, 2018a), is mainly about reducing supply uncertainty and the cost of raw materials and services. Market expansion issues are rarely relevant in crisis conditions. Reverse actions – restrictions and optimization of the organization's market share, are much more often observed.

If we want to modify the *ad-hoc* value chain, we have a number of variables that we can optimize depending on the situation. And since, according to the theory, there is no single, best way to manage the organization, and the required result can be achieved in numerous ways, taking into account the extended model of the value chain (Gospodarek, 2018b), the following aspects become crucial.

1. Satisfaction of stakeholders (analysis of expectations and opportunities in relation to the map of stakeholders – market activities are here related to customer satisfaction and marketing).
2. Protection of the result (withdrawal from long-term and low cost-effective projects – market activities are related to cost and efficiency optimization in terms of profitability and cost of capital of Weighted Average Cost of Capital – WACC).
3. Reduction of costs (reduction of obligations, limited outsourcing, reduction of redundant resources, implementation of more effective technologies – in terms of market impact we are dealing with a reduction in the cost of our own sales and marketing costs).
4. Optimization of assets and liabilities (warehouses, fixed assets – conversion to high-liquid assets, where possible, reduction of long-term liabilities; market activities at this point are associated with optimization of sales financing, reduction of WACC, while increasing stock rotation).
5. Portfolio optimization (typical market activity results from Pareto-Lorentz analyses and elimination of low-turnover and low-margin positions in the sales portfolio. Analysis of McKinsey and BCG allow to supplement information and increase the level of certainty of optimization decisions).
6. Logistics optimization (abandonment of inefficient supply and distribution channels, changes in the local supply chain).
7. Risk mitigation (verification of risk policy in accordance with ISO 31000:2009, transfer of externally-oriented third-party risk).

8. Change of marketing strategy (taking into account market restrictions, changes in preferences of buyers and optimization of the used marketing mix while maintaining the model 4P-4C (Kotler & Armstrong, 2016, p. 48).
9. Increase of key competences and knowledge content in the offer (sales of potential instead of generic products (Levitt, 1980), emphasis on the development of socio-technical systems related to the process map (Suder & Gospodarek, 2022).
10. Increasing the role of automation and the involvement of AI at the expense of human resources, especially those generating costs for organizations (re-engineering of processes mapped in the organization).

This is the adaptive market activity in a crisis situation. The more unpredictable the environment becomes, the more careful and defensive market action is to be considered rational. One of the fundamental laws of the open systems, which includes organizations, is the purposefulness of existence in time and the continuity of maintaining the micro-macro balance (Gospodarek, 2012). It is also important to remember the fundamental purpose of business activity, being important not only in a situation of danger, but also in a period of prosperity: *Business is not gambling, but the most secure way of earning money*. This requires aware market actions, backed by reliable information, knowledge, and data leading to such decisions, where the degree of uncertainty has been reduced to a minimum and the effects of materialization are predictable.

When the purpose of business and the precautionary principle during its running (which can be expressed as the Ovid principle – the sentence: *Whatever you do, do it carefully and look to the end*) have been defined, we come to the question of an Intentional-Consequential Gap (ICG). Its reduction is the more important, the greater the market uncertainty appears.

1.3. Intentional-Consequential Gap

Let us imagine a situation in which the intention was made to take some action changing the impact on the organization's market. At the time-moment t_1 we have a certain intention (e.g., to introduce a new product to the market). Let us assume that this intention materializes as an action within a specified time interval Δt . At $t_2 > t_1$, the consequences of this action are revealed, which could at most be only predicted at the moment t_1 . During the Δt time interval, there is a knowledge gap concerning how to describe this future consequential state, which should occur at $t_2 > t_1$ with knowledge accessible at a while t_1 (intentional state). In philosophy, a similar problem is called Hume guillotine. As can be easily seen, in any crisis situations, this knowledge gap is significantly increasing, and in addition, the time-duration of a rational level of certainty of the forecasted consequences is drastically reduced. Under these conditions, strategic management is no longer relevant and must be replaced by adaptive and tactical *ad hoc* strategies on the market. The Intentional-Consequential Gap (ICG)

becomes then a key issue in managing the organization, if the risk of action is to be kept to a minimum, in accordance with the imperative of the manager's function.

From the considerations of management in uncertainty concerning the macro situation (Gospodarek, 2021) the following judgements arise concerning the character of a good paradigm in the sense of Kuhn (Gospodarek, 2009; Kuhn, 1970).

1. *A good paradigm of rational action:* The imperative of rational action is to achieve a minimum of the intentional-consequential gap associated with it. This applies to the rationality of the impact on the market, whether in the form of allocation of goods, withdrawal, or undertaking marketing activities requiring capital involvement. Knowledge and information resources are needed in all these cases.
2. *A good methodological paradigm of ICG:* The systemic approach to the issue of the Intentional-Consequential Gap makes a rational methodological basis. The use of systems theory and its laws, related to the fact that a given object can be considered as a system (an organization is an open system), allows to model market activities even when a large degree of complexity of interactions with the environment appears.
3. *A good paradigm for estimating ICG:* The model of game against the environment is rational to estimate the intentional-consequential gap in a systemic approach.

The above three sentences constitute the starting point for describing and modelling the market behaviour of an organization in a fast-changing environment, and the overriding aspect is the minimization of ICG. How to achieve this? There is no universal answer, but if the organization is treated as an open system playing the non-zero sum game against its environment, we have to our disposal some tools from the area of system theory (Bertalanffy, 1998; Gospodarek, 2012). This attributes the issues of minimizing the ICG to measurable changes in system behaviour parameters, while the support from game theory allows for building criteria for rationality of actions and adopted goal functions.

There are three important claims that can be made following the application of these operating principles (Gospodarek, 2021):

1. Decisions may be considered reasonable if related to them ICG value is minimal.
2. This strategy of action is better, for which ICG is smaller.
3. Each praxeologically optimal action is associated with the minimization of ICG.

In crisis situations, these claims are gaining special importance, because ICG is much more difficult to define and minimize. In practice, there is an increasing managers' interest in the environmental data and global economic indicators. In other words, market activities are rationalized on a micro scale, because on a macro scale crises cause unreasonable behaviours of authorities, global systems and markets. An example of this is the spectacular fall of Isaac Newton on the London Stock Exchange, related to the crack of the South Sea speculative bubble (1720). He then said a famous sentence²: *I can predict the movement of stars, but never the madness of a man.*

² Harvard Business School, Baker Library; Encyclopaedia NationMaster.com; Rollins.edu; aequi-libria.com; Oxford Dictionary of National Biographies.

A separate issue is the economic phenomenon metaphorically called “black swan” or “black elephant” (Taleb, 2007), where the emergence of a crisis situation can be compared to a sudden hurricane. In this regard, even the examination of the intentional-consequential gap may prove to be ineffective. It is worth referring to the 2019 crisis caused by the COVID-19 pandemic. The reaction of governments and all powers was inadequate to the threat, which we can assess today. No one at that time studied ICG, but took *ad hoc* actions, in line with the recommendations of big pharma and the stakeholders of the erroneous concept of “Zero-COVID”, which were the beneficiaries of introducing chaos, fear among societies and lockdown. Their impact on the pharmaceutical market was an example of an emerging strategy and taking the opportunity, with the transfer of all resources to the immediate allocation of their own products. That is why the COVID-19 pandemic was not an economic “black swan”, but rather a “black elephant” of a certain interest and market pressure on the sale of expensive preparations with suspicious effectiveness. No one wanted to notice this business, and the effects of market activities of big pharma on a macro scale we will experience for several years on a micro scale. A deeper reflection on the ICG of macro decisions taken by the environment could have completely differently guided the global economy.

1.4. Some Epistemological Aspects of a Crisis

The term “crisis” typically refers to a situation of intense difficulty, danger, or uncertainty that has the potential to cause significant disruption, harm, or negative consequences. Crises can occur in various contexts, such as personal, social, economic, political, environmental, or organizational. Understanding the term “crisis” involves grasping its key characteristics, stages, and potential impacts. The occurrence may be sudden or unanticipated, but the consequences for the organization and its publics are not.

Characteristics of a crisis

- Urgency: Crises demand swift action due to their time-sensitive nature.
- Uncertainty: Crises are often accompanied by a lack of clear information, leading to confusion.
- Disruption: They disrupt normal operations and can cause chaos or instability.
- Impact: Crises have a significant impact on people, systems, or environments.
- Escalation: If not managed properly, crises can escalate and worsen over time.
- Decision Pressure: Decisions made during a crisis can have far-reaching.

Stages of a crisis

- Pre-crisis: Signals and warning signs are present, but the crisis has not fully unfolded.
- Crisis onset: The crisis becomes evident and its impact is felt.
- Response: Decisions and actions are taken to manage the crisis and mitigate its effects.

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- Recovery: Efforts to stabilize the situation and restore normalcy begin.
- Learning: After the crisis, an evaluation of the response takes place to learn from the experience.

Some aspects of a crisis management

- Assessment: Understanding the nature, scope, and potential impact of the crisis.
- Decision-making: Making informed and effective decisions under pressure.
- Communication: Keeping stakeholders informed, managing public perception, and dispelling rumours.
- Resource Allocation: Properly allocating resources to address the crisis.
- Adaptability: Being flexible and adaptable to changing circumstances.
- Collaboration: Coordinating efforts among different stakeholders, organizations, or government bodies.
- Long-term Planning: Thinking beyond the immediate crisis to plan for recovery and prevention.

Examples of crises

- Natural disasters (earthquakes, hurricanes, etc.).
- Public health emergencies (pandemics, disease outbreaks).
- Economic downturns or financial collapses.
- Political crises (widespread protests, conflicts).
- Environmental crises (pollution, climate change impacts).
- Technological crises (cyberattacks, infrastructure failures).

Impacts of a crisis

- Human Impact: Crises can result in physical injuries, loss of life, psychological trauma, and emotional distress for individuals affected.
- Economic Impact: Crises can lead to financial losses, reduced economic activity, job losses, and disruptions to supply chains.
- Reputational Impact: Organizations and individuals can suffer reputational damage if their responses to crises are perceived as inadequate or inappropriate.
- Social and Political Impact: Crises can lead to shifts in public opinion, changes in policies, and alterations in the social and political landscape.
- Environmental Impact: Some crises, such as natural disasters, have significant environmental repercussions, including damage to ecosystems and habitats.

Literature positions related to a crisis provide diverse perspectives from various disciplines, as: sociology (Tierney, 2019), political science (Shantz, 2016), economics and financial (Claessens & Kose, 2013), psychology (Richardson, 2023), communication studies

(Zaremba, 2010), environmental studies (Robinson, 2023; UN Environment Programme [UNEP], n.d.), health sciences, each contributing to a holistic understanding of the term “crisis” and its implications in different contexts (Cordero et al., 2016).

1.5. Key Performance Indicators in a Crisis Situation

Among the tools to assess correctly the state of the organization and changes observed as a result of all its strategic and tactical transitions there are Key Performance Indicators (KPIs) (Gospodarek, 2018a; Parmenter, 2015). Measuring the state defined with their help over time allows to monitor the changes and evaluate the effects of the intentions taken after the results of the action are revealed. This is the best method of reducing the Intentional-Consequential Gap, which can additionally be supported by integrated ERP-class IT systems implemented in the organization, which are *de facto* measuring devices for the assessment of the feedback power of micro changes (Gospodarek, 2018a) in relation to occurring macro changes. The more macro data will be taken into account in designing the measurement parameters and key performance indicators, the smaller ICG is expected. In crisis situations, having such a tool allows for a quick orientation in the macro situation and taking advance actions on a micro scale, protecting the business from externally oriented risks and market turbulence. At the same time, the monitoring of the risk map can be organized, because in the KPI set there are always indicators related to this issue.

Indicators from the KPI catalogue should have a measure and scale (Gospodarek, 2018a), which allows for the use of methods of their consolidation, comparison, determining the significance of differences, ordering, etc. After all, from a set of variables an integral measure should be obtained (Gospodarek, 2018a). From the point of view of changes in the value chain over time, it should be assumed that the appropriate set of KPIs creates a system of the 10 pillars of comparison presented above, to which appropriate measurement methods should be assigned, taken from the management theory instruments set. For example, you can use the indicators described in Clear Point Strategy (Jackson, 2023). What is the most important is that the integrated IT system supporting management used by the organization has reports with defined indicators that can be calculated *ad hoc* (availability under the online key after closing the processing period, e.g., day, week, month of posting, etc.). It is pretty easy to obtain financial and turnover data from the level of financial and accounting systems, provided the implementation of an intelligent chart of accounts, which gives financial data on the projects carried out and their cost effectiveness in the cost accounting calculation variant. It is more difficult with the examination of the level of satisfaction or customer service, because it cannot be obtained without the participation of the party declaring the value (survey). However, modern CRM systems cope with this problem during *quasi*-online time.

Some indicators related to the market behaviours of organizations require the use of measurement methods from the set of management instruments (Gospodarek, 2018a). These include:

- PEST (LE) analysis – assessment of the environment and the market, with the forecast and scenario of the development of the external situation,
- SWOT/TOWS analysis – a version including the forecast of the development of the values of factors and their interaction, enabling the calculation of an integral measure of the probability of success in the market,
- McKinsey analysis part A – attractiveness indicator of the sector, which is necessary to respond quickly to market trends,
- Analysis of 5 forces – quantitative multi-criteria approach with integrated indicators,
- Pareto-Lorentz analysis – quantitative ranking of stock turnover, sales of goods, employee efficiency,
- BCG analysis – an image of the organization's portfolio,
- Monte Carlo simulation – a forecast of the market result with the existence of a stochastic variable as an objective function.

The aim of the above examples was to show that a close relationship must be established between the set of monitored KPIs and the management instrument related to the interaction of the organization with the market. In this case, it is possible to monitor the quantitative changes both in the environment and within the organization. Such an action in the crisis period should be defined, because attempts to implement it just-in-time are not realistic. The markets in these conditions are changing too quickly and irreversibly over time. Therefore, any economic experiment can be done only once, since it is impossible to recreate the conditions of the environment from the past. One should be aware of this and plan market activities as well as possible. Operational research methods are well developed for most market and feasibility studies. They are also suitable for optimizing resources directly linked to sales. It is enough to start applying them, and business activities during the crisis will be easier.

1.6. Conclusions

When optimizing the organization's market activities in crisis conditions, consideration should be given to the applicability of the Le Châtelier rule and the minimization of the Intentional-Consequential Gap. The rule of contradiction, especially in actions done in advance of economic changes, allows for appropriate resource, capital and project reductions done in time. It minimizes the costs of operations while maintaining market potential. Particularly important is to concentrate knowledge and key competences, which allows for reducing the decision uncertainty and ICG. Increasing the importance of knowledge store in the organization allows for increasing the added value of products and products, which in crisis conditions can save the market position.

The tool supporting optimal operations are integrated IT systems of the ERP class, which not only enable to monitor key performance indicators and assess feedback, but also allow for creating professional groups having the status of social engineering systems within the organization. ICG can be monitored by comparing the relevant indicators over time. That is why it is worth preparing the organization for transition toward smart market behaviour with an emerging strategy that minimizes externally-oriented risk during the crisis. This is what offers management being based on ICG minimization combined with negative feedback monitoring.

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