

STIMULATING CREATIVE THINKING USING PRACTICAL KNOWLEDGE IN CASE OF FINANCIAL SUBJECTS

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Abstract Nowadays, it is often very difficult to catch students' attention, especially in financial subjects like financial mathematics, finance management et cetera. One of the reasons is the fact that for many students it is hard to imagine how theoretical knowledge can be used in practice. As a result, students are not interested in learning the whole material and are focused just on passing the exam. This publication is a reflection and opinion paper based on personal experiences of the author who combines university work with running his own law firm specialized in banking and insurance issues. Giving real examples both from consumer and company finance is an effective way to encourage students to become active and improve their knowledge gathering process. Additionally, practical examples (more complicated than theoretical examples) are inspiring creativity in students.

Keywords:

practical work, financial subjects, creative thinking, creativity, teaching methods.



University of Maribor Press

DOI <https://doi.org/10.18690/978-961-286-356-2.7>
ISBN 978-961-286-356-2

Introduction

It is important to state that it is very difficult for students to learn mathematical subjects by themselves (in library, at home etc.). Therefore, if they do not understand most of the material during the lectures, they will probably never learn it in the future. Even if they are trying to improve their knowledge, they are unsuccessful, which eventually results in disaffection towards all mathematical subjects.

During their further years of studies, such students try to avoid all subjects related to mathematics, which leads them to even skipping some parts of not typically mathematical subject's programme (such as accounting, management) because it can appear to them as too closely related to mathematics. Students are often wrongly convinced that they are just unable to acquire any kind of mathematical knowledge.

As a final result, when graduating, these students do not have the knowledge needed in their future job (they are still convinced that this is the fault of the university and not of their own). Further, they are dissatisfied with the received higher education. This situation maintains the conviction that knowledge offered during university studies is not useful and, in this way, we come full circle.

On the other hand, the author's own business experience shows that even students who learn well have big problems with using their acquired knowledge in practice. Even if they know all theoretical bases, it is very difficult for them to see the link between the practical task and the methods learned. Very often, when they finally find the solution, they are confused when they realise that it was enough to use simple, well-known methods.

This paper is based on the author's personal experience with and reflections about using practical knowledge and examples while teaching the students from finance, economics and management faculties. The author runs his own business that is closely connected with financial subjects and also works as an academic teacher focused on subjects related to mathematics.

The aim of this paper is to discuss and find teaching methods which are useful in the case of financial subjects. The author will discuss the methods used and try to indicate which of them are particularly beneficial. For the purposes of research, the following hypothesis was adopted:

H: The use of practical examples increases the interest of students and improves the acquisition of knowledge in the field of finance.

Literature review

The transfer of knowledge related to finance and economics has already been the subject of research. Published results clearly show that today's students are more interested in practical usage of knowledge and the benefit they gain from it (Kotz, 2016).

Additionally, students prefer interactive and experiential learning approaches and are much more focused on experiential classes because they are interested in practical applications of courses (Phillips & Trainor, 2014). Thus, using data and examples from practice is a perfect way to show them how they can use mathematics-related subjects in their future career.

On the other hand, some researches prove that even students themselves prefer chalk and talk method of teaching, which is quite an unexpected result. But one study suggests that 80-84% of students surveyed want to have more discussion about current economic issues (Andreopoulos & Panayides, 2009). Recent studies show that the case method of teaching is considered as more effective because it places students at the centre of the learning process and active engagement (Volpe, 2015).

Also, studies conducted in Poland indicate that the practical use of knowledge (case study) is considered by students as a beneficial solution. In particular, students pointed out that cases facilitate theoretical understanding of knowledge and increase their involvement in classes. In addition, the case study method used in students' assessment allows better understanding of economic reality and develops both analytical and social skills (Gawel & Pietrzykowski, 2014).

Polish book publications are also recommended to incorporate real-life examples, especially surprising and controversial ones, which effectively attracts and maintains students' attention (Calek et al., 2007). It may also be useful to provide students with additional materials on topics that have not been discussed in detail in class (Kordos, 2009).

Additionally, students, like most people nowadays, have problems with selecting, validating the quality of and using information. If they have more data than needed in a formula, they often try to use everything they have. This stems from the phenomenon called “overloading of information”, the issue which should also be addressed in the teaching process (Fazlagić, 2010).

Research results

In the author's opinion, a successful method of solving this problem is to use different kinds of practical examples and to show in which way students will use the presented material in the future. Often, just the fact that the teacher has practical experience makes students more interested (independently from way the material is presented). However, it is better when the teacher shares his practical knowledge during lectures. Practical examples can be prepared in the form of a typical exercise yet based on real data or in the form of a case study based on real events.

Exercises based on real data are similar to typical, theoretical exercises, but they show the students that the subject's material can be used in practice without any changes, modification or additional knowledge. Examples based on real events (such as a case study) are more complicated but also more interesting, especially if the situation was already described in press, etc.

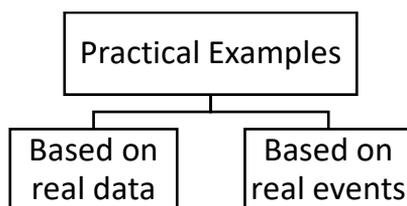


Figure 1: Proposal for the division of practical examples

Source: Author's own work.

Of course, it is sometimes impossible to give a practical example or exercise in basic and theoretical material such as in mathematics for first-year students. In such situations, we need an idea which is maybe not directly connected with practice, but looks very interesting for students (especially if they are already bored with the presented theory). Some reflections about both types of examples are presented in the continuation.

Examples based on real data

The author's experience clearly shows that even giving exercises based on real data (without a real context) can highly increase students' interest and consequently increase their knowledge level. However, the example must be properly selected for the group – merely using real data will often not have any effect at all.

For example, exercises focusing on dividend models (especially the Gordon Model) can be based on theoretical data or real data from stock exchange. It is very important to choose a company connected with group characterization. To illustrate, using companies like KGHM or JSW (the biggest mining companies in Poland) as an example will not raise students' interests – for most of them, there is no visible difference between “Company A” and “JSW S.A.” while computing the exercises (both are boring for them).

On the other hand, using data from a company that is well known by students, especially if they have some good experience with it, can dramatically change the situation. A good practice is also to give more information about the company (how it was started, how it is growing, and what its plans for future are), which will additionally attract students' attention.

In groups containing mostly females, all examples based on CCC company (i.e. shoe shop company) will guarantee their interest and consequently a higher level of acquired knowledge. It is worth to start this example with generally unknown information about the CCC acronym (i.e. *Cena Czyni Cuda* – price is doing wonders) and the beginning of this business (i.e. the owner of CCC was a trader on a bazar and was asked by his colleague to help him with selling shoes). Examples of theoretical and real data exercises are shown in Table 1.

Similarly, for prevalently male groups, it is easy to find an interesting example such as Żywiec S.A. (i.e. one of the most well-known beer brands in Poland). Some basic information like its being part of the Heineken group and additional details (e.g. the type of water used by the company) also makes students more interested.

Table 1. Examples of theoretical and real data exercises

Theoretical exercise	Real data exercise	Real data, interesting exercise
<p>Company A paid 10 PLN of dividend this year. It is estimated that the dividend will grow by 5% each year. Required rate of return is 7%.</p> <p>What is the stock value (basing on the Gordon Model)?</p>	<p>Śnieżka S.A. paid 3.20 PLN of dividend this year. The dividend is growing constantly year by year by 0.05 PLN. Required rate of return is 5%.</p> <p>What is the stock value (basing on Gordon Model)?</p>	<p>CCC S.A. (CCC is for <i>Cena Czyni Cuda</i>) is a Polish company which started on a bazar with one stand with shoes (the founder of CCC observed that selling shoes is a great business while helping his colleague). Now, CCC sells shoes in more than 15 countries and has recently bought the internet shoe seller <i>cobuwie.pl</i>.</p> <p>The company paid 2.30 PLN of dividend this year. It is estimated that the dividend will increase by 8.50% each year. Required rate of return is 10%.</p> <p>What is the stock value based on the Gordon Model (the latest stock price is 201 PLN, but 7 years ago it was just 50 PLN)?</p>
<p>Just calculating theoretical value of a non-existing "Company A". No suggestion of possibility for using the knowledge in practise.</p>	<p>Practical usage is shown – possibility of valuating real company. Due to company being not interesting (paint manufacturer), only students focused on financial market will be interested.</p>	<p>Practical usage is shown – the possibility of valuating real company. Students' good knowledge of company (probably a lot of them use its products) and additional information should interest most of the group.</p>

Source: Author's own exercises.

Additionally, while giving a real-data example, it is advisable to give some additional information not necessary for solving the task. Such exercise forces students to think more creatively and consider what they really should calculate. Examples of such exercise are presented in Table 2. If possible, the exercise can consist only of real financial statements (whole data) and task.

Table 2: Examples of exercises without and with extra data

Exercise without extra data	Exercise with extra data
<p>The net profit of PZU S.A. (Powszechny Zakład Ubezpieczeń S.A. – the biggest insurance company in Poland) for 2018 was PLN 5.368m. There are 863,347,220 shares.</p> <p>How much is EPS (Earnings Per Share)?</p>	<p>The gross profit of PZU S.A. for 2018 was PLN 7.086m and the company paid 1.718m in taxes. There are 863,347,220 shares. Assets total PLN 328,554m and equity capital is equal to PLN 37.407m.</p> <p>How much is EPS (Earnings Per Share)?</p>

Source: Author's own exercises.

Examples based on a real event

Another type of 'real' cases is examples based on real events taken directly from business practice. Such examples are a perfect way to clearly show how the presented knowledge can be used by students in the future. Students often get more interested when they are told that they can use the study material to avoid making a bad decision, especially if there is the possibility to show them real effects of somebody's acting without the needed knowledge.

Of course, just giving a task similar to a real situation is not a good solution. The real situation is often too complicated and can be analysed only by a small group of professionals who operate in a certain business area. The example must be prepared in such a way that it will make it easier and more interesting for students.

In author's opinion, there are two ways of converting a real situation to an interesting and easy example which can be used during lectures.

The first option is to prepare a simplified version of a real situation by focusing only on the lecture's topic. For example, while showing the differences between different types of loans, it is better to skip the changes in interest rates (usually based on EURIBOR, LIBOR, etc.). Students should be informed that the presented task is only a simplified version of the real situation and what kind of data from the real situation is skipped. The essential part of this approach is to focus on the most interesting problems only.

The second method is to show the whole real situation as an example without doing the calculation during the lecture. In fact, the best way is to prepare all calculations before and just present the method used and the final results. The aim of this method is to attract students by describing real events typical in their environment and then to show the way how the presented knowledge can be used and how it can help in practice. The example based on somebody's mistakes can show how using the knowledge in practice helps making a correct decision.

Real examples are also useful to show how some complicated phenomenon works in practice. Last year, there was a great example involving GetBack S.A., a company named a rising star of Polish stock market until it unexpectedly lost liquidity and all of its stocks were suspended. A lot of people had bought GetBack S.A. shares, bonds or even more complicated products based on GetBack assets. In fact, all these instruments, especially bonds, were offered as an alternative to bank deposits.

One of the author's own examples based on GetBack S.A. story is presented in Figure 2. This chart mainly focuses on showing how the risk of Polish stock exchange looks in practice. It shows that in every situation, the investor should make the decision by themselves. Before showing this picture to students, it is good to give them some commercials of based on GetBack S.A. products and ask them for their opinion.

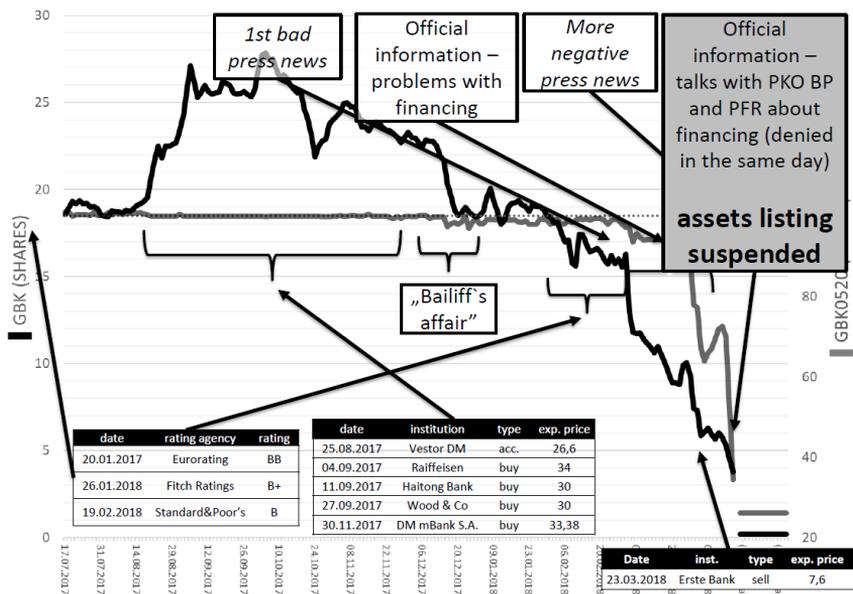


Figure 2: Example showing most of GetBack S.A. problems

Source: Author's own work.

Note: All values are in PLN, the left scale shows the share prices while the right side shows the of GBK520 bonds; PKO BP – Powszechna Kasa Oszczędności Bank Polski S.A. – one of the largest banks in Poland; PFR – Polski Fundusz Rozwoju S.A. – Polish Development Fund S.A..

The examples based on stories like GetBack S.A. downfall can be used in many different finance-related subjects in connection with topics such as stock exchange, banking, accounting, risk management or even financial and consumer law. Using such examples can also stimulate creative thinking. Further, it shows that pure theoretical knowledge is not always working in a proper way.

Creative examples

As it was already mentioned above, it is sometimes impossible to design a practical example illustrating core knowledge. Many times, the author observed that students have problems with learning how to calculate integrals after learning how to calculate derivatives. Greatly simplified, calculating derivatives and integrals involves the same

process but in the opposite direction. Most students who understand this rule have no problem learning how to calculate integrals.

Unfortunately, integrals look deterrent for many students and it is difficult to convince them that calculating them much simpler than they think. The question how to do it arises. In author's opinion, using art is a perfect method to interest students with mathematical content. One example is the woodblock print *The Great Wave off Kanagawa* (Figure 3). This globally well-known work is interpreted in totally different way by the Japanese people and the people from Western countries, which results just from the reading direction.

For people reading from left to right, this is the story about poor fishermen who will sink in a moment after being struck by a huge wave. On the other hand, for people from Japan who read from right to left, this is the story about brave fishermen who are not scared and are flowing forwards despite the wave. Telling the history of *The Wave* and its real interpretation to the students always proves interesting to them. Also, there is a big similarity between *The Wave* and learning how to calculate derivatives and integrals – everything depends only on the direction.

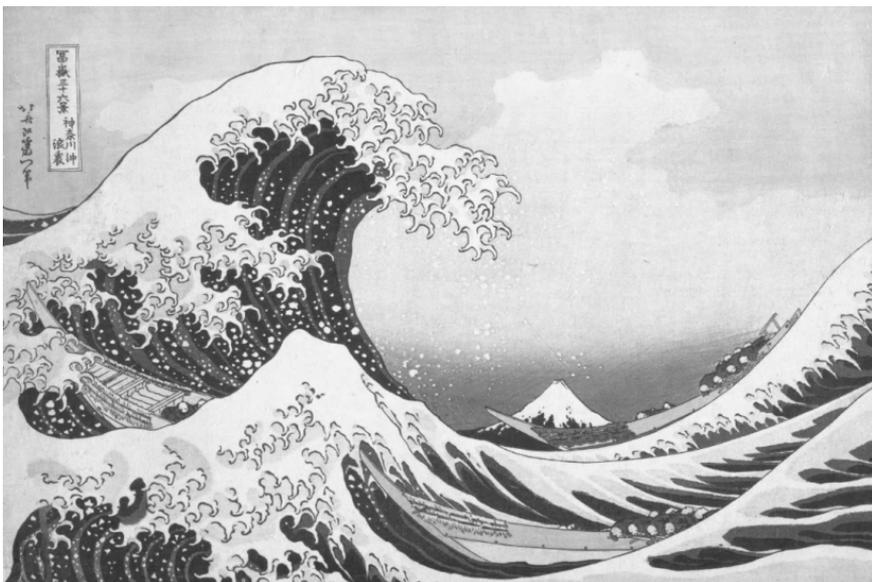


Figure 3: The Great Wave off Kanagawa

Source: www.en.wikipedia.org/wiki/The_Great_Wave_off_Kanagawa.

Of course, in case of pure mathematics, it is still necessary to use typical, theoretical exercises. However, using the example of *The Wave* simplifies the teaching process. In the end, even if understanding of the material will be too difficult for some students, they will at least learn something about art.

Conclusions

In author's opinion, all presented methods improve the teaching process and inspire students to think more creatively. Giving practical examples not only results in increasing students' interests but also teaches them competences needed in their future career. The analysed teaching methods are particularly desirable for more complex (mathematical) subjects.

Such examples are especially useful in subjects related to economics and finance. The analysis and the reflections presented in this publication lead to the conclusion that the hypothesis presented above should be confirmed. That is, the use of practical examples improves the teaching process.

However, a big problem how to generate sufficient amount of exercises and examples based on real data or situation still remains. Most academic teachers are not connected with business and have no access to real market problems (the problems described in press or journals are often a bit outdated).

In future, universities must cooperate more closely with business. However, for this to happen, it is necessary to change academic attitude. Low salaries and a lot of bureaucracy make business practitioners usually not interested in teaching students. The result is that universities have problems with providing real benefits for enterprises in terms of student education.

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