THE IMPACT OF THE FINANCIAL CRISIS ON SUPPLY CHAIN MANAGEMENT

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Executive summary

Premises

The fundamental premise of this paper is to argue the fact of the crisis on supply chain management and recite the reflex of companies and economies towards this crisis.

Every firm had its chance to experience the negativity of this crisis on the business process and each of those firms acted differently either relying on past experience or by developing new ideas.

This paper will discuss 3 main subjects

First, the impact on supply chain management. Supply chain is branched and has many sections such as transportation, logistics, warehousing and so on; however, this paper will only talk about transportation, logistics and financing. It will discuss the impact of the financial and economic crisis on the process within those three sections. Moreover, the paper will try to explain the relation between the financial crisis and supply chain management globally.

Second, the paper discusses challenges that will encounter supply chain management after the crisis. With the change of time and economic situation many challenges will encounter the supply chain management during the few upcoming years.

Finally, the paper will discuss the trends and the shifts that occurred and will occur in the near future in supply chain and supply chain management. Many firms shifted their production geographically and also in production in terms of quality and quantity.

All these points are discussed in a manner that shows the real impact of the financial crisis, in other words the crisis of the century on supply chain management.
Objectives

In the last 5 years global economies witnessed the most severe and crucial crisis in the 21st century (Bloomberg November 2012). The massive impact was spread all over the globe targeting small and big firms in all sectors. Supply chain management is still witnessing the impact of this crisis on its business process even after years past the debut of the crisis. This paper talks about how the crisis targeted supply chain management and its impact on it, as well as how companies reacted against this major problem.

This paper negotiates the impact of the financial crisis and comments about solutions to be made in order to lute against any future crisis. As Mr. Steven Culp (Global Managing Director, Accenture Risk Management) said the goal is not to predict when or what will happen, but instead be prepared and able to respond in an informed and planned manner to minimize the impact of a disruption. This paper shows the impact on supply chain management during the last 5 years and then negotiate how big firms were able to prevent major loss by creating tools and processes against any turbulence or abnormal activities around the globe. It provides all the main information about the crisis and its impact on supply chain management.

The objectives of this paper can be summarized in the following research questions.

Q1 The impact of the financial crisis
   ① How severe was the impact on supply chain management?
   ② Were all sectors, such transportation; warehouse etc., in supply chain management infected by this crisis?

   The impact of the financial crisis on supply chain management generally and on each of its sectors was very severe and targeted big, medium and small firms all over the world; Globalization was a major factor in expanding this crisis. Further on, in the review we will be discussing these points

Q2 Actions taken against the financial crisis
   ① What were the decisions taken in global economies and by firms against this crisis?
   ② What was the procedure in order to prevent a firm from falling apart?

Q3 The reaction towards processes used against this crisis and its infection on SCM
   ① Could processes and tools be used in future when another crisis or turbulence happens?
How close would be the relation between procedures taken now and the ones within a future crisis?

Methodology

The purpose of this paper is to discuss the impacts and the effects of the financial and economic crisis on supply chain management. It has been five years since the rise of a global issue: the financial crisis of 2008 in the states that led to a severe steep and slowdown in both developed and undeveloped countries. Europe, Americas and the Far East had their share of this crisis. Many of them fought fiercely in order to cut the damage caused by this turbulence.

The objective of this paper is to show the severity of the crisis on a specific sector in a firm which is Supply chain management (SCM).

Supply chain management has many different sectors like warehousing, transportation, manufacturing, production and so on. So it is a sensitive section in a firm because supply chain management is concerned in the whole company and in every aspect.

Results

The purpose of this paper from the start was to discuss the crisis issue and its effects on supply chain management. As in supply chain management we have many sectors; each of them was affected in its own different way.

Transportation in supply chain management, for example, had a dramatic and severe impact from the crisis. Many ships, vessels and transportation orders were cancelled or put on hold. Market towards emerged countries allowed a new range of customers and suppliers to help in facing this crisis.

Also in this part we will explain the new trends for supply chain management as well as the most important shifts in markets on global scale due to the crisis that helped reshaping supply chain management. In this part we eventually sum all the effects about this crisis on supply chain management.
1. Introduction

The financial crisis led to a steep increase in bankruptcies and insolvencies and is getting worse even after years of the beginning of the financial crisis that started in the states. Euro zone is having several countries in a similar state; Spain and Italy especially are suffering from the financial crisis that debuted in 2008.

Many ask what a financial crisis is and why it has such an effect on every aspect of our life from minimal things to major and important parts of our life. Before entering to our subject about the risk encountered on supply chain management, we should elaborate and explain the financial crisis.

Cleverly explained *(The Financial Crisis, as Explained to My Fourteen-Year-Old Sister kevin nguyen)* the financial crisis is nothing than over-evaluating things for the purpose of gaining more money. The financial crisis that started in the States was because of the eager of investors and banks to gain more money. Bankers and stockers over the past years valued lands and homes and stocks more than they deserve on market price for the purpose of extra gain. Many stocks went from 99 dollars to 99 cents and this fact explains and at the same time makes us wonder what the real value of the stock is and who decides what the price to sell and buy is.
The story about the crisis and its debut is that banks, agencies and brokers had one big false assumption: Prices for houses will go always up and if they drop, they wouldn’t go lower than the actual price (bank of America home loans). So the banks started to give loans, if someone “defaults”, they will in under their assumptions sell or gain a value from the property thinking that it will have high value and benefit from re selling it at a high price later. Well that was wrong. Banks offering loans to everyone especially for housing, and at a certain point, the states had 27 millions risky loans (Global Managing Director, Accenture Risk Management) – meaning 27 million owners cannot pay and they will default. This act led to banks being closed and insolvencies around the states. There were many more similar problems, like the” Wall Street crash of 1929 where buyers were in debt just to buy stocks resulting in more than 8.5 billion dollars in debt. The main lesson from this crisis was not to panic and especially not to let the public know about it because it will make the situation worse.

The crisis in the definition of Mr. Larry Smith (the head of crisis institution) is just turbulence inside an organization and people curiosity and panic effected and influenced the routine activities of the organization and has political, juridical, financial and governmental effects of the organization

After talking and explaining about the financial crisis we understand that a crisis is created by mankind and even controlled by them.

Supply chain management is one of the comprehensive methods of operational management in business especially at the massive economics scale so it’s normal to have the biggest impact from any fluctuation that happens internationally.

1.1. The financial crisis

The financial crisis debuted in the United States market and it expanded all over the world damaging firms. Why did it happen? The answer to this question is: a lot of companies have expanded their business to many countries; therefore, even if the country they were present in was suffering some economic issues, the company’s branch in that country will have to face those problems as well.

The cultural effect plays a very big role in multi-branded and international companies, because once a company enters a new country, it will have to follow the national rules of that country, that might be different from the company’s original rules, and this in turn will cause some issues. However, this did not really happen within the framework of a crisis, because in a
situation like that once a company finds a way to solve its problems in one country, it will try to implement the same solution in all the other countries where it is present. This in turn means that nations across the world will become industrialized and more alike.

Because of globalization supply chain managerial practices will become similar and face the same problems within one official standard and will have almost no impact from a country’s national culture.

The financial crisis was considered to be a “catastrophic event” to supply chain management, which has damaged severely the supply chain process. Examples of these damages could be the following: a delay in materials, information and cash flows, decreased sales, and increased costs. However, there are several ways a multi-cultural company can protect itself from these disruptions and abnormal events, but it is extremely difficult to find those solutions and apply them throughout all the branches of the company. One of the best ways of defense is to be prepared for those events or to develop resiliency. However, companies must realize that no way of dealing with crisis can ever be perfect. Moreover, due to the fact that the financial crisis has happened only 5 years ago, there are not many studies and about its impact. Nevertheless, we will see that there is no a complete study that will teach companies how to be prepared.

1.2. Supply chain management

Many of us get confused when we say supply chain and logistics, thinking that logistics is the same thing as supply chain, but in reality there is a huge difference between these two. Logistics is concerned with the organization, the movement and storage of materials and people, while supply chain is the network of the organization, the link between different processes and activities that produce a product or even a service to handle it to a customer. Supply chain management also differs from logistics management in meaning and activities.

Logistics management is concerned with the integration of activities such as warehousing management, inventory management, transportation management and procurement, to provide maximum value for the process system.

Supply chain management is not limited to planning and management of the activities as it is in logistics management. It is as well the coordination and collaboration with partners outside the organization such as suppliers, third parties and customers. Essentially supply chain management integrates the supply as well as the demand side within the whole organization. It has a major
role in linking business functions and processes, from activities included in logistics management such as warehousing transportation and everything else that matters in operations and manufacturing plus the processes of sales, design and information.

The supply chain is a network of resources the main job of which is to transform and then distribute a finished product to the final customer. Supply chain management is a very complex part of any company that is linking material information as well as financial flows. It has many convergent and divergent aspects through a company. Because all companies are focusing on a worldwide market, supply chain management is becoming a complex network.

While many think that supply chain management just means moving merchandise from one place to another or from one continent to another, in fact, it is the bone of every operation in a company.

The development of supply chain management in global context is often limited by some institutional constrains. With the globalization that we are facing nowadays, for more than 15 years the world has been becoming a smaller place in terms of demand and supply. The most important part in supply chain management is the “customer”. His demands are what make supply chain management effective. Moreover, due to the globalization, the importance of a product has become more critical. This in turn leads us to the fact that the level of attractiveness and design of a product will impact the supply chain management in terms of manufacturing processes, cost, quality, and most importantly – the lead time.

Globalization has played a big role in shaping supply chain management, but the creation of supply chain management has started long before including other factors and movements. In the 20th century when the assembly line was created, it has also created a need for a new management style that would be on a larger scale markets. After globalization took place, companies faced a need to organize their business within this large scale demand, so supply chain management was improving by categorizing everything, and this is what made outsourcing and specializing became a trend. Specialization and outsourcing let the companies to be more efficient and improve the overall process. The globalization has made the supply chain management a very complex unit in a company that has to deal with every aspect concerning the product.

The last crisis that we encountered was the financial crisis that debuted in the states in 2008, the tale of this crisis reached the whole world attacking small, medium and large companies,
where supply chain management is such a sophisticated part that controlling it became very complicated in this case of turbulence.

1.3. Objective and methodology

The literature on the impact of the financial crisis on SCM is more based on a qualitative approach than a quantitative approach.

The reviews are divided in three main subjects. The first one gives the explanation of the crisis, the supply chain, and the supply chain management. It gives the meaning and the understanding of these concepts.

The second part is showing the relation between supply chain management and the crisis. Since the main emphasis of this paper is the impact of the crisis on supply chain management, it gives all the explanations about supply chain management and the crisis together.

Finally, the last part is about supply chain management after the recession, the tools used and implemented in order to cut the loss caused by the crisis, and the creation of a more sustainable supply chain for the future.

This paper also shows that the work is more qualitative than quantitative. It will give an idea about the supply chain managing during and after crisis and will discuss the future trends of supply chain management and how this crisis has shaped the supply chain management as we know it or as it has been in the last few years.

The understanding of supply chain management during the last five years shows that the exposure to external risks has rise dramatically and SCM became more vulnerable. In the review we will show topics such as the following:

- External Exposure

- Vulnerabilities
The data was organized and discussed in the following way:

It has been 5 years since the financial crisis debuted in 2008, and since then we lack real empirical and theoretical studies about the true impact of crisis on supply chain management. The impact of this crisis is still present on global economies, and specifically on supply chain management.

Studies conducted about this impact were not on a global scale, but they are focused more on categorizing some sectors in the work field. Some examples are discussions about the impact of the financial crisis on iron supplies, others are about manufacturing airplanes.

The purpose of those studies was to figure out the impact on transportation and supply chain and supply chain management in general around the world, since the crisis hit almost all major countries within all major business sectors.

The main sources for this research were articles in various journals, studies about the impact on a certain business sectors and of course the available theoretical studies about supply chain management and the trend nowadays.

Almost all sources mentioned the risk encountered from crisis, natural disasters and man-made problems, but nothing was said about the impact on supply chain management.

The following table shows the sources used for this study:

<table>
<thead>
<tr>
<th>Type of source</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Journal of commerce</td>
<td>1</td>
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<tr>
<td>University research papers, thesis.</td>
<td>5</td>
</tr>
<tr>
<td>Journal of operation management</td>
<td>2</td>
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<tr>
<td>Journal of purchasing and supply management</td>
<td>2</td>
</tr>
<tr>
<td>International journal of engineer and technology</td>
<td>1</td>
</tr>
<tr>
<td>Journal of commerce</td>
<td>1</td>
</tr>
<tr>
<td>International journal of production and economics</td>
<td>9</td>
</tr>
<tr>
<td>Science road publishing corporation</td>
<td>1</td>
</tr>
<tr>
<td>Computers industry</td>
<td>1</td>
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<tr>
<td>The American journal of commerce</td>
<td>1</td>
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<tr>
<td>Journal of business research</td>
<td>1</td>
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<tr>
<td>International journal of management of science</td>
<td>1</td>
</tr>
<tr>
<td>European central bank</td>
<td>1</td>
</tr>
<tr>
<td>Transportation and logistics 2030 by PWC</td>
<td>5</td>
</tr>
<tr>
<td>Journal of clean production</td>
<td>1</td>
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<tr>
<td>Centre d’etudes prospective et d’information</td>
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</table>
As the table shows, the study is more based on journal articles about: the financial crisis on world economies, the supply chain management in general terms, and some of the effects of this crisis within several sections in supply chain management.

The purpose of this paper is to discuss the impacts and the effects of the financial crisis on supply chain management. As we have said it has been five years since the rise of this global issue: the financial crisis of 2008 in the states that led to a severe steep and slowdown in developed and undeveloped countries. Europe, Americas and the Far East had their share of this crisis. Many of these countries fought fiercely in order to cut the damage caused by this turbulence, some of them succeeded and some didn’t.

This paper shows the severity of the crisis on a specific sector in a firm which is Supply chain management (SCM).

Supply chain management has many different sectors like warehousing, transportation, manufacturing, production and so on. So it is an important part in any firm because supply chain management is basically participating in the whole company and in every aspect.
2. The impact of the financial crisis on Supply Chain Management (SCM)

In this chapter we will talk about the core subject of our paper. All what concerned about supply chain management and the relation with the financial and crisis that started in 2008.

2.1. Literature review

2.1.1. Managing Risk in supply chain management during crisis
The damage from the global financial crisis was massive (Financial Crisis, Its Causes, Implications, and Policy Responses”, Dubai, October 2009), wiping lots of companies and causing others to cut back on costs and salaries.

Supply chain management in recent years is encountering more and more unknown risks. With the expansion of the supply chain worldwide, supply chain is entering a dynamic, unstable environment and that in turn is leading to a rise in risks.

This risk is a major concern and usually risk is associated with negative consequences (Christopher and Lee, 2004, Paulson, 2005, Spekman and Davis, 2004, Wagner and Bode, 2006) and whilst supply chain is expanding overseas, the need for managing supply chain disruptions has risen. It is right that globalization has extended the geographical reach of supply chains and increased the risks that a firm’s supply chain will encounter, but also it had a cultural effect on both national and international markets.

In supply chain management risk has different and various definitions, but in particular we can define 3 important and major definitions Tang (2006a), such as material risk, financial risk and information risk and we note that the common thing about the three of them is that they all get affected by the crisis that hit partial, national and international markets.

Talking about materials risk we encounter 3 major problems starting from the source flow (Fitzgerald, 2005), (Christopher and Peck, 2004) followed by the operation process (Handfield et al., 1999; Khan et al., 2008; Peck, 2005) or the making of the product, and finally the delivery to the customer (Johnson, 2001), (Lee, 2002, 2007). At any point the financial and economic crisis can target these 3 major “processes”. The source flow will not be able to extract or deliver the “materials” to the company that has a consequence of not being able to deliver this product to the client, who in turn will be easily influenced by any changes in his environment. Then we can say that it all starts from the customer: in other words, any turbulence around him will suddenly change his demands, which in turn will change so the resources and production process so that the company can satisfy the demands of its customers.

The financial risk is concerned about money (Li et al. (2001), Carr (1999), Goh et al. (2007) and Kouvelis (1999). When a crisis is present, it targets the purchasing power of a customer as well as the purchasing power of a firm with an operating system. Making
almost all of it to be dependent on a customer, who has the power to buy and make an emperor from an unknown company.

Last but not least we have the information flow; it’s usually considered as the link between material and financial risk that will allow us to achieve accuracy in what we deliver (Lee, 2002, 2004; Geary et al., 2002; Raman et al., 2001; Giermanski, 2000; Bradley, 2001; Faisal et al., 2007). The flow of information should be essential and fast. The relation with information flow and crisis is the change of customers’ opinion once the delivery is made; this change will have a significant impact on the production process.

Risk management is becoming an important aspect for most parts of managerial decisions. Supply chain management is one of the most vulnerable and fragile sectors in a firm and is the most affected one by the risk created from a crisis or turbulences in the global economy.

The global competition and technological improvements are motivating companies to perform better, to present competitive prices as well competitive new products. This fact is exposing the company to both internal and external risk.

Managing the risk is becoming a trend in supply chain management because it is affecting the performance of supply chain structure, making management tools and controls benefit the firm when it comes to managing risk encountered from any turbulence. The consequences of a risk and performance are related directly to each other and, therefore, the decisions taken by managers can affect both positively and negatively the way supply chain works.

Yet another major managerial tool is timing; it is very important to be able to elaborate and come to a decision in a competitive lead time, and here we are talking about risks encountered and increased years ago from with the birth of the financial crisis. The term risk means uncertainty, which also indicates the likelihood of occurrence of an event that will lead to one thing: the malfunction of the process in the supply chain. The management of this risk or all three types of risk will be done by analyzing information around us. In order to analyze information on a worldwide basis we should build or have at least a sharing system among all firms that are capable of analyzing and studying a potential risk. This will let them try and elaborate on a solution before another crisis takes place, or better - before there is a major impact on the supply chain.
Knowledge is what enables any decision maker to give a certain outcome from this uncertainty.

Performance is related directly to crisis, which means when risks increase, the performance of a company will be affected. The performance is the efficiency and effectiveness of flow of both products and information. So the better is the transmission of information among companies, the less will be the impact of any risk on the performance of the company.

Managing risk is not an easy task since firms should deal with different turbulences in each of the suppliers’ issues and in different countries. This makes it very difficult to create an effective management strategy used all over. The complexity of supply chains is really the main core and the main nerve of any company. Factors such as locations, branches, and industry forces make the management approach of every risk difficult; a single tool cannot manage different risks in different sections and in different countries, therefore, the importance of managerial tools and information sharing among suppliers and firms nationally and internationally is extremely important, because it will help to come up with some general managerial decisions that can fit to many sectors and firms.

As we have already said before, there is no perfect solution or the best way of organizing or managing an organizational style that can ideally fit to all possible situations that can encounter the supply chain.

But we can say that decision makers during risky times should take into consideration tactical, operational and strategic phases in supply chain management. Risk has an impact on each phase and that’s why decision-making should be able to monitor disruption, uncertainty and disturbance in these phases.

Obviously after attempting to measure risks and use managerial tools to reduce those risks, the firm should implement all this and see if it is effective. However, what is certain is that crisis differs in time and in place and a decision can only prevent or decrease the damage on the supply chain.

2.1.2. The impact of the financial crisis in Europe

After explaining the risks that encounter the general supply chain worldwide, we are now going to talk about supply chain management in Europe.
The financial crisis is still having its impact on the European zone or so called euro-zone: an increase in the unemployment rate, a slowdown in production, a fear of the rise of financial debts, and long term effect on the country’s economy.

This “economic danger” has also affected the consumer willingness to spend; obviously the natural reaction of the consumer was to change his/her ways of spending, and this in turn is causing an additional price and pressure on both manufacturers and service providers.

In Europe ports are the indicators of the economic situation of a given country. Europeans still remember their ports empty few years ago, although nowadays European leading ports are having better results than before. So we are actually seeing some results after the massive crisis. People are developing and building trust again in their economy and this will take several years to regain what have been lost.

Measures are being taken by the European Union in order to limit this crisis and gain trust of customers, but the damage from the global financial crisis have led to a change in consumer behavior. Suppliers in turn were concerned and had to put on hold a lot of products.

2.1.3. The impact of financial crisis on transportation

The efficiency of supply chain depends on the operation of transportation. The process of moving loads, delivery of merchandise and energy saving. Logistics as we already explained is an important part of supply chain management, it plans, implements and controls the efficiency of flows and goods (M. Sreenivas, Alluri Institute of management sciences, Waragnal, India, Dr. T. Srinivas, department of mathematics, Kakatiya university), therefore transportation is the most effective part in the whole process to deliver the product within a lead time and within a low cost to customers.

Transport in supply chain is the most important economic activity; it makes goods and products movable and provides a time schedule for the delivery. It has a big influence on production and sale.

Transportation again in supply chain has the role of a connecting bridge between several steps or process in the company; it is the link or the resources to the manufacturer as well from the manufacturer to the customer. A great importance in the world is given to transportation. Taking into consideration risks created externally and not managed by the league such as the petrol cost and the previous financial crisis.
The petrol is one of the most important sources in order to move products, this will effect negatively the suppliers, “Analysts say Libya crisis can push oil prices past US$ 200”, Centre for Global Energy Studies, www.cges.co.uk, March 2011, as well as merchandisers and customers. It will have more pressure on price and cost of transportation between nations.

The economic and financial crisis affected production, employment, land pricing and of course the financial sector. But it has also affected the national and as well international trade volume on long and short term (World Economic Forum report Global Risks 2012, World Economic Forum, Jan 2012. Transport in supply chain, or so called freight transport, depends on the trade activity; and the economic crises that debuted in 2008 led to dramatic and horrible reduction in international trade. On short term factories were able to manage themselves and the development of the transportation section was deducted by cancelling order of many vessels and containers in order to adjust the risk encountered by the crisis.

The economic crisis has changed the structure of the economy in all countries all over the globe. More people are now measuring risk and paying attention to small details and rumors between firms and within the countries before making a step into a business.

The transportation sector, which is considered as the most important factor, had the biggest impact from the crisis.

The euro zone is investing in and developing the legislations and infrastructure of the transport system in order to be more efficient at a competitive cost. One of these legislation, made to lute against the economic crisis, is the agreement between the States and Europe about products coming to the EURO zone. The so called “blue belt” will start working from 2015 and it concerns the products within the EU zone that can move freely, without any restrictions customs charges. This type of legislation allowed the price factor to become very important among EU countries and encourage the production inside the euro zone.

The future of transportation: expectations

Transportation, the most important part of logistics and within supply chain management, is the nerve of every company to reach resources and clients at a minimal price possible.

Globalization has made the world in terms of supply chain very small: take a product and you will see that, parts if it are designed in England, but manufactured in India, only then
shipped to Europe to be assembled and reach customer in North America. In an already wide supply chain the future of transportation will be full of new developments and new agreements across the globe.

Transportation and logistics will have some challenges in the near future. And what every logistics firm is talking about is efficiency in cash and cost. Surely, when we talk about efficiency, it is not only about return but also about the infrastructure of the transportation system worldwide.

Transportation is growing day by day, people will be travelling and the population in countries is growing, so the demand will grow creating more flow of products within countries to all customers. Countries with higher GDP should be expecting improvements in technology and in all aspects of life; transportation is meant to grow and grow to feed this growing demand in the future. China, with the largest population in the world and the second largest economy GDP and the first in trade, is the country that invested and implemented new technologies in transportation system. Underdeveloped countries such as Brazil, Africa, Middle East are having the boom in technology, work, businesses, and development towards becoming better countries and better service. This means the demand will be growing day by day in the so-called third world countries. For instance, 20 years ago, the UAE were not even on the map but now, Dubai and Abu Dhabi, are the fastest growing cities in terms of logistics, shipping, importing and exporting to several nations near them and worldwide.

Demand is growing and with this growth the need to establish efficient supply chain management is a must. Transportation within global view will have investment in the infrastructure on short term and long term in order to satisfy the long term growth (Dr. Heiko von der Gracht, Managing Director, Center for Futures Studies and Knowledge Management, Supply Chain Management Institute, EBS Business School).

Globalization has led to emerging markets, many logistics companies are present in more than 100 countries and this is not new. This is old information about logistics firms working globally and all that is due to the globalization and the emerging markets. And due to this fact in the future we will see all countries in the world working together to deliver products existing in all markets. The preparation is the key to everything, to new emergent countries, to countries that were not on the map of successful countries only several years ago. We are talking about China, Turkey, the UAE, and many others countries that are on their way to development of their
infrastructure. New trades between countries and re-forming the shape of supply chain management, of the transportation system and logistics.

Globalization led to privatization and that in turn led to the development of all businesses and economical sectors in a given country. Countries such as Brazil and Mexico went straight to privatization of all resources, leading to gaining back the trust of customers.

The future of supply chain management, transportation and logistics is changing. Lots of new agreements are done or being processed. Many countries opened their barriers to products that once we forbidden to enter. The last crisis has led to one thing which is: supply chain should be more secured in every operating country.

Global supply chain management and transportation is in danger of a man-made turbulences all over the globe (World Economic Forum and Accenture market analysis, 2011) and the latest was the 2008 financial and economic crisis. The question that you hear on every board of logistics firms is how we can secure ourselves from any sudden crisis, turbulence, attacks and natural disasters and what is the right and the perfect decision to be taken in order to protect our supply chain system. Even after more than 100 years of the existence of supply chain and the risk that already encountered it during these 100 years, we are still discovering that the wider we expand, the bigger the vulnerability of supply chain and the transportation system is.

Crisis teaches the economy how to be prepared and see problems from different angles. How to organize a problem in a risky environment and what action can be done in order to prevent this problem from becoming a deeper one. Indeed, when turbulence occurs, lots of firms shut down, as well as economy as well as development technologies and infrastructure. But the thing is that population will not be affected by a crisis, population will be growing in both developed and undeveloped countries. This in turn will lead to a certain growth in demand on a long term basis. This growth will always lead to investment and development in the managerial tools; more experienced people will come out and will help in future years.

Petrol is the most important factor in the transportation section, any fluctuate in price will lead to increase, not shutdown, but an increase in price so it will result in more pressure (“Libya crisis can push oil prices past US$ 200”, Centre for Global Energy Studies, www.cges.co.uk, March 2011) on suppliers and manufactures, forcing them to set a lower price and compensate on transportation price.
Europe is depending on the oil found outside their countries and the fluctuation in price will add extra cost on products and merchandise and transportation. Several countries are now thinking of “green transportation”, but this is going to be a long term objective, because it is very difficult to shift the whole production on transportation to green transportation.

2.1.4. The impact of the crisis on supply chain financing

Supply chain financing also referred to the term financial supply chain management. It is about optimizing the flow of money in and out of business across the supply chain and its customers.

Companies generally focus on their supply chains when they are interested in the following issues (Krištofík, 2010):

- Obtaining visibility over all the processes involved in the financial supply chain.
- Increasing efficiencies throughout the chain.
- Reducing costs throughout the chain.
- Freeing up working capital by obtaining a clearer picture of where funds are required.

It allows a supplier to sell its invoice to a bank at a discount price as soon as they are approved by the buyer. That allows the buyer to pay later and the supplier to secure money earlier. It is a less risky prospect in dealing with several suppliers and more creditworthy. The win-win strategy is commonly used in supply chain; both sides improve their working capital and the bank gets a fee. And the risk is transferred from a group of suppliers or buyers to the bank.

So, supply chain financing is an important source of funds for all types of firms around the world. However, the financial crisis brought a severe disruption on firm and market level which impacted directly the decision or even the opportunity to have inter-firm financing.

Trade credits is the “agreement” between a customer and a supplier where the customer can purchase goods and pay at a later date. It is an arrangement between businesses to purchase without an immediate cash payment. The supplier provides the goods and the customer can pay after the agreed period.

Big firms with complicated supply chain have the bank as a link of payment between the firm and the supplier. The agreement is made between the firm and the supplier, and the bank makes sure that payments are made in time.
Two main categories are the main issue in supply chain financing during the crisis:

- Firms who extended trade credits to customers or suppliers
- Firms who increased or decreased the volume of goods sold on trade credits

In 2009 after almost one year after the crisis, firms changed they work. Many firms, almost 40% (Financial Crisis Survey /Enterprise Surveys.) extended their trade credit to their customers with a variation in countries. In Turkey extensions of trade credit reached 40%, whereas in Hungary they were as low as 16%.

Firms offering trade extension are considered as an innovative move from the part of the company in order to attract the customer. This method existed before, but after the crisis it was more innovation and a factor of competition between suppliers.

2.1.5. Conclusions

Over the past decade supply chain management was introduced as a vehicle through which firms can achieve competitive advantages in markets. Many companies have made large investments since 1990s in order to improve customer satisfaction and increase productivity.

Nowadays not individuals are competing with each other, but rather the competition is between strong and sustainable supply chains. It adds the most value for the customer and the lowest cost on the firm and that implies to a winning network of companies.

The set of companies all over the world are seeking how to integrate decision across supply chain functions and across time. But the fact that supply chain is getting more complex makes it crucial to integrate such decisions.

The essence of supply chain management is to integrate planning and control and it involves decisions about:

- Purchasing, manufacturing and distribution
- Geographical integration of concepts and processes
- Strategic, tactical and operational decisions

Therefore, management of supply chain in a business has a major financial impact on all parties involved in the chain either internally or externally. Due to that, supply chain management is considered vulnerable and fragile. Any economic fluctuation will lead to changes in the way supply chain management is done.

In this paper theoretical framework is used to evaluate supply chain management decision during crisis. Global companies and local companies witnessed the crisis of the century and
economies are developing ways to prevent damages from future economic and financial
turbulence. This paper negotiated about the financial crisis and how companies did manage to
react against it. No historical data is found to properly manage supply chains in time of crisis so
it was the chance to understand better the supply chain and create a globally conformed decisions
and processes to be on the same track whenever a major problem rises in the future.

The impact of the financial crisis was severe on many aspects in supply chain, but in this
paper we talked more about transportation and financing supply chain since they have the most
relative points with the crisis.

Five years passed over the crisis and still big firms are creating better ways and better
processes for a better future for the supply chain management. The first step that all companies,
on a global scale tried to do is to cut the losses on short terms and then build a sustainable supply
chain for the long term run. In the short term companies stopped major orders from suppliers as a
natural reaction for the contraction of the customers buying powers. This resulted in problems for
the suppliers in stacked stocks and unsold merchandise. Companies shifted symmetrically with
the shift in demand of the customers and searched for suppliers with lower price goods and better
payments conditions.

All these decisions resulted in major transformation on a global scale in the business between
suppliers and companies. Shift in markets and shift in demands were the most important impact
of the crisis. Customers need to tend towards less expensive goods but with good quality. This
resulted in an increase of export in emerging countries such as Brazil and China. These shifts are
explained in chapter five. It emphasizes the major shifts caused by the 2008 crisis.

3. Supply chain management challenges
Many challenges have risen right after the economic crisis and determining these challenges will lead to a sustainable Supply chain management in the future.

The implementation of supply chain management can be beneficial and challenging to a business. Determining challenges before they happen is critical to the success of SCM as both failures and successes are visible to the trading partners and competitors.

The change in the international market will add more challenges to the supply chain management. Therefore, supply chain leaders should invest more in developing their skills to meet the growing expectation about how supply chain management can support the business.

Here are the challenges that supply chain management will take into consideration for a better SCM.

The most important challenge for supply chain management is not to use the past to predict the future. Relying on past performance to predict future sales can cause major problems.
Another important challenge is the need to reduce costs while improving customer satisfaction and support the expansion in new market and product lines. This is by far one of the most important challenges for supply chain over the years.

Many challenges change with the lapse of time, but some of them remain always as a challenge and firms try to constantly improve Supply chain management.

One of the challenges that occurred after the elimination of the “silk road” is the management of the complexity of Omni-channel\(^1\) selling and customer fulfillment. As it was explained earlier in the paper, supply chain is a complex and dynamic set of supply chain. Therefore, the existing challenge in managing a complex multichannel network is important for the manufacturing and operating process to work smoothly.

Since we have talked about globalization, having a global procurement network is a major challenge. Selecting a strategic supplier that provides manufacturing locations with consistent global quality and reliability is an important challenge for any firm seeking to succeed.

4. Discussion

\textit{In this part of the paper we will be discussing the future of supply chain management and the results after studying the impact of the crisis on supply chain management. Crisis usually reshapes the process of a firm and how business is done.}

\footnote{\textsuperscript{1} It is the evolution of a multi channel sales concentrated on the customer desire through all available shopping channels}
4.1. The post-crisis world and the resilience and re-shape of supply chain management

Responses to crises

After the debut of the financial crisis in 2008 in the states and its spreading all over the globe, the first reflection of this crisis was an immediate change and a drop in demand. This created major problems for both suppliers who faced financial issues, and also the manufactures that had to change the process of manufacturing.

The massive drop in demand encouraged the leading supply chain firms to take some actions to prevent in the future the decrease in the demand. Establishing and implementing confidence in an international market was one of these instruments. They needed to stabilize their markets in order to gain or to get back to the stat that was present in many countries before the crisis. This little progress that they had allowed companies to develop several actions against sudden or unexpected turbulence.

Since the start of globalization, the world has not witnessed a severe crisis, so this is the first recession in the globalization era.

Several crises occurred during the era of globalization and it was thought that it is the ending of the globalization but lessons were given after each crisis, until the last crisis that happened in 2008 and had the most severe impact on economies across the countries. For the first time GDP all over the world dropped and affected the supply chain management and the trade between supply chains across the world. The trade which has direct connection with the
demand dropped dramatically in 2009, after only 1 year since the crisis. The wealth of population also affects the demand, and in 2009 the percentage of international unemployment increased and hit the number of 200 million unemployed, which has led to poverty across nations.

The effect of the crisis was so severe and hard that the reflection of it can be seen even now, meaning that even after 5 years firms are suffering, supply chain is having demographic and organizational transformation, and the whole demand worldwide is having a lot of reshaping in its design.

Trade was not the main casualty of crisis but it is considered very important in the world of supply chain, because any fluctuation in the market will have a direct effect on trade. The reliance on outsourcing increased the dependency on export to sustain growth. This reliance has led to a greater profit, but also to a greater exposure to external shocks.

Many operating companies in the States are depending on manufacturing in Japan or China and even India; if there is a sudden disruption in that country. For example, a tsunami that corrupted the nuclear factory or a volcano in an industrial zone exploded and damaged some firms.

The economic and financial crisis showed how important the supply chain is within the world economy. The role of trade in the transmission of the crisis was heightened by the business models based on global production and trade networks. It means supply chain management and the tools used between links and between companies helped also the transmission of economic shocks within firms and throughout different countries.

After the crisis, banks dealt in a different way with trading finance. They became more risk averse and more selective in their supply of credit. In 2009 a study made by the World Bank showed that trade finance was more expensive and less available now than prior to crisis. This issue targeted and affected small exporters.

As it was mentioned earlier in this paragraph, supply chain helped in the expansion of the economic shocks, so the denial of credit to importers in one country leads to credit problems for seller in another country. This in turn will reduce their access to credit resulting in turning down their ability to import. On the other hand, big firms within the supply chain worldwide helped to remedy trade finance by supporting their suppliers financially. Big names such as Wal-Mart and Kohl’s offered an alternative to supplier traditional means of financing.
Not all effects of the crisis are negative. During a crisis the GDP of a country falls down and this means two things. First is to postpone the purchase of certain products, second is to search for cheaper goods. Clearly when we deal with postponing purchase it means a contraction in import/export for a certain product. On the other hand, the effect of purchasing lower priced products will obviously have less impact on trade. The relativity of these substitutions will equilibrate the trade in specific countries industries and firms. As an example the substitution effect could explain the record sales of Wal-Mart and the Chinese and Bangladesh export during crisis. These last two countries exported substitute products to many countries with lower price, as well as Wal-Mart who agreed to sell these products instead of expensive ones.

But, the overall decline in the volume of trade shows that the demand effect has submerged the substitution effect. Many big firms faced declining profits by reducing cost or by increasing flexibility through outsourcing, others froze their offshore contracts. This shows how the decline in demand may affect the process of supply chain.

- Challenges and opportunities

Although crisis has led to severe damages and trade made it worse by expanding this crisis around the globe, we must realize that it will also transmit the actual recovery to global economies. The pace of recovery will be higher globally and the WTO estimates that the volume of world exports will grow significantly in 2010 and 2011.

The main subject of this paper is to find out and show if the recovery will be symmetrical between economies or we will have uneven recovery of global trade compared to GDP. This will be summarized later in the paragraph and give the possible outcomes to the current crisis.

- Shifts and challenges

After the 2008 crisis, globalization will not look the same as before; in fact, after every major crisis, globalization increases its pace with some important shifts either in demand or supply. The last crisis reveals significant shifts in global production and demand. The trend now is more towards diversification. In these few chapters we are going to explain about these shifts and about challenges in the future of supply chain.

- Shifts in global demand

As it was explained briefly in the last paragraph, the crisis will have uneven results on firms: some of them will be able to deal with the downwards of demand with outsourcing or by
cutting costs. Product and market diversification is a must in the era of technologies and development that our world is facing now.

After the crisis firms all over the globe, south and north, witnessed the shift of demand from developed countries to emerging countries. Many companies in the developed countries paid more attention to emerging countries and this led to the arrival of new brands and new investors. It is remarkably seen by shifting demands from Europe and America to China and India.

▷ Shift in markets

The shift in markets started earlier before the crisis, but the crisis has accelerated the trend towards emerging countries and, nowadays, we see that the demand is shifting towards other places.

Countries such as Brazil, India and China tried to compete with foreign producers in many sectors such as apparel and mobile phone sectors. An opportunity has risen after the crisis and exporters in the north were aware of those opportunities, but only after they saw a drop in demand in their countries. Big firms and big names went to the emerging countries looking for cheap labor and a possibility to cut production costs. They went to Bulgaria, India, China and even Korea and many of them succeeded in improving their performance after the crisis by presenting goods with a good price and a low manufacturing cost.

▷ Shift in global production

Usually a crisis changes the way things are done. From 1960s to 1970s automobiles expanded at a different and faster rate. After that the electronics era came, that was present until the 2000s. Now it accelerated consolidation trend in several industries.

▷ The next challenge

New markets are open for firms from developed countries to enter and seek opportunities and change the face of supply chain. Managers in the supply chain are always in a constant search of a better solution to be able to provide the best goods at the best price. Clearly market shifting towards the south is a major change, which all companies should adapt and deal with. Lead firms in the north or in the developed countries such as Europe or the States will establish new design and new engineering for the new markets and that will lead to many opportunities for both local and international suppliers.
The shifts in production may not be permanent, but due to the crisis itself. But if it were to be permanent, customers would ask for more sophisticated products.

As a conclusion for what we have talked about in the last chapter, the 2008-2009 crises had positive impact either on globalization or on supply chain management. Supply chain has proven resilience and have emerged new countries in the world economy. The shift of markets and the shift of demands gave a push to countries neglected in terms of development and technologies and, the crisis helped these countries to become a part of the world order.

We are seeing undeveloped countries working with developed countries and the global economy and the world production and demand gave a possibility for the south to become a part of this economy.

Accordingly, the supply chain has found its way towards a better condition and more solutions in the land of the emerging countries.

Notes:
1. “This crisis is not just a global crisis. This crisis is not a crisis in globalization. This crisis is a crisis of globalization,” Nicolas Sarkozy, President of the French Republic, World Economic Forum, Davos, Switzerland, January 27, 2010.
2. More background found in www.globalvaluechains.org

4.2. trends for the future

Supply chain management is now the center of a debate over the causes and consequences of the 2008 economic crisis and collapse on global trade. A global effect of the disintegration of supply chain (by feentra, 1988 and by Grossman and Rossi-Hansberg, 2006) were discussed even before the crisis, and after the global downturn supply chain management is seen as central to dramatic collapse of world trade (Baldwin 2009).

Every month consulting and professional companies, academics and even individual companies present a fresh idea (FIRST ANNUAL REPORT BY THE SUPPLY CHAIN MANAGEMENT FACULTY AT THE UNIVERSITY OF TENNESSEE, SPRING 2013) about the changing trends faced by supply chain management.
The recent prediction of a rapid recovery demonstrates the future major and difficult trends to adapt in supply chain management. From these trends we recognize:

1. A trend that is becoming more and more “famous” in supply chain management, it is the change from product chain to service chain. Many of us asks for a pre and post service of the product we buy. So service chain in the future of supply chain management will be integrated and also will be an important sector in supply chain management. Tim Cook (apple CEO) apologizes to costumers in China for the company’s neglecting of post sales feedback. This type of messages is a great example from a company with the most innovative products in the marketplace. This explains that the trend in supply chain management will be also dealing with post services supply chain activities (warranties, responsive consumer services, product knowledge and the like).

2. Another trend is that companies will need to have detailed knowledge of the customer segments. It is called Micro-segmentation. It is the part of the general buying category that trigger the purchasing decision. Organization will need to know their micro segments, and the supply chain must effectively service them based on business strategy. In few words, adopting business to costumer mindset even if the operation is business to business.

3. Another important trend already being used now but will be way more important in the future of supply chain management is the technological support to supply chain management. All supply chain will work under SaaS (software as a service) by 2020 (By Sumantra Sengupta page 2, July 2013)

As these trends explain the future prospective of supply chain management according to some studies (By Sumantra Sengupta, what trend will affect the next generation of supply chain, July, 2013 & game-changing trends in supply chain, first annual report by the supply chain management faculty at the University of Tennessee). We can understand from these trends how difficult will be the future of supply chain management. These trends are to be implemented and adopted by supply chain management for a resilient supply chain management.

4.3. The impact on a specific industries

This last chapter examines the impact of the 2008 crisis on the supply chain management in the automotive industry and in the electronics industry and the policies adopted by government during the crisis.
The 2008 crisis deepened the global economic recession that has been under since the early 2008. The impact of the crisis on the automotive industry as well as the electronic industry has been more severe than any other industry. This led to governments in Europe, America and far east to interfere by pumping aids(money) to companies with financial failure.

* the severity of the crisis on the auto industry was very bad in the US the most important manufacturers were in bad shape and with declining market share. Cancelled orders and the freezing of trade credits and credit market led to the bankruptcy for several manufacturer. to prevent the liquidation of the country’s largest and most heavily industry they offered bailouts and CEO made huge modification in the process used in the company. General Motors considered the biggest and most important automotive manufacturer filed bankruptcy. other companies had to let go of cross country investments(Chrysler letting go Fiat). even Europe provided bailouts but as credit support and guaranteed loans to troubled firms.

Interventions in the automotive and electronics industries had their systematic importance. The intervention was believed to be manageable in both automotive and electronic industries. Lead firms have massive supply chain all over the world so the connection is big and clear. as a result governments believed in assisting these industries which will eventually generate business for other suppliers and firms.

Large bankruptcies can create reaction in any industry or country but talking about the image of a product and the future of this product will be damaged if this name is going to failure. We can also take into consideration the image of the country itself. If lead companies and firms filed bankruptcy it will change the image of the country and will have future failures and will be difficult to rebuild the image of an economy.

The objectives, justifications and motivation for interventions have been numerous and action taken to save these companies and their supply chain will, under the assumption of the government, lead to a motivation and will refresh the national economies and economies where suppliers exist.

* the electronics hardware is the world most goods and production sector. These products enhance the productivity in other activities and lead to innovation across economies (Mann and Kirkegaard 2006). The electronics hardware helps also the implementation of supply chain management using up to date software and products so it is a mutual importance between the electronics and supply chain management.
As with almost all other sectors the electronics industry was affected by the 2008 crisis. The crisis of the electronics is showed in trade where the largest containers carriers showed revenue declines of 40 percent (Maers,hapag-lloyd). Lead firms in electronics increase outsourcing and offshoring strategies (sturgeon 2003) especially after crisis.

The demand for a lower price is the most important factor of the 2008 crisis. It led to a radical change in trading and manufacturing electronics. The shift to China started earlier than the 2008 crisis, but after that year, lead firms across the globe started shifting their production to a more convenient territory such as China, India, and Bangladesh to manufacturer the electronic goods.

Electronics hardware and systems have a propulsive effect on other industries and because expertise tended to be in few places, governments did the same with the electronics industry and interfered by giving aids to lead firms.

The increasing role for both automotive and electronics industry came into focus during the 2008 crisis. It shows increasingly the important role of a resilient supply chain to maintain the work in these two industries. Any economical failure and turbulence in these particular industries will lead to bigger problems for the future. If intervention from the government part in these two sectors we could have witnessed the largest and biggest bankruptcies in the 20th century. These industries are the leading industries for improvement and development in other industries.

Without transportation supply chain will not exist. No moving parts or goods around the globe and that in the era of globalization has no meaning. As well for the electronics industry since this is the motive for every industry in the world to improve performance and deliver to the world the technology of the future.
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