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# PERCEPTION OF CRISIS IN PROJECT-DRIVEN SMES OF CZECH REPUBLIC

***The text deals with individual research of management at small and medium enterprises in Czech Republic. It is focused on the use of project management by managers of these organizations and evaluation of crises. Only about 20% of these organizations have experience in project implementation. However, all the organizations had experience in overcoming different types of crises. The authors' aim is to assess the importance and the most common types of crises for managers of project- and non-project-based organizations.***

***Keywords:*** *project management; crisis; SMEs; Czech Republic.*
***JEL classification: M53; M12.***
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# СПРИЙНЯТТЯ КРИЗИ В ПРОЕКТНО-ОРГАНІЗОВАНОМУ МАЛОМУ ТА СЕРЕДНЬОМУ БІЗНЕСІ ЧЕСЬКОЇ РЕСПУБЛІКИ

***У статті описано результати дослідження окремих аспектів управління малим та середнім бізнесом у Чеській Республіці. Акцент зроблено на використанні проектного менеджменту управлінцями та їх сприйнятті кризових проявів. Лише 20% опитаних мають досвід управління проектами. При цьому, всі опитані організації мають досвід подолання різноманітних криз. Проведено оцінювання важливості найбільш розповсюджених типів криз, розглянутих окремо для підприємств, що застосовують проектний менеджмент та таких, що не застосовують його.***

***Ключові слова:*** *проектний менеджмент; криза; малі та середні підприємства; Чеська Республіка.*
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# ВОСПРИЯТИЕ КРИЗИСА В ПРОЕКТНО-ОРГАНИЗОВАННОМ МАЛОМ И СРЕДНЕМ БИЗНЕСЕ ЧЕШСКОЙ РЕСПУБЛИКИ

***В статье описаны результаты исследования отдельных аспектов управления малым и средним бизнесом в Чешской Республике. Акцент сделан на использовании проектного менеджмента управленцами и их восприятии кризисных явлений. Только 20% опрошенных имеют опыт управления проектами. При этом, все опрошенные организации имеют опыт преодоления различных кризисов. П\роведено оценивание важности наиболее распространённых типов кризисов, расмотренных отдельно для предприятий, применяющих проектный менеджмент и не применяющих его.***

***Ключевые слова:*** *проектный менеджмент; кризис; малые и средние предприятия; Чешская Республика.*

**Introduction.** Small and medium-sized enterprises (SMEs) play a significant role in economic activity through employment, innovation and growth (Floyd and McManus, 2005), acting as a supplier of goods and services to larger organization, and any lack of product quality could adversely affect the competitive ability of these larger organizations (Deros et al., 2006). In the European Union, SMEs account for 99.8% of companies, generating 60% of GDP and employing 70% of private sector workers (European Commission, 2008).

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In Czech Republic, the share of SMEs in the total number of active enterprises in 2014 was 99.84%. The share of employees of such enterprises in the total number of employees in the business sector of Czech Republic in 2014 amounted to 59.39% (Ministry of Industry and Trade, 2016).

SMEs undertake a variety of project types, including the delivery of tailored and bespoke products to customers, innovation and internal development. These projects constitute a significant proportion of the SMEs work, with at least a third of turnover on average being spent on projects. There is a relationship between company size and size of a project it tackles: small companies tackle small projects (Turner et al., 2012). Smaller companies have less bureaucratic and also less rational (Andersen et al., 2009) forms of project management than those traditionally available, with a greater emphasis on people-focused, behavioural competencies (Alam et al., 2010).

Methodologies and components of project management are well documented (Meredith and Mantel, 2002; Turner, 2009; Kerzner, 2013), and so we do not plan to repeat them here.

SMEs often deal with project management. However, as nowadays is the time of turbulent changes in the environment, organizations need to deal with crisis management as well. R. Rais (2007) defines crisis as such a stage in company life when after a long period of time there is a negative development of its productive potential and decline in sales. H. Fialova and J. Fiala (2006) defined crisis as accumulation of negative influences that make proper functioning impossible, calling for problem-solving approaches. Generally speaking, crisis is a decisive moment. This is the time when organization develops adverse performance and unless the situation is resolved in time, its existence is at risk (Rehor, 2016). J. Spillan and M. Hough (2003) found that SMEs focus predominantly on those types of crises they have experienced before, underestimating the risk of events they have no prior experience of. One of the greatest deterrents to more effective crisis management is denial (Pollard and Hotho, 2006). Many SMEs look at the above list of major crisis and say either "this is too unlikely" or "I am too small and don't have the resources to influence the outcome"; otherwise well-managed SMEs are put in harm's way as a result (Vargo and Seville, 2011).

**Methods.** This article aims to assess the impact of project management for SMEs in Czech Republic to the importance of the crisis, as seen by managers.

In the interviews, the managers evaluated and discussed crises in their organizations in the past years, and consequently, their rating was summarized on a five-point rating scale, where 1 represented the crisis, that was not seen as important in terms of business, and 5 represented the crisis seen as very important.

The data were collected from 183 companies in Czech Republic back in 2014. The research sample was selected using non-probable random selection, with regard to circumstances of data collection. Data necessary for conducting this research were collected via questionnaire survey and then supplemented by qualitative data, obtained through indepth interviews as well as case studies.

Representatives of different companies responded to questions concerning mainly crises that they had to solve during their operation at the market. Each of the selected companies identified at least 3 crises they had to deal with trying to minimize the impact on their business activities. Crises that were defined this way were consequently divided into 19 categories. The total number of crisis occurrence was 753.

Data were tested using two-sample Wilcoxon test and its asymptotic variant. This test is a non-parametrical two-sample test, most frequently used, when the condition of data normality is not met.

Let *X1, …, Xn* and *Y1, …, Ym* be two independent random samples from two continuous distributions, whose distribution functions can only differ in displacement. $x_{0,50}$, $y_{0,50}$ states for the median of the first and second distribution. The hypothesis that the distribution functions of the two distributions are the same is always tested. In other words, medians are tested for equality. The test result is compared to alternative hypothesis (the first of medians $x_{0,50}$ of companies which have strategies, is greater than the latter) (Freund and Wilson, 2010; Friedrich and Majovska, 2010).

In (Friedrich and Majovska, 2010):

$$H_0 = x_{0,50} - y_{0,50} = 0 \quad \text{against} \quad H_A = y_{0,50} < x_{0,50}. \tag{1}$$

At the first stage, all $(n + m)$ values *X1, …, Xn* and *Y1, …, Ym* are arranged in the ascending order by size. The entire process takes place electronically using test statistics software and this step is not described in the article, because it is a lapidary operation. Furthermore, the totals of orders *X1, …, Xn* are identified and stated as $T_1$. The sum of values in the order of companies which do not have strategy *Y1, …, Ym* will be stated as $T_2$. The next step was to calculate the test statistics for $U_1$ and $U_2$, while $U_1 + U_2 = mn$ (Friedrich and Majovska, 2010).

In (Friedrich and Majovska, 2010):

$$U_1 = mn\frac{n(n+1)}{2} - T_1; \quad U_2 = mn\frac{m(m+1)}{2} - T_2. \tag{2}$$

If statistics min $\{U_1, U_2\} \geq$ tabulated critical value, for the selected ranges of both selections and chosen level of significance, then than we may reject the null hypothesis of the identity of the compared groups at the significance level of $\alpha = 0.05$ and $\alpha = 0.1$.

Since for both samples in all test cases applies that *n* and *m* are greater than 30, the asymptotic variant of the Wilcoxon test (Mann-Whitney test) is undertaken, which is used for *n* and *m* higher than 30.

In (Friedrich and Majovska, 2010):

$$U_0 = \frac{U_1 - \frac{mn}{2}}{\sqrt{\frac{mn(m+n+1)}{12}}}. \tag{3}$$

Critical codomain for the right-side alternative is $W = \langle K2, n \rangle$. Non-negative values *k1* and *k2* are strictly defined in literature. $H_0$ is rejected at the level of significance $\alpha$, if $U_0 W$ (Freund and Wilson, 2010).

**Results and discussion.** Project management is one of the most important management tools in many companies. In the past decade, the word "project" has become widely known and used, and its importance has greatly expanded. Most often, it is used to name a sequence of related activities with a given beginning and end, the purpose of which is the realization of a certain objective.

According to the survey results, project management is implemented in only 1/5 from the total of 183 organizations (Table 1). In Czech Republic, almost 4/5 of SMEs have not designed and implemented any projects so far. The managers do not realize or they do not know what benefits they can get from project management. Potential advantages can be defined in the following listing: every activity is connected to accountability, clear identification of time and cost framework, flexible resource allocation and monitoring during implementation.

*Table 1.* **Use of project management by Czech SMEs,** *authors'*

| Project management | # | % |
|---|---|---|
| No | 143 | 78.1 |
| Yes | 40 | 21.9 |
| Total | 183 | 100 |

Figure 1 reveals different types of crises and their occurrence in organizations that are or are not managed by projects. All projects contain a part of uncertainty and are exposed to unidentified or poorly predictable phenomena. Organizations that are not managed by projects deal with crises reactively. They address the crisis once it occurs. Companies with project management use a proactive approach. They prepare in advance and thus are able to handle a greater number and variety of urgent negative situations they encountered in the past.

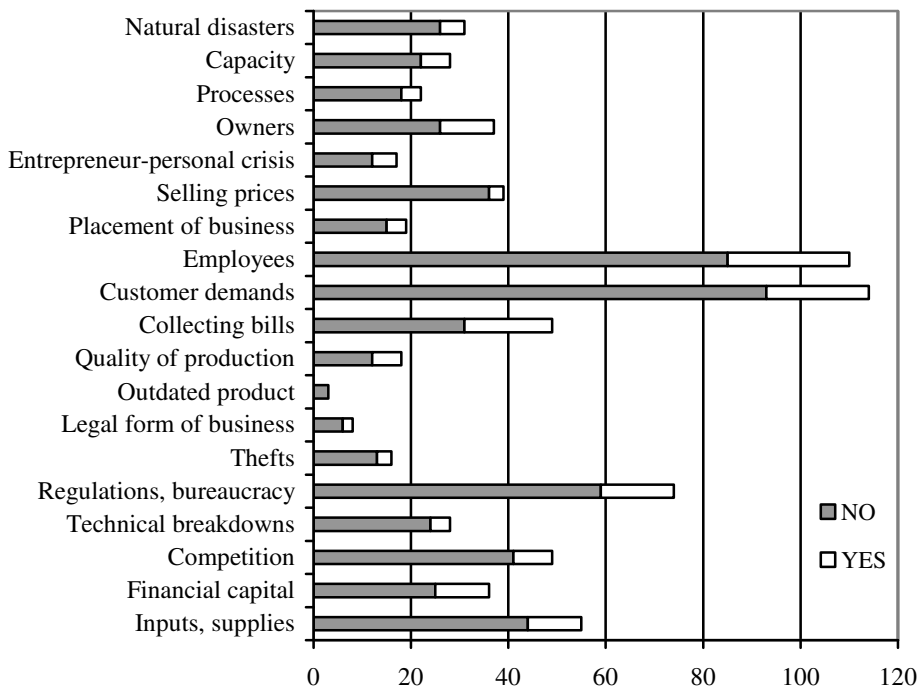


*Figure 1.* **Types of crises in project or non-project management organizations,** *authors'*

The research suggests that enterprises which do not employ project management can face higher occurrence of crises in the following fields (Figure 2).

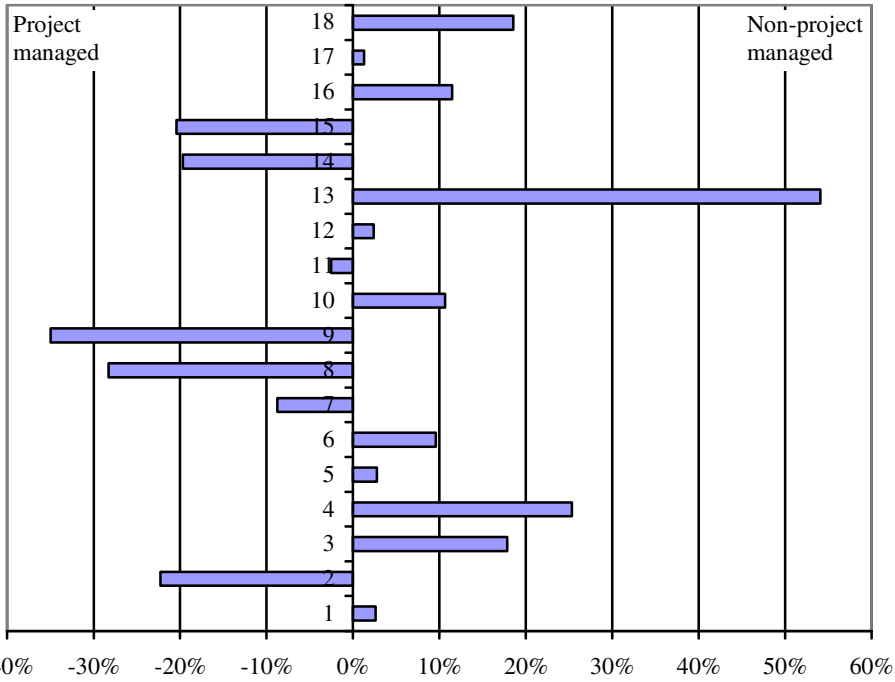


*Figure 2.* **Comparison of project-based and non-project-based organizations in terms of crisis incidence,** *authors'*

*Table 2.* **Explanatory notes to Figure 2,** *authors'*

| # | Type of crisis | Occurrence, % | # | Type of crisis | Occurrence, % |
|---|---|---|---|---|---|
| 1 | Inputs, supplies | 2.61 | 10 | Customer, demands | 10.66 |
| 2 | Financial capital | -22.27 | 11 | Employees | -2.51 |
| 3 | Competition | 17.82 | 12 | Placement of business | 2.39 |
| 4 | Technical breakdowns | 25.33 | 13 | Selling prices | 54.09 |
| 5 | Regulations, bureaucracy | 2.77 | 14 | Personal crisis | -19.67 |
| 6 | Thefts | 9.59 | 15 | Owners | -20.40 |
| 7 | Legal form of business | -8.75 | 16 | Processes | 11.46 |
| 8 | Quality of production | -28.25 | 17 | Capacity | 1.27 |
| 9 | Collecting bills | -34.98 | 18 | Natural disasters | 18.52 |

***Competition:*** businesses without project management have 18% higher probability of crisis occurrence in the field "competition" than companies managed strategically. Companies with project management perform analysis of stakeholders before a project and also possible links to competitors. As it is in terms of managing a short period of time, they tend to be relatively accurate.

***Selling prices:*** enterprises without project management have 54% higher probability of crisis occurrence in this field. The findings show that project-managed com-

panies also perform marketing research, including analysis of expected prices and competitive pricing before a project.

***Natural disasters:*** businesses which are not project managed have by 19% higher probability of crisis occurrence in the field "natural disasters" (flood, drought etc.). Our research suggests that project managed companies take into account external influences of greater force and try to minimize their impacts, e.g., through insurance as a part of risk analysis.

***Technical breakdowns:*** companies that lack project management can face 25% higher probability of crisis occurrence in the field "technical breakdowns" (equipment, water leakage, fire etc.) than the companies that are project managed. This is due to new or repaired devices, involved in a new project, because devices are usually better as compared to those used in organizations not managed by projects.

On the other hand, companies that have project management can face higher probability of crises occurrence in the following areas:

***Financial capital:*** companies which use profect management have 22% higher probability of crisis occurrence in the field "financial capital" (loans, insufficient capital etc.). Our research suggests a possible reason for this: these enterprises often have to invest large sums of their own just to plan, prepare and run a project, and sometimes they are paid late or not at all by the investor, so there are higher risks for small and medium-sized enterprises if they work as subcontractors for large companies. If these companies do not submit a complaint they must also pay taxes from the amounts although they did not get paid. This may increase their losses.

***Collecting bills:*** companies which use project management have 35% higher probability of crisis occurrence in this field. This can be explained by the fact that project management organization get paid during or at the end of a project, with no consequent compensation from outsourcers. It is quite common in the construction sector, for example.

***Owners:*** companies which use project management have 20% higher probability of crisis occurrence in the field "owners" (relations between them). From our point of view it happens because they are more focused on operational management and on current projects and they do not have time to solve long-term problems related to ownership (transfer of a company, selling etc.).

The objectivity of our results confirms the fact that project management has no influence on crises in such fields as "inputs, supplies", "regulations, bureaucracy", "employees" and "capacity".

Importance of crisis is shown in Table 3 and more comprehensively in Figure 3. The managers assessed the importance of the crisis according to their perceptions using the scale from 1 (low) to 5 (high). The average importance scored approximately 3.4 points in both types of organizations.

*Table 3.* **Importance of crisis in project (yes) or non-project (no) organization in Czech Republic,** *authors'*

| Type | # | Average | Median | Modus | Min. | Max | St. deviation |
|---|---|---|---|---|---|---|---|
| Yes | 160 | 3.425000 | 3.00000 | 4.000000 | 1.00000 | 5.000000 | 1.06723648 |
| No | 393 | 3.38167939 | 3.00000 | 3.000000 | 1.00000 | 5.000000 | 1.07943212 |

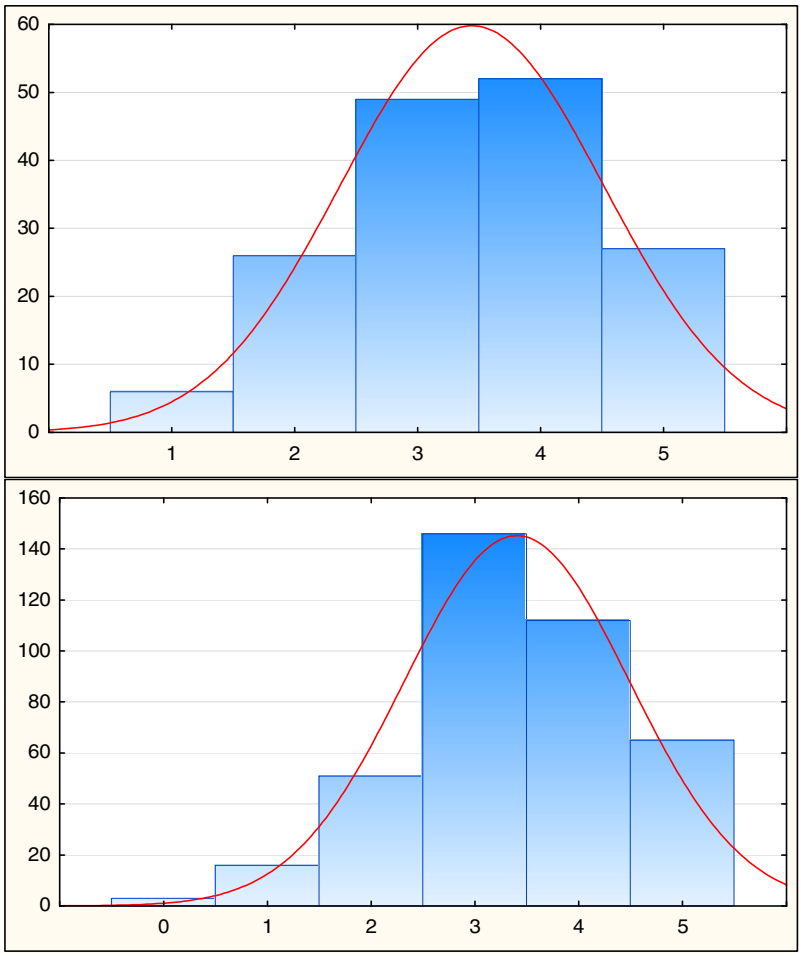


*Figure 3.* **Level of importance of crisis in (a) project-managed organizations, (b) non-project managed organizations,** *authors'*

We used the two-sample Wilcoxon test (Mann-Whitney U test) at the level of importance of $\alpha = 0.1$ to test the $H_0$ hypothesis $H_0 = x_{0,50} - y_{0,50} = 0$ supposing that the importance of crises is the same in both groups and also $H_A = x_{0,50} > y_{0,50}$ supposing that crises in non-project managed organizations are more important. For both hypotheses, $X$ stands for non-project-based organizations and $Y$ stands for organizations managed by projects at the level of significance 0.1.

*Table 4.* **Mann-Whitney U test,** *authors'*

| | Non-projectly managed | Projejetly managed | U | Z | p-value |
|---|---|---|---|---|---|
| Importance of crisis | 12573 | 4263 | 2832 | 1.8844 | 0.0596 |

p-value = 0.0596 $\alpha = 0.1$
0.0596 < 0.1 p-value < $\alpha$

The final p-value is near to zero and is smaller than the selected α, therefore we reject the null hypothesis at a significance level of 0.1.

p-value / 2 < α 0.0298 < 0.1

Based on the analysed data (Table 4), we failed to reject the alternative hypothesis, as half of the p-value is still less than the chosen α. Therefore, we can say that managers in organizations that are not managed by projects see the crisis as more significant as compared to managers in project-managed enterprises.

The abovementioned differences are reported in Figure 4 which shows that organizations not managed by projects amounted significantly greater levels as compared to those managed by projects. The median value for the non-project organizations is at the level of 3.3 points as compared to project managed organizations, at the level of 3.0 points. Both groups achieved the same minimum values; however, the maximum score of 5.0 points occurred only in non-project managed organizations. The graph also shows that 25–75% of those managed by projects is in the range of 2.0 to 4.0 points – a fairly wide margin, compared to narrower margins for non-project managed enterprises where 25–75% scored in the range of 3.0 to 4.0 points.

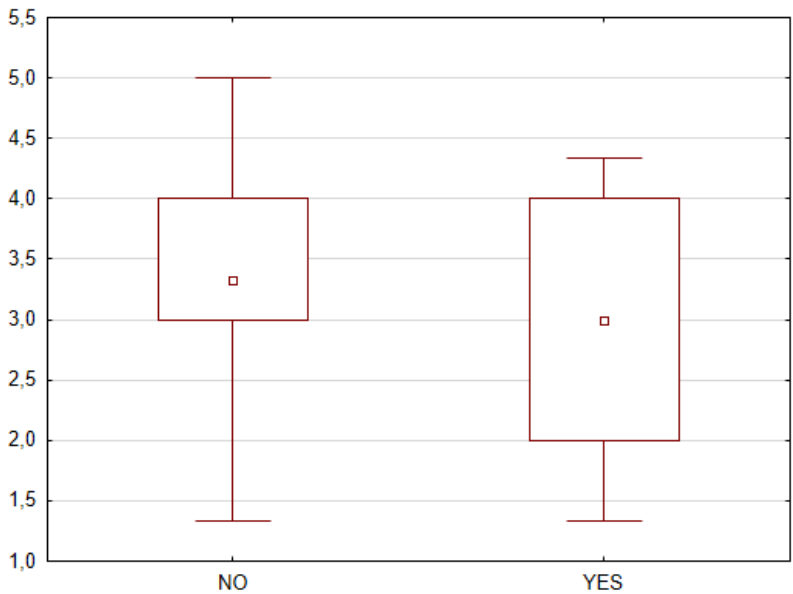


*Figure 4.* **Median and interval of data layout in project and non-project managed companies,** *authors'*

**Conclusion.** The findings of our questionnaire are an initial attempt to understand the current practices at SMEs in Czech Republic and the opinions of SMEs as to the potential of project management for performance improvement. Success of projects is based more on internal factors rather than external based on trends as the statement results show.

In Czech Republic, almost 80% of SMEs still are not engaged in project management. Managers of these organizations see projects more like a problem and challenge. The goal of each project should be new value (product, equipment, innovation,

expansion of qualifications etc.). Generally, a project should contribute to the development of organization, achieving success and boosting competitiveness. Creation of a project is burdened by large administration or constant changes in the environment and people still lack experience and willingness to implement such projects. This is confirmed by H. Kerzner (2013) and A. Svozilova (2006), who include project management and organizational changes during the project, changes in technology and project risks into problematic areas of project management.

At each stage of a project, various crises may occur as the negative phenomena threatening successful completion of projects. Crises of customers and employees are the most frequent ones. Managers must identify and eliminate such crises by appropriate communication and motivation tools. The human factor is crucial, as it is involved in successful implementation of any project. Human resources should participate in projects and in their co-management. Understanding project as a unified whole in its dynamic development is a fundamental condition for successful project management. Success lies in clear division of roles, responsibilities for the fulfilment of individual tasks and their further synthesis.

Overall, small and medium enterprises confirmed the assumption that companies without project management survive through crisis worse than project-managed enterprises. These businesses have the advantage since they process crisis plans (Cioffi, 2009; Pich, 2002) and they plan for a shorter period. For this reason, their ability to predict a crisis is more accurate. As also confirmed by A. Rodrigues (1998) in his study on the dynamics of clients' behaviour in projects, operational control method is used more often and suits more the current situation and market needs. Project management is also linked to a more autonomous management of small teams (Hirschhorn, 1992), the duty cycle is more flexible (Huchzermeier, 2001), than in holdings managed under long-term strategies.

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