



RESHORING



Elite Electronic Systems – September 2013

PART 3 - TOTAL COST OF OWNERSHIP



Your Partner For **Electronic Manufacturing**

INTRODUCING TOTAL COSTS



60% of manufacturers:

- **Apply “rudimentary” total cost models**
- **Ignore 20% -30% of the total cost of offshored products**

Archstone Consultancy Survey 16/7/11





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DIRECT vs INDIRECT COSTS



Direct costs we are familiar with:

- **A price that can be completely attributed to the production of specific goods i.e. materials, labour and expenses related to the production of a product.**



Indirect cost can change the decision making landscape dramatically:

- **Other costs such as depreciation, risk, administrative time and expenses are more difficult to assign to a specific product and are considered indirect costs.**



Any “Total Cost Of Ownership Model” includes a range of direct and indirect costs which have an impact on the “Total Cost Of Ownership”



Compare this to “cost of manufacture” which tends to focus on the direct cost rather than including all of the indirect costs



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WHY TOTAL COST OF OWNERSHIP



Outsourcing was seen as a real opportunity to offer huge savings in cost of manufacture

- **Manufacturing in Asia offered huge cost savings allowing manufacturers to be competitive in the market.**
- **OEM's considered only the cost of manufacture when outsourcing.**



In recent times an examination of "Total Cost of Ownership" has become a more accepted method for deciding on a source for manufacturing.



TCO "is an estimate of the direct and indirect costs and benefits related to the purchase of any part, sub assembly, assembly or product"



TCO is the full cost to design, build, store, package, ship, sell and maintain a product.

THE TCO ESTIMATOR



Economist Harry Moser has developed an estimator to help companies make this decision



Moser created a formula for estimating TCO



Some of the costs Harry identified

- Duty rate- import and export
- Shipment – weight and shipments per year
- Product life – the longer this is, the higher the cost of maintaining and storing product
- Packaging – % of price
- Lag from shipment until actual payment - shipment time
- Annual costs in carriage and warehousing
- % of shipment that could be delivered directly to floor with JIT



He then amalgamated these into one formula to create an estimate for TCO.

This put a figure on TCO allowing us to understand it properly



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WHY TCO ESTIMATOR



Provides a single TCO for each source



Flexible: values are 100% user selected.



Broad:

- **29 cost factors.**
- **Via pull down menus you automatically insert:**
- **Freight rates for 17 countries**
- **Duty rates for parts or tools, e.g. molds**
- **Current value and 5 year forecast of TCO.**



Easy to use:

- **Explanations and references to help select values.**



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TOTAL COST OF OWNERSHIP

SAMPLE TOTAL COST OF OWNERSHIP (TCO) ESTIMATOR (IN U.S. DOLLARS)

Cost factor	U.S.	Offshore	Calculation formula
CoGS (Cost of goods sold)			
FoB price (freight on board)	\$100.00	\$70.00	
Packaging	\$1.00	\$1.40	unit price x packaging cost %
Duty	\$0.00	\$2.80	duty % x price
Fees: percentage Of price	\$0.00	\$0.50	fee % x price
Fee: flat	\$0.00	\$0.10	Fee
Routine surface freight. excluding local	\$0.00	\$0.29	% routinely planned for surface freight x (unit weight + packaging weight) x surface freight rate
Routine airfreight, excluding local	\$0 .00	\$0 .00	(1 - % routinely planned for surface freight) x (unit weight + packaging weight) x air freight rate
Freight Insurance at 0.55 on Imported product	\$0.00	\$0.35	
Total CoGS	\$101.00	\$75.44	



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TOTAL COST OF OWNERSHIP

SAMPLE TOTAL COST OF OWNERSHIP (TCO) ESTIMATOR (IN U.S. DOLLARS)

Cost factor	U.S.	Offshore	Calculation formula
Other Hard Costs			
Carrying cost for in-transit offshored product if payed before Shipment	\$0.00	\$0.47	Shipment time in years x Interest rate x price
Carrying cost for inventory on-site	\$0.82	\$2.57	
Prototype cost	\$0.03	\$0.12	prototype cost / annual units / product life
End-of-life Inventory	\$2.41	\$5.83	1/12 x unit price x (delivery time + average inventory) x annual quantity / annual quantity / product life
Travel startup	\$0.02	\$0.17	Startup cost / annual units / vendor life
Travel: audit/maintain	\$0.08	\$1.57	annual number of trips x (per trip cost of travel time + expense) / annual units
Pick/place into local Inventory	\$0.00	\$2.00	(1- % of inventory delivered JIT) x U.S. unit price x pick and place cost as % of U.S. unit price
Purchasing cost excluding travel	\$2.00	\$3.00	us unit price x purchase cost %
Total Other Hard Costs	\$5.37	\$15.72	
Cumulative Total	\$106.37	\$91.16	



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TOTAL COST OF OWNERSHIP

SAMPLE TOTAL COST OF OWNERSHIP (TCO) ESTIMATOR (IN U.S. DOLLARS)

Cost factor	U.S.	Offshore	Calculation formula
Risk			
Emergency airfreight	\$0.00	\$0.37	% airfreight x (unit weight + unit package weight) x airfreight rate
Rework quality	\$1.00	\$2.10	unit price x quality cost %
Product liability nonrecovery risk	\$0.10	\$0.42	unit price x liability cost %
Intellectual property (IP) risk	\$0.10	\$1.40	unit price x IP risk cost %
Opportunity cost: lost orders, Slow response, lost customers	\$0.50	\$1.05	unit price x opportunity risk cost %
Economic stability of the supplier	\$0.10	\$0.35	unit price x supplier economic instability risk
Political Stability of the country	\$0.10	\$0.35	unit price x country political instability risk
Total risk	\$1.90	\$6.04	
Cumulative Total	\$108.27	\$97.20	



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TOTAL COST OF OWNERSHIP

SAMPLE TOTAL COST OF OWNERSHIP (TCO) ESTIMATOR (IN U.S. DOLLARS)

Cost factor	U.S.	Offshore	Calculation formula
Strategic			
Impact on Innovation Of distance from manufacturing to research and development (R&D)	\$0.00	\$0.35	unit price x innovation risk cost %
Impact on product differentiation / mass customization	\$0.00	\$0.35	unit price x commoditization risk cost %
Total Strategic	\$0.00	\$0.70	
Cumulative Total	\$108.27	\$97.20	
Green			
Production			
Shipping			
Local warehouse			
Travel			
Disposal of obsolete inventory			
Total Green	\$0.00	\$0.00	
GRAND TOTAL	\$108.27	\$97.50	
Five-Year Forecast			
Annual impact of wage inflation and currency appreciation on \$ price of product	0.60%	4.50%	0.3 x (wage inflation % + currency appreciation%)

(SOURCE: THE RESHORING INITIATIVE (www.reshorenw.org))



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LABOUR COSTS



China and many parts of Asia have long been seen as a haven for cheap labour.



This has changed, Labour is certainly cheaper in some parts of Asia but in 2013 the gap in average wage between the UK and China has narrowed considerably



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LABOUR COSTS



The US Bureau of Labour Stats indicate that since 2006 regions in China have witnessed an average yearly increase in wages of 20% per annum



The US Bureau also illustrated that compensation/labour costs in the UK are now lower than the likes of the USA and Japan and our neighbours in Ireland



They illustrate that between 2009 and 2012 the UK showed a small percentage decrease in labour costs



A gradual erosion of labour cost competitiveness is well underway





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CHANGING LABOUR COSTS



We expect net labour costs for manufacturing in China and the U.S. to converge by around 2015”



“take a hard look at the total costs”

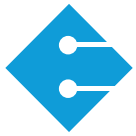
Source: Boston Consulting Group
press releases 5/11/2012 & 4/12/2012





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SHIPPING COSTS / WAREHOUSING COSTS



6-8 Week delivery times
• Larger purchases required



Hugely significant rises in fuel costs and an extra requirement for further packaging are examples of hidden costs on shipping



Decrease in flexibility





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SHIPPING COSTS / WAREHOUSING COSTS



Any short term delivery requirements will cost significantly extra

- **38KG Package**
- **1m by 1.5m by 1m**
 - **From NI to UK – 48 Hour Delivery - £29.00**
 - **From China to UK (Fed Express) - £3161 by Air**



With hardened terms elongated shipping times can mean as much as an 6-8 month lag between paying for products and actually getting paid for the product you sell

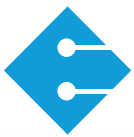
- **Up front payment**
- **6-10 weeks in transit**
- **Warehousing/despatch**
- **Customers on 30/60 days**





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HIDDEN OVERHEADS



Expensive overseas trips



Expensive use of engineering time

- Travelling
- Overtime



Cost of making changes



Cost of reworking were changes are identified after product has been shipped (in 8-10 weeks shipping a lot can happen)





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CONCLUSION



Outsourcing was based on huge costs savings predominantly driven by significantly lower 'labour Costs'



Global trends mean that these lower labour costs are not so significant



Increase to other cost mean a much smaller differential in price for manufacture and price of ownership, Mousers TCO Estimators illustrates that.



In the next ebook we consider why given the minimal differences in costs companies no longer require such elongated supply chains

We consider:

- **Impact of natural disasters**
- **Time factors**