

Enhancing Basic Metal Industry Global Competitiveness through Total Quality Management, Supply Chain Management & Just-In-Time

Alie Wube Dametew ^{a,*}, Daniel Kitaw ^b, Frank Ebinger ^c

^a School of Mechanical and Industrial Engineering, Addis Ababa University Institute of Technology-Ethiopia and Campus of Technology Technische Hochschule Nürnberg Georg Simon Ohm-Germany

^b School of Mechanical and Industrial Engineering, Addis Ababa University Institute of Technology-Ethiopia

^c Campus of Technology Technische Hochschule Nürnberg Georg Simon Ohm-Germany

Received 17 March 2017; Revised 23 July 2019; Accepted 28 July 2019

Abstract

The selection and implantation of sufficient and appropriate continuous improvement strategy are the key success factors for improving firm performance and enhancement of competitive advantage on manufacturing industries. As a result special role are given to Continuous improvement programs such as Supply Chain Management (SCM), Six-Sigma, Total Quality Management (TQM), Kaizen, Just-in-Time (JIT) and Total Productive Maintenance (TPM) in a production system, which attain sustainable business environment and competitive advantage. Thus, the aim of the study is to study the challenges and trends of global competitiveness of basic metal industries, investigates the way of integrating continuous improvement tools and then developed an integrated continuous improvement model from TQM, JIT, and SCM to improve the global competitiveness of steel and metal industries. From numerous contentious improvement programs, we have to emphasize integrated SCM, JIT and TQM implementation on basic metal industries to improve competitive performance. Mainly the study was conducted through field observation, questioner, company reports used as primary data and literature review of research articles, books, manuals, magazines, and electronic-sources, which used as secondary data. The survey data is analyzed using descriptive analysis, SPCT (fishbone diagram). The result found that poor supply chain system, workforce, raw material uncertainty, energy fluctuation, outdated technology, manufacturing systems, financial and logistics problems were identified as the obstacles and influence the Ethiopian basic metal industry performance and global competitiveness. Thus, to tackle the problems an integrated continuous improving model was developed to improve the performance and global competitiveness of basic metal industries.

Keywords: Basic Metal Industry; Integrated Model; Continuous improvement; JIT; SCM & TQM; Global Competitiveness; Ethiopia.

1. Introduction and Background

Manufacturing automating and production improving process efficiency are two major objectives of the food industry worldwide. This leads to improve the production and manufacturing processes of organizations, enhancing the efficiency and effectiveness of their systems, reduce costs and improved cycle times. The selection and implantation of sufficient and appropriate continuous improvement strategy is the key success factors for improving firm performance and enhancement of competitive advantage to manufacturing industries. Since, implementing advanced continues an improvement strategy in the modern manufacturing provides to improve the performance of the process, reduce waste and ensure on time delivery of the sectors (Yasin A. , 2014). Because the continuous improvement is a management philosophy that approaches to tackle the challenge of product and increase process improvement (Coskun Dalgic, 2011). Particularly, the Continuous improvement seeks continual improvement of machinery, materials, labor utilization, product quality and safety, and production methods through application of

suggestions and ideas of team members. Since, these strategies, enhancing in the increased control of raw materials, production process, improve warehousing and dispatching and can have a significant impact on the profitability manufacturing industries. Furthermore manufacturing firms apply continuous improvement strategies in their systems to provide to improve efficiency, effectiveness and the overall performance of the whole organizations. As a result, in global competition of the firm through optimizing their systems and improving performances continuous improvement tools have great roles (Alie , 2017). Thus, from numerous tools firms were invested to implement lean, six sigma, TQM and JIT strategies in their business process so as to enhance performance and compete at global levels, (Png, 2015). While, preproduction performance improvement strategies provides to enhance the performance of manufacturing industries investigating ,and eliminating non value add wastes to manufacturing industries (Mousa, 2013).

Besides, in Africa including Ethiopia there were an interesting progress in the sector, but currently the overall performance of basic metal firms in terms of market

*Corresponding author Email address: wubealie@gmail.com

shear, full production capacity, global competitiveness, integrated resource utilizations, rank favorably against their competitors were moderate extent and at lower stages (Ochiri, 2016). This is infancy is occurred due to the firms working individual business process rather than integrated, collaboration and cooperation systems at regional levels (Lucy Wairmu Kibera1, 2016). As a result, GDP contribution, Productivity, financial performance and global competitiveness of the firms are poor and infant (Muzeyin, 2014), (Muilu, 2013). For the time being, in industrial world, metal industries considered as the backbone for the growth and industrial revolutions of the nations. While the growth of basic metal and engineering industry is the key to the dynamic capability of economic performance and strengths. Moreover, the Ethiopia steel, iron industries performance, weak market shear, and GDP contributions are weak infant stages (Fasika Bete Georgise1, 2014), (Agency(JICA), 2010). This are due to most local industries has limited and improper continuous improvement strategies, poor technological capability, improper resource utilization, and problems in infrastructure facility (Dagne Birhanu, 2009), (Fasika Bete Georgise1, 2014), (Alie Wube Dametew B. B., 2016). Consequently, this research is designed to study the impacts of continuous improvement strategies to global competitiveness and firm performance of steel and iron industry and attempted to fill this gap.

1.2. General objectives of the paper

Primarily, the aim of the study is to investigate the performance, challenges and trends of global competitiveness of steel and metal industries to local economy contributions. Moreover, the study investigated the way of integrating continuous improvement tools and then developed an integrated continuous improvement model to improve firm performance and global competitiveness of steel and metal industries.

1.3. Research Methodology

The study was conduct through field observation, questioner, literature review of research articles, magazines, manuals, company report and electronic-sources which are discuss related to steel and metal industries growth, opportunities, economic contribution, challenges, strengths and performances in relation to continuous improvement(SCM,TQM&JIT. The analysis consider attempts to investigate continuous quality improvement issue on basic metal industry, performance, competitiveness strategy, quality challenges in Ethiopia steel and metal industry. Furthermore, integrated continuous improvement strategies were developed for the performance and competitiveness of steel and metal industries at national to global levels. Mainly the descriptive analysis and statically quality control tools were employed for the analysis and discussion of the findings. Finally the conclusion, research implication and recommendation of the study were done.

2. Literature Analysis and Discussion

2.1. Global Competitiveness

Competitiveness is extensively considered to be a major element of nations relative economic performance and remains a core theme of the strategy argue While currently, with the rise of the digital economy and the advent of network business world, the competition between companies is fierce and more complex. In order to respond the challenges and digital competitions in a business environment, companies began to pursue a strategy of innovation from a long-term perspective, rather than the conventional management paradigm such as short-term profit maximization. Particularly, improvement strategies have great role to the performance and competitiveness of manufacturing industries at higher extents (Kitaw Y. Y.-I., 2014). From numerous improvement strategies supply chain integration, quality management systems, the logistic score card, and just in time have crucial impacts to the success and competitiveness of manufacturing industries (Effah-Kesse, 2017), (Pasutham, 2012). Because manufacturing industry competitiveness can be measure in terms of quality, technological capability, productivity, resource utilization, infrastructure performance and skill manpower potentials ((WEF), 2011-2012), (Jangwoo Lee, 2015), (Atkinson, 2013). While in various business process supply chain integration provides to assimilate the customers and suppliers who, using management techniques, work together to optimize their collective performance in the creation, distribution, and support of a product. This may be helpful to think of the participants as the divisions of a large, corporation, although the independent companies in the chain are bound together only by trust, shared objectives and contracts entered into on a voluntary basis(Abushaikha, 2014). Commonly firms are integrated into a supply chain in the form of vertical, horizontal or the combined type of integrations. The firms are integrated vertically, that are carrying on business for the same product but at different levels of the production process(Scheuplein, 2010). The integration provides to which a firm owns its upstream suppliers and its downstream buyers to enhance their competitiveness in the global market(Lassar, Haar, Montalvo, & Hulser, 2009),(Fabbe-Costes & Jahre, 2007). For instance, Carnegie steel company owned mills where the steel was manufactured, mines where the iron ore was extracted, coal mines that supplied the coal (upstream), ships and railroads that transported the material(downstream) is a typical example of vertical integration. Whereas, firms which are engaged in the same stage and the same line of business seeking to achieve competitive advantage and

profitable growth through value creation activities are a horizontal supply chain integration. Though in horizontal two companies of the same industry and in the same stage of production work together (Fabbe-Costes & Jahre, 2007). The Standard Oil Company buying refineries, an automobile manufacturer buying a support utility vehicle manufacturer and the Star Alliance is Strategic Alliance of 27 Airlines to work together in connection flight to improve their comparative advantage are an example of horizontal supply chain integrations. Thus, the main goal

of any type of supply chain integrations is to improve the performance with the integration of all activities involved in the process of sourcing, procurement, conversion, and logistics. Moreover, an integrated supply chain have highly improve the performance and competitiveness of manufacturing industries at national regional and global levels as whole. Therefore the Ethiopian steel and basic metal industry should be integrated in a supply chain to improve their performance and global competitiveness.

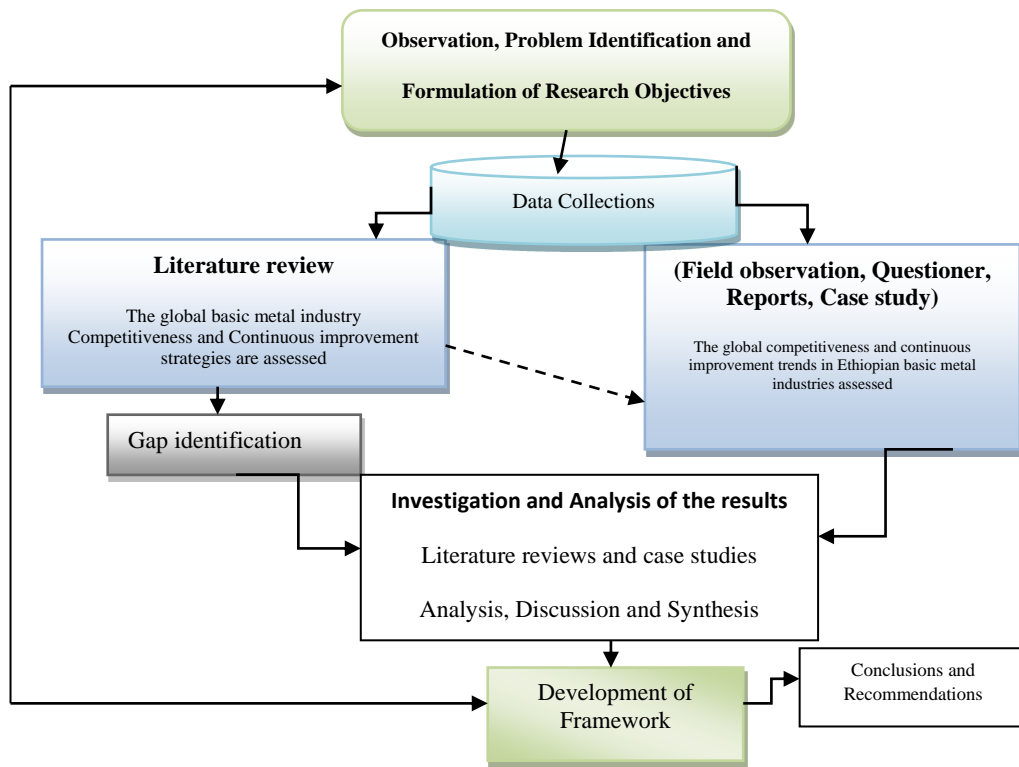


Fig.1. Research Methodology Frame work

2.2. The Roles of Performance Improvement Tools to Firm Performance and Global Competiveness

Firm seek to improve their supply chain efficiency through increased integration, continuous improvement strategies can be considered as a key enabler for supply chain integration sustainability and firm performances. However, the integration of continuous improvement strategies have great impact on the sustainability of supply chain firms. Since the supply chain improvement strategies includes total quality management, lean thinking, agile, just in time, kaizen e.t.c. Designed to exceed the business shifts taking place in technology, channel structures, globalization, sourcing and customer

demands, and provides to help in decide on a clear path to improvement of the firm.

For instance (Sher, 2016) shows that agile supply chain is not the option available in market but a necessity for the success of the company. Since agility have great impact on the success and effectiveness of supply chain firms. As well, agility in supply chain helps to explore and exploit opportunities in fast changing markets to enhance competitive advantages. However, to improve competitive performance of the supply chain firm is enhanced through the integration of continuous improvement strategies. Other study (Alie Wube Dametew D. K., 2017) also develops integrated continuous improving models that improve the global competitiveness of basic metal

industries. Thus, in this study emphasis and considers the continuous performance improvement strategies as a tool for sustainable supply chain integrations. While, organizations can have improvement choices with time depending up on the way they track to meet their strategic and operational objectives. While, continuous improvement raises the competence of numerous processes and systems and is closely integrated with means of waste elimination and there by customer focus programs such as total quality management, supply chain management, just in time and kaizen. Furthermore in the current industrial economy, supply chain performance are the most critical issues for the competitiveness of manufacturing industries (Hasan Balfaqiha, 2016). Although, the performance integration is significant for collaborative evaluation of individual organizations. Since supply chain performance integration provides to evaluate in the structure of the firm, the progress, product quality, assess national and international performance trends, evaluate distribution systems, and check situation in the entire organizations. As a well, integrated firms engaged on the evaluation of strategies, infrastructures utilization and technological efficiency and managing the overall supply chain performances systems. These enhances collaboration, cooperation, efficiency, effectiveness and the performance and mutual benefits of the firms. Besides, collaborative supply chain provides to gain a competitive advantage by improving overall performance within measuring a holistic perspective of the supply chain (Pasutham, 2012). Though, this study is considered for integrated SCM, TQM and JIT tools to improve the supply chain integration performance and global competitiveness of basic metal industries. The integration and adoption of the strategies can be considered the current local industry situation, international standards associated with local industry trends, assess firm sustainability related parameters, evaluate performance in productivity, quality, market share, profit, financial strength, global competitiveness accordingly.

2.2.1. Supply Chain Management and Supply chain integration

In a supply chain, system consists suppliers, manufacturer, distributor, retailer and customers. However, in this supply chain systems firms integrate in business processes from end user through original suppliers providing products, services and information that add value for customers and other stakeholders (Himanshu S. Moharana*, 2012). However, the primary purpose of any supply chain is to satisfy customer needs in the process of generating the profit for itself.

Meanwhile, supply chain activities should be coordination, collaboration and integration among the supply chain firms to fulfill mutual benefits.

2.2.1. A. Supply Chain Management

The management of a network of interconnected businesses process involved in the provision of product and service packages required by the end customers in a supply chain process called supply chain management. A systematic way of and the management of flow of inputs, products and services, which begins from the origin of products and ends with the product's consumption at the end-user, so as to enhance firm performances (Danese, 2013). According to (Zhao, Huo, Selen, & Yeung, 2011) study shows that SCM is the integrated planning, coordination and control of all business processes and activities in the supply chain to deliver superior consumer value at less cost to the supply chain as a whole whilst satisfying requirements of other stakeholders in the supply chain. Therefore, mainly the supply chain management is provide to manage and coordinate the raw materials, production, distribution, and shipment of products and services to the end customers.

This literature analysis to summarize the practices, concept, principles and the impacts of supply chain managements were studied in the table above. While, the study indicates that supply chain management highly impact on the sustainability and improvements of manufacturing process (Shaharudin et al., 2016), (Martusa, 2013). As a result SCM considered as continuous improvement tools to improve the performance and competitiveness of manufacturing industries.

2.2.1. B. Supply Chain Integration

supply chain is a network of suppliers, factories, warehouses, distribution centers and retailers, through which raw materials are acquired, transformed, produced and delivered to the customer (Gábor Kovács, 2015). Though, due to demand changes, supply uncertainties, technological changes, anticipation of benefits and opportunity of new markets firms should integrate within a supply chain systems. However the alignment and interlinking of business processes and embodies various communication channels and linkages within a supply network is supply chain integrations. Since, supply chain integration provides, organization strategically collaborates with its supply chain partners and manages intra and inter-organization processes to achieve effective and efficient flows of products, services, information, money and decisions, with the objective of

providing maximum value to its customers (Xiande Zhaoa, 2011). While, supply chain integration consists of internal integration of different functions within a company and external integration with trading partners (Xiande Zhaoa, 2011). Accordingly, supply chain integration through information integration and material (logistics) flow integration between supply chain partners have an effect on operational performance (Daniel Prajogo an, 2012). From this supply chain integration looking for new means to integrate supply chain management activities, improving integration of activities across supply chain ,reducing response time across supply chain ,establishing more frequent contact with supply

chain members ,creating compatible information flow for supply chain members, whereas supply chain coordination provides communicating customers’ future strategic needs throughout supply chain, communicating your future strategic needs to your suppliers, creating a greater level of trust among supply chain members. These results improve competitive advantage of manufacturing firms. As a result, supply chain are considered as a powerful tool for improving firm performance and global competitiveness.

Table 1
The influence of SCM implementations for competitiveness reported in literature are

Author	Research Objectives	Research methods	Findings
(Milovanovic, Milovanovic, & Radisavljevic, 2017)	The challenges generated by globalization in modern supply chains were investigated	Survey	Study shows that companies cannot successfully fulfill the requirements of customers and increase global competitiveness without establishing close relationships with key suppliers and without better Coordination of internal and external flows of materials.
(Martusa, 2013)	Investigating how environmental Sustainability can be integrated to create a competitive production system has been identified.	Empirical study	The study shows the impacts of green supply chain process to manufacturing performances. common manufacturing objectives such as cost, quality, delivery and flexibility will not be enough in order to stay competitive when external Stakeholders require an increased focus on sustainability.
(Johnson et al., 2004)	Present the relationship between supply chain management (SCM) practices and supply chain responsiveness (SCR), and investigates its relationship with competitive advantage (CA).	statistical methods	Study found a significant relationship between strategic supplier partnership and operation system responsiveness, logistic process responsiveness and supplier network responsiveness.
(Shimpi, 2016)	paper primarily identifies the supply chain problems commonly faced by manufacturing firms and their impacts on Pricing strategy to the entire supply chain.	Literature survey	The study shows supply chain concerns organizational aspects of integrating legally separated firms as well as coordinating materials and information flows within a procurement-production distribution Network.
(Shaharudin, Zailani, Tan, & Tan, 2016)	Examined a model linking green production, green purchasing, investment recovery and firm competitiveness	survey	The influence of green supply chain management (GSCM) practices on firm competitiveness, among manufacturing firms, were investigated
(Hervani, Helms, & Sarkis, 2005)	provide an overview of the various issues related to environmental (green) supply chain management performance measurement	case studies and literature survey	Provides an integrative framework for study, design and evaluation of green supply Chain management performance tools.
(Li, Ragu-Nathan, Ragu-Nathan, & Subba Rao, 2006)	Develops five dimensions of SCM practice (strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement) and tests the relationships between SCM Practices, competitive advantage, and organizational performance.	Survey	The impact of supply chain management practices on competitive advantage and organizational performance was studied. The results indicate that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. The competitive advantage can have a direct, positive impact on organizational performance.

2.2.2. The Concepts of Quality Management (QMS/TQM)

Particularly the role, impact and the potentials of total quality management (TQM) as continuous improvement strategies were studied by various researchers in the

following was. The impacts of TQM implementation in Swaziland’s sugar industry for increase profit margins and improve quality of products, improve productivity, enhance service delivery, customer satisfaction, increase product price and market share were studied by Kongolo &Dlamini (2014). While (A.Addae-Korankye (2013)

shows the TQM is a source of competitive advantage in both service and manufacturing sectors. Moreover the role and impacts, and potentials of TQM as a continuous

improvement studied by Deming, Philip B. Crosby , Joseph M. Juran ArmandV. Feigenbaum ,Genichi Taguchi ,Walter A. Shewhart ,Kaoru Ishikawa).

Table 2
The influence of TQM implementations for competitiveness reported in literature

Author	Research Objectives	Research methods	Findings
(Anh & Matsui, 2005)	show the present situation of ISO 9000 implementation and performance measurement impacts to manufacturing industries	Survey	The study found out that ISO 9000 has a Positive impact on quality performance and the structure of performance measurement system.
(Mohammed Yusr, Mohd Mokhtar, & Rahim Othman, 2013)	Investigate the Relationship among TQM, Organizational Learning and Innovation Performance	on-line survey approach	The relationships among TQM practices, organizational learning capability and innovation performance and determines the mediating relationship between TQM and innovation performance through organizational learning were investigated. The results of the present study indicate that organizational learning has a significant and positive influence on innovation performance whereby organizational learning is considered as antecedent of the innovation performance
(Jancikova & Brychta, 2009)	TQM and organizational culture as factors influencing business performance on the present demanding markets were studied	Survey	According to the result, the organizational culture is considered as the driving force of TQM implementation, whereas the core principles of TQM - continuous improvement and customer satisfaction play vital part in sustaining company's competitiveness in present competitive environment.
Amha Mulugeta and Daniel Kitaw (2014)	Investigated the roles of implementing continuous improvement tools on firm performance and global competitiveness	Serve supported by case	The study presented integrated implementation of an integrated JIT implementation under the umbrella of the broader TQM initiative were employed. For the integration process, the synergized approach to achieve synergized results with lower resource exploitation was considered. The study also investigated the impacts of TQM & JIT implementation as continuous improvement tools for firm performance and global competitiveness.
Alexandra Jancikova, Karel Brychta, (2009)	The study was design to study the core principles of TQM for competitiveness and firm performances	Survey	The stay was investigated the role and the positive impacts of TQM as continuous improvement tools for firm improvement and customer satisfaction- in sustainable competitive environment.
Kongolo & Dlamini (2014)	Investigates the impacts of TQM on production performance and market shears.	Survey	Investigates the impacts of TQM implementation in Swaziland's sugar industry for increase profit margins and improve quality of products, improve productivity, enhance service delivery, customer satisfaction, increase product price and market share.

2.2.3. The Concepts of Lean Philosophy

Historically the lean production system is the world famous production system developed and practiced by Toyota Company for a long time (Yasin A. , 2014) (Dave, 2002). Though the basic ideas behind the lean manufacturing system are waste elimination, cost reduction and employee empowerment. Mainly the lean concept leads to maximize customer value while minimizing all the wastes that come with that significance. While, lean processes can make jobs highly repetitive while eliminating critical rest time for employees (Eshetu, 2017). Moreover, the study (Effah-Kesse, 2017) shows that Toyota company, indicates that continuous improvement has been the main basis on which the production control system is based, with the objective of 'making the vehicles ordered by customers in the quickest and most efficient way, so that vehicles ordered can be delivered as quickly as possible. Since Japanese automobile manufacturers achieved high quality and low costs by removing buffers and impediments from the system, in lean. Eliminating excess inventory, for example, drives closer linkages between assemblers and suppliers, reshapes the factory floor, forces greater

attention to first-time quality, and so on. Excess inventory means that manufacturing mistakes or broken equipment will not halt production because downstream processes can draw on inventories to keep going while the mistakes are remedied or the equipment is fixed. However, excess inventory costs money and can hide production problems that lead to greater problems later on. Mass production allows excess inventory to provide a buffer against mistakes, while lean manufacturing aims to eliminate mistakes and hence the need for costly buffers. Though removing inventory buffers requires very tightly coupled processes that closely link different functions within the organization. Thus, Lean is a philosophy that aims to maintain smooth production flow by continuously identifying and eliminating waste resulting in increasing value of activities in the production process (Kumar1 & Kumar2, 2012). Even if the lean manufacturing concept was introduced by Toyota in the 1950s as, a part of the Toyota Production System (TPS), but until it is not exercise and implemented in developing country manufacturing firms. As a result, the performance in waste minimization, production capability and the overall performance of such firms are poor and weak (Alië, 2017), (Eshetu, 2017) (Agency(JICA), 2010). Further lean provides to enhance by reducing cost through elimination

of waste and it requires constant effort at cost reduction to maintain continuous profits in manufacturing. The prime way to reduce costs is to produce only those products determined by sales in a timely fashion, to restrain excessive manufacturing and to eliminate all waste in manufacturing methods. There are various ways to analyze and implement cost reduction, from the start of designing all the way through to manufacturing and sales. One of the goals of lean manufacturing is to locate waste pragmatically in each process and then eliminate it. It is possible to uncover a very large amount of waste by observing employees, equipment, materials and organization in the actual production line from the perspectives of the process itself and the actual work involved. Some types of waste are obvious, but others are hidden. Waste never improves value; it only increases cost. The thorough elimination of waste leads to greater employee self-respect and to major cost reductions by preventing unneeded losses (Yasin A. , 2014).

2.2.4. Just-In-Time (JIT)

The study(Akmal, A. O., Sundram, V. P. K., Nazura, M. S., & Atikah, 2016) reveal that supply chain integration, JIT purchasing and JIT manufacturing had direct and significant benefits to logistics performance. Laterally Just in time (JIT) is a systematic approach to enhance the competitiveness and excellence in manufacturing industries by eliminate sources of manufacturing waste. According to (Dr. C. Eugene Franco, 2017) the JIT philosophy implies handling of inventory in a much well-

organized manager. This ha positive impact on performance and it requires changes in culture to the organizations. The concept of zero inventory based on just in time (JIT) in the automotive industry, its benefits and its analysis and implementation process can be determined(Gahlan & Arya, 2015).The principle of Just in time (JIT) manufacturing is one of the main methodologies used to enhance manufacturers' competitiveness through inventory and lead time reduction(Xu & Chen, 2016).

Nevertheless, the lack of required information sharing, commitment, communication between stakeholders, insufficient sound action are the main challenges on the implementation and application JIT to manufacturing industries. While for the implementation of JIT allows manufacturing system a fast and efficient production of high quality products that fully meet customer needs. By producing products only when needed and with a strong quality control, manufacturing system prevents the creation of waste and thus reduces the amount of energy, raw materials and other used resources, which presents an important management tool in building ecologically sustainable business (MORIC MILOVANOVIC & SISEK, 2011). In the table below articles are presented and discuss the main concepts and roles of JIT on manufacturing industries and identify the gap and based on the concepts improvement model is proposed to basic metal industries.

Table 3
The influence of JIT implementations for competitiveness reported in literature

Author	Research Objectives	Research methods	Findings
(AkbarJavadian Kootanaee. et.al,2013)	To study the cases of waste in value chain process to the firms	Survey	Identifies the hidden problems in the value chain and reduces the production waste of the system
(Sandeep Phogat,2013)	Study the impacts of JIT to competitiveness and excellence	Literature Survey	It is a systematic approach to achieve competitiveness and excellence in manufacturing industries
(SultanSingh1&Dixit Garg ,2011),(Sanjay Paliwal et.al,2013)	The main benefits of JIT implementation was nvestigated.	Survey supported by Empirical findings	JIT system is mainly to reduce buffer stocks, reduce costs, and increase the flexibility and to enhance the profitability.
(IgnatioMadanhire. et.al ,2013)	Study the effects of JIT to competitiveness and business survival	Survey	JIT is to improve cost effectiveness of operations, quality and to achieve excellent benchmarks on all facets of the engineering entity as competitiveness in product delivery is getting to be mandatory for business survival.
(MahdiSalehi.et.al,2010)	Study JIT implementation strategies to manufacturing industries	Survey	The study shows that implementation of JIT impact on financial performance to manufacturing industries.

Extensive collection of research work was conducted related to JIT concepts, principle and progress. However, in this literature review analysis to summarize the concepts in the table above and it give lights on to different aspects of JIT implementation on manufacturing industries as continuous improvement tools .While, during the implementation of JIT practice on manufacturing industries we should know the following JIT Principles, such as attack fundamental problems,

eliminate waste, strive for simplicity and devise systems to identify problems. Although in order to sustain manufacturing industry, improvement tools have vital roles. Particularly the have great role and the implementation will include mechanisms that will bring problems to the back. Examples of these mechanisms are statistical quality control (SQC), which monitors the manufacturing process and draws attention to any defect-producing trend, and pull kanban systems, which identify

bottleneck production areas (Sunilkumar N Chaudhari, 2015). However it is possible to control the seven type of wastes (such as rejection, waiting, over production, excess motion, over processing, Excess inventory and transportation) by implementing JIT on manufacturing industries, (MORIC MILOVANOVIC & SISEK, 2011), (Vuppapapati, 1995). Since the above literature review evident that, the benefits of JIT implementations on manufacturing industries. As a result, an integrated continuous implementation system should be considered to Ethiopian basic metal industries, so as to enhancing sector performance. However, effective and effectiveness of JIT implementation highly effect on; strong management commitment; high quality supplies, a manageable supplier network; geographic concentration, efficient logistics and infrastructures.

2.3. The Basic Quality Tools in Continuous Improvement Process

Continuous improvement involves an extensive journey, gradually building up performance, skills, and capabilities within the organization to continuously find and solve problems of the company's activities. However, manufacturing industries are to find the exact quality problems, they need proper, identification tools and systems. In addition, they need to understand how to assess the quality of products and systems by using a variety of quality control tools, how to interpret findings, and how to correct problems. There are many specific tools and techniques, which can help, improve process performance. Cause-and-Effect

Diagrams, Flowcharts, Checklists, Pareto

Analysis, Histograms, Control Charts, Scatter

Diagrams are the seven powerful quality improvement tools, that are easy to understand, and extremely useful in identifying, analysis, investigate the problems quality practice, status and improve the performance of manufacturing industries. In the meantime, sometimes workers use only one tool at a time, but often a combination of tools is most helpful. As a result, these tools need to be used quite often to meet continuous performance improvement of firms.

2.4. Gaps Identified in From the Literature Review

Several researches have been conducted related to TQM; SCM&JIT practices on global competition and firm performance were mostly concerned on the developed world Kongolo & Dlamini (2014). For example, Kaizen, TQM and JIT manufacturing has been practiced in Toyota Production system in which still apply in implemented in developed nations (Akbar Javadian Kootanaee, 2013). But competitiveness is not only the result of having rich

Generally, these analysis shows that continuous improvement are complex multidimensional concept. It reflects the favorable position of the countrywide economy, mainly in the field of global relations and cooperation of the country and, at the same time, its ability to strengthen the economy of the nations. Besides, the application of continuous improvement programs in manufacturing and services industries, that impact for the expression of national economy, scientific, technological, organizational, managerial, marketing improvement and other capabilities that are successfully insuring their competing opposite foreign goods and services at the domestic and foreign markets.

production factors; rather it demands the efficient and effective integration of the factors of production to get the required product or service meeting healthy and sustainable customer requirements of the world. Although in the developing world, the study of continuous improvement management practices and organizational competitiveness performance is insufficient. In addition to this the challenges in involved SCM, TQM and JIT implementation is due to infant stage of Ethiopia basic metal industry progress and their manufacturing contribution to the global competitiveness environment being almost insignificant. As result, industries in many developing countries are working on outdated technology and techniques of manufacturing systems. Extra lookout is the much of the earlier literature argued that competitiveness means lower costs of inputs, and that this was how countries would be competitive post-quota. However, recent literature on the post textile manufacturing environment (Tewari, 2006) argues that simply focusing on lower costs in the post-quota era will not be enough to ensure competitiveness manufacturing industries (like garment and textiles industry). According to (Kitaw K. J., 2016) investigates, the majority of the company's focus is on the external customer satisfaction with their product or service disregarding workers satisfaction and working environment comfort in economic lagging countries. Nevertheless today, global competitiveness in the apparel industry requires competencies that go well beyond traditional factors of relative price and low wages. Since global competitiveness should contain and fulfill multidimensional benefits to the nations includes (firm, compotator, sustainability, safety, product adaptability). For example why Occupational health and safety for global competitiveness. Because health and safety comprises, technology, innovation, knowledge transfer, social, economical impacts, and environmental factors are under safe. (Kitaw K. J., 2016) Also shows that occupational health and safety increases the health of the

employees, satisfaction of the employees, and improve manufacturing systems. These results to improve firm performance and increase product quality. As well, occupational health and safety highly linked with management system, quality, working environment, commitment, and satisfactions workplace. Consequently,

3. Competitiveness in the State Of Basic Metal Industries

3.1. Metals Impact in Global Economy

The previous study (Mohan, 2016) shows that metal and their markets can be impact world economy for two reasons. First, at the global level, metals are at the heart of the world economy because they are key intermediate inputs in industrial production, innovation, engineering and construction industries. Metal markets are thus shaped by shifts in the volume and composition of global demand and supply. As such, transformations in metal markets also indication important changes in the world economy. In the second, for some countries, metal exports are a large portion of their total exports, and fluctuations in metal prices can have important macroeconomic consequences. However, the steel, which is produced from iron ore, is mostly used for construction, transportation equipment, and machinery highly affects the overall performance of the above sectors. As well copper is the second-most-important base metal by value accounting for roughly a \$130 billion industry annually. Since copper is used for construction and electrical wire. While globally Chile is the largest copper producer, followed by China and Peru. Thus, from an economic point of view, iron ore is by far the most important base metal, with a \$225 billion annual industry in terms of global sales and highly impacts on world economy. Furthermore, due to lightweight and durability aluminum is used in the aerospace industry as well as other industries requiring light metal. While, recycling has become an important part of aluminum production because the recycling process is much less energy intensive than the production of primary aluminum. Nevertheless, large producers of aluminum are located where electricity is cheap and abundant. Since the largest producer of aluminum is China, followed by Russia, Canada, and the United Arab Emirates. However, China consumes about half of the world's production of primary aluminum. In contrast, advanced economies rely more on recycling and in turn have less influence over primary aluminum prices. Thus, aluminum is the third-most-important base metal and accounts (with an annual \$90

Science from global competitiveness index, the world economic forum (WEF), 2016 evaluation showed that the

multidimensional improvement and development has been the heart of continuous improvement and sustainable global competitiveness. Therefore, continuous global competition and to sustain manufacturing industries, researchers should investigate and consider this and such type points.

billion industry). This implies that aluminum also highly impact the global economy at higher extent. While due numerous application, use, future and versatility metal and metal products are extremely impact the world economy at higher level (Mankowitz, 2008).

3.2. Ethiopian Economy Global Competitiveness Trends

Competitiveness is a dynamic theory related to the economic policies, strategies and institutions that countries use to facilitate their trade and growth. While firms and nations, for observable reasons, need a sustainable economic policies, healthy and educated labor force to produce, their requirements also span dimensions relating to institutions, infrastructure, and business environment prevailing in a country. However the competitiveness is found at different levels of a nations such as at Firm level, Sectors competitiveness, Regional (Area, Place, Locality, Territorial, City, Urban competitiveness), National County competitiveness), Bloc competitiveness (Regional competitiveness), and International (Global competitiveness, External competitiveness) level competitiveness. For example, a regional competitiveness can be usefully defined as the capacity and capability of regions to achieve economic growth relative to other regions at a similar overall stage of economic development, which will usually be within their own nation or continental bloc. (Robert Huggins, 2013) Study shows that how regional competitiveness is both allied to, and an extension of, regional growth theories, with a key factor in achieving such growth likely to be the possession of a critical stock of firms that are able to generate knowledge, entrepreneurs, and innovations in developing sectors and markets, and ultimately new jobs. Science the regional entrepreneurial, knowledge, and innovation capacity of regions are generally considered key factors underpinning the future economic development and growth trajectory of regions. Mean time regional competitiveness, therefore, is predicated on the presence of conditions that enable firms to compete in their chosen markets, and on the value, these firms generate being captured by the respective region. Subsequently, the flowing table shows the global competitiveness of report 2013–2017 is being launched at a fundamental time for the global economy. global competitiveness index (GCI) measurement of GCI of 2016-2017 ranked Ethiopia at 109 out of 138ountries

with score point of 3.77 out of 7 score points. GCI of 2015–2016 ranked Ethiopia 109 out of 140 countries with score point of 3.74, GCI of 2014–2015 ranked Ethiopia 118 out of 144 countries with score point of 3.60 and also 2013-2014 ranked Ethiopia at 127 out of 148 countries with score point of 3.5. These indicate that according to the evidence Ethiopia listed from low income countries. Hence, the global competitiveness of Ethiopian Economy is found at the lost level. As result, companies in these factor driven economies are characterized by low competitiveness with poor technology transfer, low technological readiness and innovativeness. However, the economy needs to emphasis and intention to look at competitiveness put up an improvement of firm and sartorial level changes for growth of the company. Science the role and influence of SCM,JIT and TQM principles, implementation procedures and the relationship b/n them are the base for basic metal manufacturing industries competitiveness. Therefore, to implement and sustain SCM, TQM and JIT as

improvement tools can secure firm’s competitiveness in its local and global working environment.

3.3. The Competitiveness of Ethiopia Manufacturing Industry

In Ethiopia light manufacturing industries, such as leather, textile, cement and metal are considered as strategic sub-sectors for the socio-economic development of the country (Industrial Development Strategy, 2013). This is because the nature and ability of the industries to absorb a significant labor force, contribute to export earnings and tendency to facilitate multiple linkage with the rural population in line with the country’s industrial development strategy is paramount. In addition, the country endowment with rich source of raw material makes the sectors very important in competing in the international market

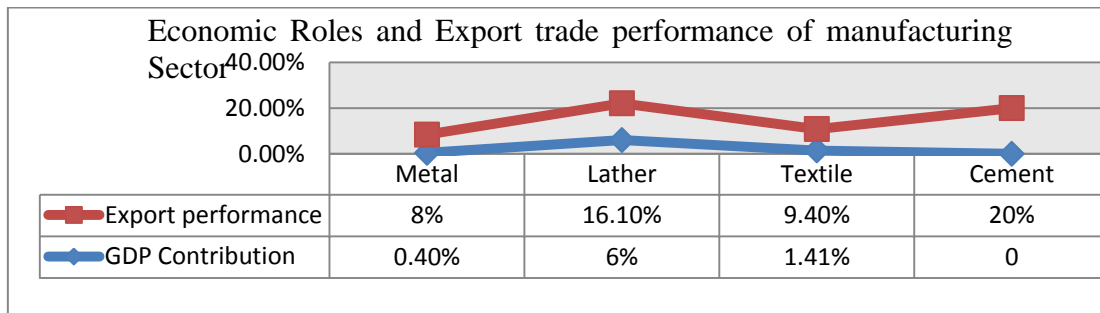


Fig. 2. Economic Roles and Export trade performance in each sub-sector (Source: (Dametew AW1,2*, 2017),(MoFED, 2014).

Even though, Ethiopia is a land of huge natural resources, but we have improperly used these resources for the development. Likewise, from the table above shows, the four light manufacturing industries are poorly using these inputs due to pair of internal problems and incapacities. This statuesque is not only costing the sectors, but also makes them to be dependent on imported inputs in problems of utilizing their internal resources.

3.4. Competitiveness of Ethiopia Steel and Metal Industry

3.4.1. Basic Metal Industry Overview

Metal and engineering industries are identified as one of the five priorities for existing industry investment to build capacity and upgrade performance in terms of utilization of capacity. The growth of basic metal and engineering industry is the key to social and economic advancement. Being a developing country the Economic growth in Ethiopia is steel intensive. According to JICA(2010)

report the annual per capital steel consumption in Ethiopia is 12kg,which is very low as compared to even some African countries like Kenya which is 65kg or African average which is 42.5kg and by far low when compared to the world fastest growing economy china which is 132.2kg. The Ethiopian metal industry is found at very low stage of development; but is having a considerable growth. The range of products manufactured in this sector includes the production of metal from, scrap and conversion of billet, slabs etc. into primary metal products such as, tubes bars, hot rolled ribbed and plain reinforcement bars, wire rod, angles, cold rolled tubes of various profiles, cold rolled sheets, galvanized sheets and tubes. The primary metal products produced by basic metal industries are subsequently raw materials (inputs) for the downstream engineering industries. Although in the figure shows that, iron ore is believed to exist in Ethiopia, it is not mined in the country. Bars and billets are produced from iron ore, coiled wire rods, from which nails are made, and coiled sheets are imported as raw materials (MIDI, 2015).

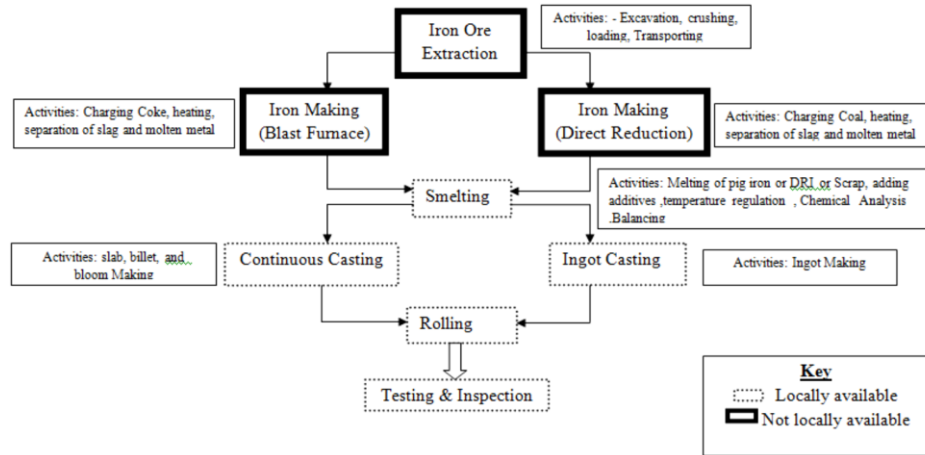


Fig.3. Production flow of Ethiopian Basic Metal Industries (Source: (Dagne Birhanu, 2009))

3.4.2. The Trends of Continuous Improvement Strategies in Ethiopian Steel and Metal Industries

On the other hand in (Fourtunne, 2016 Published on Nov 15,2016 [Vol 17 ,No 863) report shows, the metal and engineering industry has underperformed both in terms of production and revenue generation. A according to report indicates that the performance of the sector are decline compared to expected targets. Out of the total planned production of 343,105tns, only 52% was achieved by 60 industries in various areas. Translated into monetary value, these industries produced 4.85 billion Br’s worth of goods. This is much less than the first quarter target of 15.17 billion Br. From the total generated revenue of 4.85 billion Br, basic metal brought in 3.37 billion Br. However, the production of reinforcement bars generated the major

share of revenue, with 105,60tns, worth three billion birr, produced. In terms of export performance, the industry

Performed well, but below targets. Frequently competitiveness pertains to the capability and performance of a firm, sub-sector or country to sell and supply goods and services in a given market, in relation to the ability and performance of other firms, sub-sectors or countries in the same market. In the era of globalization, the popularity of competitiveness is clearly demonstrated by the fact that there is an increasing interest around the issue of competitiveness benchmarking at the country level as well as the policies through which governments can enhance national industrial competitiveness. Although implementation and applying of performance improvement tools like TQM, JIT, SCM, Six Sigma, Kaizen is critical for manufacturing industries.

Table 4
Ethiopian Basic Metal Industries implementing Continuous Improvement Tools

Name Of Improvement Tools Implemented		Number of Company
Kaizen	Fully Implemented	06
	Begin to implement	21
QMS/ISO9001:2008	Fully Implemented	12
	Begin to implement	05
BSC/Begins to implement		02

Source: (Dametew AW1,2*, 2017),(MIDI,2016), &NQAA(2017

4. Result and Discussion

4.1. Competitiveness of Ethiopian Economy

The global competitiveness index report, the world economic forum (WEF), 2016 evaluation showed that the global competitiveness index (GCI) measurement of GCI of 2016-2017 ranked Ethiopia at 109 out of 138ountries with score point of 3.77 out of 7 score points. GCI of 2015–2016 ranked Ethiopia 109 out of 140 countries with score point of 3.74, GCI of 2014–2015 ranked Ethiopia

118 out of 144 countries with score point of 3.60 and also 2013-2014 ranked Ethiopia at 127 out of 148 countries with score point of 3.5 (Dametew AW1,2*, 2017). These indicate that the global competitiveness of Ethiopia has lowest ranks even low-income countries, for global index. While the global competitiveness of Ethiopian Economy is found at the lost level. As result, companies in these factor driven economies are characterized by low competitiveness with poor educational quality, poor technology transfer, low technological readiness and innovativeness. However, the economy needs to emphasis

and intention to look at competitiveness put up an improvement of firm and sartorial level changes for growth of the company. While the role and influence of JIT,SCM and TQM principles, implementation procedures and the relationship between them to basic metal manufacturing industries competitiveness were considered. Therefore, to implement and sustain TQM, SCM and JIT as improvement tools can secure firm's competitiveness in its local and global levels.

4.2. Basic Metal industry competitiveness

Based on the survey data, the global competitiveness steel and basic metal industries were measure using various indicators including raw material, production capability, technology and information systems, quality, and workforce potentials, and Infrastructure conditions considered.

4.2.1. Poor raw materials and depend on imported raw materials

The research data clearly shows that the Ethiopian steel industry heavily depends on raw material import from multiple countries such as Italy, Turkey, Germany,

Thailand, India, Ukraine and China, rather than domestic iron making process. The (Agency(JICA), 2010)survey study shows that, most manufacturing firms used import raw materials for production process. This indicates that basic metal sector highly dependent on imported raw materials in their production of basic metal products. Cause for raw material supply shortage among the medium and large manufacturing industries (Feyissa, 2009). This is due to unavailability of raw materials locally, poor quality of local raw materials, lack of sufficient local supplier and fragmental local supply chain systems are the major cause for relying on imported raw materials (Fourtunne, 2016 Published on Nov 15,2016 [Vol 17 ,No 863), (Alie Wube Dametew B. B., 2016). On the other hand the problems and constrains related with imported inputs were, high material cost, reliability in foreign suppliers is problematic, supply chain system problems, delay in cleaning goods through custom are the major problems that faced in Ethiopia basic metal industries. Consequently, the basic metal industries production efficiency, performance, and competitiveness is poor.

Table 5
Production strategic plan performance (in terms of capacity and usage)

Budget year	Price for production/in Billion Birr			Production capacity and usage in percentile			From 2014 performance	From 2015 performance	From 2010 average growth performance
	Plan	Performance	Performance in %	Plan	Performance	Performance in %	Performance in %	Performance in %	Performance in %
2010 initial		6		-	-	-			
2011	20	6.65	33.3	75	53	70.6			
2012	26	12.0	46.2	80	61	76			
2013	33.8	19.02	56.3	85	62	73			
2014	50.7	30.14	59.45	90	54	60	79.2	197.25	
2015	101.4	35.84	35.352	95	55.3	58.2			55.3

Source: MIDI 2016

4.2.2. In-adequate manufacturing systems

According to MIDI and the central statistics agency survey shows that, the basic metal industry sector intends to reach the 2010-2011 manufacturing year production capacity up to Billion Birr in actual its performance was 6.65 Billion Birr, which is 33.3% of the intended plan. In 2011-2012 budget year the basic metal industry sub sector lay down to reach its production to be 26 Billion Birr but the actual performance of the budget year was 12 Billion Birr. In 2012-2013 and 2014-2015 budget year the production rate is intended to be 33.8 and 50.7 Billion Birr respectfully but in actual the performance was 19.02 Billion in 2012-2013 and 30.14 Billion in 2014-2015. Even if the production improvements observed on basic

metal industries from year to year but numerous problems seen on basic metal industry and competitiveness till infancy. Some of the problems seen in this survey is skill man power, improper research and development center, improper production sequence, outdated technology and related problems are some of the challenges that face production capacity of basic metal industries. Because of these and other problems basic metal firms were to produce products below their production capacity. This challenge impacts and highly reduce their competitiveness in local and global marks. As a result basic metal industries needs additional efficiency through the implementation of production improvement systems for local as well as global competitions.

4.2.3. Product quality and related issue.

The survey confirmed that manufacturing firms faced problems on the availability, quality and cost of inputs. According to CSA, MIDI and JICA 2010 study shows that basic metal industry faced various problems on quality and related issue, for comparing international basic metal industries. These quality problems found due to insufficient basic metal inputs at the required quantity, quality of local raw materials, high cost of imported raw materials quality and delay on time productions are make the firms to produce products below their customer expectations. This limits their product competitiveness, as a result the firms face obstacle in terms of delivering quality products for international markets. In addition poor quality product results waste, rejects, retesting, rework and excessive overtime are also observed basic metal industries and other manufacturing sectors (Dametew, Problems of Solid Waste Management in Small and Medium Enterprises, 2015). Since basic manufacturing industries should work effectively for organize and implementing quality management systems to fulfill quality of products and improve global competitiveness.

4.2.4. Technology and information systems

The study shows that, the technology currently applied are moderate in terms of affordability, suitability, accessibility, and the required level of skills. Although some of the industries have installed modern technology, most of them required to invest on a new technology. The study also shows the technology, used in manufacturing industries have an impact on global competitiveness. As a The development of the economy of the country specially in speeding up the transition from agriculture to industry needs new technologies and modern energy supply and use, economical way of collaborating energy needs and delivery in all round energy development is mandatory in a sustainable and dependable manner in line with the country's energy policy. Nevertheless, Ethiopia's current power capacity is 1,600 Megawatt (MW), which consists of hydro (86%), diesel (13%) and geothermal (1%). This is not enough to meet national power demand and as a result power failure is frequent, which is considered as the most serious obstacle for manufacturing industries (Dametew, Design and Analysis of Small Hydro Power for Rural Electrification, 2016).

On the other hand the logistics problems are mainly occurs because of the country is landlocked, it uses the port of another country and this leads to incurring additional costs for loading and unloading and for rent.

result most basic metal industries need to invest for new technologies in the facilities for production improvement, manufacturing expansion, modernized machines, designing facilities, research and development and experimental facilities as well.

4.2.5. Manpower

Currently the government of Ethiopia has been emphasis and investing vast amount of investment in the construction of higher education and vocational training centers in different parts of the country to produce (train) and skilled labor that fit for the sector. Even though this progress and development seen a country wide but our field observation and literature survey indicates that, the main challenge of manufacturing sector in most Ethiopia basic metal industry is lack of educated and trained workforce, problems in innovation, research and development, and global competitiveness (Dametew, 2015), (Alie Wube Dametew F. E., 2016). In addition, the sector lacks talented designers and senior manager in the area due to low wage rate, scarcity of labor, problems of facility design and inconvenient work place.

4.2.6. Infrastructure and Energy supply

The major infrastructural related problems for basic metal industry production constraints include costs of logistics and transport, problems port facility, insufficient electricity and problems for power utilization, problems internet connection for upgrading their performance and telephone connections and poor quality of services (Agency JICA, 2010).

However, currently basic metal sector highly dependent on imported raw materials in their production of basic metal products. Due to this, basic metal industries invest highest amount of cost for logistics processes. This limits the firms' competitiveness in the international market as compared to other competitors.

4.2.7. Financial and market access

The deficiency of particular banks for industry development is also a bottleneck for the sectors development. Because for private-owned medium and large firms can't obtain enough loans from commercial banks because of different reasons like the commercial banks and the development bank have their own procedures to give loan that is not in line with the special nature of the industry, Cost of finance, lack of acceptable collateral, banks appraisal of the profitability and debt to

equity ratio of the borrower. Hence, firms to large extent depend on personal sources of finance especially during initial investment. In addition cost invest for rework and defects, cost of material waste, lack of cost controlling mechanism, poor resource utilization, cost of raw materials, overhead cost and labor cost also considered as the constraints of basic metal industries. As a result of such and related constraints, the production capacity and global competitiveness of the sector also limited.

4.3. Competitiveness analysis using cause and effect diagram.

Improvements tools are widely used as "graphical problem-solving methods" and as general management tools in every process between design and delivery. These tools are show the cause of problem and their effect as well to direct the improvement mechanisms for problems on manufacturing firms.

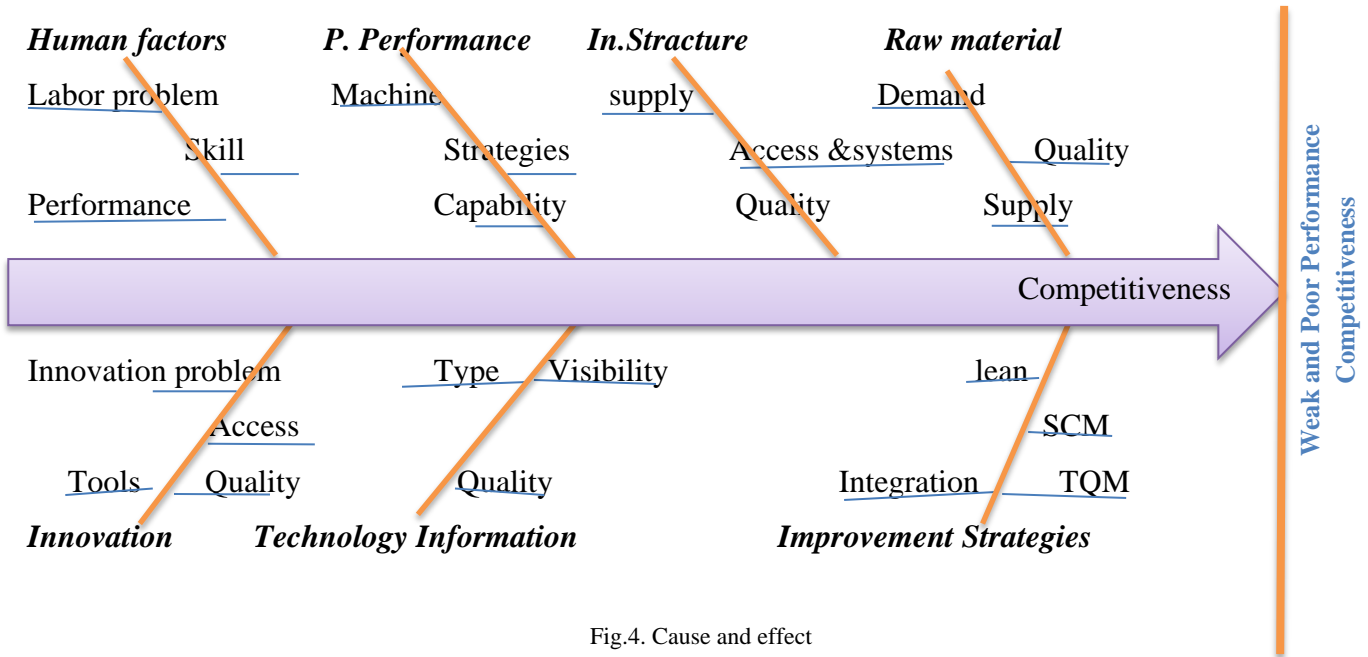


Fig.4. Cause and effect

From the above figure we observe that the competitiveness of basic metal industries are usually evaluate from several dimensions, including the man power, technology, material and resource, infrastructure and energy supply, quality and production capacity of the firms. Due to these and other hidden factors, we investigated that the current competitive performance of the Ethiopian basic metal industry is poor. As a result basic metals sector plays a limited role in the country's economic development, GDP contribution as well as employment creation and a means of foreign substitution and foreign exchange. Nevertheless both developed and developing nation firms are now looking at securing cost, quality, technology, sustainability, knowledge, health, resource and other competitive advantages as strategies to pursue in a globally competitive environment. As result currently in highly competitive and complex marketplace, a company follow with a more effective and efficient continuous improvement tool and systems have one of critical ingredients for improving company performances and attain global competitiveness. Therefore, improving

on these critical parameters will help for enhancing the competitiveness of the sector. Although basic metal industries needs additional efficiency for global competitiveness and firm performance improvements. Since, most of the time the performance improvement is achieved by implementing appropriate improvement tools for manufacturing industries. Commonly Toyota Company use TQM, Kaizen and JIT for product and systems improvements. However to tackle these problems we intended to developed integrated SCM, TQM and JIT framework to implement in Ethiopia basic metal industries.

4.4. The swot analysis on the performance of local steel and metal industry

Under this section, the case industries, the current competitive positions in strengths, weaknesses, opportunities and threats are evaluated and investigated. The field observation data used as a main source of this SWOT analysis.

Table 6
Analysis the Strength and Wakens of Ethiopian Basic Metal Industries

Strength	Weakness
<ul style="list-style-type: none"> ➤ Relatively structural products are good quality ➤ Vast natural resources ➤ Relatively skill man power ➤ Highly marketable products ➤ Increasing product mix ➤ Relatively new machinery(ETAB) ➤ Good motivation to revolve the sector(ETESI) ➤ Improving with joint venture(ETWSI) ➤ Decentralization systems/dep't level(ETWSI) ➤ Relatively, good leadership coordination(ETWSI) 	<ul style="list-style-type: none"> ✳ Resource problems/(insufficient scraps, and high cost of imported raw materials) ✳ Outdated technology ✳ Limited production capability (design, marketing, production, maintenance) ✳ Problems in Warehouse Management System and Facility ✳ Weak management and leader ship systems ✳ Improper resource utilization(material, manpower, fiancé ,technology), ✳ Problems in Skill man power, training and capacity building center ✳ Fragmental Supply chain systems ✳ Problems in supply chain visibility, coordination and collaborations. ✳ Poor project management skills of the international projects ✳ Problems in R&D ✳ Challenges in product Varity and quality ✳ Mostly use poor quality materials(ETAISI) ✳ Weak performance improvement implementation strategy ✳ Insufficient production capacity for global market ✳ Employee turnover(ETAB&ETAISI) ✳ Crucial problem in safety and health(ETAISI) ✳ Poor supply chain Sale and distribution network ✳ Infrastructure performances(IT, Energy, Technology, logistics facility) ✳ Cheating in quality(ETAISI)
Opportunities	Threats
<ul style="list-style-type: none"> ● Better regional market potential for basic metal products. ● Relatively good government support for basic metal industries ● Corporate cooperation with international partners ● Good regional initiation for collaboration and integration ● There are a lot of opportunities from global industries to as joint venture ● Good internal market opportunity ● Cheap Labour 	<ul style="list-style-type: none"> ✳ Global Raw Material Uncertainty ✳ Challenges In Foreign Currency ✳ Inflation That Could Affect Profits, ✳ Low Value-Added Production Moves To Lower Labor Cost ✳ Quality Problems In International Competition ✳ Global un-stability

The table above SWOT analysis result indicates that the various factor on metal industry performances was determined and this leads to the poor competitive advantage of east African basic metal industries. From the above SWOT analysis determined that, due to the problems in resource utilization and labor, production process and technology, infrastructure and related issue, environmental issue, the regional un-stability and human rights, problems on warehouse, outdated technology, insufficient technological capability, traditional, and poor production systems, limited & power fluctuation, poor transportation and logistics infrastructure, on-integrated system, un-skill manpower, problems leadership, management cooperation problems, weak management commitment, corruptions, dictatorial leadership, null & improper implementation of consensus) are hinder the performance and competitiveness of basic metal industries in the region. While effectively to undertake the problems, have played a great role for enhancing firm performance and global competitiveness East African basic metal industries at national, regional and global levels. Consequently, from various business performance

improvement strategies alternative, regional supply chain integrations have to be given the first priority.

5. Strategies for Integrated SCM, JIT, & TQM Model Development

The methodology trailed to develop the model and implementation rule to this continues improvement strategies have various concepts and principles. Mainly the models are done based on literature analysis from similar published articles and empirical investigation. Consequently, this continuous improvement tools like Kaizen, lean six sigma, TPM, TQM, SCM and JIT system are not new to the present situation of industrialization for achieving the performance of manufacturing industries. While that method is not inadequate to any particular industry but due to its large potential of benefit and it has a widespread application throughout the all business process. Many industries have adopted it and others are going to implement it for their survival in the fast competition at each stage in each area. However, this study shows that a small number of Ethiopia basic metal industry is in progress to implement continuous improvement scheme to be competitive in its global marketplace. On the other hand, a number of problems

discussed above tend to hold it back from achieving sustained and organization-wide improvement.

Further (Vuppapapati, 1995) study JIT implementation is agreed to be effective for repetitive production with fairly stable demand whereas applicability of TQM is much broader as it can be implemented in large or small, repetitive or adapted production, manufacturing or survive. The study accomplished with the view that companies should implement an integrated business strategy in which JIT is viewed as a natural component of overall TQM philosophy of organizational performance improvement. As well the other researchers agree that harmonized implementation of quality improvement programs aids companies to achieve fruitful improvement results (Kitaw A. M.-I., 2014), (Kitaw Y. Y.-I., 2014). From the literature reviews we gain that, continuous improvement program implementation is done any of the following three methods (Alie Wube Dametew D. K., 2017).

1. Realized/ Adopted Continuous program, as it is e.g you can implement on of, Kaizen, TQM, JIT or other programs.

2. Order implementation of quality improvement programs aids companies to achieve fruitful improvement results (Kitaw A. M.-I., 2014) (Kitaw Y. Y.-I., 2014). This implies that, we can be implemented two improvement tools in the company at different time. E.g first implement Kaizen or JIT and then you implemented BSC, TQM or other. Since in one manufacturing industry use two improvement tools sequentially in order.

3. Cohesive implementation of two or more continuous improvement tools, Vuppapapati, K. L.Sanjay A. and Gupta, T., (1995), Low Sui Pheng and Gao Shang, (2011). This means integrate integrating TQM&JIT, SCM, JIT and BSC or TQM& Kaizen or else. While from the literature in view of the fact that, using concepts from pervious literature, we argue that SCM, TQM and JIT have the potential tool to create competitive advantage and improve global competitions of manufacturing industries. The above figure presents the integrated TQM, SCM and JIT conceptual model that has been developed as an improved model of basic metal industries. The model proposes that most of JIT, SCM and TQM practices have some aspects in common and that they will have an impact on Sector performance. This conceptual model also suggests that there are some practices that are important for JIT, SCM and others for TQM, but also some that are transversal for in cooperation fields, explicitly Standardization, Safety, Sustainability, customer& employee satisfaction. JIT principle Pull system/ measures whether or not the plant has implemented the physical elements of a kanban/pull system. Regarding SCM, three main practices were designated: procurement, internal logistics, and distribution. TQM principles were identified Quality Culture and Quality (service, product, and system). Quality culture is the shared beliefs, values, attitudes, institutions, and behavior patterns that characterize the

members of a community or organization. In healthy business culture, what is good for the company, for the customers comes together, and becomes the driving force behind what everyone does. Since integrated SCM, TQM and JIT implementation on basic metal manufacturing industries attempt to smooth the flow of materials, production process, information from the suppliers to and manufacturers and the customers, thereby increasing the speed of the manufacturing process, improve product quality, innovativeness, OHS and achieve sustainability and customer satisfaction. Since this program to change the manufacturing system gradually rather than drastically. In the meantime, at the evaluation stage, the contribution of the improvement system should be evaluated whether the companies improve their competitive advantage, recover their performance and attain their expectation or not. If the evaluation is in good condition, manufacturing industry approaches to overall Organizational performance and Business Success. Doing so, depending on the industry standpoint they apply different performance measurement systems.

As a result we have to select the third option for development of integrated continuous improvement our in our model development. So in most studies shows, implementation of JIT and TQM all together has been observed as common argument Vuppapapati et. al(1995), Low Sui Pheng and Gao Shang,(2011).

Consequently developing of an integrated SCM,JIT & TQM model and the implementation it, in Ethiopia basic metal industries have significance effect on firm performance and Competitive advantage. For SCM, JIT and TQM integration and implementation phase, various interdependent variables and activities need to be execute. Since from the previous literature work we take out the most important critical factors for JIT, SCM and TQM implementation to basic metal industries. Although in to consideration of this, in this study we identified these most critical factors for JIT, SCM &TQM implementation to basic metal industries are classified in to three basic groups. These are

✚ **People evolvment and strategic issue** (Leadership commitment, Stakeholder and Employee involvement& Commitment, Strategic planning, continuously monitor and control, Training, Feedback, External relations,).

✚ **Modern systems** (Technology, Innovation, flow, Quality team, Information, Warehouse, performance evaluation, Flexibility).

✚ **Resource Utilization and Related issue** (Cost, awareness and training, Waste Controlling Mechanism,). Having this information and imputes the following models are developed for implementing continuous improvement program on basic metal industries.

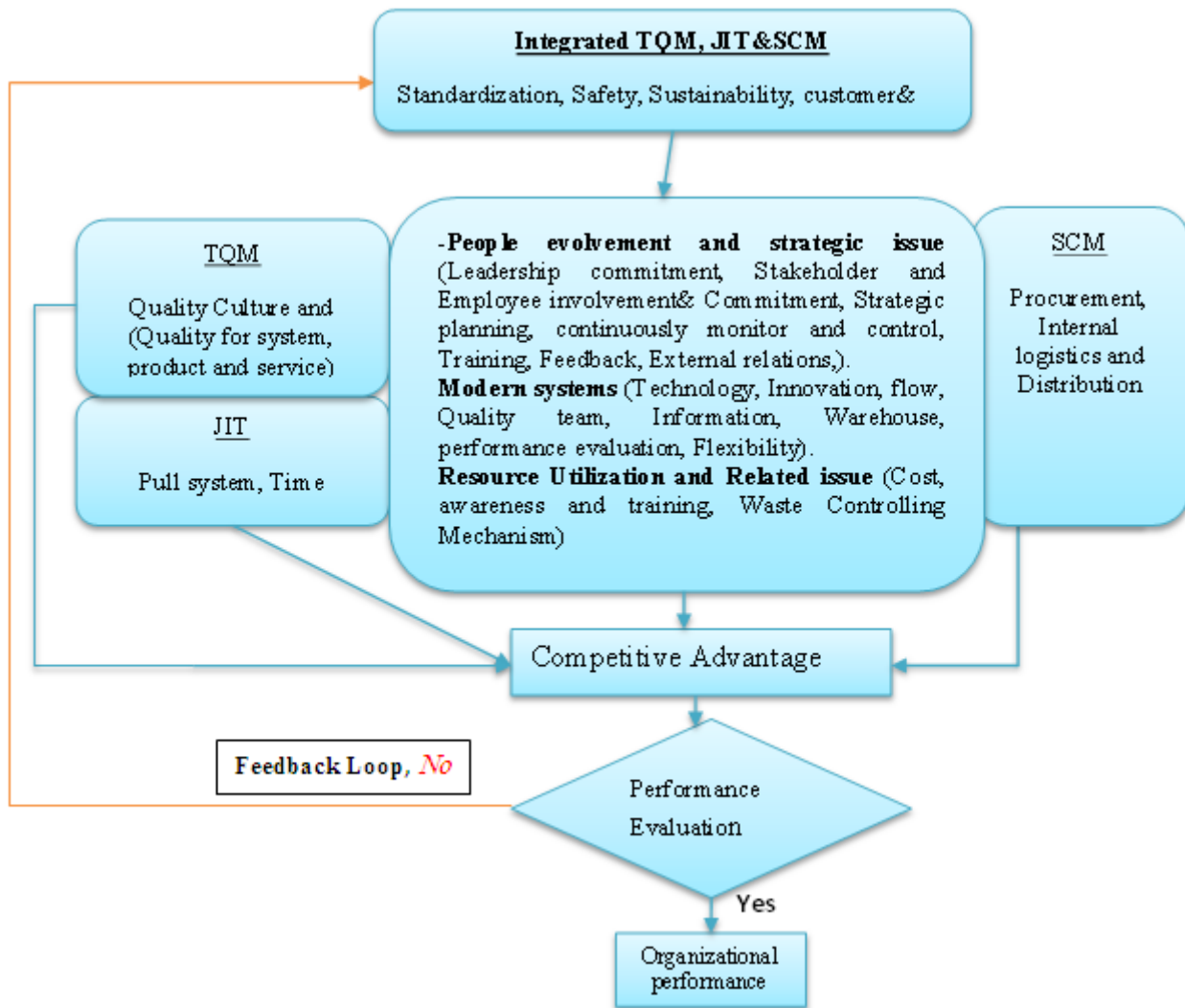


Fig.5. Conceptual model developed

6. Conclusion and Recommendations

Industry and other organizations investigate for new business paradigms that would attain to competitive advantage. Since Just in Time (JIT), Supply chain Management (SCM), Theory of Constraints (TOC), Balanced Score Card (BSC), Total Quality Management (TQM) and Warehouse Management System (WMS) are examples of strategies that helped companies to improve their performance and achieve a comparative advantage. Thus, a continuous improvement program is vital for business success and overall organizational performance improvement. Although, competitiveness in the current business environment not only focuses on local competition but also on the performance of foreign companies in the local market as an efficient and effective integration of resource in the result of globalization. Accordingly, the aim of the study is to assessed and investigate the challenges and trends of global competitiveness of basic metal industries, investigates the

way of integrating continuous improvement tools and then developed an integrated continuous improvement model so as to improve the global competitiveness of basic metal industries. Since, field observation, questioners and literature survey data we obtained from Metal industry development institute (MIDI), Kaizen Institute (KI) and National Quality Accreditation Agency (NQAA), shows that only a few companies are implemented quality management systems like ISO 9000, Kaizen and BSC as continuous improvement program. Even if some companies implemented this continuous improvement, tools but they are not properly used. Because of improper use and limited implementation of improvements tools, poor supply chain system, labor, raw material problems, energy fluctuation, outdated technology, manufacturing systems, financial and logistics, problems are identified as the obstacles and influence the Ethiopian basic metal industry performance and comparative advantage. Consequently, of such problems Ethiopia were missing in comparative advantage from metal sub-sectors in regional and global levels. Though to improve the deficiency seen

in the sector, the integrated TQM, SCM & JIT quality improvement model has been proposed for implementation in Ethiopia basic metal industries for

Recommendations

A detail integration and implementation prouder of improvement programs were investigated and this has potentials approach for further integration of other improvement tools. Basic metal manufacturing process always supported by research and then every industry should have research and development center.

Acknowledgement

My spirit thanks goes to almighty GOD at first because I did it he kept me alive, and thereby to my supervisor Prof. Daniel Kitaw (Dr. Ing :-) in supporting and giving this opportunity to take action on writing this papers. The other thank goes to my dear colleagues who supported me in idea sharing while we were doing together our work through similar formatting. My grateful thank goes to Ato Derjie manufacturing Department manager Ato Smuale and Ato Abomiya Senior Expert Metal Industry Development institute Ato Kashune & Mrs. Bezawite from Kality Metal product factor Quality Mentadent Team providing all necessary documents and support on Basic metal industries in Ethiopia and other Institute staffs for their collaboration, as awhile in providing any information I requested.

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This article can be cited: Dametew, A. & Ketaw, D. & Ebinger, F. (2021). Enhancing Basic Metal Industry Global Competitiveness through Total Quality Management, Supply Chain Management & Just- In –Time, *Journal of Optimization in Industrial Engineering*. 13 (2), 27-46

http://www.qjie.ir/article_667919.html

DOI: 10.22094/JOIE.2019.741.1472

