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DIFFERENT MEASURES, DIFFERENT TRENDS – CONTRADICTIONS IN MACRO AND MICRO LEVEL GROWTH MEASURES

Péter Juhász, PhD, CFA[1]
Kata Váradi, PhD[2]
János Száz, PhD[2]
Ágnes Vidovics-Dancs, PhD[2]

Abstract

When focusing on business performance of a country, industry or an individual firm the performance of companies may be tracked using various measures. By simulating the behaviour of a simple firm, our model underlines that the choice of measurement unit determines what distortions we will face, and thus, using different measures we may end up identifying completely contradicting cycles at macro, mezzo, and micro level. On top of that, these cycles would radically change if firms examined changed their operational, investment or financing strategy or when structural changes happen in the economy. This may end in researchers analysing non-existing cycle changes and looking for nearly identical explanations of development differences for industries, regions or countries.

Keywords: *fluctuation, corporate performance, inflation, leverage, strategy*

JEL Classification: *D92, G31, G32, O14*

Introduction

Business growth is a key issue at any level of economics. While company owners are concerned with their future profit, industry associations and market analysts focus on general trends hitting a given industry. At the same time, regulators and politicians usually concentrate on macro tendencies to enhance the wellbeing of the given country. Once growth is slowing down, all these decision makers are worried, while they become more relaxed if measures show an upward trend. In the CEE countries nowadays it is particularly important to find the right way to speed up convergence to western countries. When growth is weak at the macro level investigations start to

[1] Corvinus University of Economics, e-mail: peter.juhasz@uni-corvinus.hu
[2] Corvinus University of Economics

uncover causes that hinder the industry level growth. At the meso level there is an ever bigger need to identify key factors that explain why certain firms perform better than others in order to connect micro and macro level measures.

But is it really true that a macro level upward trend automatically means that most of the firms in the economy see their performance growing? Can we experience a fall back at the country level while most of the firms are actually doing better? Based on common sense, this is hard to imagine. But once we use different measures to track performance at all three levels, due to the heterogeneous approaches we may see the values measured showing completely different trends even in a radically simplified world, which makes it very hard to clearly identify when things are getting better or turning worse.

Corporate performance may be measured in various ways. Total sales, operational profit, or after tax profit are used by market analysts to describe a given industry, sum of added value (GDP – gross domestic product) is a common measure in macro papers, while at the firm level owners may focus on dividends, cash flows, or some profitability ratios, like ROI (return on investment), ROE (return on equity), or CFROE (cash flow return on equity). We may assume that an industry of well performing companies should be doing well at the sector level, and an economy consisting of boosting industries ends up with great trends at the macro level. This argumentation may be logical, but is that really true once we use different measures to access the performance at each of those levels? Our simple model shows how measurement results may differ across measures in case of a simple company when controlling for (1) operational and (2) financial leverage, (3) equipment lifetime, (4) demand fluctuations, and (5) inflation.

The main goal of our paper is to show how the measured (and not the actual) performance can differ depending on how we carry out our analysis: at the level of the whole economy, at the industry level or company level. This is an important question, since in the literature several papers are dealing with the question of performance measurement by contrasting firms, industries, and even countries or regions, but usually the researches focus on one of the levels, applying different indicators, and different analysis methods.

For example, at the macro level, a key issue related to performance is handling business cycles. Research related to the measurement of business cycles goes back to the late forties. The first notable research was carried out by Burns and Mitchell (1946). This research was followed by several more in this field. The main focus of these papers was to decompose the business cycle component from the empirical datasets, e.g. Baxter and King (1995), Hodrick and Prescott (1980), Hassler et al. (1992), Diebold and Rudebusch (1994), Darvas and Szapáry (2004), Zarnowitz and Ozyildirim (2006), and Yogo (2008). The most commonly used methods based on Baxter and King (1995) were the following: a two sided moving average; first-differencing; removal of a linear or quadratic trend; application of Hodrick-Prescott (1980) filter; and the band-pass filter.

Wagner et al. (2017) highlight that the way we measure economic fluctuations plays a central role in research. While the Gross Domestic Product (GDP) is most widely used for the national economies, business cycles influence a number of economic activities. So, the Consumer Price Index (CPI), yield spreads, trade volumes, the Purchasing Managers Index (PMI), the unemployment rate, and special indexes like the Chicago Fed National Activity Index (CFNAI) are also applied in the literature, among other indicators, as good descriptors of business cycles. To that, we may add the GNP, total investment of the period or new workplaces created, and total employment, among others, yet staying at the macro level. Can someone really believe that all these measures end up showing the same trends and cycles? But if those differ, why should we be surprised to learn that some micro level indicators are not moving together with the “trend” identified at the macro level.

At the same time, performance is also measured at both industry and company levels in various ways both empirically and theoretically. For example Capon et al. (1990) are using a meta-analysis method to analyse corporate performance by applying financial and non-financial indicators. They collected the indicators based on the empirical literature of the industry and company level based researches between 1921 and 1987. Since in our paper we will focus only on financial indicators, we will use those which are usually used in the literature, like the Sales, EBIT or the ROE (Damodaran, 2012), but it is also very common to use some kind of management, trust or customer index to truck cycles.

Besides relying on the financial indicators generally used in the literature, we also take into account the results of the literature in another aspect as well. Previous papers found that the effect of inflation is notable regarding the profitability and the value of a company (Dömötör et al., 2013, Radó, 2005). Halling et al. (2016) showed that firms tend to change their leverage in accordance with business cycles. Using a sample from the US they showed that most of the companies follow a counter-cyclical strategy, but 10-25 percent of the firms stick to a pro-cyclical leverage. Wagner et al. (2017) showed for US companies that business cycles are strongly linked with the cycles of operational disruptions severity. This is why we include not only inflation, but also differences in the financial and operational leverage in our models.

The rest of the paper is structured as follows. After the literature review, our model will be introduced, then we show the results of a base scenario, where the demand on the market is stable and the leverage of companies is zero. Then, in the following part, we show how the fluctuation in demand will affect the performance of the company, the industry, and the whole economy. We will also analyse the performance effect of different operational and financial leverages, that of inflation, and the lifespan of equipment. Finally, conclusions and limitations of the research are presented.

Literature review

Skare and Stjepanović (2016) review the history of business cycle measurement. While offering an excellent summary of methodological issues and challenges in finding the appropriate definition of a cycle, it becomes clear that literature considers the problem of how to measure cycles far more important than to find out what exactly should be measured. The way of measurement poses two types of questions: what econometric methods to use, and what kind of effects to separate. For example, Zarnowitz and Ozyildirim (2006), and Yogo (2008) underline the difference between analysing growth cycles and business trends, the former requiring estimation and elimination of trends. Zarnowitz and Ozyildirim (2006) consider the effects of trends on cycles in the US, where they call attention to the common error of interpreting downward business cycles, as negative growth trends and state that growth trends and business cycles can be separated. Still, business cycles are measured by changes in GDP only assuming that the general performance of companies is similar to the development pattern of the GDP. Analysing business cycles for emerging markets Boz et al. (2011) tell apart permanent and transitory components – an idea very similar to Zarnowitz and Ozyildirim (2006). But when measuring macro performance, they focused on TFP, and not on the absolute amount of GDP.

Dabla-Norris et al. (2015) examined cyclical properties of development aids for the period 1970 to 2005. For testing that, they also separated the permanent component from the transitory component of the GDP. At the same time, it is very important to note that this is one of the rare articles which realise and state that this measurement is only one of the "proxies for the output cycle". They found that bilateral aids are usually pro-cyclical with respect to both the donor and the receiving country, offering a cushion to developing countries during heavy downturns. They also emphasise that quantifying economic fluctuations is more difficult in aid receiving countries, particularly in low-income countries that are undergoing structural transformation and are subject to more frequent and severe shocks.

Using both a US and an international sample, Halling et al. (2016) conclude in their paper that leverage ratios in case of most companies are counter-cyclical, while for a minority of 10-25 percent of the companies, the leverage is pro-cyclical as usually assumed. The article uses business cycles and economic trends as synonyms and does not tell apart different industries, rather it compares data from years with macro crises with ratios of periods without such crises. While that could be a drawback, using various measures is a key contribution. They document pro-cyclical dynamics of profitability, market-to-book ratio, and corporate investments, while sales and PPE (plant, property and equipment)/assets showed no clear connection, and size and leverage was found to be counter-cyclical. This draws attention to the importance of what measure is used to track performance.

Wagner et al. (2017) emphasise that "the effects of business cycles should be taken into account to more accurately calibrate operational risk models used not only by banks, but also by manufacturing firms." At the same time, they underline that contrary to the earlier seen application of GDP in the field of macro finance supply chain, management research has traditionally used the Purchasing Managers Index (PMI) as an economic indicator and studied the implication of it on supply chain management activities. When investigating US manufacturing and financial service industries they confirmed that severity of operational risk is pro-cyclical when cycles are derived from PMI, but frequency of losses is not. An important takeaway form this is that terms like pro-cyclical and counter-cyclical should only be used when indicating the cycle of the specific measure we consider. This is also emphasised by Perron and Wada (2016). They used both real GDP and consumption to measure business cycles in the G7 countries and showed that there are important qualitative and quantitative differences in the implied cycles.

The same problem appears at mezzolevel. When analysing firms' growth in the EU 27 countries for 2000 to 2003, Oberhofer (2012) estimated the industry growth total manufacturing value added. He concluded that domestic demand fluctuations created detectable heterogeneity in the reaction among several different firm cohorts, while the adjustments to the European industry recoveries and recessions were homogeneous. In other words, when domestic level fluctuations were considered, company level fluctuation patterns were very far from those at the industry level.

Jovanovic and Rousseau (2014) translated the development of Tobin's Q as firm level cycles and measured co-movement of investments with that measure. They showed that investment may be cyclical for newly established firms while it is counter-cyclical for older ones, highlighting that individual characteristics like age might play a role in how fluctuations influence certain activities often even aggregated at the national (macro) level. They even use an aggregate Q for the industry level performance measure. Bachmann and Bayer (2014) also investigate the connection of investment with business cycles. In their finding, the investment is pro-cyclical, while productivity, output, and employment growth have counter-cyclical dispersions. This means that the latter measures show a completely different business trend when tracked compared with the pattern of investments. They also call attention to the importance of how firms are chosen when mezzo and macro level measures are quantified: for example, we may end up with very different charts depending on whether we consider only firms with ongoing operations or all of them.

Funk (2006) has shown that firms' reaction-to-demand swings differ across industries: companies in SIC 28 (Chemicals and Allied Products) and SIC 38 (Measuring, Analysing, and Controlling Instruments) reduce research investment during positive demand shocks, while for SIC 35 (Industrial, Commercial Machinery and Computer Equipment) the same occurs during negative demand shocks. Holly et al. (2013) underline the importance of another firm characteristic: ability to grow, which could be a measure for competitiveness. The paper shows that companies with low or negative growth rates (e.g. less competitive) are typically more responsive to aggregate shocks. Thus, effects of demand cycles may differ considerably depending on the distribution of competitiveness (ability to grow) of the companies. In other words, once the general competitiveness of the economy is changing, that will also change the way and extent demand fluctuations affect aggregated performance measures. When examining the North-South difference in Italian business cycles, Basile et al. (2014) conclude that 50 percent of the differences can be explained by firm-level heterogeneity, in particular by firm size, demand conditions and liquidity conditions.

Table 1. Factors affecting reaction to cycles

Level of analysis	Issues to consider
Macro	telling apart country level and regional (e.g. EU) cycles; structural transformation of the country
Mezzo	(changing) distribution of firms (e.g. competitiveness), including firms with ongoing operation only; industry characteristics
Firm	age, size, ability to grow, demand, liquidity

Source: Literature review

Our literature review has three major findings. (1) We have to be very careful in defining what exactly is a trend or a cycle. Separating those from each other, and from one-time shocks is vital to get a fair result. (2) We cannot compare directly the cycles quantified in different measures. The inconsistency of measures may create blurred or fictive trends in itself. It is common to focus on GDP, GNP, TFP, and investments at the macro level, while manager indexes or total sales might be used at the industry level. Explaining these with firm level quantities like productivity, employment, cash flow, profit or R&D spending may fail or lead to wrong conclusions because our variables do not track exactly the same factor. (3) There are various factors affecting how a firm and industry or the economy of the whole country may react to cycles. The most important of them are summarised in Table 1.

Model description

Our model tracks the performance of one single simplified firm not following any specific growth trend but subject to business cycles. The company has only one product, which is manufactured using one type of machine. The net working capital of the operation is zero – payables completely financing inventory and customers –, so invested capital (IC) equals the total value of equipment.

The sales price (10) and demand quantity (2000 in the first period) is determined by the market forces and cannot be influenced by the firm itself. At the same time, the management will have an exact prediction of the demand at the beginning of each period, so they can purchase exactly the needed amount of machines and will manufacture all products that the market asks for. (There are no information barriers.) Though, they may not sell equipment purchased in the previous periods. Capacity only decreases once lifetime of the machine is over.

The firm has variable costs depending on the quantity produced and fixed costs that do not change with the amount produced. A pre-set part (50%) of both cost types is labour expense. Both sales and all types of manufacturing costs grow at the same inflation rate. To allow for comparison, we always set manufacturing costs such that during the first period the firm earns an operational profit before depreciation and amortization (EBITDA) of 8000.

There are several kinds of machines available for the production and they are all able to produce the same amount (10 thousand pieces) of product during one period.

Those only differ in their useful lifetime (from 1 up to 6 years) and are depreciated linearly. The cost of each machine is calculated so that the yearly cost equivalent for each type would be the same. (So, from a financial point of view, the company decision makers have no preference among the machine types.) The price of machines is indexed to inflation across periods and only a whole number of machines can be bought.

At the start of period 1 we always assume that the machines owned are just enough to serve the first period demand and had been purchased in equal quantities during the previous years, so those will need gradual replacement during the coming periods. Given the different lifespans of equipment, when the required product quantity on the market changes, the company may have to purchase new machines earlier than otherwise or accumulate unused capacity depending on the type of machine used.

To calculate the operational profit (EBIT), manufacturing costs (both variable and fixed) and D&A (depreciation and amortization) are deducted from sales. Then, the cost of debt (interest) is accounted for, and corporate tax (20%) is deducted to calculate profit after tax (PAT). The interest rate is automatically indexed for inflation. Retained earnings is calculated based on the required growth of equity, given the product demand of the next year. The difference of PAT and retained earnings is the sum of dividend paid and equity raised or repurchased. This is the cash flow that owners will face (FCFE – free cash flow to equity) and which would determine the real life market value of ownership.

Base scenario

In the base scenario, there is no growth or fluctuation in market demand, no inflation, and we have variable manufacturing costs only (operational leverage=0), the firm operates without debt (financial leverage=0). Due to this, all periods modelled look the same.

Depending on the management choice of machines (financially completely value-neutral) we will see a different investment need, D&A, EBIT, tax, PAT, and dividend (FCFE). Though, sales and added value (AV = EBIT + D&A + Labour expenses) are the same in each case. As the choice of machine influences the investment need (IC), ROI, ROE and CFROE also differ heavily.

Table 2. Comparison across machine types

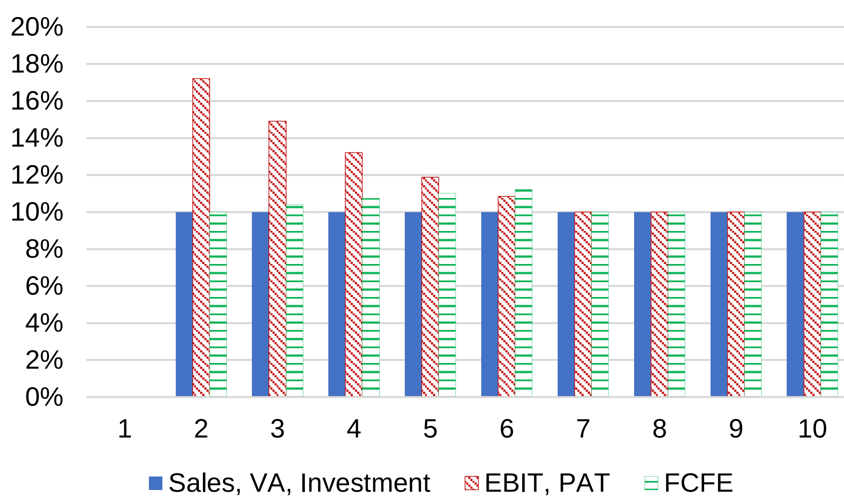
Level of analysis	Performance measure	Lifetime of machines		
		1 year	3 years	6 years
Macro	Added value	14 000.00	14 000.00	14 000.00
Industry	Sales	20 000.00	20 000.00	20 000.00
Industry	EBIT	2 990.38	3 409.16	3 920.00
Industry	PAT	2 392.31	2 727.33	3 136.00
Firm	ROI	59.69%	37.13%	27.45%
Firm	ROE	47.75%	29.70%	21.96%

Source: Calculation of the authors

Table 2 illustrates the differences between firms using machines of 1, 3 and 6 years of useful lifetime. We may conclude that while macro analysts would see no difference between the firms, industry analysts would see better performance at firms with machines of longer useful lifetime. At the same time, owners of the firms with shorter lifetime assets would be happier due to higher returns achieved.

Operational leverage would have no effect here, as costs are not changing over time, while the financial leverage decreases PAT and boosts ROE (if cost of debt is less than ROI). The effect of inflation may seem neutral for the first look, as both sales price and all types of expenses are inflated by the same percentage. This is indeed true for sales, added value, and investment but not for EBIT, PAT, and FCFE (dividend), once the useful lifetime of machines is longer than 1 year as it is shown in Figure 1.

Figure 1. Yearly growth rate at 10% inflation for machines of 6 years lifespan



The reason for this is that D&A is not indexed for inflation, so it takes time for it to reflect the growing price level with the gradual replacement of the machines at the new price level. The lower than realistic D&A increases EBIT and PBT (profit before tax). As due to this effect, PBT is increased by more than the inflation rate, the real tax burden of the companies grows. As invested capital (and so equity) is not indexed by inflation either, ROI and ROE also grow radically. This phenomenon is also illustrated by Tables 3 and 4.

Table 3. Effect of inflation on the first year's numbers (1)

Machine lifetime	1 year		
Inflation	0%	10%	Change
Added value	14 000.00	15 400.00	10.00%
Sales	20 000.00	22 000.00	10.00%
EBIT	2 990.38	3 790.38	26.75%
Tax	598.08	758.08	26.75%
PAT	2 392.31	3 032.31	26.75%
ROI	59.69%	68.78%	15.23%
ROE	47.75%	55.03%	15.23%
IC	5 009.62	5 009.62	0.00%
E	5 009.62	5 009.62	0.00%

Table 4. Effect of inflation on the first year's numbers (2)

Machine lifetime	6 years		
Inflation	0%	10%	Change
Added value	14 000.00	15 400.00	10.00%
Sales	20 000.00	22 000.00	10.00%
EBIT	3 920.00	4 720.00	20.41%
Tax	784.00	944.00	20.41%
PAT	3 136.00	3 776.00	20.41%
ROI	27.45%	32.14%	17.06%
ROE	21.96%	25.71%	17.06%
IC	14 280.00	14 280.00	0.00%
E	14 280.00	14 280.00	0.00%

This means that depending on the average useful lifetime of machines applied, a suddenly appearing inflation may distort statements for several years showing improvement in some of the measures while leaving other unchanged. On top of all that, the exact extent of distortions is also dependent on the type of equipment used by the firm.

Introducing demand fluctuation

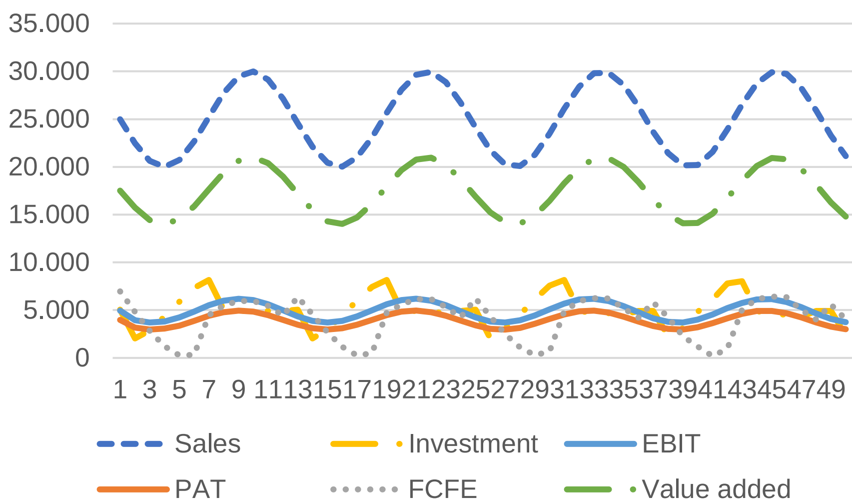
To get a more realistic model we assume some fluctuation in demand over time. To keep it simple we use a sinus function to achieve cycles between 2 and 3 million pieces per period. Figures 2 and 3 contrast the development of key quantities in case of different machine types. Our equation for demand (Q) is as follows:

$$Q_t = Q_0 + a * (1 + \sin(c * t)) \quad (1)$$

For the sake of example, a=500 and c=100 have been chosen as parameter values.

Figure 2. Effect of demand fluctuation – lifetime of machines: 1 year

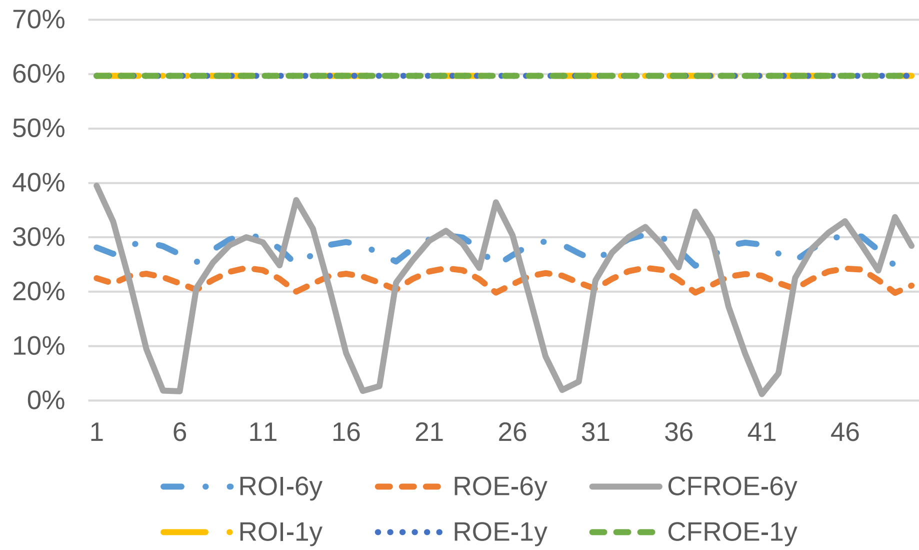
Figure 3. Effect of demand fluctuation – lifetime of machines: 6 years



Note that longer lifetime leads to investment and FCFE following new patterns. It is key to see that even during times of increasing output, sales and added value, the investment may fall back as the current capacity is dependent not only on the current investment level, but also on those of the previous 5 years. Due to this fluctuation, FCFE may not only grow when performance increases, but also when lower proportion of current profit is needed to keep production capacity at the required level.

Thus, cash flow and accounting profit will show different patterns when analysing the performance.

Figure 4. Effect of demand fluctuation – financial ratios



Differences are more dramatic when focusing on financial ratios instead of absolute quantities. As Figure 4 shows, the previously experienced synchrony disappears: in case of using 1-year machines CFROE, ROI, and ROE are unchanged and equal, as the firm can adapt to market fluctuations perfectly. When using equipment with 6-years life time, the company will have some unused capacity during some periods, destroying its capital efficiency. This means that the risk of shares of companies with these different production strategies will also differ.

Fluctuation and leverage

Now, that manufactured amount changes from period to period, the amount of operational leverage (percentage of fixed costs) plays an important role. Assume that two technologies exist: the one used until now with 6 units of variable cost (VC) per piece and no fixed costs (FC), and another with 4 units of VC and 5000 units of FC. Note that both of these technologies imply an EBIT of 4960 for the initial manufacturing quantity.

The only two measures that the operating leverage does not affect are sales and investment. As fixed costs do not change over time, more fluctuation is to be seen in all other quantities. Figure 5 offers a comparison between two otherwise identical firms using two different technologies.

Financial leverage (we assumed D/IC=50% and interest=10%) only affects P/L (profit and loss statement) items after EBIT. PAT and FCFE are both lowered by interest payment, but this would only hurt CFROE if ROI was lower than the cost of debt. During investment periods, FCFE is higher for the company with leverage, as part of its investment would be covered from debt. So, CFROE is boosted at any time due to the continuously lower equity requirement, as can be seen in Figure 6. It is also worth noticing that operational leverage increased risk by enhancing downside potential, while financial leverage (under the given conditions) fuelled risk by letting the upside grow (as ROI is higher than the cost of debt).

Adding inflation to the fluctuations will also complicate trend analysis. The steady price growth pushes up profits faster than sales or AV due to the lagging historical prices in D&A. This is due to the fact that (historical) book value of machines (IC) is not indexed by inflation, while profit is higher due to the D&A effect. ROI and ROE distortedly show better performance. CFROE is more realistic as D&A effect is not hitting it. FCFE shows radical fluctuations because the demand fluctuation requires to buy a huge number of new equipment every twelfth year. As FCFE is growing slower than investment, during those years, fresh equity needs to be raised to cover extra investment, while the real performance of the firm has not changed at all.

This means that just to maintain the same performance, owners have to pay in additional capital because of inflation. In other words, shareholders have to pay not to increase their business but just to keep what they have already possessed earlier.

As we have seen, once demand is not constant, it is not only the useful lifetime of equipment but also operational and financial leverage and inflation that would modify the measureable performance trends. In the next step we investigate how all these factors together may influence the financial numbers of a firm.

Let us compare the development performance measures of two firms facing the same demand trends but using different machines (1-year lifetime against 6-years lifetime), different technology (VC=6 only and VC=4 and FC=5000), and different financing (D/IC=0 and D/IC=50% interest=10%). For simplicity, we assume that these firms operate in the same country and face no inflation (0%). Note that the first firm is identical to what appeared in Figure 2.

Figure 8 illustrates the performance measurement problem of a given sector. Though sales trends are just the same (flat line at 100%), all other performance measures differ across firms due to individual characteristics. It is easy to see that distortions are very different both in size, form, and timing. So, when aggregating (summing, averaging) certain performance measures, we would end up concluding totally different trends for the whole industry altogether depending for ex., on the relative weight of the firms following the two given strategies.

One might think that careful modelling may help us to get rid of these distortions. Unfortunately, Figures 9 and 10 support the fact that the problem is more complex. Just increasing the wave length of demand fluctuation twofold or fourfold (slower fluctuation of the same size: c=100, c=50, c=25) leads to a very different set of differences. Distortions in performance measures become more similar as wave length increases. (Endlessly long waves can be very similar to the flat demand we used at the beginning of this paper.)

It is important to notice that while in case of the original fluctuation (Figure 8), ROE was able tooverperform the base model at peak times (Figure 2) due to a change in the wave length, this is not possible anymore for c=50 and c=25 cases. As for CFROE, only c=25 makes it impossible to perform better at any time. In other words, it is also the type of demand fluctuation that determines how successful a given strategy might be on the market. In our example, for fluctuations over longer periods, equipment with shorter lifetime is more adequate.

Figure 5. Performance with operational leverage as a percentage of that without leverage (machines used for 6 years)

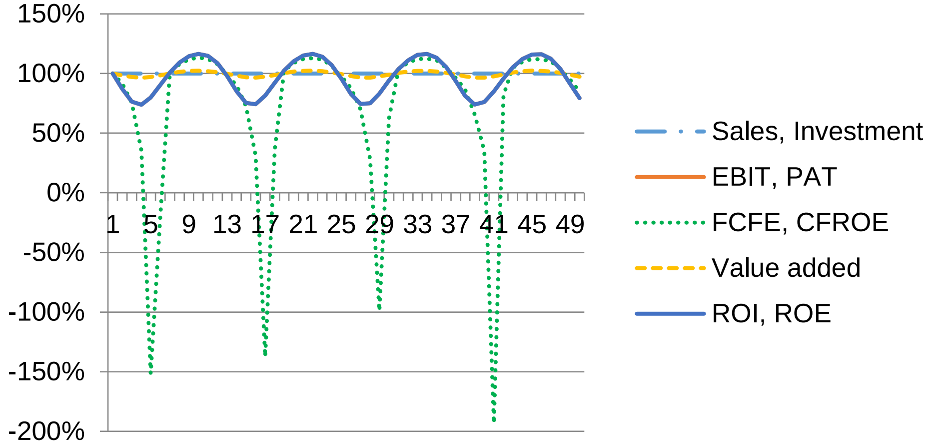


Figure 6. Performance with financial leverage as a percentage of that without leverage (machines used for 6 years)

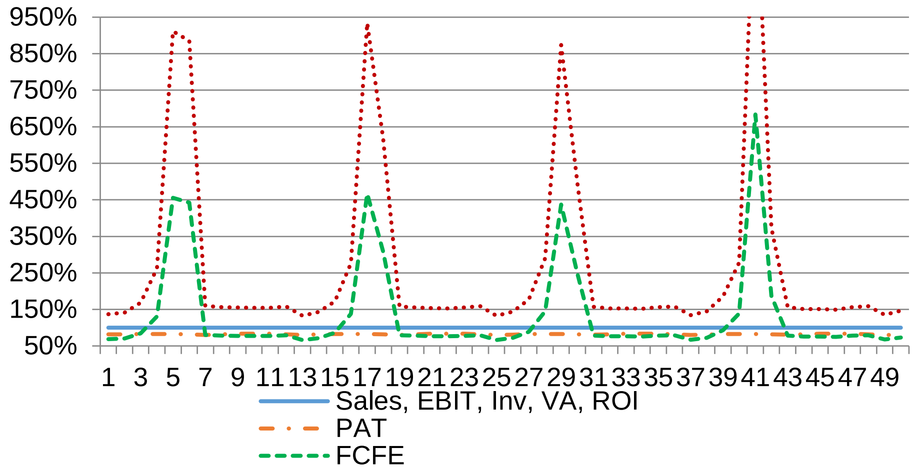


Figure 7. Performance with inflation (10%) as a percentage of that without inflation (machines used for 6 years)

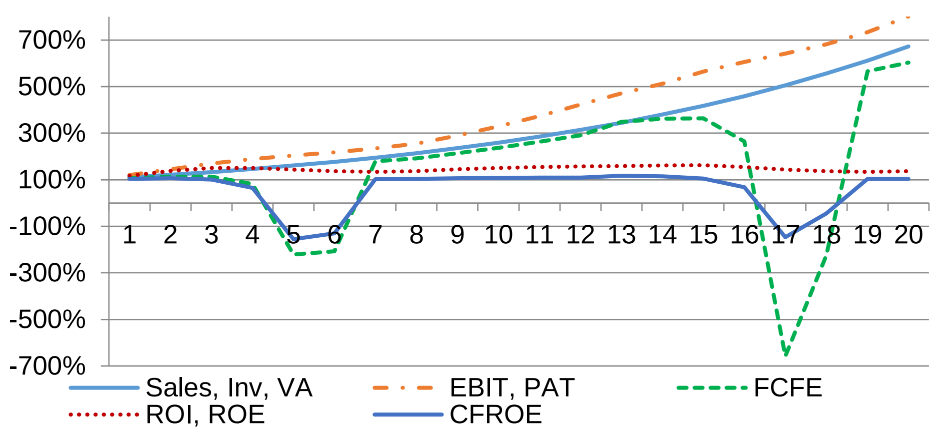


Figure 8. Comparing firms of different equipment, technology, and financing (a=500, c=100) (ratio of performance measures)

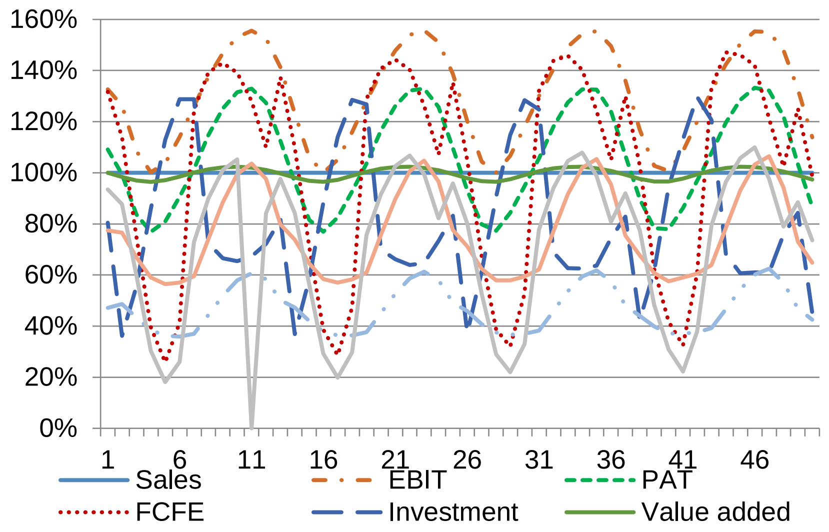


Figure 9. Comparing firms of different equipment, technology and financing (a=500, c=50) (ratio of performance measures)

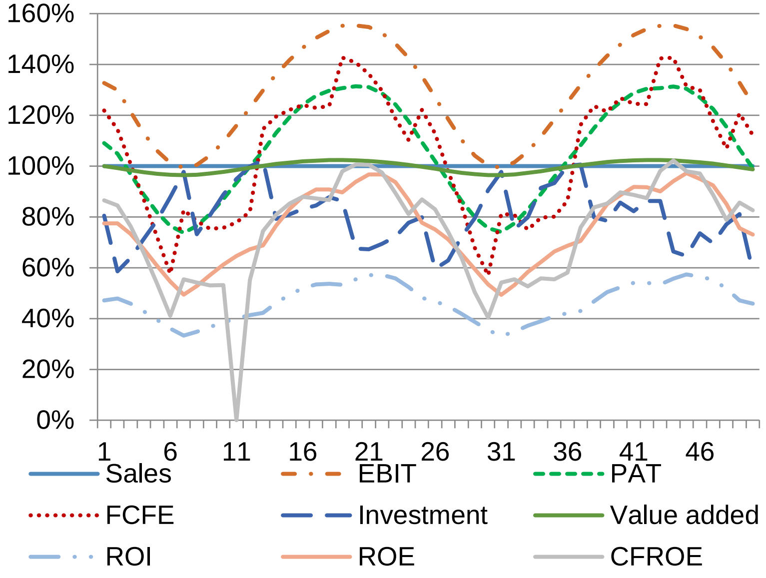
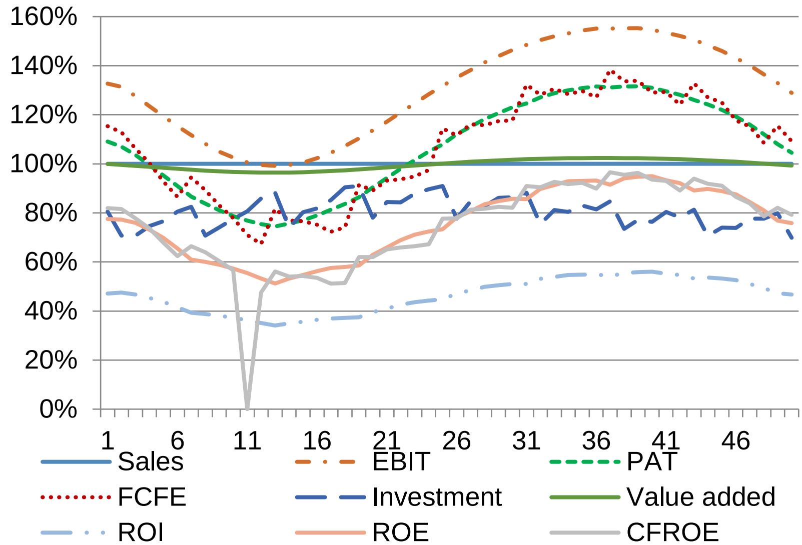


Figure 10. Comparing firms of different equipment, technology and financing (a=500, c=25) (ratio of performance measures)



Conclusions and limitations

We prepared a simple financial model of a manufacturing firm and analysed how the useful lifespan of equipment used (length of replacement cycle), operational and financial leverage applied (business strategy), demand fluctuation and inflation (market conditions) would influence performance measures. Even in case of stable demand the kind of assets used had serious effects on financial performance although financially, all of equipment alternatives cost the same (same yearly cost equivalent) – a result quite counterintuitive that is explained by shocks that the uneven equipment replacement creates.

We also saw that appearance of inflation not only increases tax payment in real terms cutting back on the value of the firm but, at the same time, it distorts performance measures to show a contrary trend. When demand fluctuation was introduced into the model it became clear that investment may not peak in periods where demand does depend on the length of equipment lifetime. Due to that, cash flow to shareholders may also be higher in years with lower demand. This could be explained mainly by the lower average capacity usage of the company with longer equipment lifespan. The use of short lifetime equipment seems to protect owners from fluctuations of profitability ratios, while operational and financial leverage increase risk. Though added operational risk shows in increased downside potential only, while financial leverage (under our assumptions) offered an enhanced upside potential when the cost of debt was below ROI. When considering inflation, a new serious problem was identified: because of demand fluctuations, owners were forced to regularly pay in cash to maintain the operation, an event that did not happen at all in real terms.

Finally, we compared performance measures of firms with different strategies but the same inflation to figure out that the choice of firms of machines and leverage would have dramatic effect on the performance measures making the original demand trend nearly unrecognisable. Depending on what kind of measure we focus on, the industry cycle would be described completely differently. This issue becomes particularly important in transforming economies. Once companies tend to change their strategy (some technologies, machine types gaining popularity or access to debt financing is eased) or the structure of economy is shifted preferring firms with a given strategy, we may measure macro trend changes that are not existing at all. That has been underlined also by Boz et al. (2011) and Dabla-Norris et al. (2015).

Unfortunately, these distortions are not even stable, but rather depend on the speed of market fluctuations. It is not only the size but also the speed of market fluctuations that determine how successful a business strategy would be. Due to these we have to be very careful when choosing a metric to track financial performance of a given industry of firm across time. Even a change in strategy could lead to very wild fluctuations in performance on a relatively stable market when different waves interpolate. This conclusion is just in line with the result of Holly et al. (2013) and Basile et al. (2014) emphasising the importance of individual firm characteristics.

Our models have serious limitations, though. In real life, firms may not be able to precisely predict the quantity to be produced and sold during the next period, which may lead to distortions in investments and manufacturing. No matter whether they over or under estimate demand, they will have worse performance than predicted by our model, as both unneeded capacity and market growth potential which are not completely used causes losses compared to the optimum. Inflation rates may also differ across various types of cost, particularly the increase of wages may be very different to that of the material expenses. This could lead to even more complex distortions.

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