# SUSTAINABLE GLOBALSOURCING

# USING PROGRAM PERFORMANCE ANALYSIS MODEL

*Research Paper*

Sambhunu Cherikkandiyil House, DBA Student Swiss School of Business and Management,Groningen, Netherlands, sambhunu@ssbm.ch

## Abstract

*In the unprecedented pandemic ruined economic situation it is important for sustainable organizations with long term strategy to source and resource their suppliers. The primary purpose of Program Performance analysis (PPA) is to provide a rigorous and complete understanding of the program cost and a rational forecast at different stage. Another purpose of Program Performance analysis is for an early indication of expected total cost of project. No research occurred about the influence of Program Performance analysis on global sourcing, this study will accommodate these factors and important global sourcing decision drivers like Contribution Margin, EBIT Margin, Net Flow of Revenue, Internal Rate of Return, Net Present Value and Payback after Start of Production. This research will use Should cost breakdown or Total Landed Cost breakdown as an input to calculate variables of Program Performance Analysis to determine long-term global sourcing decisions.*

*Keywords: Global Sourcing, Program Performance Analysis, Net Present Value, EBIT Margin.*

## 1 Program Performance analysis (PPA)

Program Performance Analysis (PPA) is a tool that can be used to identify global suppliers of long-term projects. PPA can be created from should costs of supplier's regions, from quotes of strategic suppliers and from Total Landed Cost. After analyzing literatures of "Machado et al. (2015),Kaplan and Anderson (2004), Mandolini et al. (2018), Husband (2014), Carter & Mueller (2011), Parivs F. Rad (2002),Saha (2011),Pettersson and Segerstedt (2013), Blocher et al. (2019), Holweg et al., 2011), Monczka and Trecha (1988), Anderson et al. (2009), Morita et al. (2007), Pumpe and Vallee (2015), Varadarajan (2013), Marco Melacini and Bonanni (2010), Medina et al. (2013), Feller et al. (1995), Cardinali (2014), and Pumpe and Vallée (2017)" the types of Program Performance Analysis are divide into three categories based on the information used for the analysis.

- Program Performance Analysis can be created from Total Landed Cost (TLC) made from should cost analysis (SCA). This method helps to find potential suppliers and supplier regions with a new design or concept. This method can be called Should Cots to Program Performance Analysis (SPPA).
- Program Performance Analysis can be created from Total Landed Cost (TLC) made from a supplier quote. This method helps to find the best suitable suppliers from a quote of suppliers. This method can be called the Quote to Program Performance Analysis (QPPA).

- Program Performance Analysis can be created from Total Landed Cost (TLC). This method helps to find low-cost suppliers from TLC or TLC of an alternative supplier if the product is in production. This method can be called TLC to Program Performance Analysis (TPPA).

## 1.1 Introduction

The concept of Program Performance Analysis (PPA) is not widely used, organizations usually relay on present costs to take long-term global sourcing decisions. After start of production the quantifiable variables like labor cost, material cost, manufacturing costs, packaging costs, logistics costs changes according to the varying economical scenarios.These changes are local and global in nature.The purpose of this paper is to identify the major components of global Sourcing decisions. This paper aims to provide a tool for decision makers to help identify suitable suppliers for long-term global sourcing. As part of this research, a model template will be developed to analyze the financial factors that influences strategic global sourcing decisions. This research will use Should cost or Total Landed Cost as an input to calculate variables of Program Performance Analysis to determine long-term global sourcing decisions.

## 1.2 Problem Statement

Sourcing can contribute to improving a firm's global supply chain competitiveness. In order to do so, it explores the elements to be considered while developing the strategic sourcing (Biazzin, 2019). The purchasing department can play a key role in an organization's efficiency and electiveness because it has a direct effect on cost reduction, profitability and flexibility of a company (Ghodsypour & O'Brien, 2001). Global sourcing is the practice of sourcing from the global market for goods and services across geopolitical boundaries. Global Sourcing is aimed to procure the part as cheap as possible without compromising the quality standards of the firm (Jia et al., 2017). Program Performance analysis (PPA) provides a prediction of total cost of project or program. These understanding is essential for making good decisions while analyzing the project, exploring opportunities, and mitigating undesired variances.

The problem in hand is depended on various data available from different sources that are internal, external, global, and regional. These data are quantitative in nature. Program Performance Analysis made from should cost or Total Landed Cost will make more insight into best possible sourcing solutions available for a global sourcing organization. The long-term global sourcing strategy derived using Program Performance Analysis (PPA) created from Total Landed Cost (TLC) or from should cost analysis (SCA) of low-cost supplier regions will be the primary output of this study. The output required from PPA to take Global Sourcing are Contribution Margin, Earning Before Interest and Taxes Margin, Net Investment Flow of revenue, Internal Rate of Return, Net Present Value and Payback after Start of Production. The findings imply that global sourcing does not automatically lead to higher cost savings, need to have a mathematical method to analyze best suitable scenarios. The procedure proposed can help companies that do global sourcing to identify the best supplier region or best supplier for their long-term global sourcing activities. The study considered only on analyzing global sourcing of automobile parts. Assuming all strategic suppliers can produce product with required quality and quantity, can deliver on agreed time frame/s.

## 1.3 Objectives

Global sourcing refers to buying the raw materials or components that go into a company's products from around the world, not just from the headquarters' country (Babu John Mariadoss, 2015). Global

sourcing refers to buying the raw materials, components, or services from companies outside the home country. In a flat world, raw materials are sourced from wherever they can be obtained for the cheapest price (including transportation costs) and the highest comparable quality (Mason A. Carpenter & Sanjyot P. Dunung, 2012). Majority of companies today strive to harness the potential of global sourcing in reducing cost. Hence it is commonly found that global sourcing initiatives and programs form an integral part of the strategic sourcing plan and procurement strategy of many companies (Robert B.Handfield & Kevin M McCormack, 2007). Global sourcing is often associated with a centralized procurement strategy for a multinational, wherein a central buying organization seeks economies of scale through corporate-wide standardization and benchmarking. A definition focused on this aspect of global sourcing is: proactively integrating and coordinating common items and materials, processes, designs, technologies, and suppliers across worldwide purchasing, engineering, and operating locations (Hugos, 2018).

It is important for sustainable organizations with long term strategy to source and resource their suppliers. Companies make the global sourcing decisions based on the manufacturing cost (Jearasatit, 2010). After manufacturing, the product needs to reach the various assembly plants spread across the globe. Many factors outside of manufacturing costs comes into effect until the part gets assembled or used at the final location (Holweg et al., 2011). This final cost can be termed as the Total Landed Cost (González-Ramírez et al., 2020). Total Landed Cost was investigated within multidisciplinary context (Young et al., 2009). These studies were based on manufactured cost of product in the present year or product cost in the first year of production. Cost drivers that determine the cost of the product and TLC changes from the start of the program to the end of the program. The rate of changes depends on many factors that are global as well as local.

This study is aimed to create better understanding of major drivers of Global sourcing, by creating a program performance analysis (PPA) model to make sure the entire program can be evaluated against each available scenario to an organization. Program performance analysis will help to compare the key figures that drive sourcing decisions, mainly Contribution Margin, EBIT Margin, Net Investment Flow of revenue, Internal Rate of Return, Net Present Value and Payback after Start of Production. The targets of these are set by the finance department according to the organization's goals. The cost of a product from region A may be lower compare to region B in the start of program, it may vary at the end of program(Allon & Van Mieghem, 2010) like in (Figure **1**). The data requires for the calculations of key figures using Program Performance Analysis model can be divided into Product data, procurement data, financial data, TLC data.

## 1.4 Methodology

Global sourcing decisions are dependent on many factors that are quantitative and qualitative in nature. It is very difficult to create a general template for qualitative variables. The quantitative variables are used to calculate the measurable key factors that determine long-term global sourcing decisions. Long-term procurement is complex due to direct and indirect factors that changes like labor cost, material cost, manufacturing cost, annual volumes, geopolitical relationship, technology, regulations change. In today's highly competitive environment, companies with global operations are in a position at which very often minimizing total landed costs (TLCs) is crucial for their survival (Chakrabarty, 2006). TLCs comprise the original price of the product plus all the logistics related costs such as transportation fees (both inland and ocean), customs, duties, taxes, tariffs, insurance, currency conversion, crating, handling and payment fees (González-Ramírez et al., 2020). The study will construct using TLC data provided by supplier or created by the organization. The TLC data can be created from should cost study if currently no supplier is awarded or quoted.

(Pettersson & Segerstedt, 2013) proposed a model for measuring supply chain costs, considering manufacturing, administration, warehouse, distribution, capital, and installation costs. Their study show that many companies do not measure total supply chain costs, focusing only on some parts of the chain such as manufacturing complemented with distribution costs, neglecting other costs that may make a product or family of products. The use of comprehensive Program Performance Analysis models as an effective decision support tool is not widespread. Comprehensive models are not typically found because of several key factors: the necessary data are not available in many organizations. Organizations typically need to perform the analysis and arrive at a decision within a short time frame that precludes appropriate data collection; many organizational structures inhibit if not outright preclude the use of such models. many organizations may not be sufficiently sophisticated to be able to recognize that administrative overhead costs are important to the overall sourcing decision "(Young et al., 2009)". Systematic use of should cost, TLC and PPA will help the offshoring to become right shoring.

To arrive at a base knowledge of Program Performance Analysis a methodology was constructed using observation of a series of global sourcing activities to develop case studies that identified those elements appearing to hold significant meaning. The Companies often depend on their suppliers. The key to the success of companies depends on the selection of the appropriate supplier. A methodology is proposed to address this issue by identifying the appropriate selection criteria and then developing a mechanism for their inclusion and measurement in the evaluation process. Analysis of the case studies was undertaken to establish common themes whereby any derived conceptual model could have the widest possible appeal and applicability. It was also recognized that certain features of the model might not be currently used by all the companies, but rather could suggest levels of detail that would be desirable in their quest for making better decisions concerning their global sourcing.

The proposed methodology is illustrated by considering a case study. This case study presents an evaluation framework and illustrates how this framework can be implemented using global sourcing decision making of a leading firm in USA automobile industry and its part suppliers in China, India, Poland and Mexico. In the case study Company "T" Inc is attempting to evaluate 10-year long-term purchasing strategy using the proposed template. To get the financial approval from program management the Global Sourcing team needs to meet the financial criteria set by finance department. The factors that measured are Contribution Margin, EBIT Margin, Net Investment Flow of revenue, Internal Rate of Return, Net Present Value and Payback after Start of Production.

**The Organization**-The data is collected from an organization "T Inc," is a teir1 company, supplies products to automobile OEMs across global after assembling, validating, quality checking of the parts or assemblies from teir2 companies. And produces automobile parts for automobile OEMs across global. The company operated primarily surrounding the design, manufacture, and sale of automobile systems with an established footprint that includes facilities in more than 26 countries. It operated approximately 200 facilities with 66,000 employees, maintains 22 technical centers and 14 test tracks in vital markets around the world.

**The Data-** The data requires for this case study was replicated same as the data used by company T Inc. The data collected for this study is like the data being used by this organization for their global sourcing, and raw data was not directly collected, but based on information from Company T Inc, a representative case is presented. The Company T Inc uses these data for their Total Landed Cost Calculations, supply chain data is from global sourcing team of the organization. Due to a confidentiality agreement specific reference for the data used to estimate the model's parameters are not provided. The analysis is intended to show the potential value of this mechanism and can be used

for evaluating the competitive position, from a high-level perspective. Case study is conducted to demonstrate the model's ability to support strategic decision making. All the replicated data that are used based on the real data from company T Inc, truly represent the real scenario that are being used for global sourcing.

Product data can be usually collected from should cost analysis, supplier quotes, Total Landed Cost analysis. Material Cost from raw material suppler /commodity purchasing/ Sourcing team/Cost engineering department/ another external source/supplier quote. Labor Cost from labor data bank /commodity purchasing/ Sourcing team/Cost engineering department/another external source/supplier quote. Manufacturing Cost from Cost engineering department or supplier quote. Cost Markups percentage from Cost engineering department/supplier quote/commodity purchasing/ Sourcing team.

Procurement data usually available from program/project management team. Start of Production (SOP) year is the year the item is available for delivery, planned years of production, annual labor cost at SOP from Cost engineering department, projected annual wage increase from commodity purchasing/ Sourcing team/Cost engineering department/ another external source, projected annual interest rate from commodity purchasing/ Sourcing team/Cost engineering department/ another external source, annual production volume from program/project management team, efficiency improvement plan from commodity purchasing/ Sourcing team, Purchase Price Variance /Long Term agreement from commodity purchasing/ Sourcing team.

Financial data are available with financial department formulated to achieve the financial goals of the organization. Currency of invoicing from Finance, weighted average cost of capital from Finance, Day sales outstanding from Finance, Days payable outstanding from Finance, inventory turns in days from Finance, Supply chain overhead allocated from Finance, other charges from Finance, inhouse scrap percentage of sourced parts from program/project management team, Product warranty from program/project management team, planned lumpsum quick savings from program/project management team, direct investments from program/project management team, annual interest rate of sourced country from Finance, inflation rate from Finance, SGA expenses and profit over product from Finance.

TLC data can be created from should cost data using total landed cost template of organization or can be used from breakdown of Delivery Duty Paid (DDP) data. The data required to create Total Landed Cost. Ex works from should cost or supplier quote. Packaging costs from commodity purchasing/ third party. Sea freight, Rail freight, Road freight, other freight from commodity purchasing/ third party. Warehousing cost commodity from purchasing/ third party. Inventory carrying cost from commodity purchasing/ third party. Import duty from commodity finance/purchasing/ third party. Port cost /Other cost from finance/purchasing/ third party. Supply chain risk from finance/purchasing/ third party.

Annual spent is the product of annual volume and product cost, usually annual volume is lower at SOP and EOP, peaks at midlife of product. This scenario makes the situation more complex. It is easy to come to a conclusion if the annual volume is same through the production period. In the SOP year product cost of Supplier A is is more than supplier B, but end of production (EOP) product cost of Supplier B is is more than supplier A like in **Figure 1.** The supplier A is in high cost country and annual product cost increase at 4% rate, the supplier B is in low cost country but annual product cost increase at 10% rate. The longterm sourcing decisions cannot be decided on just product cost at SOP or EOP. If the annual volume is same through the production period the supplier with low average cost is easy pick, in ideal production scenario annual volume follows a bell shaped curve. So it is important to consider other financial parameters that are generally used by finance department to measure the financial feasibility, these are Contribution Margin, EBIT Margin, Net Investment Flow of revenue

(NIF), Internal Rate of Return (IRR), Net Present Value (NPV) and Payback after Start of Production (PaSoP). Each has its important in long-term sourcing depends on the financial condition of buyer, type of product, expected performance of product on the intended market, competition, expected technology change, market share, targeted customers etc.

**The general assumptions**-The following assumptions are of supplier C used for case study, the SOP year is 2024, the number of production years is 10, the projected wage increase is 4% per year, the projected annual interest rate is 4% per year, the labor cost of year 2023 is $12, annual volume varies, efficiency improvement and PPV/LTA are also varying, Currency of invoicing is USD, weighted average cost of capital (WACC) is 10%, Days of sales outstanding is 30 days, Days payable outstanding is 30 days, inventory turns in days is 15 days, Supply chain overhead allocated is 8%, other charges is 1%, inhouse scrap percentage of sourced parts is 1%, Product warranty is 1%, lumpsum quick savings is Zero, direct investments is $100,000 and annual interest rate of sourced country is 4% per year. Projected annual volume of first ten years are 5000, 8000, 10000, 120000, 14000, 14000, 10000, 8000 and 6000.

**Projected manufacturing market growth/inflation impact on product Cost, TLC, Prime Cost**

Product Cost, TLC and Prime Cost are depending on annual inflation and Purchase Price variance (PPV)/Long-term agreement (LTA) efficiency improvement. At SoP Product Cost, TLC and minimum Selling price are $14.3, $16.4 and $20.4.

Annual volume of the product in year 2025 is 8000 units, applying the annual volume and calculated annual cash flows that are more relevant for sourcing decisions for year 2025.

- Cash from operations = 33.1k USD
- Sales outstanding = 13.9k USD
- Payables outstanding = 11.2k USD
- Inventory turns = 5.6k USD
- Total working capital = 8.3k USD

The annual incomes and expenses that are more relevant for sourcing decisions for year 2025.

- Annual Revenue = 169.4k USD
- Annual Material Cost = 27.1k USD
- Annual Manufacturing Cost = 52.2k USD
- Annual Landed Cost = 17.6k USD
- Annual Labor Cost = 15.9k USD
- Annual Mark Ups = 23.4k USD
- Annual Overhead & warranty = 15k USD

**Figure 3**. shows the labor cost movement in manufacturing market of Supplier B and its projected imapact on the product during the production life of the project. **Figure 3**. shows the product cost from start of production (SOP) year to end of production (EOP) year. At SOP year product cost of supplier A is higher than the product cost of supplier B, but at EOP year product cost of supplier B is much higher than the product cost of supplier A. **Figure 4.** Also follows the same trend, the minimum selling cost from start of production (SOP) year to end of production (EOP) year. At SOP year minimum selling cost of supplier A is higher than the minimum selling cost of supplier B, but at EOP year minimum selling cost of supplier B is much higher than minimum selling cost of supplier A. The flexible annual volume of this project are 5000, 8000, 800, 10000, 12000, 14000, 14000, 10000, 8000

and 6000 with the SOP year is 2024 and EOP year 2033.**Figure 5** shows projected annual spent and expected annual revenue through the production life of the project.

by analyzing these factors using Program Performance Analysis template the key figures are calculated. The key figures that drive long term sourcing decisions of over production period are Contribution Margin, EBIT Margin, Net Investment Flow of revenue (NIF), Internal Rate of Return (IRR), Net Present Value (NPV) and Payback after Start of Production (PaSoP). The targets of these are set by the finance department according to the organization's goals.

For this case study there are three scenarios as in **Table 1** Supplier A is in a high cost country with a potential growth at 4% rate, Supplier B is in a low cost country with a potential growth at 10% rate and Supplier C is actually Supplier B in a low cost country with 4% growth rate.If the results are green the NPV ranking of other suppliers are analyzed before final decision. Once NPVs of finance approved suppliers are available, the suppliers with lowest NPVs are invited for final negotiation, then the project is awarded to best suited supplier/s. The finance department usually has a target that needs to be met for every project or program. These targets are created by keeping long-term and short-term organizational goals. The factors that influence these targets are market share of organization, expectation of stakeholders, maturity of similar products in market, influence of main competitor products, customer demands and supplier availability,future market predictions, technology, financial condition of organization etc.

In ideal cases once the Program Performance Analysis results meets the finance target, then similar proposals from different suppliers are analyzed. Ranking of Net Present Value (NPV) is presented to project/program management with potential risk rating. Based on the feedback from project/program management the sourcing is awarded to one or more suppliers. Non-ideal cases suppliers may not meet the target, then best ranked supplier/s selected for sourcing according to past experiences and negotiation power of organization.

**The Results**- The key figures that drive long term sourcing decisions of over production period are Contribution Margin, EBIT Margin, Net Investment Flow of revenue (NIF), Internal Rate of Return (IRR), Net Present Value (NPV) and Payback after Start of Production (PaSoP). The targets of these are set by the finance department according to the organization's goals. Results are Green, Finance will approve the project. When we analyze the results of supplier A (**Table 2**), supplier B (**Table 3**) and Suppler C (**Table 4**) the Supplier C is most likely to get the project, But the supplier C is Supplier B with annual growth rate of Supplier A. Supplier A and Supplier B did not meet the the NPV target. If supplier B was following the growth rate of supplier C then the project was awarded to supplier B. In the present scenario Supplier A will get the project even though the total landed cost is higher than the total landed cost of supplier B at the start of production due to high growth of manufacturing market the overall project cost of supplier A is much lower than that of supplier B. If both suppliers are from same manufacturing region then supplier B gets the project.

The report provides a very simple case study to show the impact of accurate program performance analysis calculation in terms of global sourcing decision-making. As can be seen in the charts and tables , what initially appears like the smart decision to go to Supplier B due to initial low ex-works cost for product sourcing winds up changing to Supplier A sourcing strategy when the full program performance analysis is considered for life volume of project. Program Performance Analysis (PPA) is an attractive metric because it enables companies to capture both obvious and hidden costs associated with product movement, revealing the true cost of sourcing and global sourcing decisions.

## 1.5 Figure

*Figure 1. Price Increase trend forecast (Supplier A and Supplier B)*

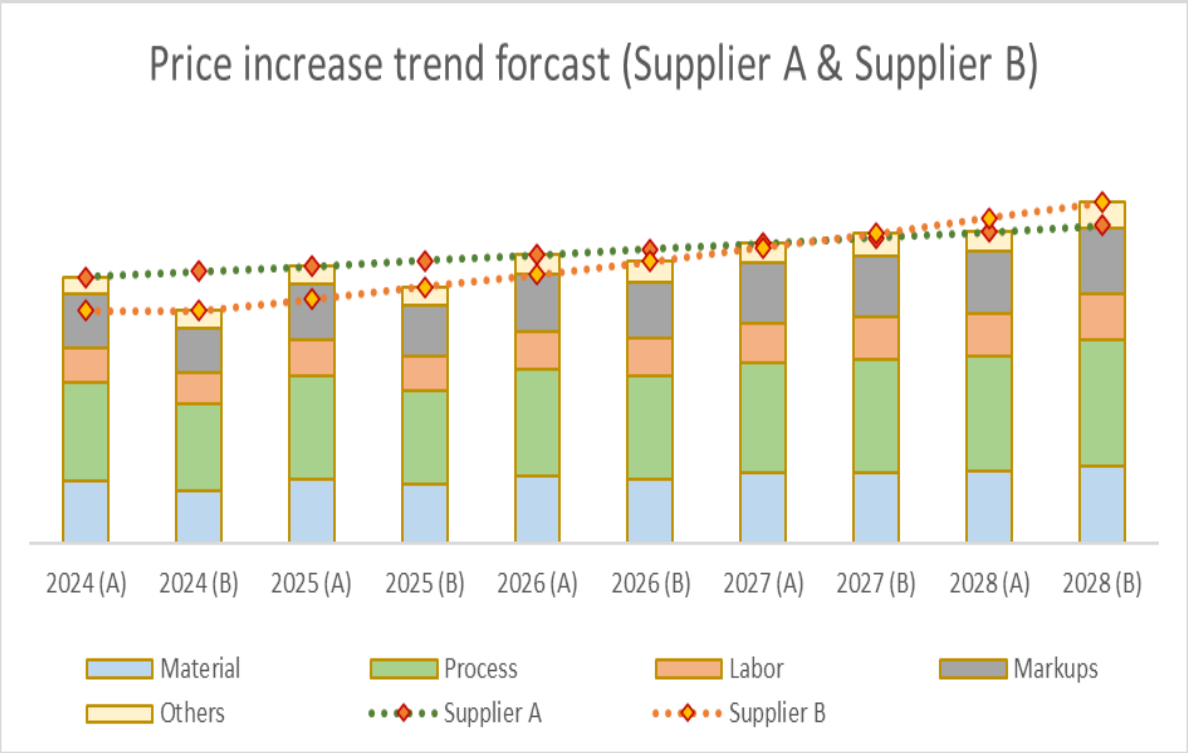



Figure 2. Product cost trend- Supplier A and Supplier B from 2024-2033

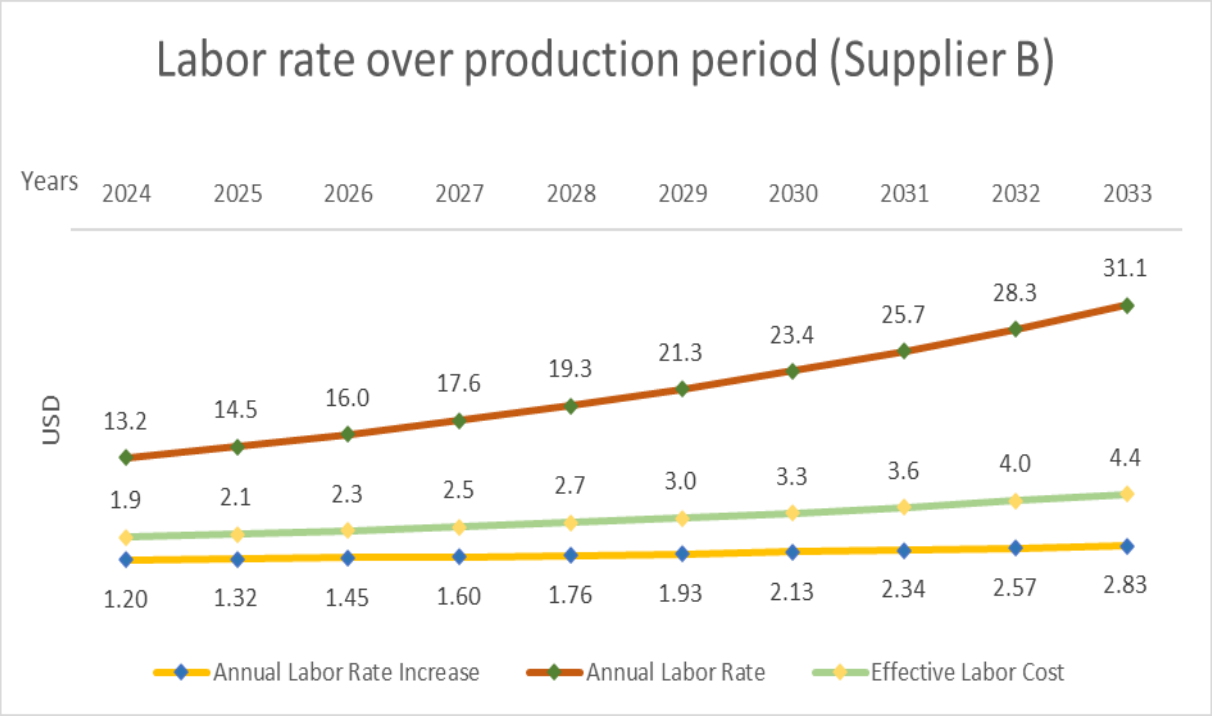


*Figure 3. Product cost trend- Supplier A and Supplier B from 2024-2033*

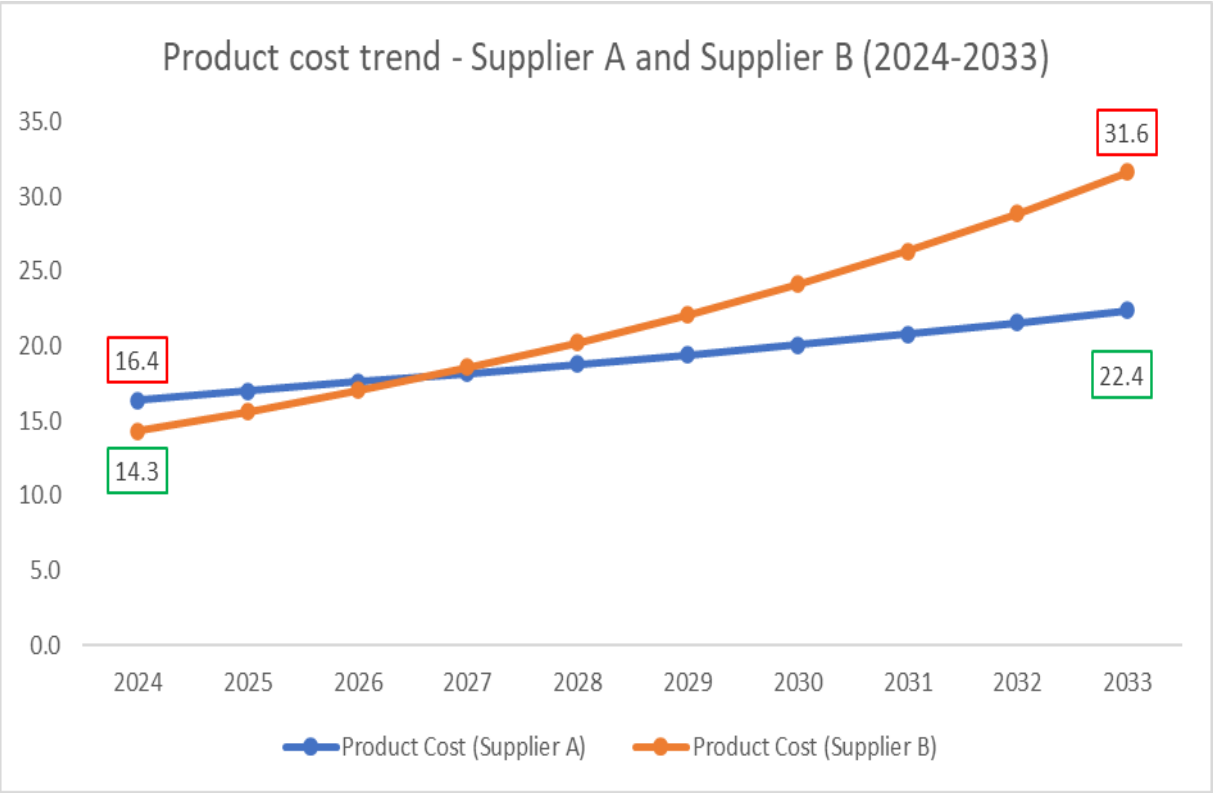



*Figure 4. Selling Price trend- Supplier A and Supplier B (2024-2033)*

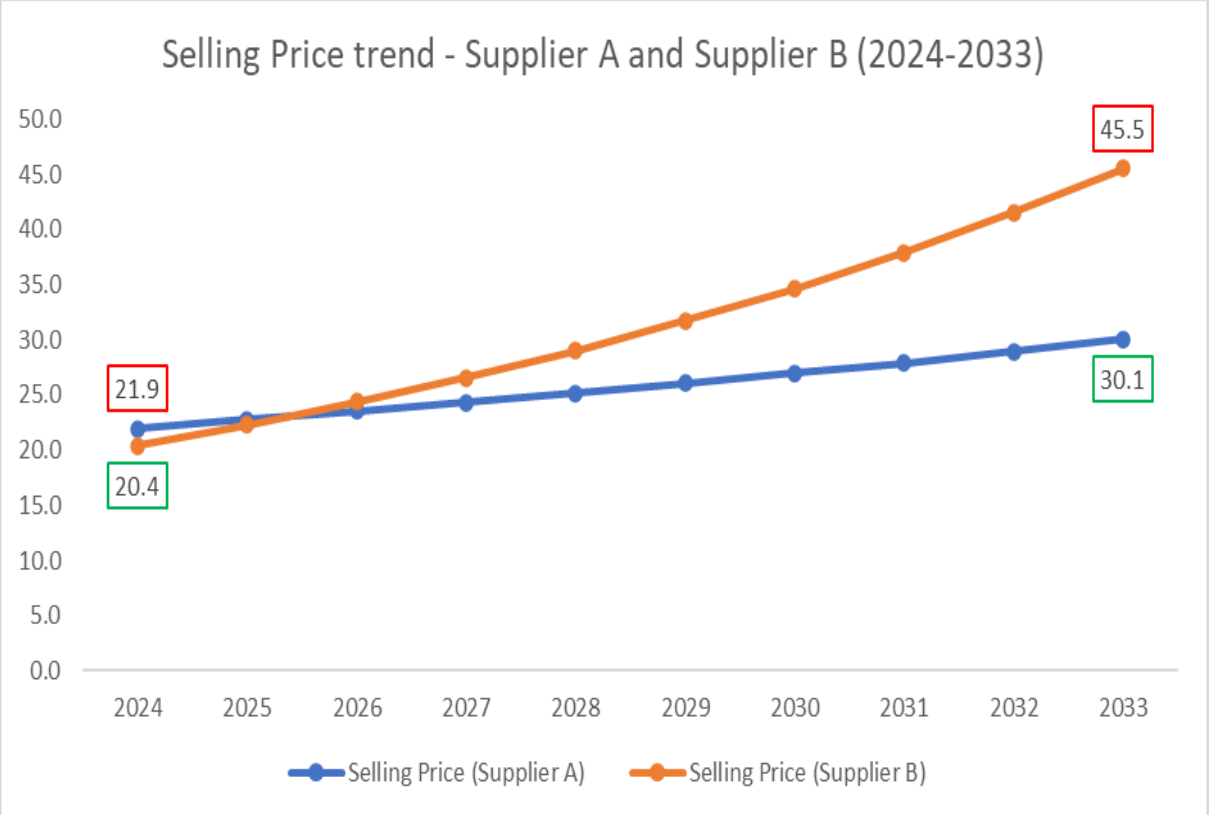
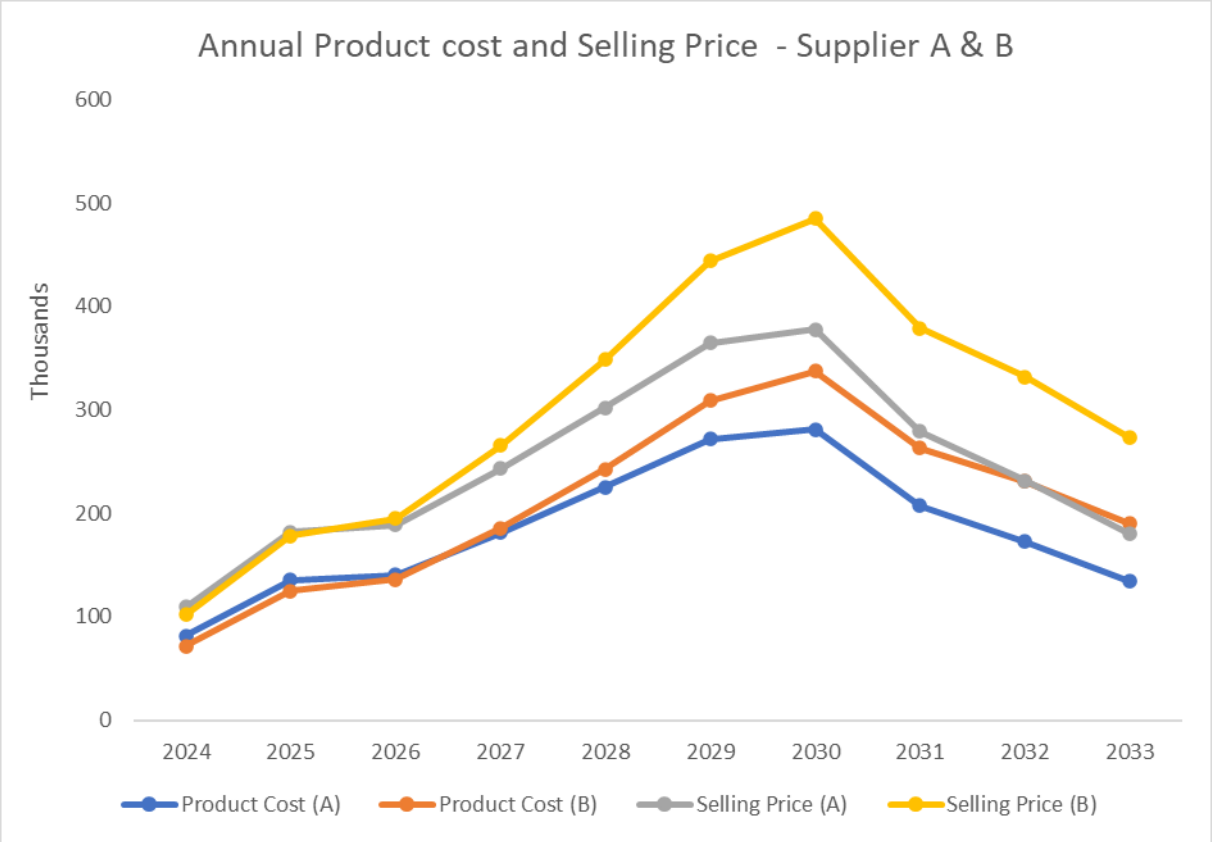


*Figure 5. Annual Product cost and Selling Price - Supplier A & B*




## 1.6 Table

| Data for PPA calculation | | | |
|---|---|---|---|
| **Description/Name** | **Supplier A** | **Supplier B** | **Supplier C** |
| Material Cost | $3.81 | $3.26 | $3.26 |
| Process Cost | $6.04 | $5.26 | $5.26 |
| Labour Cost | $2.19 | $1.93 | $1.93 |
| Markup Costs | $3.29 | $2.81 | $2.81 |
| Other Cots | $1.05 | $1.05 | $1.05 |
| Landed Cost | $1.27 | $2.12 | $2.12 |
| Total Landed Cost | $17.65 | $16.43 | $16.43 |

*Table 1. Data for PPA calculation.*

| Program Performance Analysis (PPA) Results - Supplier A | | | |
|---|---|---|---|
| **Description/Name** | **Target** | **Calculated** | **Status** |
| Contribution Margin (CM) | 10% | 20% | Green |
| Earnings Before Interest and Taxes (EBIT) | 10% | 11% | Green |
| Net investment of Revenue (NIR) | 2% | 0% | Green |
| Internal Rate of Return (IRR) | 50% | 43% | Green |
| Net Present Value (NPV) | $200k | $214.3k | Rank-2 |
| Payback after Start of Production (PaSoP) | 6 | 3.7 | Green |
| Results are Green, Finance will approve the project. Ranking and strategic relationship decides the decision | | | |

*Table 2. Program Performance Analysis (PPA) Results – Supplier A.*

| Program Performance Analysis (PPA) Results - Supplier B | | | |
|---|---|---|---|
| **Description/Name** | **Target** | **Calculated** | **Status** |
| Contribution Margin (CM) | 10% | 20% | Green |
| Earnings Before Interest and Taxes (EBIT) | 10% | 11% | Green |
| Net investment of Revenue (NIR) | 2% | 0% | Green |
| Internal Rate of Return (IRR) | 50% | 45% | Green |
| Net Present Value (NPV) | $200k | $260k USD | Rank-3 |
| Payback after Start of Production (PaSoP) | 6 | 3.7 | Green |
| Results are Green, Finance will approve the project. Ranking and strategic relationship decides the decision | | | |

*Table 3. Program Performance Analysis (PPA) Results – Supplier B.*

| Program Performance Analysis (PPA) Results - Supplier C | | | |
|---|---|---|---|
| **Description/Name** | **Target** | **Calculated** | **Status** |
| Contribution Margin (CM) | 10% | 20% | Green |
| Earnings Before Interest and Taxes (EBIT) | 10% | 11% | Green |
| Net investment of Revenue (NIR) | 2% | 0% | Green |
| Internal Rate of Return (IRR) | 50% | 41% | Green |
| Net Present Value (NPV) | $200k | $197k | Rank-1 |
| Payback after Start of Production (PaSoP) | 6 | 3.8 | Green |
| Results are Green, Finance will approve the project. Ranking and strategic relationship decides the decision | | | |

*Table 4. Program Performance Analysis (PPA) Results – Supplier C.*

## 1.7 Limitations

In an era of extreme globalization, accurate calculation of program performance analysis should be an essential competence for almost any supply chain organization, certainly those that source products globally. The study has limitations in line with the vast field of its applications. The data was collected only from two automobile Tier 1 suppliers and one medical equipment manufacturing OEM. The data used is secondary data from these industries. Data from the year 2020 is used for this study. Two supplier scenarios of one product are analysed, the two regions of suppliers are Asia Pacific and Europe. Commodity type limited to mechanical assemblies. Major risk analysis like currency risks, quality risk, importing and exporting nations relationship risks, technology risk are not included in the study.Future work will focus on exploration of additional factors that influence the long term global sourcing that can be organizational specific, regional specific and global in nature. Author is hoping to

continue the research in these directions in future and also has the passion of implementing these models in the organisation associated with the study. It is difficult to define all of the factors contributing to program performance analysis, and obtaining all of that data can be very challenging. The quality of the result directly proportional to the quality of the input provided. If input has any error the error will show proportional error in the final result.

## 1.8 Conclusion

Manufacturing is more and more global by each years, means procurement supply chains are increasingly global and complex, and moved from few sourcing scenario option to many sourcing scenario options.The concept of program performance analysis is not widely understood, but from the report program performance analysis is the sum of all costs through the life time of the project associated with making and delivering products to the point where they produce revenue as an end result. Global sourcing decisions that depend only on start of production (SOP) year product cost no longer adds value to the organisation's sourcing goals due to the fast changing character of manufacturing markets. The organization needs to analyze the factors like market share of organization, expectation of stakeholders, maturity of similar products in market, influence of competitor products, demand fluctuation and supplier availability, future market predictions, technology, financial condition and expectation of organization are some to name. Incorporating all these are very difficult in every product sourcing, however a template that mimics major quantitative factors that are important for finance and production will definitely give the right direction to the sourcing team. This template will add more value to long term global sourcing decisions. Instead of sourcing from low cost regions the focus should shift to right source regions, that can be inshoring , nearshoring, offshoring or friendshoring. However this leads to right shoring. The pandemic and international turbulence due to conflicts of nations are forcing organizations to think this way, because right sourcing is the only way to sustainability.Program performance analysis is a very commercial viable tool that can be used for different type of business decision like

- Make Vs Buy.
- In house production Vs Sub contract.
- Same continent Vs Different continent.
- Low cost region Vs High cost region.
- Volume for the best Sourcing solution.
- Optimal Sourcing and Manufacturing Solutions.
- Low Vs High Volume Programs.
- Single source Vs Multisouce.

Program Performance Analysis (PPA) is a tool that can be used to identify strategic suppliers for long-term sourcing. Every organization uses some method to select suppliers for projects and programs, and need a model that covers financial and operational goals. The Program Performance Analysis model is the best answer to such model. The goals can vary, the template can be modified to adjust the goals of an organization. Ultimate aim is to compare available proposals from the suppliers or regions to select the best supplier for final negotiation. This model accommodates the basic goals of finance and operations that are generally used in automobile Tier1 and Tier2 industries. Operation model of every industry changes so the model needs adjustment accordingly. However a similar model is an essential tool that gives direction as well as solutions for longterm global sourcing organization. New research needs to be done to create organization specific or industry specific global sourcing strategy. Program Performance Analysis (PPA) model has the capability to use historic economic data to project future program performance analysis. It can be used to calculate compare various long term global manufacturing and sourcing scenarios. The inputs of the program performance analysis model can be updated on a regular basis from globally recognized data sources and all historic data is archived for reference.

## References


Allon, G., & Van Mieghem, J. A. (2010). The Mexico-China Sourcing Game: Teaching Global Dual Sourcing. *INFORMS*, *10*(3), 105–112. https://doi.org/10.1287/ited.1100.0045

Anderson, S. W., Dekker, H. C., & Anderson, Shannon W; Dekker, H. C. (2009). Strategic cost management in supply chains. In *Accounting Horizons* (Vol. 23, Issue 2). https://doi.org/10.2308/acch.2009.23.2.201

Babu John Mariadoss. (2015). *Core Principles of International Marketing*. University of Minnesota. https://opentext.wsu.edu/mktg360/front-matter/acknowledgements/

Biazzin, C. (2019). The role of strategic sourcing in global supply chain competitiveness. *Managing Operations Throughout Global Supply Chains, January*, 159–180. https://doi.org/10.4018/978-1-5225-8157-4.ch008

Blocher, E., Stout, D., Juras, P., & Smith, S. (2019). Cost Management: A Strategic Emphasis. In *Mc Graw Hill Education*.

Cardinali, A. (2014). Should Cost Reviews and Supply Chain Integration: A case study at ASSA ABLOY Entrance Systems. In *Lund University*. Lund University.

Carter, A. B., & Mueller, J. (2011). Should Cost Management: Why? How? In *Defense Acquisition University,Defense AT&L*. Defense AT&L.

Chakrabarty, S. (2006). Making sense of the sourcing and shoring maze: Various outsourcing and offshoring alternatives. In *Outsourcing and Offshoring in the 21st Century: A Socio-Economic Perspective* (Vol. 1). https://doi.org/10.4018/978-1-59140-875-8.ch002

Feller, B., Rosenfield, D., Simchi-Levi, D., & Supervisor, T. (1995). Development of a Total Landed Cost and Risk Analysis Model for Global Strategic Sourcing. In *Massachusetts Institute of Technology*. Massachusetts Institute of Technology.

Ghodsypour, S. H., & O'Brien, C. (2001). The total cost of logistics in supplier selection, under conditions of multiple sourcing, multiple criteria and capacity constraint. *International Journal of Production Economics*, *73*(1), 15–27. https://doi.org/10.1016/S0925-5273(01)00093-7

González-Ramírez, R. G., Villalobos, J. R., & Meneses, C. (2020). The strategic design of port services based on a total landed cost approach. *The International Journal of Logistics Management*, *32*(1), 96–120. https://doi.org/10.1108/IJLM-01-2020-0026

Holweg, M., Reichhart, A., & Hong, E. (2011). On risk and cost in global sourcing. *International Journal of Production Economics*, *131*(1), 333–341. https://doi.org/10.1016/J.IJPE.2010.04.003

Hugos, M. (2018). Essentials of Supply Chain Management. In *OPSEARCH* (Vol. 38, Issue 2). https://doi.org/10.1007/bf03399229

Husband, D. M. (2014). Applications of Should Cost to Achieve Cost Reductions. *Defense ARJ*.

Jearasatit, A. (2010). Using a Total Landed Cost Model to Foster Global Logistics Strategy in the Electronics Industry. *Using a Total Landed Cost Model to Foster Global Logistics Strategy in the Electronics Industry*.

Jia, F., Orzes, G., Sartor, M., & Nassimbeni, G. (2017). Global sourcing strategy and structure: Towards a conceptual framework. *International Journal of Operations and Production Management*, *37*(7), 1–49. https://doi.org/10.1108/IJOPM-09-2015-0549

Kaplan, R. S., & Anderson, S. R. (2004). Time-driven activity-based costing. *Harvard Business Review*, *82*(11). https://doi.org/10.5117/mab.82.12839

Machado, A., Mendes, C., Mira Da Silva, M., & Almeida, J. (2015). Costing as a Service. *ICEIS 2015 - 17th International Conference on Enterprise Information Systems*. https://doi.org/10.5220/0005373401730181

Mandolini, M., Favi, C., & Germani, M. (2018). Should costing: A holistic approach from the product

design to procurement. *Advances in Transdisciplinary Engineering*, *7*, 619–630. https://doi.org/10.3233/978-1-61499-898-3-619

Marco Melacini, I., & Bonanni, S. (2010). A MODEL OF TOTAL LANDED COST FOR GLOBAL SUPPLY CHAIN MANAGEMENT. In *POLITECNICO DI MILANO*. Italy.

Mason A. Carpenter, & Sanjyot P. Dunung. (2012). Challenges and Opportunities in International Business. In *Atma Global Inc*. Creative Commons.

Medina, M., Truong, S., & Ghosh, D. (2013). Total Landed Should Cost for Specialty Chemicals in Oil & Gas Industry. In *misi.edu.my* (Issue 1).

Monczka, R. M., & Trecha, S. J. (1988). Cost-Based Supplier Performance Evaluation. *Journal of Purchasing and Materials Management*, *24*(1), 2–7. https://doi.org/10.1111/J.1745-493X.1988.TB00198.X

Morita, M., Rosenfield, D., Whitri~y, D. E., Supervisor, T., & Berechman, D. (2007). Total Cost Model for Making Sourcing Decisions. In *Massachusetts Institute of Technology*. Massachusetts Institute of Technology.

Parivs F. Rad. (2002). Project Estimating and Cost Management. In *Management Concepts*. Management Concepts.

Pettersson, A. I., & Segerstedt, A. (2013). Measuring supply chain cost. *International Journal of Production Economics*, *143*(2), 357–363. https://doi.org/10.1016/j.ijpe.2012.03.012

Pumpe, A., & Vallee, F. (2015). Total Landed Cost for international sourcing decisions. *2015 International Conference on Logistics, Informatics and Service Sciences (LISS)*, 1–6. https://doi.org/10.1109/LISS.2015.7369613

Pumpe, A., & Vallée, F. (2017). A typology for selecting an appropriate Total Landed Cost method in international supplier selection decisions. *Transportation Research Procedia*, *25*, 853–869. https://doi.org/10.1016/J.TRPRO.2017.05.462

Robert B.Handfield, & Kevin M McCormack. (2007). Supply Chain Risk Management: Minimizing Disruptions in Global Sourcing. In *CRC press*.

Saha, S. (2011). 'Should Cost' in a global environment. *AIAA Centennial of Naval Aviation Forum '100 Years of Achievement and Progress'*. https://doi.org/10.2514/6.2011-7031

Varadarajan, K. (2013). should-cost analysis a key tool for sourcing and product designers. In *QuEST Global*.

Young, R. R., Swan, P. F., Thomchick, E. A., & Ruamsook, K. (2009). Extending landed cost models to improve offshore sourcing decisions. *International Journal of Physical Distribution and Logistics Management*, *39*(4), 320–335. https://doi.org/10.1108/09600030910962267