



## OF ROBOTS AND MEN

One of the great themes of recent times is the debate whether and to what extent peoples' jobs will be taken over by robots. Although this is by no means a new topic, it is one that has recently been coming back to the forefront. It is a fundamental certainty that development is headed in a direction where certain manual activities, but most especially intellectual ones, that are currently performed by humans will in future be performed by robots, or by humans in collaboration with robots. Certain types of activities and some entire professions will gradually cease to be human activities, as has been happening already for hundreds of years.

### **How does investing look from this perspective?**

The development of artificial intelligence is of course reflected also in investing and asset management. But even here it is nothing new. Back in the 1990s, when I was working at Atlantik as a broker, a number of my US clients (quant hedge funds) were using artificial intelligence to a greater or lesser extent. In investing, the term artificial intelligence represents an immensely wide scale characterising the degree to which computers are involved in investment decision-making. On one end of the scale there are funds with programming teams made up of several hundred people searching for millions of parameters which together could create added value (alpha), and on the other end there are small investment boutiques with Excel sheets and several simple parameters.

### **Are humans better than robots?**

In 2016, Man Group, a UK company, conducted a large study examining the returns of 9000 hedge funds for the period 1996–2014 (Man vs. Machine: Comparing Discretionary and Systematic Hedge Fund Performance). One of the findings was that funds for which humans make the decisions (i.e. discretionary funds, which also are much more numerous) had slightly higher returns than did funds for which the influence of people on decision-making was minimal or non-existent (systematic funds). In conclusion, people are still beating robots. The difference was not too big, but that was to be expected, because the larger is the studied sample of the market (and 9000 funds is already a pretty big part of the market), the more closely their average return must approximate that of the market.

### **What to make of these conclusions?**

For an investor who decides to have his or her money actively managed, however, this debate is too academic. The fundamental question he or she wants to resolve is: How do I choose a fund to which I will entrust my money? That is a rather complex matter for the common investor. In my book *Akciové investice (Equity Investments)*, I dedicated an entire chapter to this and I don't want to repeat all that here. Let me just briefly say that one of the main criteria concerns the portfolio manager's ability to explain clearly his or her investment philosophy, and then whether or not the investor understands and identifies with it. In the case of funds where computers make the decisions instead of



humans, it is difficult to satisfy this condition. There certainly exist many great such funds, but how to recognise them? For understandable reasons, their algorithms are secret. Transparency of their investment processes is very low, both *ex ante* and *ex post*, and that makes it difficult for clients to come to grips with such funds. Very often, the main selling argument involves back-tested results from some sort of simulation model. Unfortunately, and as rather frequently happens, a model that works in back-testing may break down completely when confronted with the actual market. One can find a great many relationships, formulas, and correlations in financial markets. The vast majority of these, however, demonstrate no ability to predict the future.

#### **How do robots influence the market?**

The part of the investment field which uses artificial intelligence is very non-homogenous in terms of its approach to and level of automation, and it uses terminology that is partially overlapping: algorithmic trading, computer-based trading, robotic investing, quant investing, artificial intelligence, machine learning, and the like. While in many cases this is all very much a marketing trick to be used on investors, many such funds do things in a very serious and sophisticated manner. For simplicity's sake, I will refer to this entire diverse group as "robots". For Vltava Fund, which is a fund where decisions on investments are made by people and not at all robots, it is interesting to think about how robots influence the functioning of the market, what opportunities they present, and whether they are a potential source of risks.

#### **Time arbitrage**

The very names of some of these approaches (algorithmic trading, computer-based trading, high-frequency trading) suggest that robots are concerned more about trading than investing. In general, it can be stated that they are attempting to win by timing rather than pricing, which is much more difficult and yields lower returns over the long term. Most robotic algorithms are essentially based on technical analysis and relying on reversion to the trend or to the mean. Therefore, they tend to have problems in situations where previously functioning formulas and correlations break down. Moreover, robots usually have very short investment (speculative) horizons, and at the shortest end of the investment horizons they are merely struggling with one another. The more funds and assets that are managed in this manner, the less will be the competition at the long end of the investment horizon – the end that is measured in years and where we operate.

The idea that robots would use complicated algorithms to choose a stock to hold for 7 years is not very realistic. Instead, they endeavour to chase after the phantom of short-term profit. They do not concern themselves with those investment opportunities having high probability for attractive long-term return but minimal chances for momentarily favourable price movements. But these are exactly the opportunities we seek, and the fewer investors that are doing the same thing, the better for us. We call this time arbitrage and robots make it easier for us.



### Risks associated with robots

It is relatively easy to program a computer to play chess well. Chess has clear rules, and the objective of the game and the permitted moves are clearly definable. It is much harder to program a computer to invest well. The rules of the game and its objective are very difficult to define. The majority of events on the capital markets occurs within the range of two standard deviations from the trend, but the most interesting things happen outside of this interval. Who knows how robots will respond to these situations? Simple algorithms may appear stable when tested on extraordinary situations, but their interaction with the other algorithms can be a great source of instability (fallacy of composition). Robots also magnify systematic risks by rapidly transferring such risks from one market to another.

This is related to the existence of two critical types of risk: self-reinforcing feedback loops (an initially small change amplifies itself through feedback) and normalisation of deviance (unexpected and risky events increasingly come to be considered as normal until they cause a catastrophe to occur). In general, I see the greatest risk of robots in respect to the fact that it is not clear how they will behave as a whole in times of extraordinary market stress. We already have seen several such rather unpleasant episodes hit the markets in recent years (e.g. the Flash Crash in 2010, the Knight Capital disruption in 2012).

I still think that human creativity is greater than that of a computer in a critical situation. Do you remember the film *Sully: Miracle on the Hudson*? A human outperformed the

machine. I personally get goose bumps from sometimes seeing that people with practically no experience in investing are programming robot algorithms. Maybe it doesn't matter, but I don't want to believe that.

### Markets will keep going their own way

To summarise, I think the influence of robots on our investing is small and overall rather positive, because it is an indirect source of opportunities. How robots behave in times of crises remains an open question. I am inclined to believe that in such situations they will contribute to greater instability. Over the long term, however, it does not really matter who trades on the markets, whether there will be on the whole more humans or robots. **Long-term stock market returns depend primarily on returns to capital achieved through the activities of companies whose shares are traded on stock exchanges and not at all on the type of investors who or which are active on the market.**

In conclusion, I will not shy away from still one pessimistic note. When during the 19th and 20th centuries machines took over most of manual labour, people adapted by focusing on intellectual activities. What will people focus on when robots take over most of the intellectual work? I really don't know. Will the human race further develop or will it degenerate? I'm afraid the reality may be closer to the second of these, and I frequently have the impression that it's already happening. Intellectual activity is the most beautiful thing associated with investing. It would be a shame if the robots deprived us of it.



### Changes in the portfolio

“Good day, Major Gagarin, the time has finally come.” So go the lyrics of what was a popular song in Czechoslovakia from 1961 celebrating the accomplishments of Soviet cosmonaut Yuri Gagarin, the first human being to journey into outer space. Now the time has finally come for a little correction in the equity markets. At the turn of January and February, the main equity markets recorded a decline of approximately 10%. From our perspective, this was a very pleasant and welcome but unfortunately very short period. We managed to take advantage of it to make two changes. Already before the correction we sold Onex (3% return) and Aon (45% return).

In both cases, the reason for selling was the relative valuation of these stocks. This means we had more attractive opportunities into which we later moved the money thereby freed up. In part, these were titles we already had in our portfolio. We also added one additional stock, newly acquiring a UK company. We believe the market is overlooking a sustainable competitive advantage that this company enjoys and therefore that it is incorrectly priced. Our own analyses suggest that the company's value is almost 100% greater than the price at which its shares are currently trading.

That means the number of UK companies in our portfolio has increased to 5. The total number of titles in our portfolio has diminished to 21. When I look at our notes, I see it has been almost a year and a half since we last bought a US stock. We still consider the US market to be very expensive. Our net exposure to the US market is approximately just 30% of the portfolio. Other markets (for

example the UK, Japan, and certain emerging markets) are currently priced much lower and they offer plenty of attractive opportunities. Of course, the regional distribution of our portfolio takes this into account.

Currently, my favourite market is that of the UK. I silently envy the Brits that they will soon be outside of the EU. When the dust settles, I am convinced that leaving will prove to have been an historically lucky decision for the UK. The British economy and UK companies will fare very well – better than will the EU – and this will become more apparent during the next economic recession. The current consensus opinion, however, is just the opposite. Most of the media continuously encourage everyone to believe that the only thing awaiting the UK is to wither away at the periphery of society. This opinion is shared, too, by most investment managers. They are thus underweight in UK stocks, and this makes the UK market very attractive.

Let me just add a small comparison with the American market. Before the end of March the US market had a cyclically adjusted P/E, or CAPE, of 33. CAPE is a well-known Shiller indicator that compares the prices of stocks and their mean earnings for the last ten years net of inflation. The mean CAPE for the period since the end of World War II is 18. This means that if the US market were to drop by 45% its valuation would reach the long-term mean and could remain there for a very long time.

In contrast, the UK market has a CAPE of approximately 15-16 and is currently just below its long-term average. If the UK market were to drop by 45%, its CAPE would fall below 9. Historically, it has been at such a



level for only approximately 5% of the time and thus it is not probable that it would remain there. By this comparison, the US market is not only very expensive but also very risky. Although we do not buy entire markets, it is quite understandable that we find more opportunities on such inexpensive markets as that of the UK and that our investments on the expensive US market are gradually diminishing.

### **Current price and value of the portfolio**

Our investing is based on a very simple idea. We strive that the amount we pay for any individual investment (its price) is lower than what we get in return (its value). For each of our stocks, we have an idea of its value. We update the value estimate approximately

every quarter, as companies report their profits. When we combine the values of all companies in the portfolio, the result is an estimate of the value of Vltava Fund's portfolio as a whole.

The difference between the Fund's portfolio value and its price (NAV) is now the largest since the summer of 2012, which means in more than 5 years. The Fund's NAV has increased by 75% through the same period. The magnitude of the difference between our portfolio's price and value tells us a lot about how low-priced is our portfolio and what is its growth potential. For us, this has always been a good indicator of returns in the coming years, and we believe it still is today.

Daniel Gladiš, April 2018

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