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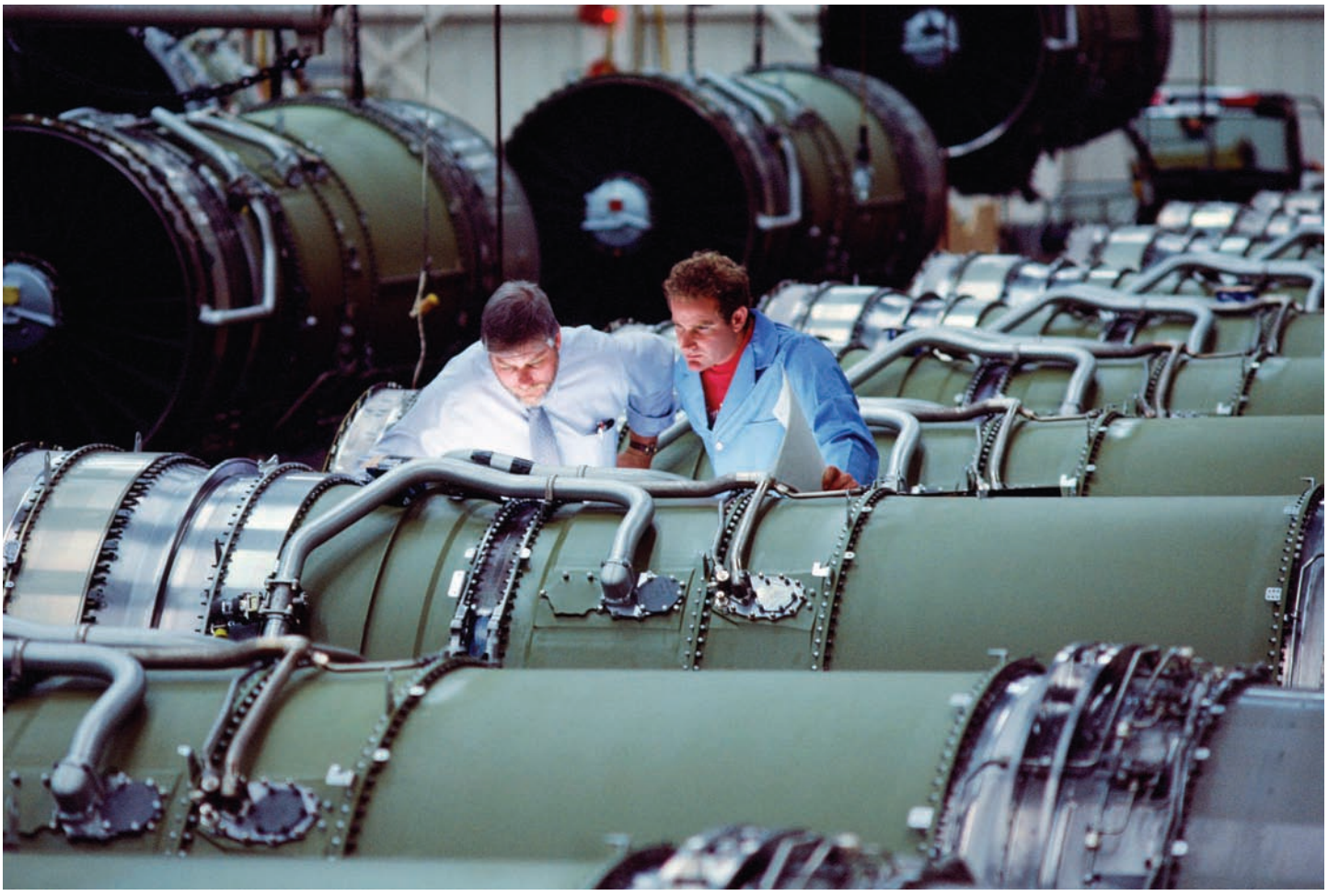
Serious Tire-Kicking For Sizing Up the Shop Floor



An in-depth analysis tool, Operational Due Diligence, helps investors flesh out whether a target's manufacturing operations would enhance or reduce deal value.

By Guest Writer Charlie Reid

You're a private equity investor looking to buy a manufacturing company. You've carefully examined the company's business case. You like the market and the industry. You like the company's position and potential. And management appears to be first-rate.

While the business seems to be humming along in full swing, you're not quite sure whether this company is operating

efficiently enough to meet the needs of the future you have planned for it. How do you make sure? Enter Operational Due Diligence (ODD).

ODD is a technically focused analysis of the target's operational characteristics to assess whether it can deliver the pro forma operational performance it promises. ODD can also surface any operational weaknesses and, to a lesser degree, it identifies and quantifies the target's upside potential.

ODD Misconceptions

When people learn that I specialize in ODD, they'll often nod knowingly and say something like, "You tell your clients whether a company is a good manufacturer or a bad one, right?"

That's half right. ODD is not so much about determining whether a company is strong or weak as it is about ascertaining that it is what it claims to be.

Sample questions addressed in ODD include:

- Can the company support projected growth?
- Is the projected capital expenditure (capex) high enough to support the operations? Is it too high?
- Are there well-documented operating cost improvements resulting from capital projects? Are these improvements properly reflected in the pro formas?
- Do the operational cost statements withstand close scrutiny? Is projected performance consistent with historical actuals? If projected performance is better than historical actuals, does the target have operational plans that support the improvements?
- Are there operational weaknesses that diminish deal value?
- Is there undocumented upside potential for improvement? How would improvement be realized, and how much capital would be required?

A company with ineffective management and/or below average (even far below average) operational fitness, when compared with either peers or benchmarks (such as lean manufacturing standards), can still deliver the results it has delivered historically. If pro forma projections are based on historical performance levels and the results still present an attractive investment opportunity, the fact that the target is underperforming is nothing but good news for an investor.

> Many disruptive weaknesses do not show themselves until growth strains the infrastructure to the point of failure. Should this occur, the failures can be swift and catastrophic.

Where to Look

ODD should include much more than a review of the shop floor. Investment risk, deal value drivers, and business weaknesses exist in many other technical areas of a manufacturing company.

Also look for competence and capacity in:

- New product development;
- New product launches;
- Information systems;
- IP strategy development and execution; and
- Manufacturing strategy development and execution

The most intensive area of review in ODD will almost always be the factory's shop floor and supporting departments, such as production planning, quality management, and maintenance. But it's a good idea to make sure that you don't ignore ancillary areas.

Is ODD Necessary?

Private equity firms and mezzanine lenders have been investing in manufacturing companies without conducting in-depth ODD for quite some time. Is that a mistake? Not always.

If the target has some or all of the following characteristics, a deep dive into operations may not be needed:

- A relatively simple manufacturing process — e.g., made up of one or two processing steps, or consisting only of assembly of supplied components.
- A simple bill of materials — e.g., a handful of raw materials or components.
- The direct workforce doesn't seem to change much with volume fluctuations.
- Operations are not even close to full capacity — e.g., running on one shift Monday to Friday.
- Projected growth will not come anywhere near the "full capacity" point. If it's close to full, it should be subject to detailed capacity assessment.

• The company makes a small number of products, and this mix will not change much in the future.

A manufacturer with all of these characteristics is normally quite stable, has fewer potential points of failure, and is easy to model. It's usually much easier to see potential operational risks in simple operations like this. In this case, you might get away with a less-intensive review.

A Word About Growth

Almost every deal I've encountered has had some element of revenue growth, and sometimes it has an extensive element of such growth. Growth is one of the most coveted characteristics of a deal and ironically, for a manufacturer in particular, it creates the biggest business risk. Significant growth strains capacity, production management systems (both manual and information systems), maintenance resources, and quality management; it also drives capex and launch activities that, in turn, drive cash flows and, in some cases, influence revenue flows.

Generally speaking, growth is hard on a manufacturing operation. When seemingly healthy manufacturing companies fail, often failure to manage growth is to blame. Interestingly, this is a point of failure often overlooked by analysts charged with looking for "operational" problems.

But not all growth adds the same amount of risk to a business. To understand the risk posed by growth, you first need to understand the nature of the growth to be absorbed.

Questions to consider include:

Does the growth involve introducing and making new products?

If the target will be growing by selling more of exactly the same product that it currently makes, it might reasonably be expected to operate in the same way as it always has. Here the number of shifts (and thus headcount) needed to handle increased production, including the number of trucks that need to be filled, etc., increases but almost everything else stays the same (e.g., approach to scheduling, amount of tooling, the number of changeovers, invoices, and purchase orders, etc.).

> A machine with an uptime efficiency of 85% to 95% often can have OEE in the 60% range — making a huge difference in assessing capacity.

If new products will be introduced, how many new part numbers will be involved?

Risk increases as the number of new products/part numbers increases. Twenty million dollars in growth from one new part number is much easier to launch and integrate into a production operation than $20 million over 40 new part numbers.

A new part adds complexity. Each new part makes production scheduling more complicated, means that new sets of quality assurance documents need to be created and maintained, increases the number of quality checking gauges and fixtures to store and deploy, and increases the amount of production tooling to use. New parts need to be counted. They require inventory storage space. Parts inventory must be managed, and suppliers must be established with a setup for credit checks, etc.

Additionally, each part number must be launched and managed by a team of engineers. All of the above are true whether the part number is high- or low-volume. Infrastructural strain is directly proportionate to the number of new parts being introduced, not the revenue from those new parts.

Are the new products considerably more complex than existing ones?

When the target company needs to learn new manufacturing techniques in order to roll out a new product, the risk of failure or delays in the product launch increase.

Does the target have a track record of successful new product launch?

Regardless of the number or complexity of the new part numbers to launch, a critical indicator of success is how well the target has executed new product launches in the past, including how well the company has handled introduction of new manufacturing techniques.

Nothing destabilizes a production system like growth. It's helpful to understand the nature of the growth you're facing to better understand how much it may disrupt the target's operations.

Fatal Weaknesses

As mentioned earlier, ODD is not so much about operational strength or weaknesses. It's important to qualify this. If the target is fatally weak in any operational area, this weakness will eventually lead to significant business disruption, or possibly even business failure. At the very least it will lead to an unexpected and dramatic increase in costs to operate. So while a classification of strong or weak isn't of particular importance, the identification of significant disruptive and or costly weakness is critical.

There are several thorny aspects of fatal or disruptive weaknesses. The first is that serious weaknesses can exist in operations that are otherwise strong in almost every other regard. Even trickier is that a condition that represents a grave weakness in one company would be totally acceptable in another. Yet, the trickiest aspect is that fatal weaknesses can often be insidious and difficult to spot.

Many disruptive weaknesses do not show themselves until growth strains the infrastructure to the point of failure. Should this occur, the failures can be swift and catastrophic.

Looking for Fatal Flaws

In addition to examining the impact of growth and the product launch capability, what other factors should be scrutinized?

Some typical factors that can compromise the target company include:

- Major quality problems resulting in product recall and or massive increases in either internal or external inspection.
- Underestimating the capital required to support the business, resulting in the inability to meet customer demand and, thus, revenue projections.
- Costing errors (usually on new business) resulting in significantly understated projections of actual costs.
- Vastly overstated valuations of inventory — sometimes related to costing errors, sometimes premeditated fraud. Either case is extremely difficult to find unless you suspect it.
- Vastly overstated estimates of the payback from capex projects.
- Major equipment failures crippling production capabilities for extended periods of time.
- Underpowered information systems.

Some of these issues cannot be detected despite the depth of your ODD, but your chances of unearthing them increase by heightening your level of scrutiny.

Two critical elements that surface in most of my due diligence work are confirming the capacity to grow, and establishing the reasonability of capex. Outlined below is a brief review of how to look at each of these key factors.

> There's no such thing as a normal level of scrap, productivity, or downtime for manufacturing companies, even manufacturing companies that use the same production technologies in the same industry.

Calculating Capacity: Tips and Traps

Manufacturing companies do detailed capacity analyses about as often as they anticipate growth will exceed their existing capacity — roughly every 5 or 10 years. It shouldn't be surprising, therefore, to find out that, generally, manufacturing companies do a relatively poor job of detailed capacity analysis. Dangerous shortcuts can result in huge inaccuracies.

Shortcuts could include using the average sales revenue per hour or average units per hour to extrapolate sales capacity. But most companies make a number of diversified products, and the various products take different amounts of time to make; they are also priced differently and often have different margins. Unless the company has an extremely simple product mix, average revenue or units per hour can generate misleading conclusions.

Estimating sales capacity is by far the most technically demanding part of ODD. Getting it right depends on understanding the production characteristics of both the current and intended product mix, in quite some detail.

At this point, numbers-crunching is critical. While tedious, the most accurate way to do capacity analysis is part number by part number. For each part number you need the volume, estimated production standard, and, if available, the actual scrap and efficiency for the part number. It's perfectly normal to find a wide variation in the latter figures from part number to part

number. In fact, if you don't find any variation, you should be suspicious of the data.

For new volume you will need the same information, but projected scrap and efficiency will need to be based on similar products, *not* the average levels for all parts. Even with this approach, keep in mind that most efficiency figures quoted by most manufacturing companies refer only to the machine's effectiveness when it's running. Capacity consumption is as much about how often the equipment runs as it is about how fast it runs.

The measure of efficiency needed is the effective utilization of the total available time, including all sources of downtime (e.g., both planned and unplanned maintenance, breaks, lunch, setup time, etc.) It includes adjustment for time spent making poor-quality products and time spent running the equipment at speeds below standard. This measure is more properly called overall equipment effectiveness (OEE). It's quite

uncommon for this measure to be reported, but ask for it anyway. If OEE is unavailable directly, it (or a proxy measure) needs to be derived.

OEE always will be considerably lower than most "efficiency" numbers. A machine with an uptime efficiency of 85% to 95% often can have OEE in the 60% range — making a huge difference in assessing capacity.

Capacity Analysis Outputs

Effective capacity analysis should result in determination of the target's capacity to support projected growth.

Most investors also want to know how much more revenue could be supported with the existing assets as well as how much more could be supported by adding more resources into available space.

Insufficient capacity to support projected growth need not be a deal-breaker, although it may decrease the deal value for an investor.

Capital Expenditures

Once you've established the revenue level that the target's operations can support, next you should determine the amount of capital that will be needed to yield this level of growth.

Capex projections can vary considerably from one year to the next, over several years. As such, evaluating capex projections is usually much more speculative than evaluating capacity. At this point, it's more about "reasonability" than "precision." Again, the target's historical performance will set the bar for establishing "reasonability."

Most investors are familiar with the terms "maintenance capex" and "growth capex." Some analysts, including me, prefer the terms discretionary and nondiscretionary.

Curve Balls

Other complexities and nuances of ODD worth mentioning include:

- Overhead rate miscalculations are quite common, and they influence both inventory values and capital justifications.
- Only the capacity of the bottleneck operation matters. Different products often have different bottlenecks. You can save a lot of time if you can identify them.
- "Full capacity" needs to be defined at a number below 100% utilization to accommodate the need to surge production every now and then (for equipment breakdowns, quality problems, or other disruptions).
- Efficiency of 85% means to divide standard hours by 0.85, not multiply by 1.15.
- Major revenue growth is often won by aggressive pricing. Watch out for margin differences on new business.
- There are two kinds of scrap: "Process scrap" (the bad kind) and "engineered scrap" (the inherent kind). Make sure you know which is which.
- Using contribution from incremental revenue in a capex justification is almost never appropriate and will overstate the true benefit of the capital investment.

Maintenance, or nondiscretionary, capex is that which is required to sustain operations and to protect the ability to produce revenue. It includes repair capital, replacement capital for worn-out assets, building maintenance capital, etc., as well as regulatory capital expenditures, such as environmental compliance, safety compliance, etc. A good rule of thumb is that projected maintenance capital needs to be at least as high as it has been historically. Once that's determined, look for equipment that could be on its last legs.

Discretionary, or growth, capex supports expansion into new territories or business lines or otherwise supports revenue growth. Discretionary capex is a one-time expenditure made to reach a new level of earnings and revenue. Generally, discretionary capital will do one of two things for the target: It will either increase capacity, such as additional productive assets, or it will decrease costs, such as adding automation to existing productive assets. In many cases, it will do both.

When reviewing discretionary capital, it's important to establish the reasonability of the estimated returns. Examine this carefully because this will tell you whether the projected capital is needed or not. In middle-market or smaller manufacturing companies, be prepared to find little or no documentation of capital projects. In these cases, you will need to find other means of establishing the payback.

Often the target has overstated discretionary capital paybacks, meaning that there's a good possibility that these investments can be avoided in future cash flows. Another common finding is that even though proposed paybacks withstand close scrutiny, they have not been accurately reflected in the projected operating cost statements. Therefore, an investor might not need to spend as much future capex as the company has projected, and the operating performance will be better to boot.

Equally important in establishing the reasonability of capex projections is the historical performance record on major capital projects. An investor should assume that a company with a history of being late and coming in over budget on major capital projects will continue this behavior in the future. In these cases, the projected capex should be adjusted upward by some amount — generally, an amount that reflects historical budget variances.

Myths and Misconceptions

It's worth dismissing a few myths and misconceptions about the nature of manufacturing operations and what you can expect from ODD.

First, there's no such thing as a standard or normal level of scrap, productivity, or downtime for manufacturing companies, even manufacturing companies that use the same production technologies in the same industry. Put aside the fact that there are no standardized definitions of operational measures from one manufacturing company to another, as well as the fact that engineered standards may be developed differently at different companies. The normal amount of scrap, productivity, or downtime will depend on the number of parts numbers produced, the amount of equipment available, and the specific complexity of the company's product mix. What is "normal" for a company is what it has consistently produced in the past. That is why you can't compare one manufacturer's scrap level, downtime, or efficiency with another's unless the two companies have exactly the same product mix and equipment configuration.

Second, you can't tell whether an operation is operating "normally" just by observing it. You can establish the degree of operational sophistication, and some aspects of its operational strength or weakness. You can spot opportunities for improvement, and you may even be able to quantify this upside, but you will not be able to tell whether the operations are running normally.

In order to evaluate the target's current performance, you need to determine what it normally accomplishes. Again, historical performance is the critical indicator. Watch out for significant shifts in operating ratios (say percentage of direct labor, percentage of material, etc.) from historical levels. Sometimes, the shifts may be supportable, but other times they are not.

Summing It Up

A recurring theme of ODD is the importance of understanding the target's historical performance record. At its core, ODD provides decision support to investors. No matter how technical the analysis or the findings, everything needs to be placed in deal context. ODD should clearly flesh out whether the target's operations enhance or reduce deal value.

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