Bálint Zsolt Almási
PhD Student (Economics), Assistant Lecturer, Accounting Department,
Faculty of Finance and Accounting,
Budapest Business School
10-12 Buzogány Str., Budapest, 1149, Hungary
almasi.balint@pszfb.bgf.hu
ORCID ID: https://orcid.org/0000-0003-1377-9431

Zoltán Zéman
D.Sc. (Economics), Professor,
Faculty of Economics and Social Sciences,
Szent István University
1 Páter K. Str., Gödöllő, 2100, Hungary
zeman.zoltan@gtk.szie.hu
ORCID ID: https://orcid.org/0000-0003-2504-028X

Macroeconomic growth in business valuation

Abstract
The article is dedicated to an important statement, mostly neglected by the overtly finance-focused valuation practice in the present days regarding the influence of the macroeconomic conditions of the system on the business value. It should not only be perceived and analysed through discount businesses and capital expenditure, but the underlying effect of the system as well. In our view, the analysis of macroeconomic effects does not only aid in the refinement of business value calculation, but also in its forecast and long-term analysis, and even in comparative methods.
Occurrences accompanied by immediate, specific, and irreversible transactions only provide part of business valuation and value production tasks. In other cases, business value production is forced to work with uncertain data and forecasts. The solution for long-term value production processes could be analysis methods tailored to macroeconomic trends.
Even with the numerous distorting factors not filtered yet, it can be concluded that the risk premium content of equity returns changes in relation to its deviance from the GDP trend. It means that conjuncture cycles influence share yield expectations, and through this the value of the shares themselves, as well as the business value.
The authors examine whether and how conjuncture cycles affect additional risk premiums, and through that, business value, working with two basic datasets. They analyse the link between the growth of US real GDP in 1961-2018 and the calculated risk interest premium from the S&P500 portfolio dividend discount model for the same timeframe. It has been considered that, when the market prices-in probable events, the switch point of a conjuncture cycle can be forecast from the variation of additional risk premiums and vice versa. The authors have found that interest premiums show double amplitude compared to conjuncture-cycle fluctuation, meaning that interest premiums peak before the conjuncture switch points. Hence, a connection between them is presumable, while its force and direction are described at a later point. Future research will be aimed at analysis the tightness of these connections by sectors with the help of industry betas, especially data concerning Europe, and Hungary.
Keywords: Macroeconomic Growth; Business Cycles; Business Valuation; Conjuncture Cycles; Additional Risk Premiums; Value; US GDP
JEL Classification: E44; F44; G17
DOI: https://doi.org/10.21003/ea.V175-03

Альмаши Б. Ж.
аспірант, викладач, кафедра аудиту,
факультет фінансів та аудиту,
Будапештська школа бізнесу, Будапешт, Угорщина
Земан З.
доктор економічних наук, професор,
факультет економіки та суспільних наук,
Університет Святого Іштвана, Гьодоло, Угорщина
Макроекономічне зростання та оцінка вартості бізнесу
Анотація
Стаття присвячена важливій проблематиці, здебільшого ігнорованій в орієнтованій переважно на фінанси практиці оцінки бізнесу в наші дні, що стосується впливу макроекономічних умов системи на вартість бізнесу. На наш погляд, аналіз макроекономічних ефектів допомагає не тільки уточнити розрахунок вартості бізнесу, а й прогнозувати його, проводити довгостроковий аналіз і навіть порівнювати.
Події на фондовому ринку, супроводжувані негайними, конкретними й незворотними транзакціями, забезпечують тільки частину оцінки бізнесу й завдань щодо створення вартості. В інших випадках при оцінці вартості бізнесу доводиться працювати з невизначеними даними й прогнозами. Рішенням для прогнозу довгострокових процесів створення вартості можуть бути методи аналізу, адаптовані до макроекономічних тенденцій.
Автори досліджують, чи впливають цикли кон'юнктури на додаткові премії за ризик і, як наслідок, на вартість бізнесу, працюючи з двома основними наборами даних. Вони аналізують зв'язок між зростанням реального ВВП США в 1961–2018 рр. і розрахунковою процентною премією за ризик по моделі дисконтування дивідендів портфелю компаній S&P500 за той же період. Розглянуто точку зору про те, що коли ринок формує ціни на основі реалізації ймовірних подій, точка перемикання циклу кон'юнктури може бути передбачена на основі зміни додаткових премій за ризик і навпаки. Автори виявили, що процентні премії показують подвійну амплітуду в порівнянні з коливаннями кон'юнктурного циклу, а це означає, що процентні премії досягають максимуму перед точками перемикання кон'юнктури. Отже, зв'язок між ними є передбачуваним, у той час як його сила й напрямок вимагають додаткового вивчення. Далі дослідження буде направлено на аналіз тісноти цих зв'язків по секторам за допомогою галузевих бета-версій, особливо на основі даних, що стосуються Європи й Угорщини.
Ключові слова: макроекономічне зростання; бізнес-цикли; оцінка бізнесу; кон'юнктурні цикли; додаткові премії за ризик; вартість; ВВП США.

Альмаши Б. Ж.
аспирант, преподаватель, кафедра аудита, факультет финансов и аудита,
Будапештская школа бизнеса, Будапешт, Венгрия
Земан З.
доктор экономических наук, профессор, факультет экономики и общественных наук,
Университет Святого Иштвана, Гёдоло, Венгрия

Макроэкономический рост и оценка стоимости бизнеса

Аннотация
Статья посвящена важному утверждению, в основном игнорируемому явно ориентированной на финансы практикой оценки бизнеса в наши дни, касающейся влияния макроэкономических условий системы на стоимость бизнеса. На наш взгляд, анализ макроэкономических эффектов помогает не только уточнить расчет стоимости бизнеса, но и прогнозировать его, проводить долгосрочный анализ и даже сравнивать.
Происшествия на фондовом рынке, сопровождаемые немедленными, конкретными и необратимыми транзакциями, обеспечивают только часть оценки бизнеса и задач по производству стоимости. В других случаях при оценке стоимости бизнеса приходится работать с неопределенными данными и прогнозами. Решением для долгосрочных процессов производства стоимости могут быть методы анализа, адаптированные к макроэкономическим тенденциям. Авторы исследуют, влияют ли циклы конъюнктуры на дополнительные премии за риск и, как следствие, на ценность для бизнеса, работая с двумя основными наборами данных. Они анализируют связь между ростом реального ВВП США в 1961–2018 гг. м расчетной процентной премией за риск по модели дисконтирования дивидендов по портфелю компаний S&P500 за тот же период. Рассмотрена точка зрения о том, что когда рынок формирует цены на основе реализации вероятных событий, точка переключения цикла конъюнктуры может быть предсказана на основе изменения дополнительных премий за риск и наоборот. Авторы обнаружили, что процентные премии показывают двойную амплитуду по сравнению с колебаниями конъюнктурного цикла, а это означает, что процентные премии достигают максимума перед точками переключения конъюнктуры. Следовательно, связь между ними является предполагаемой, в то время как ее сила и направление требуют дополнительного изучения. Дальшейшее исследование будет направлено на анализ тесноты этих связей по секторам с помощью отраслевых бета-версий, особенно на основе данных, касающихся Европы и Венгрии.
Ключевые слова: макроэкономический рост; бизнес-циклы; оценка бизнеса; конъюнктурные циклы; дополнительные премии за риск; стоимость; ВВП США.

1. Introduction

In this article, our goal is to criticise market descriptive methods, mainly how they split into two core groups, namely, the essentially economic models and the financial models. In this case, we are only concerned with the analysis of basic models. Both of them tend to be used in different market situations, so, neither can be said to be ineffective or inoperable. However, their usefulness in time and economic situations is strictly determined by the assumptions they must be restricted by to be effective. Asset allocation is critically dependent on the ability to forecast the equity risk premium, whereas the predictability across the business cycle is not always strong enough (Baltas & Karyampas, 2018).

The task of the undertaken research which is an art of wider study is to find a definite answer whether more universal models can be created by combining mostly economic and financial models. To see if the universal models can widen the limits created by restrictive conditions without their complexity impeding applicability. This first article is an investigation into whether there are connections between the «families» of models. At first, we want to work with the basic models, choosing standard business-cycle model and Capital Asset Pricing Model (CAPM) as they are universally known and widely applicable. The main research question is the following: What kind of connections can be found between the two models in terms of empirical observation?

We will describe both models using monetary series, and then test the correlation level between the two.

2. The dilemma

Even at the first glance it was clear that clashing a classically economic approach with a classically financial approach was not going to be a minor task. The business-cycle theory (conjuncture-cycle theory in our case) approach prefers theoretical models and long-term projections, while the Capital Asset Pricing Model is more of an empirical approach. It is not this article's aim to discuss the approaches, so no arguments will be made for either of them, and no comparison made to show which one is better. However, purely on an observational level, it is noticeable that economic models tend to skip over the complex analysis of problems and mistakes revealed by empirical investigations by pleading «ceteris paribus». Meanwhile, classically financial approach models tend to simplify examinations by ignoring models describing long-term trends in favour of analysing economic effect on solely a market basis, similarly pleading that «the market will price-in probable effect anyway». The aforementioned effect has its grounding in the two main claims:

1) associated with the Efficient Market Hypothesis (EMH) and works by P. Samuelson and E. Fama in the 1960s who both analysed stock prices and realised that the price changes are nearly random in the financial markets;
2) the prices reflect economic fundamentals (Delcey, 2019).

To make the task easier, we analyse the connectivity of two specific market modelling procedures (the conjuncture-cycle theory and CAPM). In such a way, the relationship between economic variations and capital markets can be analysed more closely. Practice shows that either approach can be operable in certain situations if the appropriate simplifications and conditions are present (distorting reality to an extent). This distortion only becomes a problem when the simplifications introduced bump the efficiency of the analysis over the acceptable margin of error. In this regard, it becomes a valid question whether the two approaches can be combined to create the one applicable in practice. Such holistic approach would need to be able to avoid oversimplifying or overcomplicating the processes leading to the outcome, as well as rendering them incomprehensible and unusable. It is not an easy task and must be approached carefully (Koller, Goedhart & Wessels, 2010).

Not only GDP could describe the business cycles for our model, but we can investigate the effect of other macroeconomic cycles, for example, production and consumption, demand and supply, as far as the dislocation, or disjunction, of these cycle-pairs, could move the risk-premiums as well. An interesting observation in this regard is made in the paper by Cs. Lentner who argues that in the countries affected by the crisis the balance of payment deficit could be observed before the explosion of the crisis. The vulnerability of the United States was as well caused by the domestic production exceeding consumption (Lentner, 2010).

In an ideal scenario, a model (or models) could be created by merging financial and economic models which provides an accurate picture by placing innumerable CAPM models onto the diagrams of macroeconomic growth. For this, we would have to find a strong correlation between the two. It

would, then, even give an accurate and reliable picture of the probable fluctuations of the value of businesses and investments. In reality, it is worth analysing if the relationship between macroeconomic trends and the (sur)charge of investments is significant (Sander, 2018).

Even if no such model could be built, important modes of action can be discovered. Similarly, while studying business value determination, one can learn that it is not always the end result that is the most important part but, in many cases, the study of the method itself. We share a similar view on this present discussion. The end result might not be a single model, but important insight into correlations that have not been studied closely before. If there is no chance to find a model-like connection, than we can use the results for a controlling-like methodology.

3. The idea

Let us focus on the original question: is there a measurable connection that can be examined, maybe even predicted, between the risk premiums and the macroeconomic field? More simply, is there a connection between the development of conjuncture-cycles and risk premiums? Putting aside all statistical benchmarks for the time being, and only relying on the economic logic, let us analyse the kinds of relationships that can exist between business cycle and risk premium. If, by agreeing with both theories, we accept that the market actually prices in probable effect, then, would it be possible to forecast the conjuncture's expected course from the changes in interest margins? Let us examine how this theory would work according to the economic logic.

Accepting the statement that economic fluctuation affects risk premium, and through that also the value of investments, one should assume that this connection should be verifiable. However, how would market mechanism work in an ideal situation? Inspecting it through a capital market (merchant) point of view, the market would evidently not be regarded as bad pro tempore it follows the known and forecasted path. Hence, when the direction of fluctuation is known, it does not really matter if it is ascendant or regressive - it can be favourable either way. It must be noted that for the economy on the whole, a continuously regressive conjuncture is naturally bad, but from the capital market perspective, even that can be profitable. Looking at the simplest example on a capital market, while the economy moves on a continuously regressive course, it is worth to persistently stake on the selling option, whereas in an ascendant economic trend buying is more profitable (Brealey & Myers, 2005).

Problems arise when the trend foreseeably turns around. The question is, then, when that will happen. The source of the problem here is the assumption that the market is the most perfect forecast mechanism. In this case, an analyst with a financial approach (in an almost self-fulfilling manner) could say: «we should not be worried about this, as the market will definitely price-in probable changes». At this point, one should infer that, if this is true, and they listen to the market, then changes will always become foreseeable from risk premiums. Because if one knows that tendencies are about to change, and so knows that their current strategy will become unprofitable, they need to change it up. However, they probably do not know exactly when to make this move. Their risk will steadily increase with the approach of the trend turn, and it becomes riskier to play according to their old strategy. Thus, before the trend turns of a conjuncture-cycle risk, premiums will expectedly peak as it is impossible to know how long the old strategy will be sufficient or when to bring in a new one.

4. Data and the model

Recent studies show that stock returns are predictable in recessions, while bond returns are predictable in expansions (Sander, 2018). To begin with, we want to demonstrate how to document this with a model, if our assumptions are correct.

As a first step, any region's data should be enough as, in theory, this model is valid on every market. Because of the sheer amount of data available, we chose two datasets from the United States Census Bureau and the available on-line data collection of Aswath Damodaran (2019) who is a professor of the Stern School of Business at New York University and a known researcher in the field of finance and investment.

For the description of conjuncture cycles, we will use the real GDP data of 1961-2018, while for the capital market risk modelling, the calculated risk interest premium from the S&P500 portfolio dividend discount model for the same timeframe. It is clear from previous descriptions that the analysis is not easy, so, for the first investigation of our hypothesis, we chose a graphic approach. This way it is easy to decide whether data from the empiric analysis yield the picture we have hypothesised previously, making it easy to decide if it is worth continuing to the next phase of the analysis. It should be noted that the applied dataset is still contaminated with disturbing effects like coincidences or speculations. For now, we will not filter these out because, if the model fits even with these factors, then, it is definitely worth continuing the analysis. Let us demonstrate conjuncture cycles with a sinus curve for now. According to our hypothesis that the market prices-in the expected changes of the conjuncture, right before the turning point of the descriptive graph of the conjuncture-cycle (no matter which direction it changes to from) risk premiums will peak. Ideally, placing the two graphs below each other, the curve of the risk premiums will be double amplitude slightly shifted to the left compared to that of conjuncture-cycles (Figure 1).

Let us analyse what the actual graphs produced from the dataset show. For this, some adjustments must be done in the data sets, as they cannot be compared in their initial form. Firstly, the problem of scale can be eliminated by standardisation without harming the aspects of the analysis. Secondly, we are not interested in the continuous GDP growth, only the conjuncture fluctuations, so, GDP tendencies must be eliminated as well. For this we must first examine what trend fits the GDP data best (Table 1). We can mainly decide which graph fits the function by its R^2 index. The trend graph with the highest value can represent the values of the dataset.

Figure 2 clearly shows that the cubic ($x^3 + x^2 + x + c$) type trend fits the dataset best, so, we should filter out trend values calculated with this from the data to yield a genuine fluctuation. We achieve this with a simple calculation of difference. It should be noted that because of the crisis unfolded in 2007-2008, there is a clear break in the GDP course shown on Figure 3. However, by referring to Jánossy's theory that after the «hitches» the conjuncture returns to its

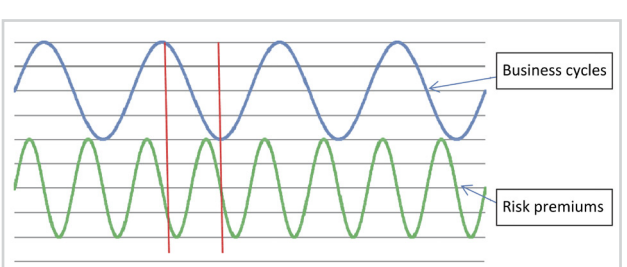

Fig. 1: **Theoretical connection between business cycles and risk premiums**
Source: Compiled by the authors

Tab. 1: **Trend testing for the GDP timeline**

Equation	Model Summary				
	R Square	F	df1	df2	Sig.
Linear	0.976	2087.731	1	51	0.000
Logarithmic	0.724	134.088	1	51	0.000
Quadratic	0.992	3080.986	2	50	0.000
Cubic	0.993	2492.807	3	49	0.000
Compound	0.991	5441.841	1	51	0.000
Exponential	0.991	5441.841	1	52	0.000

Source: Compiled by the authors

previous course (Jánossy, 1975)[1], the trend fitting analysis can be carried out by emitting this period of time. This way, according to expectations the R^2 values became higher, and the cubic trend still yields the strongest connection (Table 2).

Then, we draw up the conjuncture descriptive graph after appropriate transformations (standardisation and shifting along axis y for representability), the GDP data cleared of trends shown with the continuous graph and the standardised data of the S&P500 portfolio risk premiums shown with the intermittent curve in Figure 3.

Of course, no far-reaching conclusions can be drawn from the graph, but many of the properties of the ideal scenario (Figure 1) can be observed here as well. For example, the greater intensity of the periodicity of interest premiums, and that they typically have local maximums before the trend-changing points. However, it is already clear that the inequality of the periods that interest premiums precede conjuncture-changing points will become a problem during the analysis. This irregularity will impair the opportunities of model building. The present paper does not delve into this topic, but it is worth engaging with it. What does the size of these periods depend on? Or even is it dependent on other factors (Tarjan, 2000) like the intensity of the conjuncture change, the length of the period etc.?

Translating the phenomenon depicted above into mathematical terms, we can say that before the local extremums of the dataset descriptive of the conjuncture cycle risk premiums peak, they reach a local maximum. Data used can principally represent the connection, but because of its distorting factors, it is unknown how representative it is of the actual interrelation itself. For now, it is not our aim to compare completely undistorted data, only to provide a statistically descriptive form for the previously mentioned logical idea and prove its suitability for further analysis. So, the analysis continues with statistical methods. It can be accepted that in its current form the data set cannot be fitted into correlation analysis, as it could not appropriately interpret the comparison of local extremums - both minimums and maximums - and exclusive local maximums, or the shifting of periodicity. This can be observed from the correlation coefficient of raw data (Table 3).

It can be seen that the analysis is not significant and the correlation coefficient is very low, which is the consequence of the previously mentioned incompatibility problems. Therefore, we transformed data so it could be understood by statistical analysis. First, we made the local extremums and exclusive local maximums compatible. Data of deviance from the average fluctuate around the zero axis (as a trend) after standardisation, so, they only needed to be squared - basically stretched along and mirrored onto the axis x (Hunyadi & Vita, 2002). Compared to the graph of the ideal theory (Figure 1), the cycles of the conjuncture curve doubled, and every extremum appeared as a local maximum as it is presented in Figure 4.

5. Empiricism

After the transformation, data can be analysed via regression analysis. The main problem now could be that the shift of periods compared to each other is not equal, so the explanatory power of the model is reduced. Nevertheless, let us consider the findings achieved within graph and statistical analysis.

Figure 5 shows the theoretical assumption much clearly. The curve of risk premiums (a continuous blue graph) behaves as expected at many points. It has a local maximum before local extremums. On the graph before the maximums of the GDP square (an intermittent red curve) the risk premium also has a maximum. Just by looking at the figure, the hypothesis may be considered probable. However, the statistical results are different (Table 4).

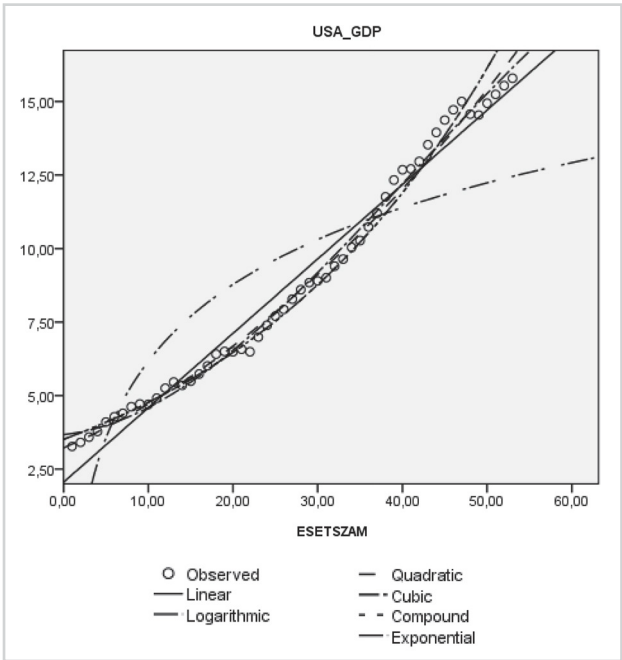

Fig. 2: **Adjusted USA GDP data trend test**
Source: Compiled by the authors

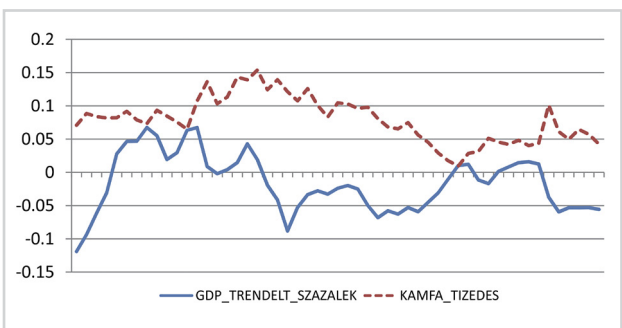

Fig. 3: **GDP standardised data**
Source: Compiled by the authors

Tab. 2: **Secondary trend test for GDP data**

	Model Summary					Parameter Estimates			
Equation	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	0.966	1249.113	1	44	0.000	2.195	0.245		
Logarithmic	0.710	107.801	1	44	0.000	-1.268	3.187		
Quadratic	0.996	5537.385	2	43	0.000	3.565	0.073	0.004	
Cubic	0.997	5349.339	3	42	0.000	3.212	0.159	0.000	6.392e-5
Compound	0.995	9490.548	1	44	0.000	3.42	1.033		
Exponential	0.995	9490.548	1	44	0.000	3.42	0.032		

Source: Compiled by the authors

Tab. 3: **Correlation table of raw risk premium and GDP**

Correlations

		Zscore (KAMFA)	Zscore (TREND_ELTER)
Zscore (KAMFA)	Pearson Correlation	1	0.156
	Sig. (2-tailed)		0.264
	N	53	53
Zscore (TREND_ELTER)	Pearson Correlation	0.156	1
	Sig. (2-tailed)	0.264	
	N	53	53

Source: Compiled by the authors

[1] Ferenc Jánossy (1914-1997) was a pioneer of the analysis of long-term time series in Hungary, proposing his famous trendline-theory in the 1960s. He argued that economic growth of developed industrial countries can only rise significantly above secular trend value after wars, natural disasters, catastrophes, epidemics etc., when the recovery period's higher growth rate lasts until the economy reaches the emission level it would have reached without the event of war, catastrophe, epidemic etc. After the recovery period, the rate of economic growth returns to the secular trend, the value that the profession structure designates as a quasi-natural rate. Jánossy understands the recovery period as the gradually disappearing discrepancy between profession structure and workplace structure because of the war, catastrophe, crisis etc.

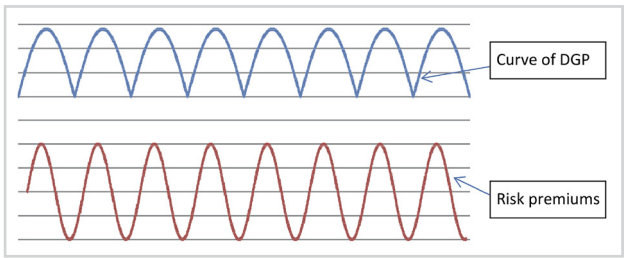

Fig. 4: **Adjusted (theoretical) curve of DGP (blue) and risk premiums (red)**
Source: Compiled by the authors

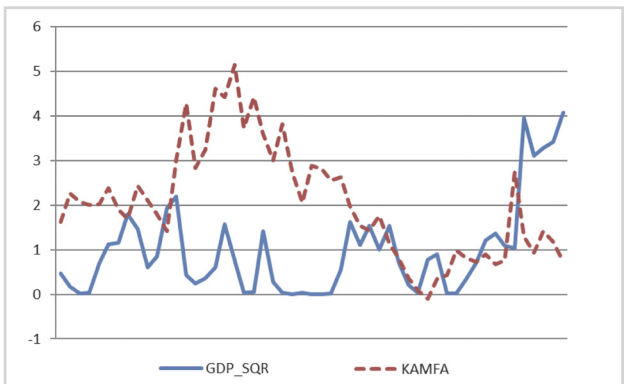

Fig. 5: **Transformed GDP-risk premium curve**
Source: Compiled by the authors

Tab. 4: **Regression statistics with absolute risk premiums**

Regression statistics					
r value	0.241756245				
r-square	**0.058446082**				
adjusted r square	0.03998424				
standard deviation	0.229698468				
observations (n)	53				
VARIANCE ANALYSIS					
	df	*SS*	*MS*	*F*	*F signif.*
regression	1	0.167031	0.167031	3.165777	0.081156132
residuals	51	2.690831	0.052761		
Total	52	2.857862			

Source: Compiled by the authors

After analysing data, it can be concluded that neither the level of significance nor the explanatory power are adequate (Table 5). Where did the analysis go wrong? At first, it seemed that by shifting the graphs horizontally in relation to each other to abolish the previously hypothesised «forecast» period, data would line up, but, as noted before, because of the unequal length of periods, that did not provide a significant difference. It should also be noted here that if the curves are analysed in a three-year shift in relation to each other, that is assuming that the market prices in the probable conjuncture changes three years in advance, and these periods are examined as stand-alone units, then, certain sections show surprisingly strong correspondence. For example, the periods of 1964-1972, 1973-1975, and 1980-1982 which are the phases between crises (Marosán, 2008), as well as data of the years 1985-2000.

Clearly, the model «malfunctions» during the financial crises. Without counting those periods and eliminating the forecast period deviance, we can measure a strong enough explanatory power among data. This is convincing enough to continue the analysis. One important aspect has not been incorporated into the model yet. The conjuncture cycle descriptive GDP dataset has been adapted for statistical analysis. However, so far only the nominal data of risk premiums have been considered, stating that we are only looking for the local maximum, no other modification is necessary. Looking deeper into the premises of models with a financial approach, we can see that risk premium is always relative. If we still insist on using the basic models, the amount of these premiums should not be considered purely on their absolute value, but rather in relation to the current market environment. In numbers, it means that we should compare to either the actual risk-free rate or the yield expectations of the actual period. We chose the latter to be able to analyse the amount of risk premium of the actual yield expectations. This way the distorting effect of other factors can be filtered out, whereas this cannot happen if we compare to the risk-free interest rate. According to the chosen approach, the level of the relative risk premium (risk premium content) can be calculated using the following formula:

$$\text{Risk premium content} = \frac{\text{Risk interest premium}}{\text{Expected dividend yield}}.$$

The data set produced according to in the chosen approach is represented in Figure 6.

Even with the numerous distorting factors not filtered yet, it can be concluded that the risk premium content of equity returns changes in relation to its deviance from the GDP trend. It means that conjuncture cycles influence share yield expectations, and through this the value of the shares themselves, and even the business value. If we depict risk premium content by the amount of its deviance from the GDP trend (Figure 7), it becomes visible that despite any disturbing effects, risk premium continuously rises (Duarte & Rosa, 2013, 2015).

Of course, as stated in previous analysis, it is not enough to analyse graphs, and statistical methods are also necessary

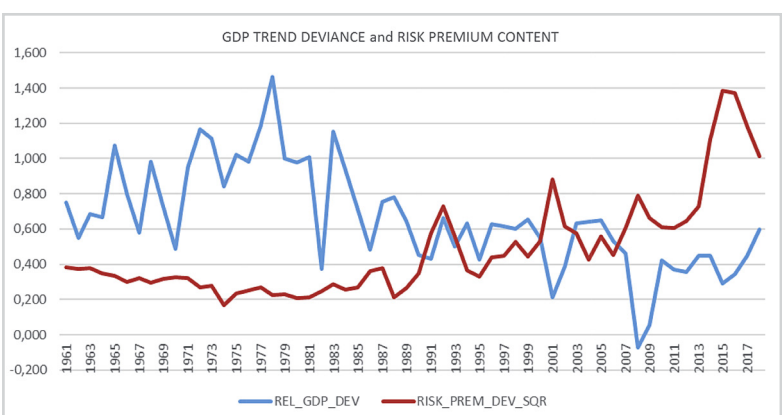

Fig. 6: **Actual data curves**
Source: Compiled by the authors

Tab. 5: **Crisis cleared statistics (test)**

1964-1972	
Regression statistics	
r value	0.604209663
r-square	**0.365069316**
Adjusted r square	0.274364933
Standard deviation	0.028027343
Observations (n)	9

1973-1975	
Regression statistics	
r value	0.520987351
r-square	**0.27142782**
Adjusted r square	0.190475355
Standard deviation	0.103377217
Observations (n)	11

1985-2000	
Regression statistics	
r value	0.907875186
r-square	**0.824237353**
Adjusted r square	0.810717149
Standard dev.	1.945676492
Observations (n)	15

Source: Compiled by the authors

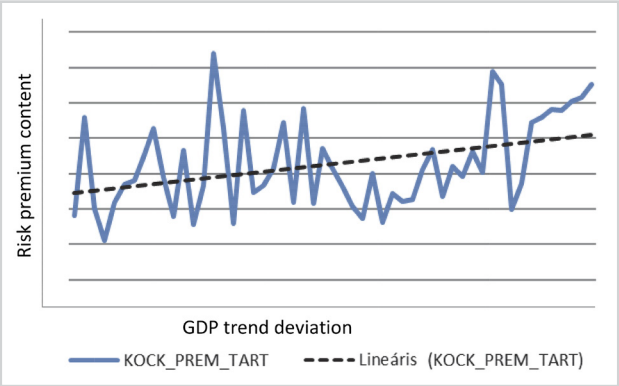

Fig. 7: **Risk premium trend deviation**
Source: Compiled by the authors

to demonstrate the hypothesis. Analysing data through regression calculation (Table 6), it becomes apparent that statistical analysis supports the correspondence of the two data sets. It can be inferred from Table 6 that the connection between the two data sets is significant; their strength can be considered mediocre. The identified correspondence is not a coincidence, and the actual connection between the data sets can be justified.

6. Conclusions

Economic fluctuation affects business value through the risk premiums, that is why, there is a raison d'être for models that blend economic and financial approaches. Through these models we can gain better insight into the inner mechanisms of the market, and for them to be applied in general, not just under strict conditions. Since the 1990s, next to smaller sectoral changes, the correlation between the sectoral dynamics and business cycles (GDP growth) is stronger. Hence, sectoral analyses can be a future step in order to analyse the markets outside the stock markets by sectors and find the sectors more and less susceptible to such new hybrid analyses (Tase, 2019).

The sectoral upgrade of this analysis could be a future aim, and based at the research of by University of Zaragoza, we can identify different clusters in Europe while studying the business cycles, as «a more detailed analysis of the estimated parameters and the features characterising each cluster would give us valuable information of the European business cycle» (Gadea, Gómes & Bandrésa, 2018).

Filtering out the problems and distorting factors mentioned in the article still needs to be resolved but knowing that the connection is there encourages further work and analysis.

Tab. 6: **Regression statistics with relative risk premiums**

Regression Statistics					
Multiple R	0.618973034				
R Square	**0.383127617**				
Adjusted R Square	0.372112039				
Standard Error	0.233108237				
Observations	58				
ANOVA					
	df	*SS*	*MS*	*F*	*F signif.*
Regression	1	1.8899547	1.8899547	34.780527	2.23031E-07
Residual	56	3.0430092	0.0543395		
Total	57	4.9329639			

Source: Compiled by the authors

References

1. Greenspan, A. (2007). *The Age of Turbulence.* New York: The Penguin Press.
2. Damodaran, A. (2002). *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* (2nd edition). New York: John Wiley & Sons, Inc.
3. Damodaran, A. (2013). *Equity Risk Premiums (ERP): Determinants, Estimation and Implications* (2013 edition). New York University: Stern School of Business. doi: https://doi.org/10.2139/ssrn.2238064
4. Damodaran, A. (2019). *Data Sets Collection.* Retrieved from http://pages.stern.nyu.edu/~adamodar
5. Brealey, R. A., Myers, S. C., & Allen, F. (2005). *Principles of Corporate Finance.* New York: Irwin/McGraw-Hill.
6. Lentner, Cs. (2010). Some historical and international aspects of the Hungarian economic crisis and its management. *Public Finance Quarterly, 55*(3), 561-584. Retrieved from https://www.researchgate.net/publication/312041620_A_magyar_gazdasagi_valsag_es_valsagkezeles_nehany_torteneti_es_nemzetkozi_aspektusa (in Hungarian)
7. Duarte, F., & Rosa, C. (2013, October 30). *The Equity Risk Premium: A Consensus of Models.* Social Science Research Network (SSRN). doi: https://doi.org/10.2139/ssrn.2377504
8. Duarte, F., & Rosa, C. (2015, February). The Equity Risk Premium: A Review of Models. *Federal Reserve Bank of New York Staff Reports No. 714.* Retrieved from https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr714.pdf
9. Hunyadi, L., & Vita, L. (2003). *Statistics for economists.* Budapest: KSH (in Hungarian).
10. Jánossy, F. (1975). *On the trend line of economic development.* Budapest: Magvető Könyvkiadó (in Hungarian).
11. Sander, M. (2018). Market timing over the business cycle. *Journal of Empirical Finance, 46,* 130-145. doi: https://doi.org/10.1016/j.jempfin.2017.12.002
12. Marosán, G. (2008). *Crises in history, history of crises* (in Hungarian).
13. Gadea Rivas, M. D., Gómez-Loscos, A., & Bandrés, E. (2017). Clustering Regional Business Cycles. *Banco de Espana Working Paper No. 1744.* doi: https://doi.org/10.2139/ssrn.3087272
14. Baltas, N., & Karyampas, D. (2018). Forecasting the equity risk premium: The importance of regime-dependent evaluation. *Journal of Financial Markets, 38,* 83-102. doi: https://doi.org/10.1016/j.finmar.2017.11.002
15. Tarján, T. (2000). Jánossy's theory in the light of the new growth theory. *Közgazdasági Szemle (Economic Review), 67,* 457-472. Retrieved from http://efolyoirat.oszk.hu/00000/00017/00060/pdf/tarjan.pdf (in Hungarian)
16. Koller, T., Goedhart, M., & Wessels, D. (2010). *Valuation: Measuring and Managing the Value of Companies* (5th revised edition). New Jersey: Wiley & Sons Inc. Retrieved from http://elibrary.bsu.az/books_200/N_1.pdf
17. Delcey, T. (2019). Samuelson vs Fama on the Efficient Market Hypothesis: The Point of View of Expertise. *OEconomia, 9*(1), 37-58. doi: https://doi.org/10.4000/oeconomia.5300
18. Tase, M. (2019). Sectoral dynamics and business cycles. *Economics Letters, 175,* 60-63. doi: https://doi.org/10.1016/j.econlet.2018.12.014

Received 18.10.2018