

Supply Chain Management in Crises

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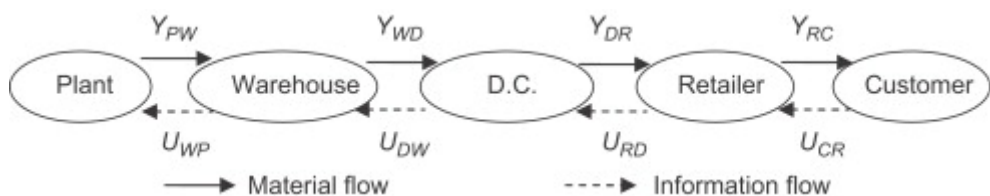
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1. Introduction

As more and more companies face limitations to further efficiency through classical measures, they have been forced to divert to the proper management of their supply chains. The supply chain consists of the company's suppliers, their suppliers, the company's customers, and their customers. Through several techniques involving the integration of each of the players in the SC the overall profit can be maximized and, with the help of good negotiations and/or contracts, also the respective profits of every company within the supply chain or, in these bad times, reduce losses for the supply chain as a whole. The following picture is an example of a typical supply chain (here only the last part of the supply chain is illustrated, as the plant will have suppliers, which will themselves have suppliers):



1

As you can see from the graph, there are two types of flows in a supply chain, material flow and information flow. Material flows are the actual goods, resources, or components, while information flows typically consist of orders placed, demand forecasts, financial data, and strategic changes and should go up- and downstream.

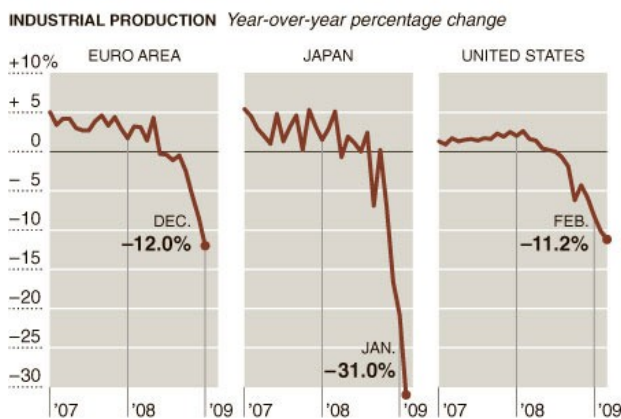
Over the last decades a lot of companies have outsourced or off-shored large parts of their businesses to focus on their core competencies and/or cut costs making the SCs even more complicated and thus increasing supply chain risk. The more complicated the SC, the more of a need there is to have it managed properly, and the higher the costs saved or service levels achieved. Furthermore it becomes harder to communicate necessary information through the SC the more players there are in it. Having supply chain partners in different countries, often involves the use of different languages and ways of operating, which certainly does not facilitate the task. This makes it extremely interesting to see how well supply chain partners cooperated over the last months in situations, where demand for

¹ Balan, S.; Vrat, Prem; Kumar, Pradeep (2009): Information distortion in a supply chain and its mitigation using soft computing approach.

industrial products dropped significantly, and to analyze to what extent supply chains were able to cut their own production according to the fall in demand. Furthermore, not every stage of the supply chain performs equally well, so it can be of relevance to differentiate supply chains into stages and see which stage was able to provide quantities of goods in best accordance to actual demand.

The ongoing crisis has started in a different sector but has spilled over onto manufacturing, because of globalization, which leads to markets becoming larger but also more competitive and more positively correlated between industries and/or national/regional economies. If one economy or industry does well, it will positively affect other economies and/or industries, while poor performance will do the opposite. These spill-over effects have always existed, but not to this extent. As can be seen by the following graph, industrial production and the strongly linked demand for industrial products dropped significantly over a short period of time and in all major economies.

Shrinking Output



Source: Bloomberg

2

It is of the utmost priority for companies to be able to adapt their output, as quickly as possible, as not to produce overstock or have low service levels. While it is always a challenge to manage inventory and try to meet target service levels, the demand fluctuations in a recession make this much harder. In the current crisis however, supply chains do not just have to face the task of having its production meet demand, but have a whole new set of

² Balan, S.; Vrat, Prem; Kumar, Pradeep. Omega, (2009): Information distortion in a supply chain and its mitigation using soft computing approach.

problems to worry about, most of which are caused by supply chain partners running into financial problems. Companies have started developing strategies to decrease the likelihood of these problems from occurring and ways of managing these problems' consequences.

In this thesis I will first of all first explain the basic concepts of supply chain management (chapter 2), followed by a chronological description of the current downturn (chapter 3), focussing on the extent to which the manufacturing industry and its supply chains have been affected by this. The fourth chapter will analyze to what extent supply chain management was carried out successfully during the last months, while in the chapter 5 I will develop some guidelines that will help companies to better prepare against a recession or help overcome it.

2. Introduction to Supply Chain Management

Supply Chains have always existed, as it was never common to have one company performing all of the tasks in a given industry: collecting the raw materials, assembling components, manufacturing the product, distributing and selling the product. However, a lot of inefficiencies would occur requiring a better approach to this problem especially when the companies within a supply chain were owned by different owners. It was actually not so long ago that companies realised the potential benefits of managing supply chains more effectively and introducing Supply Chain Management (SCM). “SCM is a set of approaches utilized to effectively integrate suppliers, manufacturer, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations and at the right time, in order to minimize systemwide costs while satisfying service level requirements”.³ This means that the total system profits are maximized while often leading to one of the SC players or division within companies being worse off than before. The right incentives for every company should be put in place to make sure that everybody gains from the optimization, but I will return to this when talking about supply chain alignment later this chapter.

According to Gunasekaran/Lai/Cheng there are 5 primary dimensions or goals, which should be used as variables in an optimization model: “(1) procurement (maximum purchasing discounts), (2) inbound logistics (low transportation costs), (3) operations (low production costs), (4) marketing and sales (wide product range/high availability), and (5) outbound logistics (low transportation costs)”.⁴ It is good to remember that some of the goals are conflicting and thus make optimization more challenging. Other problems are that certain dimensions cannot easily be put in numerical terms (e.g.. how much is a marketing campaign worth?). Furthermore, there are other factors which contribute to a successfully managed supply chain which cannot really be placed under those 5 dimensions mentioned above.

There are many different ways of making a SC more profitable, some of which I will talk about briefly:

³ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 1.

⁴ Gunasekaran /Lai/Cheng (2008): Responsive supply chain: A competitive strategy in a networked economy.

2.1. Supply Chain and Supply Network Planning

Before one can successfully manage a Supply Chain, one must first design the SC. If a SC is designed poorly then even perfect management will not be able to eliminate the given inefficiencies. Furthermore, every existing functioning SC will need to review its design on a regular basis, due to change in its environment.

The main tasks in SC Planning are to determine where to build factories or warehouses, how large they should be, and which products they should produce or store. Furthermore, efficient distribution strategies, from suppliers, between factories and warehouses, and also to customers, need to be developed. “The objective is to design or reconfigure the logistics network in order to minimize annual systemwide cost, including production and purchasing costs, inventory holding costs, facility costs (storage, handling, and fixed costs), and transportation costs, subject to a variety of service level requirements.”⁵

2.2. Inventory Management

While Inventory management is not really a SCM subtopic, it is very important to know how inventories are managed in view of being able to follow the remaining issues discussed in this thesis. It is crucial for success for managers to reduce inventory, as the holding costs for it are significant, while trying to satisfy the customers’ needs (i.e. high service levels). There are several approaches, of different complexity, which try to optimize inventory levels under different assumptions.

-The most basic approach is the Economic Lot Size model which assumes no variability in demand and zero lead time.

- The (Q,R) Policy, which takes into account variable demand and lead times. Whenever the level of inventory falls to the point R a fixed quantity Q is ordered. The reorder point R is a sum of the safety stock plus the average demand during lead time. The safety stock is determined by the variability in the demand during lead time as well the target service levels.

⁵ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 80.

In order to be able to implement a (Q,R) policy the company needs to perform regular reviews of the inventory level.

-The (s,S) policy is slightly different from the (Q,R) policy because it assumes that managers are not able to continuously review their inventory, however on a regular frequent basis. Instead of having a fixed order quantity Q an order-up-to level S is used if the inventory falls below point s.

- If for some reason the inventory cannot be reviewed frequently a periodic review policy is applied. "If there is a larger time between successive reviews of inventory (weekly or monthly, for example), it may make sense to always order after an inventory level review. Since an order is placed after each inventory review, the fixed cost of placing an order is a sunk cost and hence can be ignored."⁶ It is interesting to note that the safety stock has to be significantly larger than for the other two policies as it will have to be able to deal for demand variability not only during the lead time, but also during the whole length of the review period.

2.3. IT systems

While in the past processes were all planned by humans, in today's world IT systems have taken over: Depending on the complexity of the system, Enterprise Resource Planning (ERP) systems are capable of doing transaction processing and decision support. "Transaction processing relates to the posting and tracking of activities that document the business. While decision support relates to how well the system helps the user to make intelligent judgements about how to run the business."⁷

It is common for most large companies to use ERP systems, integrating different functionality sectors into a common database. But with these systems it is also possible to integrate whole supply chains, through everybody sharing collected information by uploading it onto the common database. "The primary goal of IT in the supply chain is to link the point of production seamlessly with the point of delivery or purchase. The idea is to

⁶ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 45.

⁷ Vollmann/ Berry/ Whybark/ Jacobs (2005): Manufacturing Planning and Control for Supply Chain Management 5th Edition. Page 110

have an information trail that follows the product's physical trail.”⁸ While ERP systems will not produce physical products, they help ensuring that the right products are produced at the right places and distributed to the right customers. Because if information can be accessed for all players in a given Supply Chain immediately, this will completely cancel information lead times and any problems caused through them.

2.4. The Need for Supply Chain Management

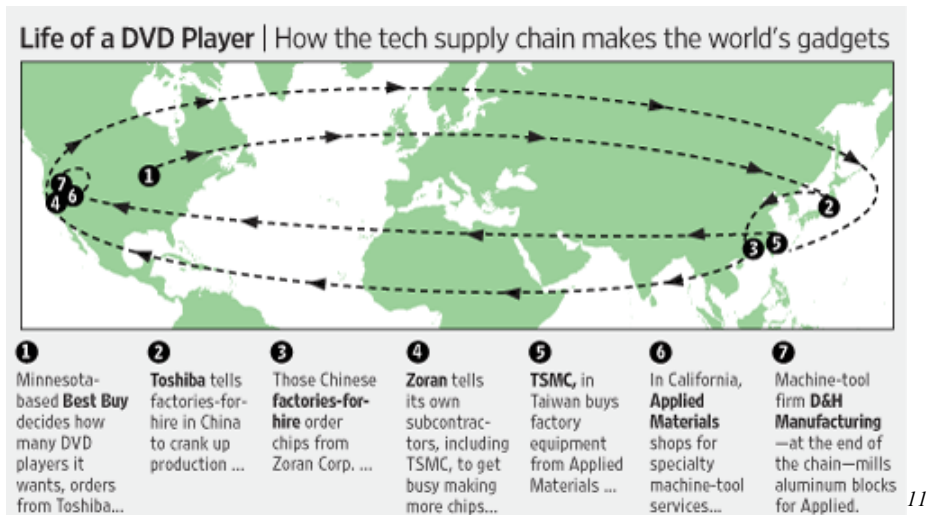
In times where products are offered in seemingly infinite variations with often very short life cycles it is very difficult to foresee future demand patterns accurately. While this is already the case for retailers, it gets harder for each player to forecast demand the further down the SC he is. Even if actual consumer demand at the retailers is fairly stable demand from retailers to warehouses will be more variable, while warehouses' demand to manufacturers will be of even higher variance and so on (i.e. firms at the top of the supply chain have lower variance in demand than firms at the bottom).

This phenomenon is called the bullwhip effect. There are several reason for it taking place one of which is the lack of sharing the right information within the SC. “Distorted information from one end of a supply chain to the other can lead to tremendous inefficiencies: excessive inventory investment, poor customer service, lost revenues, misguided capacity plans, ineffective transportation, and missed production schedules.”⁹ This effect - on average – tends to inflate or amplify the changes in demand at one stage by about 1.7 at the preceding stage. This implies that total supply chain amplification is $(1.7)^n$, where n number of nodes or stages in the supply chain.”¹⁰ And there can be many stages in a supply chain as illustrated by this example:

⁸ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 415.

⁹ Hau L. Lee /V. Padmanabhan / Seungjin Whang (1997): The Bullwhip Effect in Supply Chains

¹⁰ Vollmann/ Berry/ Whybark/ Jacobs (2005): Manufacturing Planning and Control for Supply Chain Management 5th Edition. Page 585.



Other causes for the bullwhip effect are:

Demand Forecasting: A lot of problems are caused by the way companies forecast the demand of their products. “Forecasting is often based on the order history from the company’s immediate customers.”¹² This brings about several problems: Past data is often collected over too short a period to be able to describe all possible futures outcomes, especially those relating to rare or extreme events. With the company’s environment changing, using past data to forecast will lead to distorted results, as past risks are not a good indicator for determining future risks as risk can change with daily fluctuations. Furthermore the fact that demand is derived from the demand of the immediate customer and not of the end consumers, means that it will take a long time before companies realise changes in actual end demand. When these demand changes finally reach the company, the impact of these will have been amplified significantly.

Information and delivery lead times: Long delivery lead times make the SC less responsive to actual demand and forces SC players to forecast further into the future, and thus forcing them to undertake more inaccurate forecasts, and carry more inventory or have lower service levels. By going down a couple of stages in the SC this will get worse. Information lead times are lead times associated with ordering and the processing of these

¹¹ Dvorak (2009): Clarity is Missing in Supply Chain. Wall Street Journal.

¹² Hau L. Lee /V. Padmanabhan / Seungjin Whang (1997): The Bullwhip Effect in Supply Chains

orders and have the same effect as deliver lead times. If it takes a given company A 2 days to receive and process an order and delivery lead time is of 1 day, and company B 0 days for the order and 2 days to deliver, then company B would be the better choice, despite the longer delivery lead time, assuming that the companies are perfectly homogenous apart from lead times.

Price changes: If prices change continuously then quantities demanded will too. It is easy to see that quantities will go up when prices fall and vice versa. Often price changes are not caused by external sources but by promotions offered by retailers or manufacturers. “This practice, referred to as forward buying, implies that retailers purchase large quantities during distributors’ and manufacturers’ discount and promotion time and order relatively small quantities at other time periods.”¹³ This will lead to a great and unnecessary increase in variability of demand.

Order inflation: When a given resource/ product is rare at a given time, then customers will tend to state their orders larger than they actually are. By doing so they expect a higher percentage of the total amount produced. The following example will help to show this:

Manufacturer A produces 100 units.

Retailer B and C both need 100 units.

If both retailers state their real demand, then the manufacturer will likely give 50 units to both retailers. If however retailer C claims that he needs 200 units, then the manufacturer might be more inclined to give more units to retailer C than to B, maybe one third to retailer B, who is worse off now, and 2 thirds to retailer C, who receives more units than if he had stated his actual demand. “When the period of shortage is over, the retailer goes back to its standard orders, leading to all kinds of distortions and variations in demand estimates.”¹⁴

¹³ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 156.

¹⁴ Simchi-Levi/ Kaminski/ Simchi-Levi (2008): Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 156.

Batch ordering: Firms will tend to order large quantities every once in a while instead of small quantities regularly. They will do this to benefit from truckload (TL) transportation, meaning the quantities are large enough to fill up the trucks, as opposed to less than truckload (LTL), and other economies of scale. The result of this is that firms will order a large quantity in one period and then nothing in the periods to follow. Clearly this drives up demand variability for the manufacturer.

While it is not possible to eliminate the bullwhip effect there are ways to reduce its impact and push up service levels and/or reduce safety stocks throughout the Supply Chain. According to Lee/ Padmanabhan/ Whang there are four ways in which the bullwhip effect can be tackled:

Avoiding multiple demand forecast updates:

“Bullwhip effects are created when supply chain members process the demand input from their immediate downstream member in producing their own forecasts.”¹⁵ If the companies in a supply chain choose to share demand forecasts from downstream players to upstream players, this effect can be minimized. Upstream players will not have to base their demand on the probably much more variable demand of their respective customers, but can instead use the more consistent end consumer demand to plan their processes. Modern IT systems facilitate this information exchange significantly.

Despite sharing relevant information companies within a Supply Chain will tend to make different forecasts, because of different perceptions of the future or different forecasting techniques used. This still supports the bullwhip effect. There is one approach aiming at reducing this problem: Vendor Managed Inventory (VMI).” In a VMI partnership, the supplier, usually the manufacturer but sometimes a reseller or distributor, makes the main inventory replenishment decisions for the consuming organization.”¹⁶ VMI helps the supplier to keep the right level of stock, because it knows when its customer needs to have

¹⁵ Hau L. Lee /V. Padmanabhan / Seungjin Whang (1997): The Bullwhip Effect in Supply Chains

¹⁶ Waller/Johnson/Davis(1999): Vendor-managed inventory in the retail supply chain

its stocks replenished, instead of having to wait for irregular and often large orders. In other words the service levels of the supplier should be higher and/or safety stock lower. The fact that orders come in more often and with less variable quantities leads to more regular production processes, which tend to be a lot cheaper, than if the company has to struggle for extra capacity after a big order. An even more radical approach is not cooperating with downstream partners as was seen in VMI, i.e. to cancel them out and sell to consumers directly. “Apple Computer has a ”consumer direct” program, i.e. it sells directly to consumers without going through the reseller and distribution channel. A benefit of the program is that it allows Apple to see the demand patterns for its products.”¹⁷

Breaking order batches: Many of the strategies mentioned above also help in reducing order quantities. By applying VMI the supplier is given the choice of lot sizes and can optimize global costs. These are made up of transportation, ordering and inventory costs. While average transportation and ordering costs are lower with large batch ordering, inventory costs both at the supplier as well as at the customer will increase with lot size. While in traditional supply chains consumers never worried about their suppliers’ inventory levels, with VMI it is taken as one of the variables in total costs, leading to higher supply chain profits.

While in the past, companies often chose to wait with orders until they could order full truck load quantities, several initiatives have taken place to change this tradition. Companies may use third party logistics which “(...) involves the use of external companies to perform logistics functions that have traditionally been performed within an organization.”¹⁸ Other options are using the same trucks to transport different products. Both of these measures will make the handling of the shipment more complicated, but hopefully the reduced cost of transportation will more than offset this.

Stabilizing prices: This can easily be achieved if companies commit to Everyday Low Price (EDLP) strategies instead of offering promotions. A lot of large companies have switched to this approach, because of the smoothening in demand over time that takes place.

¹⁷ Hau L. Lee /V. Padmanabhan / Seungjin Whang (1997): The Bullwhip Effect in Supply Chains

¹⁸ Skjoett-Larsen (2000) : Third party logistics – from an interorganizational point of view

Eliminating gaming in shortage situations: Problems resulting from gaming in times where the respective products are scarce can be easily tackled by supplying not according to orders, but to past orders. This way, customers have no incentive to inflate their orders.

2.5. Supply Chain Alignment

“The Triple-A Supply Chain” by Hau L. Lee stresses the importance of 3 characteristics that make a supply chain successful: Agility, Adaptability and Alignment. A supply chain with high agility is able to meet demand regardless of sudden changes in both demand and supply. Adaptability in a supply chain can be summed up by how well a supply chain is able to cope with a changing economic environment. Finally, alignment can be seen as the ability of a supply chain to give every company within a supply chain the right incentives, so that a company trying to maximize its profits will also lead to overall supply chain profits being maximized.

While I have discussed concepts related to agility I just barely touched upon those related to adaptability and alignment. As adaptability is related to a change in the political or economic environment, which is the case in this recession I will go further in to depth on adaptability in the last chapter, when describing flexible strategies. Note though that companies should not try to implement flexible/adaptable strategies should be implemented before a company finds itself in a crisis.

In a non-aligned supply chain every player is for himself and tries to reach his own targets and pursue his own goals. Two simple examples will illustrate this phenomenon:

-Example 1: Often suppliers will ship infrequently to take advantages of economies of scale, while at the same time the manufacturer will have to hold more inventory and/or have lower service levels causing costs and/or missed sales, which more than offset the gains of the supplier.

-Example 2: Another example can be a vendor managed inventory where the supplier pays for the inventory at the manufacturer and thus takes on additional risk without being properly compensated by the manufacturer. Especially if the supplier is small, the additional risk will raise its cost of capital to cancel out any gains achieved from the vendor managed inventory practice.

It becomes obvious that in example 1 the manufacturer should approach the supplier, urging the supplier to agree to more regular shipments. Some of the extra profit would have to go to the supplier to guarantee that also the supplier is better off than before. In example 2 the supplier should not be given all the risk while the manufacturer should not be reaping all the benefits. The manufacturer could either promise to take measures to take over some of the risk (e.g. by financing the VMI initiative) or by sharing some of the profits gained, as to prevent the supplier from falling into financial distress and the extra costs that brings with it.

In reality, however, it is more difficult to determine how much a measure to optimize the supply chain will cost one company and benefit another. This is why companies should frequently communicate with one another and regularly review to what extent processes can be adapted as to increase overall profits. To prevent having to constantly argue about profit allocation companies should make contracts which give the necessary guidelines and the right incentives to make sure companies maximize the supply chain profits through maximizing their own.

3. The Global Economic Crisis of 2008/2009

3.1. The Causes of the Crisis

The crisis of today started in 2007 when it became apparent that a high percentage of the mortgages granted to American homeowners would not be paid off. What started as a crisis for the US financial sector spread quickly to other industries and to other economies and ended up being one of the biggest crises in modern times. “The current economic crisis so far eclipses anything the American economy has undergone since the Great Depression that "recession" is too tepid a term to describe it.”¹⁹ To make matter worse the full extent of this crisis is not known as we still find ourselves in the middle of it. Or as the Economist puts it: “Things could yet get a lot grimmer.”²⁰ Before we analyze how supply chains and their respective players were affected by the crisis, let us take a step back and look at how the crisis first started.

As a response to the poor economic performance of most major economies in the early 2000s, central banks reduced interest rates significantly to stimulate borrowing. While lower interest rates make it easier to borrow and thus promote investment, “it also broadly depressed risk premiums as investors sought riskier opportunities to bolster their investment returns.”²¹ The banks, needing to get their profits from somewhere, lent money to people with high credit risk ignoring possible threats to their investment. For some years things went well and profits were high, because:

- The economy was booming. Income rose and guaranteed subprime borrowers to be able to pay back their debt.
- House prices were steadily increasing including the houses of the subprime borrowers.

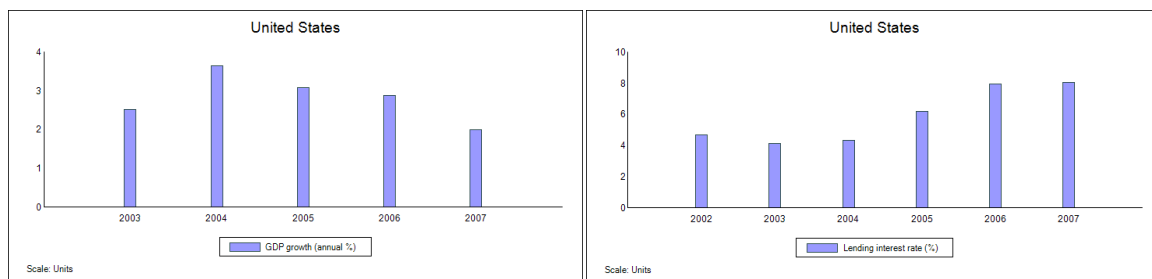
¹⁹ Posner (2009): Capitalism in Crisis. Wall Street Journal.

²⁰ The Economist (2009): Buckle down

²¹ Eric Petroff :Who is to Blame for the Subprime Crisis?

- Interest rates were low and stayed low. Most of the loans given out to subprime borrowers were with adjustable rates. This means that pay-off payments were negatively correlated with interest rates, so as long as these stayed low, repaying the debt was relatively easy.

This all changed in 2006, when house prices started dropping, thus reducing home value and equity of the home owners and borrowers started having trouble in paying back their mortgages. Also FED interest rates had started rising throughout 2005 making it harder for borrowers, especially subprime borrowers, to repay their debt. Economic growth was also worsening: While economic growth was still at 3.65 % in 2004 it dropped steadily to just 2.00% in 2007.



The above mentioned trends led to a soar in foreclosure as homeowners, especially those with subprime contracts, became unable to pay their mortgages. During the next months banks had to make massive write downs of their outstanding loans. Not only American banks were affected but banks worldwide as these also held US mortgage bonds. By May 2008 total losses for banks worldwide amounted to 379.2 billion U.S. dollars of which 332 billion are write downs while 46.9 billion are credit losses.²²

Consequences were dramatic: In September 2008 Lehman Brothers, one of the largest American investment banks, filed for bankruptcy. It was eventually bought by several different firms for bargain prices. “Lehman’s demise set off tremors throughout the financial system. The uncertainty surrounding its transactions with banks and hedge funds exacerbated a crisis of confidence. That contributed to credit markets freezing, forcing governments around the globe to take steps to try to calm panicked markets.”²³ Other financial institutions

²² Yalman Omeran (2008): Subprime Losses Top \$379 Billion on Balance-Sheet. Bloomberg

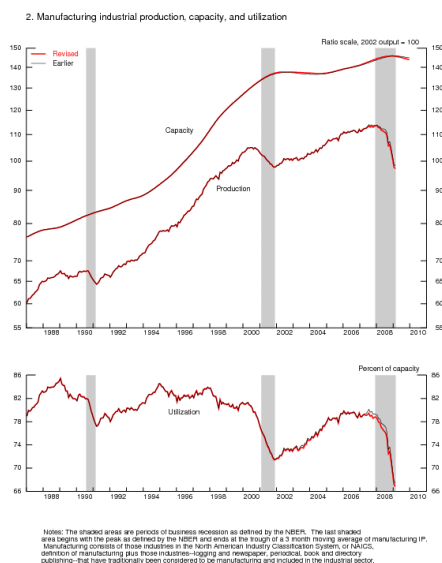
²³ New York Times : Lehman Brothers Holdings Inc.

did terrible and were either bought by other companies, were rescued by governments or simply failed. Stock markets in both Europe and the US fell significantly.

Through contagion the crisis spread to other countries and there were rescue plans for financial firms forged in many European countries. Central banks started lowering interest rates to increase the money supply and thus stimulate the economy. The following graphs show stock market index prices of a few selected countries.

3.2. The Consequences of the Crisis

So how has this affected the manufacturing industries? After all the crisis started in the financial sector and should not have significantly damaged the other sectors. As can be seen by the following graph it did wreak massive havoc and reduced present day production in the US manufacturing sector to the level of early 2002, the level it had had just after the dot-com crisis. This means that all the growth that was achieved from 2002 until 2007 has been completely nullified. If we look at the utilization rate (of production capacity of US manufacturing companies) we can see that it is at an all time low and that it dropped by a bigger percentage than actual production. We can see that even during the recession in 2008 capacity was still expanded, while it should have been reduced. Only in 2009 there seems to have been a slight reduction in capacity. This is a reliable indicator that the people in charge did not at all expect this crisis and/or underestimated its magnitude.



The effect of the crisis on the American industry sorted by sectors was marked by the following features:

- The construction industry shrank considerably in the 2008 recession. Businesses involved in construction had however been doing badly since 2006, so the crisis might not have been the main and/or only cause for its decline.
- Durable consumer goods have done terrible by their output dropping around 30 % since early 2008. Nondurable consumer goods have actually stood their ground fairly well.
- The business equipment sector seemed unharmed until the second half of 2008, where its output had a significant diminishment.
- The non energy part of industrial materials sector, which had been doing very well until 2008 where it experienced a major downturn. The energy sector actually seems unaffected, with a short dip and a rise shortly afterwards in the second half of 2008.
- Most high-technology industries have been doing very poorly. Only companies involved in the production of communication equipment seem to have been able to continue their steady growth output.

In other markets things have been similar:

Japan saw its industrial production growth tumble to -31%²⁴ (current annualized rate) while industrial production fell by 18.4% over the last year until February 2009.²⁵ Manufacturing in Europe dropped to around 91% of its 2005 level: A loss of around 15% in just the last 6 months up to February 2009.²⁶ Furthermore, “In February 2009 compared with February 2008, industrial new orders decreased by 34.5% in the **euro area** and by 33.3% in the **EU27**.”²⁷ In other words industrial output will probably fall further in the next months, as there is very little demand at the moment.

²⁴ Bloomberg

²⁵ Eurostat

²⁶ Eurostat

²⁷ Eurostat (2009): Industrial new orders down by 0.6% in euro area.

In addition to low demand companies are suffering from low credit availability as they face a credit-crunch situation. Banks are not willing or capable to lend out the same amount of money as some years back. If companies need to make certain investments, maybe to make their processes more efficient or flexible, they will have to pay higher interest on them. A lot of potentially profitable opportunities are being missed out on, because of companies' inability to acquire the necessary capital and/or having to pay too high an interest rate on it. "The consequence (of the credit crunch) is a prolonged recession (or slower recovery), which occurs as a result of the shrinking credit supply."²⁸

3.3. The Decline of Transportation

A good way of analyzing the magnitude of an economic downturn for the manufacturing sector is by examining how many goods have been transported by carriers. Carriers are companies handling the transportation of goods, while the companies that hire them are called shippers. Looking at the US figures for 2008 we can see a rapid decline in transportation for every transportation mode: Rail, road, sea, and air.

- Rail volume decreased by 16% from January 2008 to 2009, mainly because of the lack of demand for cars, which make up a considerable amount of rail transportation volume.²⁹
- The For-Hire Truck Tonnage Index fell to its lowest point in five years in October 2008.³⁰
- The monthly Port Tracker report, which is undertaken by the National Retail Federation and IHS Global Insight, revealed a 7.1% drop in 2008 in cargo volume at major US ports.³¹
- The International Air Transport Association (IATA) published several concerning numbers: North American carriers had to deal with a 14.4% decline while Latin

²⁸ Investopedia.com

²⁹ Association of American Railroads

³⁰ American Trucking Associations

³¹ National Retail Federation

American and European carriers experienced 15.7% and 11% declines, respectively. Global decline was also worrying at 13.5%.³²

While this is worrisome data, as it represents yet another indicator for how bad the economy is doing, it also provides opportunities to supply chain managers: “Weak demand for capacity typically favors shippers in contract negotiations, which is why many shippers have conducted procurement engagements over the past 18 months.”³³ Despite many shippers taking advantage of low rates it might be recommendable for the shippers to not bully their carriers around and maybe even aim for long term partnerships as to be have the necessary links for when demand is stronger and/or carrier capacity more demanded.

3.4. An Extreme Example: The Automotive Industry

While all industries have encountered significant problems since 2008, one of the worst affected is the automotive industry. Automakers, parts suppliers, and car dealers from every region and every type of car have been affected, though some have been affected worse than others.

In particular the “Detroit Big Three” (Ford, General Motors, and Chrysler) have been consequently underperforming and “have had to watch their sale volumes drop by more than the industry average in the US market.”³⁴ This, however, had been a trend already in the years leading up to the crisis, as the “big Three” had been relying too much on the production of pick-up trucks and SUV, which were not fuel efficient enough, to cope with high gas prices. Looking at General Motors’s stock price we can see a drop from 40 \$ per share to 1.09\$ a share today (May 29th 2009). Ford, who has actually been doing a lot better than GM, also had its stock price fall by around 39% from its highest point in 2007. ³⁵ Both GM and Chrysler have been having great financial distress problems, with Chrysler having already filed for bankruptcy in April and General Motors in June. Some experts believe it

³² International Air Transport Association

³³ Gonzalez, Adrian (2009): Transportation Statistics Point to Continued Economic Woes.

³⁴ CBS News (2009): GM Sales Plunge 49%, Ford Down 40%

³⁵ Financial Times

would have been better to let one of the big three fail to increase the others' chance of success, but the US government is ready to give billions to both General Motors and Chrysler, hoping both of them will be more profitable in the future.

Japanese car manufacturers have not performed better: In March 2009 the whole Japanese car industry produced half of what it produced a year before.³⁶ Other major carmakers like BMW (-21.2%)³⁷, Mercedes Benz (-24%)³⁸, Volkswagen (-24.1%)³⁹, Peugeot Citroën (-23.5%) have seen their production levels dwindle. Unluckily when car manufacturers perform poorly, many of the thousands of suppliers and retailers will have to struggle as well, causing damage to whole economies. In the next chapters I will take a closer look at what problems arise.

As we can see, despite the crisis starting in a completely different sector it has influenced all parts of the economy, including manufacturing, not just in America, but also all over the world. Crises like this put to a test not only every company, but the whole supply chain and thus require better management of the supply chain and more communication between the interacting firms. As seen before, it is hard enough to successfully manage a supply chain in stable times, but in times of change it becomes a lot more challenging

³⁶ Japan Automobile Manufacturers Association

³⁷ www.bmwgroup.com

³⁸ www.daimler.com

³⁹ www.volkswagenag.com

4. Supply Chain Management in the Crisis

While Supply Chain Management is already a very complex subject in itself, it becomes even more of a challenge when the economy finds itself in a crisis like the recent one. A 2009 study by Capgemini Consulting, in which 300 supply chain managers from companies worldwide were interviewed, has shown that “over 65 percent of the questioned managers engaged in logistics affairs, say that their strategy is affected by the crisis.”⁴⁰ Risk management and improving communication with suppliers/customers has become very important. There are many strategies that companies can employ, should they be facing a crisis, though having a flexible supply chain is the main key to success, as we shall see more in depth in chapter 5.

4.1. Findings of the Capgemini study:

As mentioned above the crisis and its effects are the most important business drivers for supply chain managers in 2009. While the other important business drivers are not related to the crisis they have been influenced significantly by it: Second on the list is meeting (changing) customer requirements and third is sustainability. Meeting (changing) customer requirements is of high importance in these times of great change, as new kind of products and services attached to these products are required to fulfil the needs of customers, which are likely to have changed completely.

It is of course an interesting finding that sustainability has remained an important goal for 2009. While one might think that sustainability is typically an expensive luxury, companies are able to afford in good times only, it continues to be a very important issue. Furthermore, as sustainability and logistics cost reduction go hand in hand, companies who are trying to reduce logistics costs will end up making their supply chain more sustainable and companies who are trying to be more sustainable can offset some of the costs incurred by these “green” measures through logistics costs savings.

⁴⁰ Capgemini Consulting (2009) :Crisis dominates the Supply Chain Agenda in 2009.

The study also asked managers on which fields of supply chain management they would focus the most: “Top of the list shows projects that lead to reduction of inventory and logistic costs. Beside the fact that these are traditional areas of attention, due to the financial crisis supply chain managers will focus even more on realising these projects.”⁴¹

Other goals that are more related to long term success are pushed back as companies struggle to stay out of financial distress: For instance, when a firm has low liquidity (which is the case with a lot of companies these days) it cannot consider reorganizing its whole distribution network, but should much rather try to secure cash flows coming in. In chapter 5 I will present the opinions of several experts that believe companies are focusing too much on the short term and completely ignoring potential future growth opportunities.

The supply chain projects that have gained the most attention are inventory management, which gained 11% and contract renewal strategy logistics partner(s), which are clearly short term projects. Supply chain strategy project, which was the most important project in 2008, has lost 14%, while improve long term forecasting / planning and network redesign projects have both lost 4% of importance.

Finally a lot of investment regarding companies’ IT has been postponed. The major postponements are from the following 5 fields:

- Technology based warehouse innovation (e.g. RFID/ Voice picking)
- Transport Management System (selection or implementation)
- Design and implementation of logistic software solutions
- Warehouse Management System (selection or implementation)
- Advanced Planning Systems (APS) implementation

The effect of this is a reduction in long term growth, but currently companies just try to survive and once the recession is over they will be able to divert their attention back to these fields and possibly realize on which great opportunities they have missed out on.

⁴¹ Capgemini Consulting (2009) :Crisis dominates the Supply Chain Agenda in 2009.

Summing it up, supply chain managers have diverted from long term thinking to short term supply chain optimization. IT innovation has come to an abrupt halt and supply chain planning projects have also seen less attention devoted to them.

4.2. Supply Chain Performance in the Recession

Many experts agree on the fact that information sharing techniques have been put to good use during the last months, leading to production and capacity reductions at every stage of the supply chain. “For the first time in history the global network of retailers, wholesalers, manufacturers, and raw materials providers was able to rapidly sense and respond to a decline in demand.”⁴² So instead of having massive inventory build ups, because of production not following demand responsively, companies were able to cut production quickly enough to prevent further losses from huge inventory build ups. In other words supply chain performance has been rather impressive.

A bad side effect of the quick response is that in just matters of weeks, capacity and production had been slashed that took years to build up. While previous recessions took some time before they hit hard, this recent one made every industry feel its impact immediately. While this is not necessarily a bad thing, the speed of the demand drop made it very hard for companies to predict a reasonable new production level. Or as Mr. Vitelli, the merchandising chief of Best Buy said: “You actually had to pick a number with no knowledge whatsoever, because nobody knows anything.”⁴³

In Mitul Shah’s article “How do I forecast during Recession?” it is clearly pointed out that the forecasting systems which are often very complex and use elegant mathematics to predict the future, are only able to accurately predict demand development in stable times. This is because these systems rely on past data for many time periods, and they are usually slow in identifying downturns: “Even before the system detects the dramatic drop in demand, probably a quarter or two has already passed!”⁴⁴ Shah suggests reducing complexity of the

⁴² Shepherd, Jim (2009): The Global Supply Chain: Accelerating Recession and Recovery

⁴³ Dvorak, Phred (2009): Clarity is Missing in Supply Chain. Wall Street Journal.

⁴⁴ Shah, Mitul (2009): How do I forecast during Recession? Infosys.

systems and shortening the time horizon in order to have more recent and useful data. Finally, Shah adds the importance on focusing more on customer end demand than direct orders received, which of course is nothing new, but worth mentioning many times!

A study, undertaken by the Federal Reserve Bank of St. Louis, has looked at forecast errors of GDP and unemployment for more than 20 years. While this is not necessarily the same as forecasting demand in a given supply chain, demand will be correlated positively towards GDP and negatively towards unemployment for most industries. The forecasting source used was the Survey of Professional Forecasters and these forecasts, which were made for every quarter for a year in advance, were compared to the actual numbers. The study shows that “the MSE’s (Mean squared error of the forecast) are four times larger than those made when the economy is not in a recession.”⁴⁵ This shows that in recessions predictions are inaccurate or at least less accurate than predictions of steady times or booms.

In part 2 of this thesis it was extensively explained what problems are caused by this unpredictability of future demand. This is especially challenging because managers will tend to have different opinions on the magnitude of the recession, causing problems such as the bullwhip effect. It is a must that the companies communicate well (and it seems like there is a lot more communication than ever before) to counteract these problems.

Finally, another problem from the manufacturing industry’s quick response towards demand is that many companies have cut their capacity by more than an adequate amount, meaning that these companies will have a very hard time to fulfill orders when the economy gets back on track. “It’s easier to turn the switch off than turn it back on,” says David Pederson, vice president of corporate marketing for Zoran, a chip producing American based company.

4.3. Improving Supply Chain Stability

A recent article in the Financial Times has highlighted a new dimension of supply chain management on which managers have previously not dedicated or had to dedicate much attention: Monitoring supplier health. While in former times it was generally assumed

⁴⁵ McCracken, Michael W. (2009): How accurate are Forecasts in a Recession?

suppliers would be financially stable, a lot of manufacturing companies have gotten into trouble, because of their suppliers not being able to meet orders in time or actually going bankrupt. As previously discussed in Chapter 2, effects of suppliers failing to meet orders can be catastrophic.

So how can companies protect against this new form of risk and thus make their supply chain more stable? “The first step companies need to take is an internal one – assessing their exposure to risk based on the amount spent with each supplier and the importance of the procurement or the part to their business.”⁴⁶ Furthermore trying to build close relations with suppliers or at least supervising them with the company’s own staff will help prevent negative surprises as better insights into the supplier’s operating practices can be achieved: And as soon as crucial elements start changing this could be an indicator for trouble.

In general, companies have been putting quite some effort into finding strategic partners, especially with big transparent companies, as these will be less likely to run into trouble and/or they will not be able to hide it so easily. While it is a new trend for companies to supervise their suppliers in this respect, companies had better done this earlier: “(...) 20 per cent of respondents reporting that their suppliers were unable to meet their supply levels or needs and for almost 15 per cent, suppliers had been put out of business or forced to merge with other companies.”⁴⁷

But it is not only customers that are being put to a test in the crisis, suppliers are also facing similar problems: When an important customer fails, not only will the supplier miss out on sales, but he will have too much finished products inventory and unused capacity. Unless the suppliers are able to find replacement quickly, they might find themselves in the same position as the insolvent customer sooner than expected. Some suppliers, in an attempt to manage risk, have been wise enough to insure their supply chain. When a customer falls into financial distress, suppliers are allowed to claim the missing payments from the insurance company. Of course, with more companies performing poorly supply chain insurance claims have increased significantly over the last years. According to the Financial Times, this has

⁴⁶ Murray, Sarah (2009): Supply chains: It pays to keep your ear to the ground. Financial Times.

⁴⁷ Murray, Sarah (2009): Supply chains: It pays to keep your ear to the ground. Financial Times.

led to a reduction in the availability of credit insurance meaning that in the future suppliers will not be able to hedge against this kind of risk so easily or under less favorable conditions.

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Professor Wagner from the Swiss Federal Institute of Technology suggests 4 steps to secure supply chain stability. The first two steps are applied by many companies and focus on monitoring supplier health, which was described above. The first step for a company is to introduce a rating system that describes supplier financial health. According to Wagner, emphasis should be put more on cash flows than on profits. The second step is to implement a warning system to warn the manufacturer in case certain habits of the supplier change. Steps 3 and 4 go beyond basic supplier monitoring, as they do not just look at suppliers one level below. Step 3 requires companies to look at their suppliers' suppliers and look for potential problem caused by these. Professor Wagner mentions a German carmaker which had to halt their production, because the supplier producing threads for its seat producing supplier went bankrupt. The last step involves analyzing different suppliers and to what extent these depend on the same markets and customers. By doing so the manufacturer should be able to see how correlated the success of these suppliers are. If all suppliers depend on the same client or industry, one supplier's failure can mean other suppliers' failures becoming more likely. In a recent article called *Supplier Default Dependencies: "Empirical Evidence from the Automotive Industry"*, Professor Wagner analyzes these dependencies and for most cases supplier default probabilities do correlate. In other words, using multiple suppliers for important components might not resolve the risk of having the supply of this component discontinued.

Emerson, a manufacturing giant with a world-wide reach, also follows a very strict supplier rating program. This program builds a lot on the points mentioned above by Professor Wagner: Suppliers get rated not only by their own financial stability, but also by how these suppliers supply themselves (i.e. financial stability of suppliers and whether there are multiple sources of supply not just for themselves but also for their suppliers) and whether they are located in countries that bring political or environmental risks with it. Should a given supplier perform poorly in this rating system, Emerson will ask the supplier to present

⁴⁸ Felsted, Andrea (2009): Supply chain insurance policy claims jump 40%. Financial Times.

business plans describing how that supplier will try to avoid any of these risks (supplier risk and financial risk) from actually occurring. Should the supplier's future look too shaky then Emerson will commence initiatives to find alternative sources of supply. Furthermore, Emerson reassesses risks originating from suppliers on a regular basis in order to improve its world-wide inventory distribution. If a certain component is produced in, or transported through, a high risk country, then Emerson will tend to keep more inventory of that good as to ensure buffer times and thus smoother processes. While these continuous evaluations require Emerson to have a lot of well qualified people spend a lot of time on them, it helps Emerson in its strive to achieve its profitability goals. "Emerson appears poised, once again, to come out of this recession with more market share than before the recession started."⁴⁹

4.4. Supplier Development

While the findings in 4.2. suggest that companies should observe their suppliers and consumers carefully, it can be argued that this is not enough. In some cases it can be of great benefit to actively support a supplier instead of just living with the consequences of a supplier performing poorly and/or having to cope with the problems should the supplier go bankrupt. As firms tend to outsource a lot of their manufacturing, trying to concentrate on their core competencies, a failing supplier will leave the company with great problems: It will often lead to production having to be halted, while the company struggles to find replacements. In many cases, however, a given supplier might be the only one with the right technology or machinery to produce a certain component, making it impossible for a manufacturer to find another supplier of this component within a reasonable time frame. Firms are more dependent than ever on their suppliers' capabilities to accomplish strategic goals and create competitive advantage.

The consequence of the problems mentioned above is, that in some cases it pays to support suppliers to guarantee their survival in bad times like these. Before a buying company decides to develop its supplier, it should have considered the alternatives. It should analyze to what extent it makes sense to switch supplier, which is often expensive or impossible as

⁴⁹ Banker, Stephan (2009): Integrating Strategic and Supply Chain Planning at Emerson

only that one supplier has the expertise required. The other alternative is to acquire the supplier altogether as to be able to produce the component internally. This often requires considerable amounts of capital that even large manufacturer do not have access to. Furthermore, such measures “might be contradictory to the firms’ intention to focus on their core competencies and outsource noncore activities.”⁵⁰

If a company does decide to develop one of its suppliers it can choose to do so indirectly or directly. By indirect development we understand a manufacturer trying to improve its supplier’s performance without actively devoting resources to the supplier. Indirect development can be achieved by stimulating the supplier to increase efficiency. Examples of this are setting goals to the supplier or pointing out that competition exists. Direct development, on the other hand, requires the manufacturer to commit money and/or some of its workforce to make the supplier more reliable, efficient or financially stable. An example of direct supplier development is BMW, which pumped considerable amounts of cash into its supplier Edscha. Edscha supplies different car parts and produces the sunroofs of BMW’s new Z4 model.

⁵⁰ Wagner, Stephan (2008): Indirect and Direct Supplier Development: Performance Implications of Individual and Combined Effects

5. Guidelines for Supply Chain Management in Crises

In general it can be said that none of the concepts of supply chain management mentioned in chapter 2 become futile during recession, but that some of them become more important and that certain absolutely new concepts start being relevant. In this chapter I will try summing up these new concepts and give some other hints on how supply chain managers should act during recessions and/or how they can prepare as to limit the effects an economic downturn can cause to a company and its supply chain.

5.1. Managing Risks

Smart companies are the ones that are capable to deal with “home-made” (i.e. from company internal processes) risks as well as those stemming from their supply chains or their environment. While risks always exist, it is during crises that more and more of these undesirable events take place: During this recession credit has become practically unavailable, global demand has dropped and many suppliers and customers have fallen into financial distress or have failed altogether. While some companies choose to deal with these events once they have occurred, smart companies will prepare for these risks, either by introducing processes that will decrease the chance of a certain event from occurring or by arming the company to deal with the consequences of that event.

There are many different kinds of risks that manufacturers in today’s global economy have to be aware of⁵¹:

- Natural disasters
- Geopolitical risks
- Epidemics
- Terrorist attacks

⁵¹ Simchi-Levi/ Kaminski/ Simchi-Levi (2008) Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 316.

- Volatile fuel price
- Currency Fluctuations
- Port delays
- Market changes
- Supplier's performance
- Forecasting accuracy
- Execution problems

Note that the first risks are uncontrollable and unforeseeable, and that going down this list these risks become more and more foreseeable and controllable. Furthermore it can be added that some of these risks, mainly the ones on the top, have a more or less steady probability of occurring (e.g. Natural disasters, Epidemics) while others become a lot more likely to arise in a recession (e.g. Market changes, Supplier's performance, Forecasting accuracy).

5.1.1. Uncontrollable/Unforeseeable Risks

According to Simchi-Levi/Kaminski/Simchi-Levi there are three concepts related to coping with uncontrollable and unforeseeable risks:

- Invest in redundancy
- Increase velocity in sensing and responding
- Create an adaptive supply chain community

Investing in redundant capacity might seem controversial, but can greatly improve a supply chain's performance, should an unexpected event take place. It might cost the company extra to have the spare capacity available, but will help the company manage disruptions more effectively, especially for global companies that are trying to build capacity in different regions. Obviously companies should still try to operate cost effectively, but sometimes redundant capacity can be achieved by just slightly increasing costs, because of certain other benefits that come with having this spare capacity, which might be able to offset the extra

incurred costs to a certain degree. An example of this would be a company having an extra production plant in a market and thus being able to benefit from lower transportation costs into that market. Unluckily, it is extremely difficult to determine how much spare capacity is needed and where it should be located, as these unforeseeable events and the gains from building up redundancy are impossible to quantify.

Increasing velocity in sensing and responding to certain events is crucial as the failure to do so will lead the manufacturer into a bad position once the consequences of that event start taking effect. For instance, if a manufacturer's supply of an important component is interrupted by a natural disaster, the manufacturer should try to find alternatives immediately and not wait until its own stock of this component is depleted. In this case the manufacturer would be best off had he been actively monitoring and/or communicating with the supplier. This way even before the consequences actually reach the manufacturer, he can start planning on how to overcome the upcoming shortage of supply.

Finally, an adaptive supply chain is a supply chain where all of the partners work together should something unexpected happen. Simchi-Levi/Kaminski/Simchi-Levi mention an example of this: When a supplier of Toyota, which was the only one producing a certain important component, had a fire in its factory and was not able to produce anything for several weeks, Toyota had to leave all of their factories closed as production was impossible without that crucial part. Instead of being immobile Toyota asked some of its other supplier to help Toyota out: These suppliers were not familiar with the production of this component, but with everybody's cooperation, including that of the original supplier, they managed to restart Toyota's car production just a couple of days later. What could have been months ended up being only a week of lost production. As can be seen from this example Toyota did not invest in redundancy, because they wanted their supplier to be able to benefit from economies of scale, to be able to produce cheap and high quality components for Toyota. This could have had catastrophic consequences, but Toyota and its suppliers improvised and cooperated perfectly to implement the adaptive supply chain.

5.1.2. Foreseeable Risks

On the other hand, there are risks which fortunately are somewhat more predictable and that all global supply chains will face one way or another. As mentioned before examples of foreseeable risks are market changes, supplier's performance, forecasting accuracy, most of which are related to economic factors. Therefore these risks can "to a certain extent" be "quantified and controlled."⁵² There are 3 ways in which companies can deal with these risks:

-Speculative Strategies

-Hedge Strategies

-Flexible Strategies

Speculative strategies are not just futile with regard to risk management, they actually worsen effect should an undesired event occur. A company pursuing a speculative strategy just hopes that a certain event will not take place. If the dreaded event does not occur then the company will benefit greatly (often because it is able to benefit from things such as economies of scale), if it does consequences can be disastrous. Nevertheless, companies, many successful ones too, still use speculative strategies assuming that the expected utility of the speculative strategy is higher than that of a hedge or a flexible strategy. The lower the likelihood and the smaller the consequences of the undesired event, the better the speculative strategy becomes.

Hedge strategies are much more effective in reducing foreseeable risk: "Using *hedge strategies*, a company designs the supply chain in such a way that any losses in part of the supply chain will be offset by gains in another part."⁵³ While hedging is a common term for coping with risk that stems from price changes of currencies and resources, which also represent major risk sources for global supply chains, it can also be used with

⁵² Simchi-Levi/ Kaminski/ Simchi-Levi (2008) Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 320.

⁵³ Simchi-Levi/ Kaminski/ Simchi-Levi (2008) Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies 3rd Edition. Page 321.

regard to supply chains. By sourcing from different suppliers or producing in different countries manufacturers can hedge against supplier/ country specific risks. Another hedging strategy which I have mentioned before is committing to supply chain insurance: By doing so, companies can perform alright regardless of whether their partners stay clear of financial problems or not.

Flexible strategies aim at making profits from different scenarios. Flexible strategies can be considered the opposite of speculative strategies. Companies pursuing a flexible strategy will try to benefit from whatever scenario should occur. Mike Kilgore, president of ChainAlytics, a supply chain strategy consulting firm, believes that “firms need to conduct continuous rather than sporadic planning efforts.” By doing so companies can always anticipate trends and quickly learn how to best deal with different scenarios before these actually take place. Kilgore mentions 5 strategies to achieve a flexible supply chain:

- Continuously planning the supply chain network
- Evaluating a range of supply chain network alternatives
- Limiting exposure to cost fluctuation
- Using outsourcing to implement flexibility
- Leveraging supply chain network optimization tools that enable scenario planning

In summary, Kilgore stresses the importance of routinely evaluating different networks, while applying what-if scenarios, to find a flexible solution for the supply chain. Furthermore he also recommends the use of hedging (when related to costs of currencies/commodities), which should be viewed as a complementary and not an opposing strategy to flexibility.

5.2. Outsourcing

While outsourcing might not be an obvious measure to counter economic downturns it has one clear advantage: When comparing two companies, one with outsourced logistics and the other with its own logistics operations, we can see that once orders start decreasing, the outsourcing company will not have to worry about its idle capacity. In other words it does not have overhead costs for its logistics operations, which can be a great advantage during recessions. This advantage is obviously particular large for companies which outsourced by means of contracts that oblige these companies to pay for the quantities used. If this

company uses the service less, then they also pay less. Outsourcing can be viewed as a hedging strategy as outsourcing companies are not as affected by a downturn as a non-outsourcing company.

Steve Banker, supply chain expert for the ARC Advisory Group, wrote an article on this subject. While he agrees to above statement in general, he adds: “This strategy, however will not work for everyone, and it is particularly ineffective for companies whose value proposition is being a low cost provider.”⁵⁴ This is mainly because low cost companies will often have very efficient operations and will therefore not choose to outsource, because it is too expensive compared to just running these operations internally.

There are two other big disadvantages:

Firstly, outsourcing makes the supply network more complicated. The result being less responsive supply networks with longer lead times and lower service levels, which can result in amplifying the bad effects from the recession on the supply chain. If a company does choose to outsource, it should implement communication routines for it and its outsourcing partner(s) to always know what is going on. Finally outsourcing creates dependencies on other companies. Results are companies having to worry about more suppliers and their financial health, as discussed in chapter 4.

5.3. The importance of communication

While this subject has always been touched upon, it is good to stress the fact that a supply chain that has a lot of communication between its partners is far superior to a supply chain where little communication takes place. Particularly in volatile times like a recession it becomes crucial to let the other companies within the supply chain know what is going on, and communication can prevent numerous problems from occurring. There are a many subjects which the supply chain partners should be communicating about, the two main topics being demand forecasts and financial stability:

- Demand forecasts

Retailers should pass their sales figures as well as their predictions on demand development down the supply chain. While proper production quantities in

⁵⁴ Banker, Steve (2009): The Recession and the Outsourced Supply Chain

recessions will still be difficult to predict, having the above information from retailers, can significantly help companies a couple of stages down in having their supply meet demand.

- Financial stability

When a supplier (or a customer) is doing poorly, he will often choose not to tell the supply chain partners, fearing the customers (or suppliers) will pull the plug, out of fear of not being supplied (paid). This is especially the case for suppliers, whose customer(s) can easily switch between suppliers. For the firm to whom this information was hidden, terrible things can happen, when the supplier goes bankrupt and supply stops (Chapter 4). This of course represents a major problem as the supplier is not rewarded for being honest while the manufacturer and the whole supply chain as a whole would benefit from this information. To prevent the supplier from hiding information contracts can be put into place, when times are good, that ensure the supply chain being run in the optimal way. An example would be the supplier providing all their financial data to the manufacturer, and the manufacturer promising to help or at least not abandon the supplier in case things go bad.

Furthermore, when the supplier provides information to its customers, supplier development measures might be initiated.

5.4. Long-Term vs. Short-term thinking

Even though it might be appealing to companies to focus on short term measures to improve short term profitability during downturns, they often forget to plan ahead for the times after the recession. According to the article “Three Critical Mistakes Manufacturers Make During a Recession” by Riddleberger, fear seems to be dominating managers’ decision making. In efforts to stay alive companies apply strategies that are caused by panicking and that will neither bring the much-desired short term relief nor help to fulfil any of the company’s long term goals. While a recession is a time of low production and demand, it is also a time in which companies applying the right strategies can differentiate themselves from their competitors, gain market share and thus greatly improve future cash flows. The three most common mistakes according to Riddleberger are:

- Cutting Your Prices

While it seems like an obvious measure to take when demand is low, companies tend to damage themselves doing so. Margins will tend to be too small to ensure the necessary profits in the short run and in the long run it will be difficult to raise prices once the economy picks up again. Companies that keep their prices up will be able to protect their margins and will be better prepared for what is to come after the recession. “Many even gain market share during an economic downturn.” On the other hand, “Weaker competitors who fail to hold the line on margins may lack the resources to fulfil their orders.”⁵⁵

- Cutting your Sales Development Budget and Cutting your Marketing Budget

Points 2 and 3 go hand in hand, as both the sales development as well as the marketing budget are put in place to increase sales. While it is always easy to determine how much a company spends on sales development and on marketing, the benefits (i.e. the increase in sales) are not so easily determined. Often these two parts of the company will see drastic cuts to their financing, leaving the company without proper ways of selling their products. “If your salespeople aren’t selling, though, no budget cut – regardless of how steep – can keep your company afloat.”⁵⁶

Another research, on exactly the same problem, carried out by AMR research looks at exactly this problem, not from a specific company’s viewpoint but from that of a supply chain. “The fact is supply chain management (SCM) is a long-term play.”⁵⁷ In times of crisis a lot of managers seem to forget that and reduce their funding and their attention towards supply chain measures. This leads to companies somehow managing to survive the recession, but being put in a position where they are not able to take advantage of the upswing coming after the recession. “Smart companies across industries will be much more strategic, targeting areas that will not only see them through a rough economy, but help them thrive

⁵⁵ Riddleberger, Barrett (2009): Three Critical Mistakes Manufacturers Make During A Recession

⁵⁶ Riddleberger, Barrett (2009): Three Critical Mistakes Manufacturers Make During A Recession

⁵⁷ AMR Research (2008): Thriving in a Recession: Value Chain Strategies at Work

during and after it passes.”⁵⁸ Basically, to be successful one must try to find measures that improve long term growth without putting too much of a strain on cash liquidity.

⁵⁸ AMR Research (2008): Thriving in a Recession: Value Chain Strategies at Work

6. Conclusion

This recession has had terrible, crippling effects on the economy and the manufacturing industry. While it is a difficult time for all companies and their supply chains, it is not a time to panic or stop co-operating with their supply chain partners. Smart supply chain managers keep a careful eye on liquidity but still try to implement measures that will benefit the company and its supply chain in the long run. Furthermore, supply chain managers need to become more risk aware and not just after the recession has begun. It is however during recessions where risk management measures used in the past will pay off: Companies that have put more effort into managing risks will see their losses limited compared to companies having used speculative strategies. Finally, companies should increase communication to share knowledge and expertise to make their supply chains stronger and hopefully survive the recession in a good state.

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Abbreviations

APS	Advanced Planning Systems
EDLP	Everyday Low Price
ERP	Enterprise Resource Planning
FED	Federal Reserve System
GDP	Gross Domestic Product
GM	General Motors
LTL	less than truckload
MSE	Mean squared error
RFID	Radio Frequency Identification
SC	Supply Chain
SCM	Supply chain management
SUV	Sports Utility Vehicle
TL	truckload
VMI	Vendor Managed Inventory