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Performance Measures Transcript

**Part 3**: Performance Measures

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Now we go through, performance measures and some additional concepts, some additional related concepts.

Financial performance measures are financial key variables

External performance measures are what the others, customers, community, stakeholders, think about our process and our product and internal performance measures are those things which are at our control, like level of our inventory, flow time, and so on and so forth.

Financial measures are divided in three categories, absolute measures like revenue, cost, operating income, and net income.

These are measures which are computed on a yearly and monthly basis, usually yearly and monthly and their definitions are clear.

Then we have net present value, here we compute all cash inflows throughout the useful life of the project or the process, all cash outflows.

Suppose this is end of year 0,and here is year 1, year 2, year 3, and year 4.

Then we compute the difference between cash inflow and cash outflow, which are these parts, and then we bring all of them to the end of year 0, and suppose this is the present value of all the net cash inflow, and then we compare net value of cash inflow with net value of cash outflow, and if it is positive, we have a profit, if it is negative, we have a loss.

The difference between net present vale and net income, here we deal with cash, cash inflow, cash outflow, and here we deal with value of everything over the useful life of the project, all values brought to the present using different discount rates.

I will explain it later.

Then we have relative measures ,that is returned on invest whatever we have invested in this product or in this process, that includes whatever we have invested from ourselves, plus whatever we have borrowed.

Then we have return on asset, which is return on our equity plus liability, and then we have return on equity, which is just return on our asset minus our liabilities, which is our equity.

I may have total investment here, or total asset here, or total equity here in the denominator.

In numerator, I have earning before income tax minus tax, and then we have survival measures, which is our cash flow, we may have a lot of money but that may not be are own hands yet, but by the end of the month we should pay our employees, and if we don’t have cash, then we will be in trouble.

We should pay for raw material and components that we have logged, so if we don’t have cash, then we will be in trouble.

The problem with financial measures are they are aggregate, they are not in very detail, they are result oriented, rather than action oriented, and they are lagging.

Financial measures should be linked to external measures and internal measures.

External measures track customer satisfaction, internal measures track operational effectiveness.

External measures track customers satisfaction or dissatisfaction, customer satisfaction we may have surveys regarding if the product meet and exceed customer expectations in the four dimensional space of competition.

Customer dissatisfaction may be measured based on the number of warranty repairs, product recall, field failures, the same as financial measures.

External measure are aggregate, they don’t direct us to a specific point and they are result oriented, not action oriented, and they are lagging, they are not leading.

External measures must be linked with internal measures, internal measures track operational effectiveness and process manager can control that.

It is true internal measures that we can improve external measures and financial measures, suppose customers are not happy because our fights are always delayed.

We can set up an internal goal, average arrival and departure delays cannot exceed 15 minutes, and then if it exceeds 15 minutes, we should go and look what is the source of the problem.

Is it our human resource, our capital resource, our information infrastructure, our inputs, our processes and buffers, where is the problem?

Then we should try to fix by training, or by new methods, or by better management, or by better technology, and decisions like this.

Suppose customers unhappy because when they call us it takes a long time to get the operator, they should wait for a long time on the line.

We may set up an internal goal, which says we need to answer 95% of the calls in less than 30 seconds and if they can’t they we should find out what is the source and improve that source.

As soon as we improve that source, our customer will not complain anymore and because our customers are satisfied because they are the most important people in our company, when they are satisfied our financial measures will improve.

Suppose customers want flexibility, more models, more options in our product, then we should transfer that variety that our customs want into internal flexibility and we say internal components where flexibly are short set-up time, crossed trained workers, therefore, we should for example, set up a goal that our set-up times to move from one product to another shouldn’t exceed 30 minutes, or all the workers should know one additional task in addition to what they already know.

For example, in UPS hub in Lousiville, Kentucky, all the managers know how to do the job of the operator, so in peak days, or if some part of the human resource goes on strike, or something like that, then the manager can come into the line and perform the tasks.

Suppose customers are not happy with the quality of our products, then we may set up a goal that failure rate should be less than 1 in 100,000, and then if it is more than that, then we should go and see if it is from the material, if it is from the operator, if it is from the machinery, and so on, and find the source and fix, we are trying by improving the internal measures, improve the external measures, improve satisfaction and loyalty of our customers, and if we improve in that dimension because customers are the most important elements of our production system, then our financial measures will improve.

Now I will go through three financial measures.

If you already got a course in Finance you already know these measures, but I will go through them anyways.

The first one is Pay Back Period, the number of years needed for the project, or the process, or the product to repair its initial investment, pay back period therefore, is defined as initial fixed investment divided by annual net cash inflow.

Suppose a project or a process costs $100,000 and it is expected to save the company $25,000 per year.

$25,000 savings per year, either increases the profit by $25,000 or reduces the loss of the company by $25,000.

In the first case, it will increase taxes.

In the second case, it will decrease tax savings, therefore, in both cases, we need to know what is the tax rate, and tax rate in this example is 20%, therefore,$ 25,000 saving after computing for tax is $25,000 minus $5,000, which is $20,000.

So $25,000 savings for the company is transformed into only $20,000 cash flow because either taxes of the company will increase by $5,000, or tax savings will decrease by $5,000 and net effect will be $20,000 cash inflow, cash inflow per year.

Initial investment is $100,000, net cash inflow is $20,000, therefore, five is pay back period.

It takes five years for this project to repay the initial investment, now if the project is in place for more than five years, that is considered by this factor a reasonable investment, and if it is in action for less than five years, if the project life is three years or two years then this project is not that good project.

Pay back period, five years.

Let’s go through another example to feel more comfortable with the difference between income and net cash flow, and also the concept of pay back period.

Suppose we have a project or a process, the initial investment at the end of year 0 is 10 million dollars, depreciation is a straight line, salvage value is 0, accounting life of the project is 5 years, so the project is 10 million, salvage value is 0, accounting life is five years, therefore, depreciation per year is 2 million dollars.

Net income before tax and depreciation is 3 million per year, tax rate is 40%, compute net income after tax in year 1, compute net cash flow in year 1, compute pay back period.

Net income before tax and depreciation is 3 million dollars, depreciation as we computed is 2 million dollars per year, income before tax is 1 million dollars, three minus two, one million dollars.

Tax is 40% of 1 million dollars, which is 0.4 million dollars, therefore, net income after tax is 0.6 million dollars, this is the answer for the first question.

Compute the net income after tax in year 1.

What is the answer to the second question?

Compute net cash flow in year 1, so I have 0.6 million dollars here and I have not spend this one, this is still available to me it was not cash outflow, therefore, net cash flow in year 1 is 2 plus 0.6, which is 2.6, therefore, out of 3 million dollars profit, 0.4 of it went to tax, the rest 3 minus 0.4, which is equal to 2.6 is cash net inflow.

Net cash inflow per year is 2.6, initial investment was 10 million dollars, 10 million dollars divided by 2.6 million is 3.85 years.