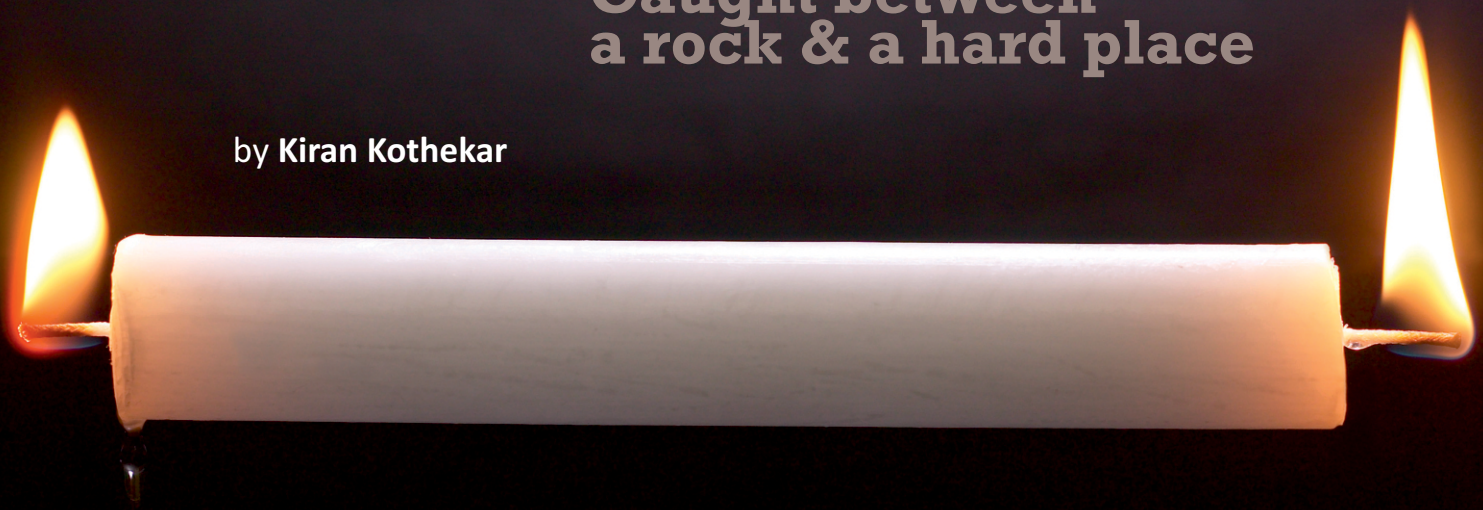


The Agony of the Tier 1 Suppliers

Caught between
a rock & a hard place

by Kiran Kothekar



Most Tier 1 suppliers of OEMs claim that they supply more than 90% of the requirement of OEMs for the month. Yet, most OEMs declare that their suppliers are unreliable and that they have to continuously follow-up for material.

At the beginning of the month or end of the previous month, the suppliers get a monthly plan with a weekly schedule. They plan raw materials, parts, and production batches accordingly. The same plan is communicated to their suppliers (Tier 2). Generally, in the first week itself, the Tier 1 suppliers get communication from the OEMs that the weekly schedule has changed. Some items are required earlier than scheduled. As the procurement and production batches are planned, this leads to huge expediting and replanning in the Tier 1 suppliers. They also have to reschedule their suppliers. Some suppliers are unable to cope with the changes and fail in their delivery. As the OEMs cannot produce the assembly (vehicles) even if one item is not available, nor can they leave their capacities unutilized, they have to reschedule again. This again forces a change of plans given to suppliers. Soon, sales of OEMs are not getting models according to forecast given. Compound this with the fact that the forecasts provided by sales cannot be accurate, and hence sales also forces continuous changes in the original plan. The schedule given to suppliers is changed again, and thus the vicious cycle continues.

The OEMs demand reliable delivery and blacklist suppliers who perform poorly. Rightly so, as the consequences of poor delivery from the supplier result in huge damage for the OEMs (eg, stockouts and

surplus of models, loss of capacity, constant expediting, etc). Most suppliers have established capacities to deliver specific products (eg, radiators, starters, filters, etc), and losing business is huge risk to their financial performance. Being unreliable toward the OEMs puts them in a weak position to ask for price increases, which influences their profits and capability to add capacity.

Suppliers keep asking OEMs for a stable plan. However, due to the vicious cycle described above, the OEMs are unable to provide a stable plan.

The only way out for the suppliers is to keep huge inventories of Raw Material (RM) and Finished Goods (FG). But there is a limit to the working capital that can be deployed, as margins are shrinking in every quarter. As the plans given by OEMs change frequently and have spikes, soon the tier suppliers land up with mismatched inventory – for some items the inventory is for many weeks (or months), while for others it is very less or stocked out. Hence, in spite of having high FG inventory, the Tier 1 is still firefighting and working hard to meet daily schedules. High inventories have resulted in huge financial losses during the downturn, as the age of current inventories suddenly doubles or triples when demand falls abruptly.

The suppliers are caught between a rock and a hard place. They neither get a stable plan from the OEMs, nor can they increase inventories to provide for the variations in this plan.

The way out

In the auto industry, JIT/Kanban/Toyota Production System (TPS) is considered the solution for a reliable and lean supply chain.

Most OEMs are beginning to adopt TPS. To them it means having 1-2 shifts inventory of parts in the plant. They have adopted the policy of ordering the parts on the same day or the earlier day for production plan for the day (drop plan). Without a stable plan, this results in a huge chaos at the supplier. The TPS at the OEM will not work if the suppliers are not reliable. As a matter of fact, the suppliers are paying a huge price as a result of adopting this system.

Worse, some suppliers have implemented TPS/JIT with partial understanding of the TPS system. The most popular visible features of TPS include very low inventory and spic & span shop floors. They have adopted the 5S approach and restricted space for inventory. They have adopted the same principle of 1-2 days of RM inventory and expect their purchasers to get the material from Tier 2 suppliers on a daily basis. With the schedule of the OEMs changing nearly daily, and the Tier 2 suppliers not equipped to react for daily changes, it is a near impossible task to get the RM for that day on the same or earlier day. Unfortunately, most Tier 1 suppliers have to gather parts (kits) to make assemblies. Unreliability of suppliers and the need to utilize capacities lead to a production plan that is not in sync with the OEM requirements. Therefore, the vicious cycle has been continuing since a long time.

There are two fundamental reasons why TPS/JIT is not successfully implemented in most OEMs and their supply chain:

- ➔ The plan from the OEM for the month must be stable, ie, no change
- ➔ The suppliers have not been well equipped to implement JIT

However, both changes look very remote in the short term.

The way out for Tier 1 suppliers: The OEMs should supply frequently to actual sales (at the dealers) as observed on a daily basis at the dealers (ie, replenish daily what is sold daily) and from a central FG stocking point. This regular replenishment to actual sales ensures that the dealers will not have capital locked in non-

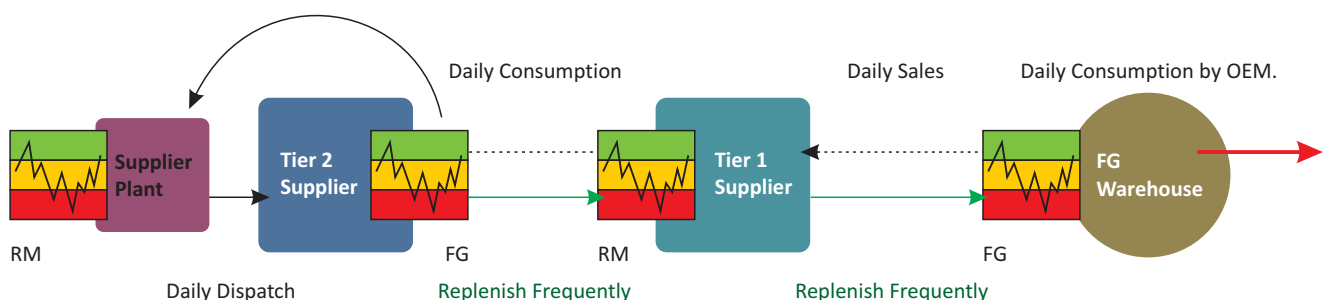
moving stocks, thus preventing the need to postpone buying or prepone by the attraction of higher credit limits. False signals of high/low demand are prevented from entering the plant. The challenge here is to meet the numbers without pushing. Sales has to work in the market to increase secondary sales, and not on primary sales. (The impact of push sales is seen in the subsequent month if the dealers do not sell the required quantities pushed earlier).

Due to the Principle of Aggregation, the central warehouse cancels out the variations from the dealer's sales across the nation (high sales of a model at some of the dealers while low sales at others), thus providing uniform load for each SKU to the plants. The OEMs' plants can increase production to fill the FG buffers, but no additional production. Also, sudden spike in demand on some days is absorbed by the FG buffer, and hence the panic is not relayed to the Tier 1 suppliers. Therefore, the production plan according to the requirement generated from the penetration of the OEM FG buffers is quite uniform across a period, and the same is relayed to the Tier 1 suppliers. Consequently, the Tier 1 suppliers will face a fairly uniform and stable demand.

This appears logical and an excellent approach, but bringing about this big change in the OEMs planning from Push to Pull is beyond the domain of the Tier 1 suppliers. Waiting for the OEMs to make this change will not help the Tier 1 suppliers. The Tier 1 suppliers have no choice but to invent a system that can ensure high reliability on a daily basis at lower inventories, in spite of unstable planning by the OEMs.

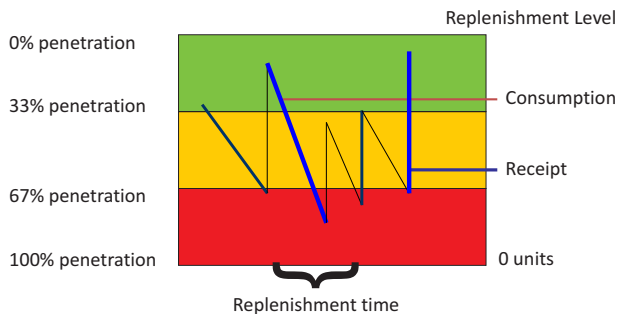
The direction of solution for Tier 1 and 2 suppliers: The Tier 1 supplier maintains an FG buffer and supplies daily requirements of OEMs from the FG buffer. ***Production is defined as planning to fill the buffers and not reacting to OEMs' schedules. This is a critical change.*** The question here is what should be the size of FG buffer. If all components, procured or made inside, are available at all times, usually, the assembly time of any product in the Tier 1 supplier is 1-3 days. With such reaction times of production, an FG buffer of 10-12 days is sufficient to address any reasonable daily demand from the OEMs on a daily basis.

In order to maintain continuous availability of parts, the same system of replenishing to the RM/parts buffer is followed with the Tier 2 suppliers as well.



At times, the load on the plant (which is the difference between the target level of the FG inventory and the current stock across all SKUs) will be greater than the capacity on a given day. The available capacity could reduce due to various issues such as absenteeism, manpower unavailability, and/or breakdown of machinery. There has to be a priority system to decide what has to be produced in limited capacity for the load generated from the penetration of FG buffers. As the objective of the plant is to maintain availability of all items in the FG buffer in all warehouses, the priority is decided by the penetration of the stock into the buffer. The lower the stock as compared to the FG SKU target level, the higher is the priority. For making the

communication simpler to the plant, the target level is divided into three equal zones – the bottom one-third is red, middle one-third is yellow, and the top is green. The stock level moves between the three zones.



The stock level in red gets the first priority, followed by yellow and then green.

The stock of the RM parts is also colored accordingly and communicated to the suppliers in the buffer penetration report every day. The supplier produces/supplies the red stock first. The supplier is convinced to keep similar buffers of items that the Tier 1 has buffers for, and gets assistance to change production planning to maintain availability in his FG buffers. If Tier 2 maintains FG buffers, the Tier 1 can maintain buffers sized to accommodate just the transportation time from the Tier 2 along with some safety, ie, very low inventories of 3-6 days for local suppliers and about 10 days for suppliers outside local area.

Why would the Tier 2 supplier agree to keep FG buffer and follow the replenishment system? He gets the benefit of a uniform demand and transparency to the real priority from the Tier 1. He can use this transparency to prioritize his limited capacity to prevent using capacity on a not immediately required part. This helps the supplier to improve service to his customers. Capacity is released, as he is not producing items that are not required. Also, as the load is uniform, this helps him to plan his RM at lower stock levels. Over a period, the demand rate of OEMs' models changes. Continuing with the initially sized buffers can still lead to stockouts and surpluses. Having a mechanism that changes the target levels based on changes in the rate of consumption helps maintain appropriate inventory levels, Dynamic Buffer Management captures trends (decrease or increase) in the consumption of the OEM immediately. If the part is continuously dipping in red for the period of the replenishment time, and there are no issues on the supply side, it indicates an increase in the demand. The buffer is increased by one-third to accommodate the increase in demand, and a similar step is taken for the decrease in demand. The only difference here is that the decrease is evaluated over a longer period, ie, being aggressive while increasing and cautious while decreasing buffer sizes. During a downturn, as signals are captured early, the inventory levels are decreased early. The disastrous vicious loop of capital getting locked in a slow-moving inventory is avoided and the Tier 1 and Tier 2 suppliers can sail smoothly even during the downturn. Such changes can be facilitated by using a simple software tool. For any changes more than 33% (seasonality, etc), the changes are made manually, thus changing the buffer levels once and letting the system takeover for further increase or decrease.

Described above are some of the elements of the Theory of Constraints (TOC) solution for managing operations in order to maintain availability at very low inventories that Vector Consulting Group has implemented in Tier 1 suppliers to achieve over 98% reliability on a daily basis as well as increase output significantly (over 40%) while reducing inventory substantially (at least 30%). More significantly, the firefighting is nearly eliminated, which releases considerable time of the senior managers. The time released is used to take up improvement projects to decrease lead times (which decrease inventory further), value engineering projects to reduce material costs, and work with suppliers to reduce cost of parts, thus increasing gross contribution and profits.

OEMs will also favor such suppliers as these meet the inherent requirement of the OEM – Guarantee for Availability (GFA) for any plan on any day. The OEMs will increase business share with such Tier 1 suppliers, as they realize that the gains of reliable delivery on a daily basis is many times the gains from a cheaper, but unreliable, supplier. For the Tier 1, this will result in increase in volumes. If these additional volumes are produced from capacity released from the existing infrastructure, the gross contribution of the additional sales adds to the bottom line (as fixed costs have not increased), thereby increasing profits significantly.

The analysis of the buffer trends (continuous reds) will reveal the areas of improvement. The obstacles exposed and projects for reduction in lead times reduce the buffers continuously, bringing the system to deliver JIT or TPS service to OEMs, despite their frequent changes in plans.

Following are two cases of Tier 1 suppliers who implemented TOC thinking and solutions company wide, with Vector Consulting Group, and achieved fantastic results, creating a win-win situation for the Tier 1, OEMs, as well as suppliers of Tier 1:

Fleetguard Filters

Fleetguard is a company of the Cummins group, market leader in manufacturing and supplying auto filters for the commercial vehicle segment. The company delivers a service of over 98% for daily requirements on an everyday basis to all its OEMs. It has been delivering this service for the past five years, since it started the TOC journey. The output has increased by over 100% from the existing infrastructure.

Tata Radiators Ltd

Tata Radiators Ltd is a company of the Taco group, and supplies radiators and intercoolers to the OEMs. In one year, the company has improved its service levels to daily requirements to OEMs to over 97%. The output of the plants has increased by over 30%.

Kiran Kothekar is a founding Director of Vector Consulting Group.

Vector Consulting Group (www.vectorconsulting.in) is the leader of 'Theory of Constraints' consulting in India. Vector has been working closely with some of the well known retail chains, FMCG, fashion products, custom manufacturing industry and auto after market companies to improve their overall profitability through supply chain effectiveness.

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