Results matter!

Pyramid scheme

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Imagine someone, on behalf of an investment company, offers you a quick way to grow your money. The only thing you need to do is to convince three of your friends to invest as well. However, your money won't actually be used to buy gold or stocks, it will be split between the people who joined the company before you. If you can convince three friends to join, you'll get a share of their money and also a portion from the other people they convince. This continues until the whole model collapses for lack of new investors and the company's owner mysteriously flies off to the Bahamas. It has to be said that this sort of thing is not good for friendships.

You've just fallen victim to one of the most widespread fraudulent business models – *pyramid scheme*.
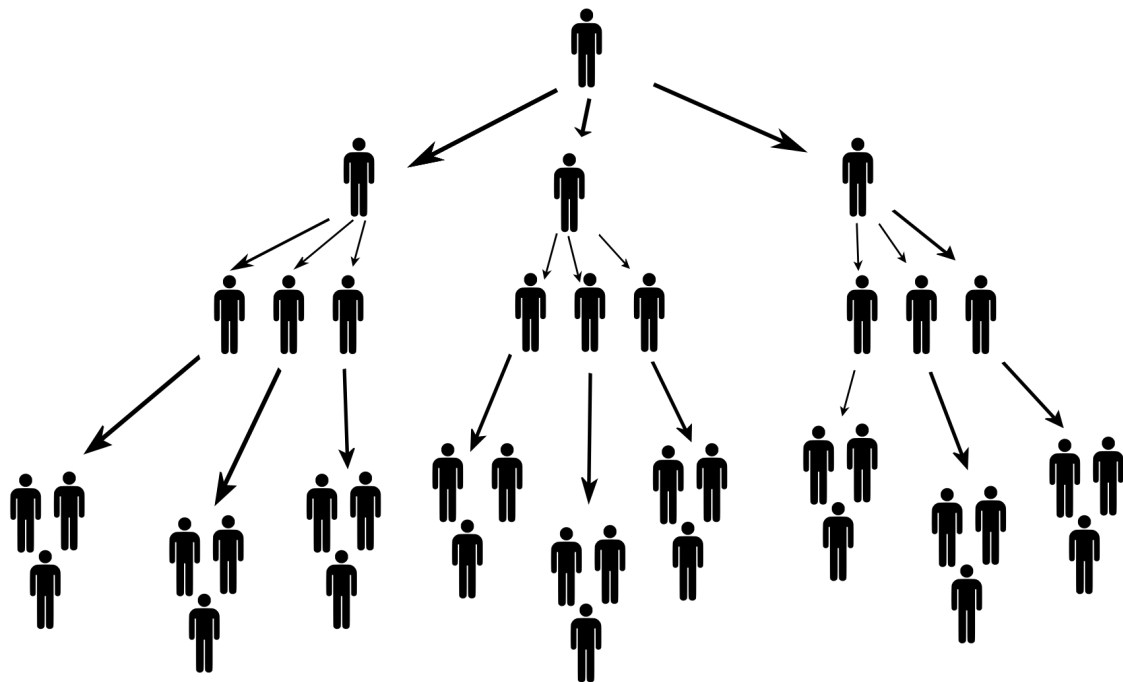

Figure 1: Pyramid scheme

Assignment

The founder of the company (the first level of the pyramid) recruits three investors (the second level of the pyramid) and collects a fixed entry fee of 20 000 CZK from each of them. The task of each of the three investors is to bring in three new investors into the scheme (the third level of the pyramid) and collect an entry fee of 20 000 CZK from each of them. The same process is repeated for the subsequent levels. For simplicity, we will assume that the recruitment of new members always occurs only after the entire pyramid level is filled. For example, recruiting new members into the fourth level only begins after recruiting all nine investors to the third level.

The entry fee paid by new members is distributed among existing participants as follows: 6 000 CZK will be given to person A, who brought in the new person, 1 000 CZK will be given to person B, who brought in person A, another 1 000 CZK will go to person C, who brought in person B, another 1 000 CZK will go to person D, who brought person C, and so on until the entry fee is divided. If the money is paid to the founder of the company, he gets the rest of the fee.

Exercise 1. When will the newcomer get a refund for the joining fee?

Exercise 2. When a certain level of the pyramid is reached, the founder of the company does not receive money from the entry fees for the first time.

1. Which level is it?

2. After reaching this level, how many people are there in the entire pyramid? Compare this number to the number of people in your school or community.

3. Determine the percentage of people who are in a loss after this level is reached.

Exercise 3. In real cases from the Czech Republic, the number of participants was in the order of units of thousands. Therefore, let's say that the number of participants in our pyramid is between 2 000 and 8 000, after reaching a certain level. 1. Which level is it? 2. Determine the percentage of people who are now at a loss. 3. Determine the total profit of the founder of the company. 4. Determine the total profit of the investor in the second level of the pyramid. 5. What percentage of all entry fees collected will be paid to the people in the first three levels of the pyramid?

Literature

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