



London International Conferences

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Out of equilibrium: Diversification and experience in response to crisis

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Abstract

On the occasion of the Covid19 pandemic the question arises why some firms are better able to respond to crisis than others. The buzzword here is “resilience”. An approach that is probably the basis of most studies today and has the advantage of being easy to measure is that of Pimm (1984) who defines resilience in terms of the resistance of a system as well as by the time it takes for a variable to reach equilibrium after a disturbance (Voss et al., 2016). The idea of not putting all your eggs in one basket is supported in many studies on resilience where it is postulated that more complex systems were expected to be more stable than simple ones (Pimm, 1984). Applying Pimm’s approach to companies and its product offerings, this research explores how a high variety along the product and (or) geographical dimension as well as experience in handling crisis can help withstand current crises. Using case studies, four companies are selected based on their longevity and their carefully thought-through diversification strategy. A conceptual model is developed for better visualization of these companies whose initial equilibrium state is disturbed by an external shock caused by the Covid19 pandemic and which

return to initial equilibrium through resilience. This study finds that the four companies under investigation can overcome the threats to their existence through diversification.

Keywords: economic slowdown, business rebalancing, product assortment



1. Introduction

Companies around the world had and will always have to experience crisis that narrow their scope of action and often enough lead to problems of survival and real economic hardship. At the time of writing this article, the Covid-19 pandemic has brought companies to their knees.

Understanding crisis as a challenge and also as an opportunity can produce some unexpected and outstanding results. In the words of Yu (1998) “Bad companies are destroyed by crisis. Good companies survive them. Great companies are improved by them”. In real life there is no business opportunity without risk. Therefore, risk generates business opportunities and goes so far as to imply that proactively viewing risk as an opportunity driver is a key component of strategic planning in the 21st century (Thornton, 2016). This understanding is the starting point for the idea of creating a conceptual equilibrium model with the Garp3 software, that offers the possibility of mapping domain-specific knowledge in the form of conceptual models. A balance has to be found between business risks and business opportunities. The conceptual model shows that a serious crisis (e.g. the Covid-19 pandemic) is able to destroy the system in balance, i.e. the company that found the right balance between risks and opportunities. Like after a fire that destroys the forest ecosystem, which regains functionality through biodiversity, ways and means must also be found in the organizational context to make the system functional again. Resilience (i.e. the resistance of a system to regain equilibrium after a disturbance (Pimm, 1984)), is achieved through biodiversity in a forest ecosystem. How is resilience achieved in a business context? As the literature research shows, diversification is a strategy to achieve resilience, i.e., to find a functioning equilibrium again after a crisis. Diversification is possible on different dimensions, e.g., entering new product markets (product diversification), entering new geographic markets (International diversification).

A distinction can also be made between related diversification (the new activity has to do with the firm's core business) and unrelated diversification (the new field of activities is not linked with the existing business activities). Studies show that diversification makes a way out of the crisis possible. Previous studies refer to previous crises such as the "dot-com" crash from the years 2000–2001. This research tries to find an answer to the current covid-19 crisis and tries to answer the question whether diversification can also be helpful in successfully overcoming the covid-19 pandemic. In short, this paper aims to carefully examine four well-known companies investigate whether the crisis indicates the positive effect of diversification. By attempting to draw a comprehensive picture of the companies investigated through case studies, further issues have arisen that have to be clarified, e.g., whether there is a causal relationship between age and resilience. Another aim is to use a conceptual model and the associated visualization to give both business risk and business opportunity the attention required to help strengthen the awareness for business leaders and their businesses that this way of thinking is needed to survive crisis.

2. Literature

Earlier studies show that diversification can be seen as the key to resilience and an effective response to economic downturns. There are many studies providing empirical support that diversified companies survive crisis better than non-diversified companies.

Aivazian et al (2019) explore the question of how a firm's product diversification strategy may weaken the seriousness of economic disruptions by analyzing the "dot-com" crash from the years 2000–2001. The results imply that capital investment in both diversified and focused non-IT companies declined sharply after the crash. But the decrease in capital investments

in non-diversified companies was disproportionate compared to diversified companies. This could be because conglomerates have better access to internal financial resources than focused companies. Diversification also reduces the general volatility of cash flow and reduces the risk of default. Another point is that it is sometimes easier to forecast the cash flows of a diversified company (Aivazian et al., 2019).

The study of Mangani et al. (2017) report a similar trend. They examined the empirical relationship between specialization, diversification, and entrepreneurial survival in a recession in the digital publishing industry. The authors explored Italian digital editors between 1995 and 2014 and conclude that those digital publishing companies that were also engaged in paper publishing or in other mass media businesses have a higher survival rate in the market. This shows the value of diversification and the opportunities contained therein for overcoming a crisis.

The nature of diversification matters. This is shown by Kuppuswamy and Villalonga (2016) who analyze the effects of the financial crisis of 2007-2009 on the value of diversification. The authors conclude that diversification strategy gave companies financing and investment advantages during the crisis and therefore the value of diversifying companies increased during the crisis. The authors found that pure conglomerates (i.e., unrelated diversifiers) offer higher co-insurance than related diversifiers. This can be explained by the fact that the correlation between the segment cash flows should increase with the degree of kinship between them.

Shen et al. (2018) found evidence that nature of a firm's diversification strategy, i.e., related versus unrelated, influences a firm's reaction to crisis. Analyzing data on nearly 4.000 private Chinese companies it was found that diversified companies outperformed focused companies during the 2008 global financial crisis and more diversified firms performed

better than less diversified firms. Diversifiers therefore outperformed non-diversifiers in the 2008 crisis.

Kiss et al. (2018) also interrogated the effect of the technological proximity of products in companies' portfolio has in a crisis. An economic crisis, which goes hand in hand with decreasing demand, may cause a dynamic in company diversification in that companies either restrict or diversify their product portfolio. The results of the study show that the more an additional product is linked to the core product, the less a company reduces its volume during the economic downturn.

The core premise of the studies mentioned is that diversification makes a difference, especially in a crisis. Diversified companies are better off in a crisis (i.e., an economic recession) compared to focused firms. In addition to that, it makes a difference if a company pursues a related or unrelated diversification strategy. The main arguments used to justify the superiority of more diversified firms on the product dimension seem to be also true for the international dimension, that is entering new geographic markets. Sabatino (2016) demonstrate that international diversification might also be an effective response to economic downturns. The most resilient enterprises are those that slowly and carefully expand to markets outside their home countries. The focus will therefore remain on the original market and will lose nothing in attractiveness. Investments are being made in geographical areas which are coherent and may be strategically important for the company. Companies that can make decisions quickly have a high resilience rate. This is because especially in times of crisis fast actions are needed (Sabatino, 2016).

The concept of resilience now plays an essential role in that resilience is needed to overcome crises and diversification is an important tool for quickly returning to a state of

equilibrium. Based on the definition of Pimm (1984), who defines resilience by the resistance of a system as well as by the time it takes for a variable to reach equilibrium after a disturbance, organizational resilience is understood quite similarly in this research.

The obvious approach would be that resilience, especially in connection with old age, could be of great importance, that could be based on experience and learning. Therefore, the firm's age is important in terms of resilience. An investigation of firms in the semiconductor industry show that firms learn three times more from their own experience as from experience at another company (Irwin et al., 1994).

Numerous studies have been carried out to investigate the relationship between firm's age and performance. The phenomenon of failure of young firms is discussed under the heading "liability of newness" (Stinchcombe, 1965) and explains the more frequent failure of young companies compared to older companies by the fact that new organizations must cope with new tasks and new roles and this need to learn is associated with costs. In addition, young companies lack stable relationships with stakeholders. The hypothesis on the "liability of adolescence" (Bruderl and Schussler, 1990) assumes that the highest risk of failure should not be seen at the beginning of the organizational life cycle because the initial stock of resources ensures the survival during this period.

According to a study conducted in 2015 with 1,000 Alberta businesses, it is equally likely that young as well as old firms are diversified. The results showed no statistically significant effect of firm age on diversification. Firms over the age of 20 are likely to be diversified in just two ways. Companies in the "age group" "6 to 10 years" are very likely to be diversified in all 5 ways studied, that is by customer, product or service, sector, location of markets, and location of operations.

Companies aged “5 years or less” showed a mixed picture. Among them are companies that are fully diversified and some that are completely undiversified (BDC, 2015). The same findings are also provided by the study of Coad et al (2013), that focuses on German machine tool manufacturers between 1953 and 2002 and concludes that mature companies have lower diversification rates than younger ones. It is also shown that diversification rates even become negative for mature companies. Negative diversification means leaving certain product lines. (Coad et al., 2013).

3. Research Methodology

The research objective of this study is to analyze the existing literature on diversification. The study also seeks to examine four companies in order to identify the effectiveness of diversification when it comes to an economic downturn and therefore firm crisis and to derive a conceptual equilibrium model.

This chapter concentrates on giving an overview of the methodology used to analyze the stated problem. The rationale for the chosen methods will also be evaluated in this chapter.

A. Design

The chosen methodology consists of a questionnaire containing eleven different questions, 10 of it being likert-scale questions and one is an open question. Extensive internet research forms the basis for case studies. Since the assumption that diversification is a useful strategy in times of crisis is also confirmed when evaluating the questionnaires, an attempt is made to create a conceptual model using the Garp3 workbench. The models of cause-and-effect relationships implemented in Garp3 (Bredeweg et al., 2009) attempt to make the complexity of a corporate crisis manageable. The adequate formalization of the domain-specific knowledge not only creates transparency, understanding and traceability for

decision-makers in the corporate environment, but also for researchers in the field of complexity and crisis management.

B. Sample

The companies were found through a google search for headlines that came up by entering the terms diversification, company, and covid-19. Newspaper and internet articles found showed that diversification is an important way for these companies to overcome the crisis.

As table 1 shows, family-owned businesses have a long company history. The number of different business line is limited. As literature results would suggest, older firms may be not as broadly diversified as younger companies. The companies under investigation have between two and four different business lines. All four companies pursue related diversification, and the high product variety is considered to positively correlated with performance. As the previous literature research showed, the study at hand also shows that diversification is helpful in an economic crisis such as the covid-19 pandemic. For the future, all of the companies examined can imagine continuing a related diversification strategy. All the four companies are not yet so sure about whether and to what extent an unrelated diversification could make sense in future.

Table 1. Results of four case studies

	Vandemoortele	Falke	Dr. Oetker (not the Dr. Oetker Group)	Sick
Type of business	Family business	Family business	Family business	Family business
Founding year	1946	1895	1891	1946
Number of business lines	2 (one in bakery products and the other in margarines, culinary oils and fats)	3 (hosiery, women's & men's legwear, underwear)	4 (ambient foods, frozen food, chilled products, Dr. Oetker Professional)	2 (sensors and sensor solutions for industrial applications)
Type of diversification strategy	Related diversification	Related diversification	Related diversification	Related diversification
The high product variety (product diversification) is considered to correlate with performance	Yes	Yes	Yes	Yes
The company is performing well during the corona crisis, at least to a certain extent	Yes	Yes	Yes	Yes
Unrelated diversification is conceivable in future	Conceivable	Not conceivable	Not conceivable	Slightly conceivable
Related diversification is conceivable in future	Planned	Planned	Yes	Related product diversification is planned in future

C. Procedure

Literature research as well as the four case studies show the importance of diversification for managing a serious crisis. On the basis of this knowledge a conceptual equilibrium model is created.

Since the results of the questionnaires provide a similar picture with the results of the literature research, an attempt is made to create a small conceptual resilience model.

Based on the definition of Pimm (1984), who defines resilience by the resistance of a system as well as by the time it takes for a variable to reach equilibrium after a disturbance, Pimm's understanding is applied to the business concept to develop a model of organizational resilience. Therefore, a conceptual equilibrium model is introduced at the beginning.

The basic assumption of the model is that a company operates well when it is able to balance risk and opportunity. Based on Pimm's (1984) definition of resilience, the organizational resilience is expressed by the way a company reaches equilibrium again after a disturbance.

The condition concerning the balance between risk and opportunity is fulfilled in the beginning.

The assumption is that "risk" follows the development of "drive". In the example, the stimulus arises from a worldwide pandemic and determines the level of perceived and measurable risk of the company. The model fragment "A trigger for risk" (see Fig. 1) consists of the entities "World Pandemic" and "Company Popeye GmbH", the two quantities "drive" and "risk" as well as the configuration "influences".

"Drive" is characterized by the quantity space {zero, plus} and the quantity "risk" has the quantity space {minus, zero, plus}. A positive direct influence ("I +") describes the causality between "drive" and "risk". "I +" causes the following development of the quantities: if the current value of "Drive" is positive, the "risk" increases; if "Drive" has the value 0, then "risk" remains unchanged. The expectation of the model fragment can now be summarized as follows: Since the model fragment is not linked to any condition, it is consistently visible to the Garp3 engine in the simulation and can be used. The assumption is that "risk" follows the development of "drive".

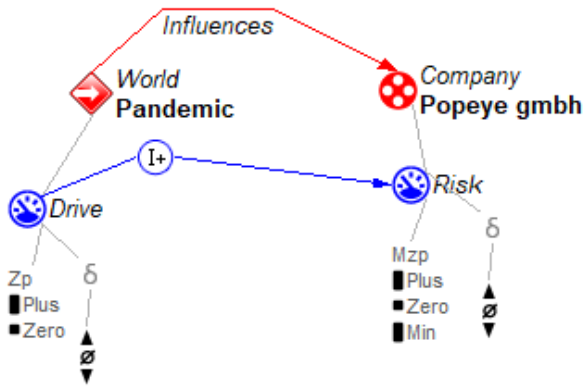


Figure1. A trigger for risk

In the model fragment “Rebalancing mechanism” (see Fig. 2) a mathematical calculation (minus) is used to determine the “diversification rate” from the difference between “risk” and “opportunity”. The causal relationship between the quantities is described by a positive proportionality (“P +”), which leads from the quantity “risk” to the quantity “diversification rate”. “P +” means that the “diversification rate” increases when “risk” increases, “diversification rate” decreases when “risk” decreases and “diversification rate” remains the same when “risk” remains the same. For the negative proportionality (“P-”), as it is used in the relationship between “opportunity” and “diversification rate”, exactly the opposite applies. A positive proportionality (“P +”) is used to describe the causal relationship between the “diversification rate” and “product diversification”. The causality between “product diversification” and “opportunity” is described by a direct influence (“I +”). The expectation is that “product diversification” increases when “risk” is bigger than “opportunity”. “Product diversification” will increase until a balance (the quantities are qualitatively equal) between “risk” and “opportunity” is reached.

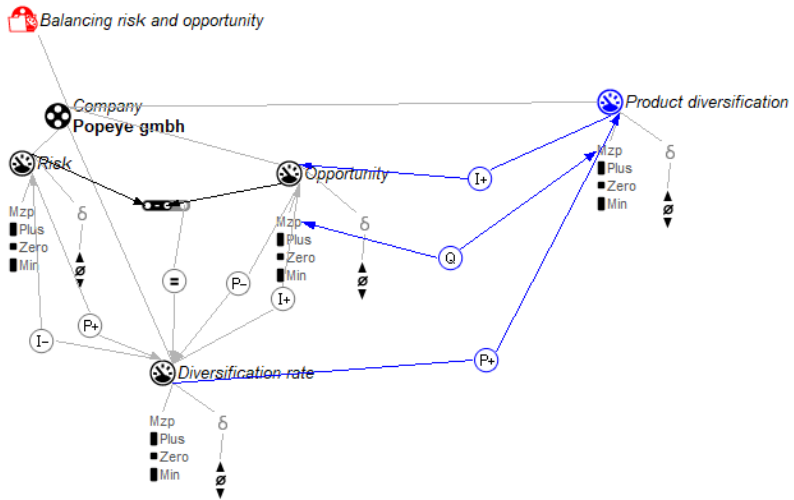


Figure 2. Rebalancing mechanism

D. Analysis

The purpose of this section is to analyze the simulation results. In the course of analyzing the simulation results, new perspectives can be created for decision-makers. The simulation provides a state graph with 20 states as a result (see Fig. 3), state 16 is the final state. The shortest path {1 -> 10 -> 11 -> 13 -> 16} should be analyzed in more detail.

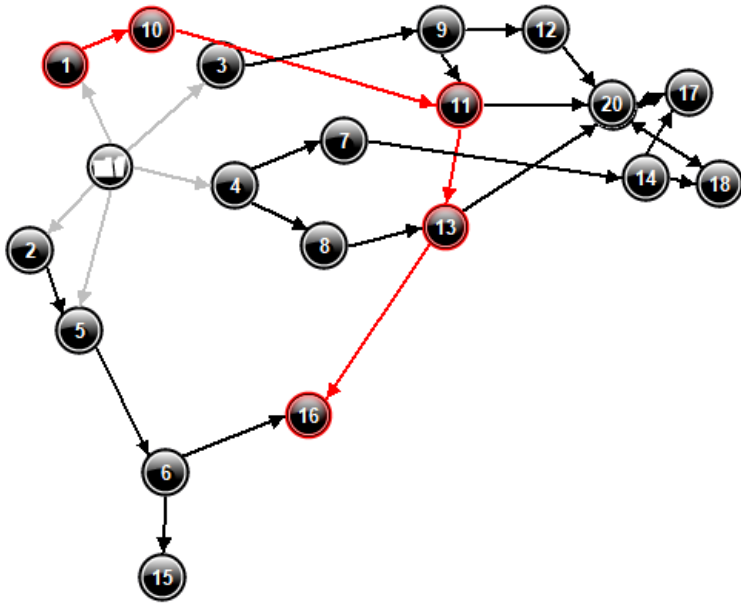


Figure 3. State graph

To get information about the development of the individual quantities, the value history from Fig. 4 is used.

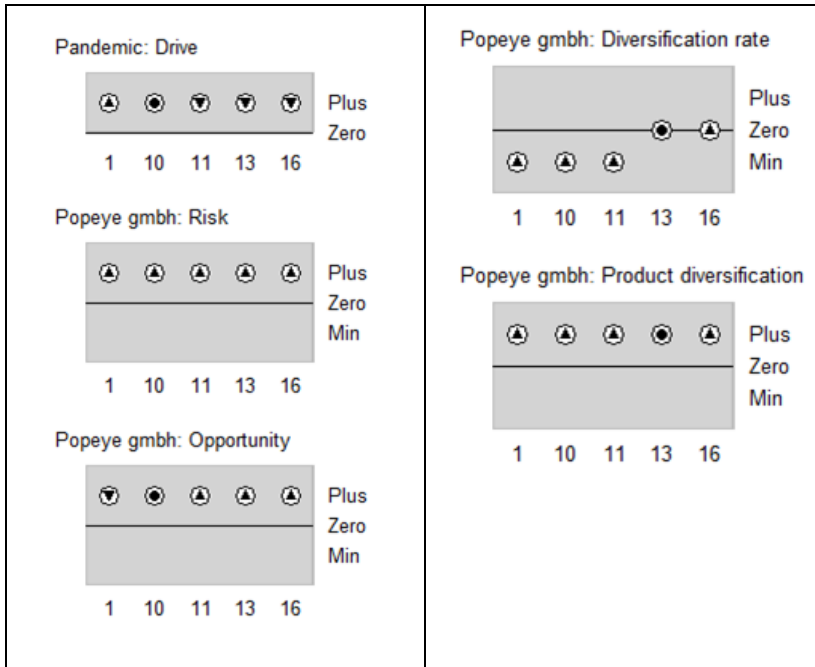


Figure 4. Value history

“Drive” rises in state 1 and shows a downward trend in states 11, 13 and 16. The qualitative value of “Risk” increases in all states. The quantity “opportunity” shows an increasing trend from state 11 on. Fig.4. shows that the quantity “product diversification” increases in the states 1, 10, 11 and 16 and stabilizes in state 13.

It is also advisable to take a look at the equation history (Fig.5). As the equation history shows, the system reaches a balance in states 13 and 16.

$$\begin{array}{ccccccc} \text{Risk (Popeye gmbh) ? Opportunity (Popeye gmbh)} & & & & & & \\ < < < = = & & & & & \\ 1 & 10 & 11 & 13 & 16 & & \end{array}$$

Figure 5. Equation history

4. Discussion and Conclusion

Diversification is seen as a survival strategy in times of crisis. This is shown by studies that examined the impact of diversification on past crises as well as the present study of four companies in the covid-19 pandemic. The way companies deal with crises could be decisive in how they cope with them. In order to master a corporate crisis, it is important to know the causal relationships that characterize a company during the crisis. The model developed here understands a functioning company in such a way that there is a balance between risks and opportunities. One thinks about a helpful way to restore the initial balance. In this example, diversification creates the possibility of rebalancing. Even the formalization of domain knowledge turns out to be a great enrichment here, as it forces one to think about cause-effect relationships and to get emotional distance to the topic and to work based on facts. The knowledge gained here of diversification as a growth and survival strategy is an important first step for further research. Without claiming to be exhaustive, it was very important to present a conceptual model and to present a new way of thinking and capturing domain knowledge about crises and to discuss the first simulation results. By reflecting on causal relationships and visualizing reflections and knowledge and making them visible to the reader, one can achieve significant progress. Important things that can have an influence suddenly appear in a different light and may in future be included in a different way than before.

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