

# Identifying Optimal Point Of Operation Utilizing Cost Curves As Part Of The Automation Evaluation Process



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Jeff Hedges, President  
OPEX Material Handling

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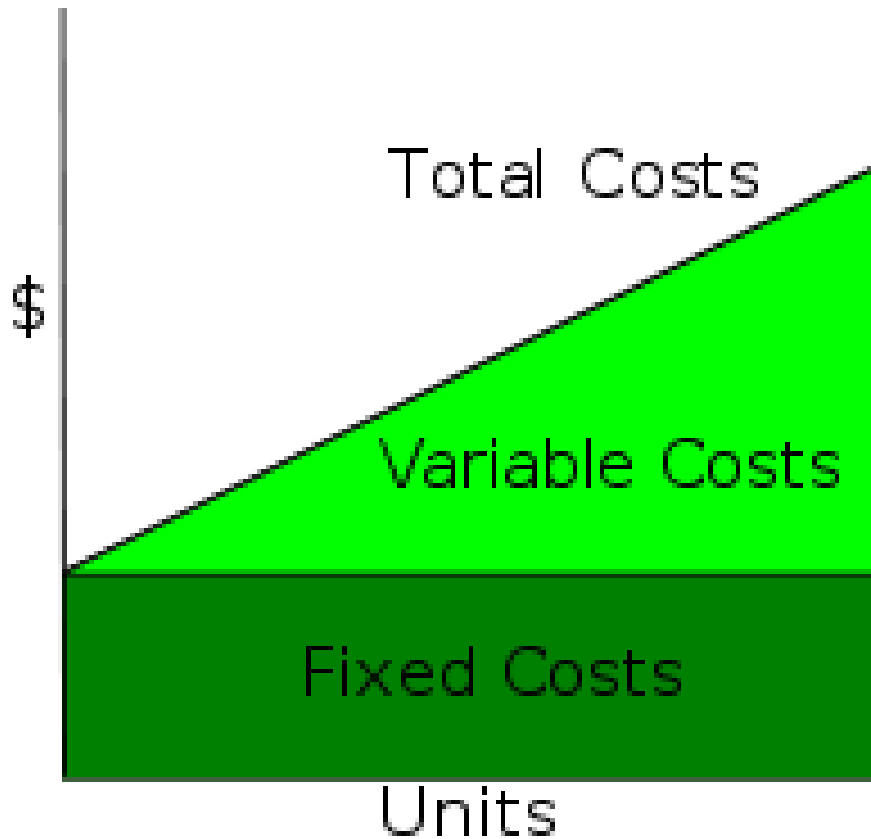


# Agenda

- Tracking fixed and variable costs
- Inside/outside influences
- Warehouse automation
- Traditional ROI approach
- Cost curves explained



# Fixed and Variable Costs



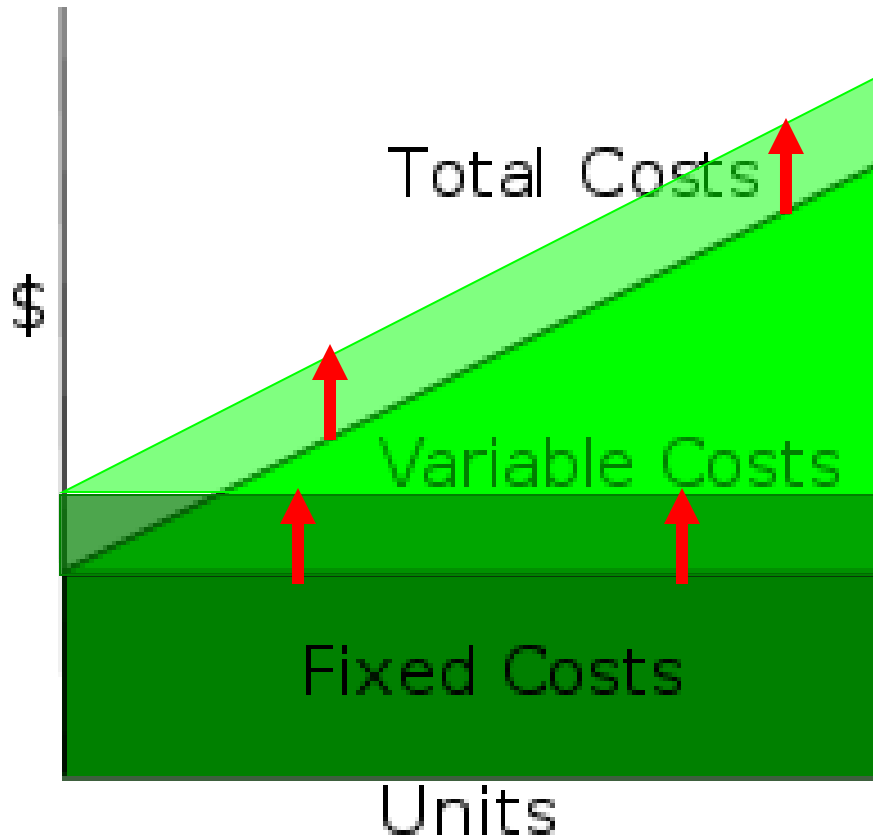
## Variable

- Raw Material
- Energy
- Hourly wages

## Fixed

- Facilities
- Equipment
- PM
- Rental/lease

# Today's Dilemma



## Transportation & Shipping

- Energy rates
- Raw materials
- Labor rates

## Taxes

- Employee benefits
- Government legislation

# Tackling Variable Costs



- Transportation
  - Locating distribution centers closer to market
    - Adds to fixed costs
  - Consolidating shipments
    - Affects timeliness of delivery, especially if you deliver to multiple clients
  - Alternative shipping methods?
    - rail, air, sea – too costly
- Energy
  - Investing in solar, wind, thermal
    - Hard to justify without federal subsidy or willingness to accept long term ROI
    - Value of carbon credits/certificates have declined by over 300%

# Tackling Variable Costs

- Raw Materials
  - Raw material manufacturers are subject to the same fixed and variable costs that you are facing and are forced to pass added costs of doing business on to you
- Labor
  - Finding qualified labor
  - Retaining labor
  - Training of new employees



# Fighting Fixed Costs

- Taxes
  - Water reclamation fees
- Employee benefits
  - Healthcare
  - Workman's Comp
- Legislation
  - FSMA
  - CTPAT
  - Taxation on Internet sales



# Material Handling Supply Chain

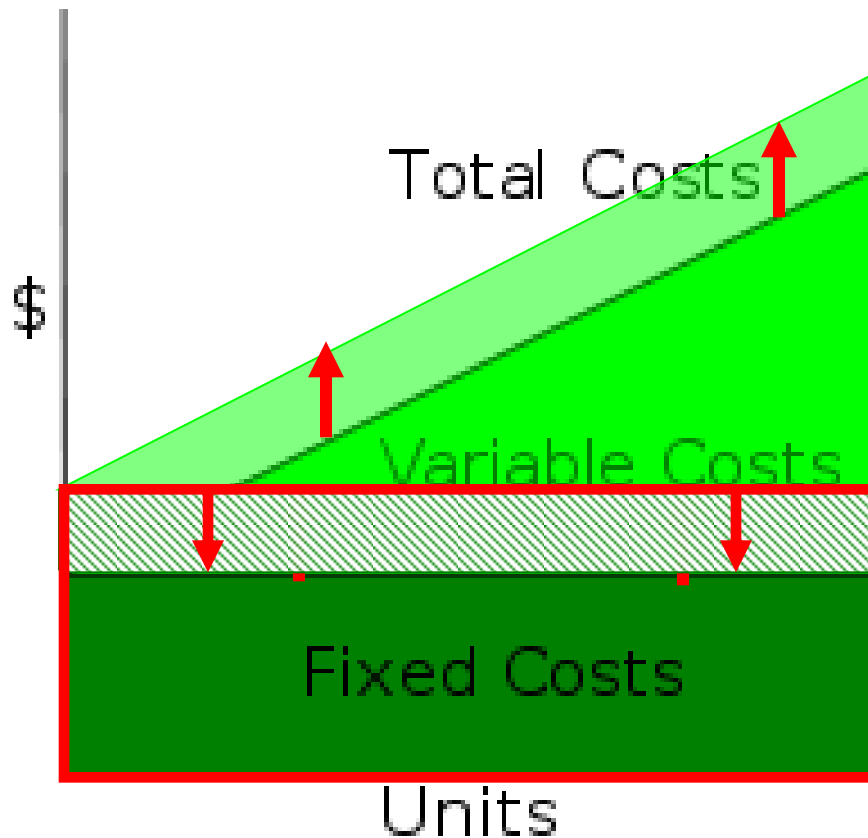


- Companies are looking to their warehouse as an avenue to counter uncontrollable rising variable costs
- Supply Chain Executives
- Traditionally seen as a necessary cost of running a business – no longer
- More focus on improvement methods – i.e. lean manufacturing, Six Sigma, etc.
  - Addresses only your process
  - Tend to be fads
  - Over 70% are deemed failures
- Technology is becoming a key ingredient



# Why Automation?

To Decrease Fixed Costs



# Problem with Traditional ROI Approach

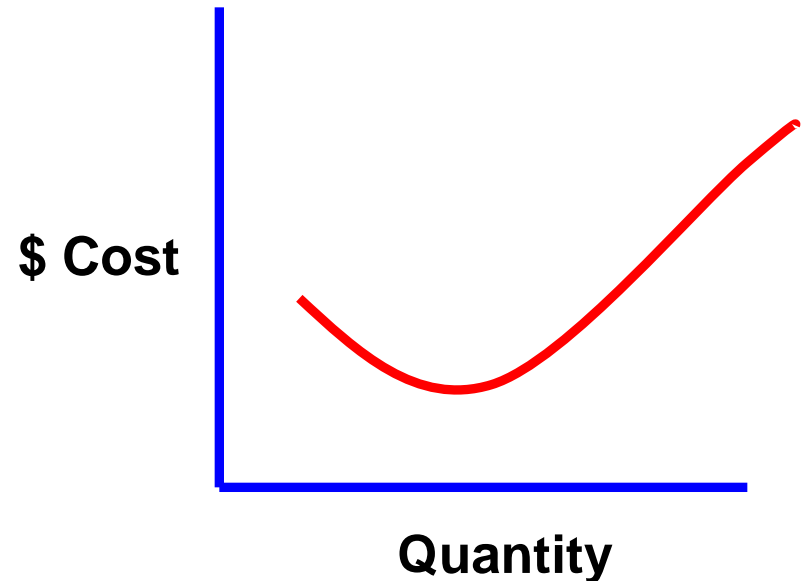
## Return On Investment

- Based on fixed period payback
- Assumes you are at a gain once the ROI target is met
- Even fixed costs change annually
- Does not take into account the depreciating value of \$\$ in future years (IRR)



# Cost Curves

- a **cost curve** is a graph of the costs of production as a function of total quantity produced

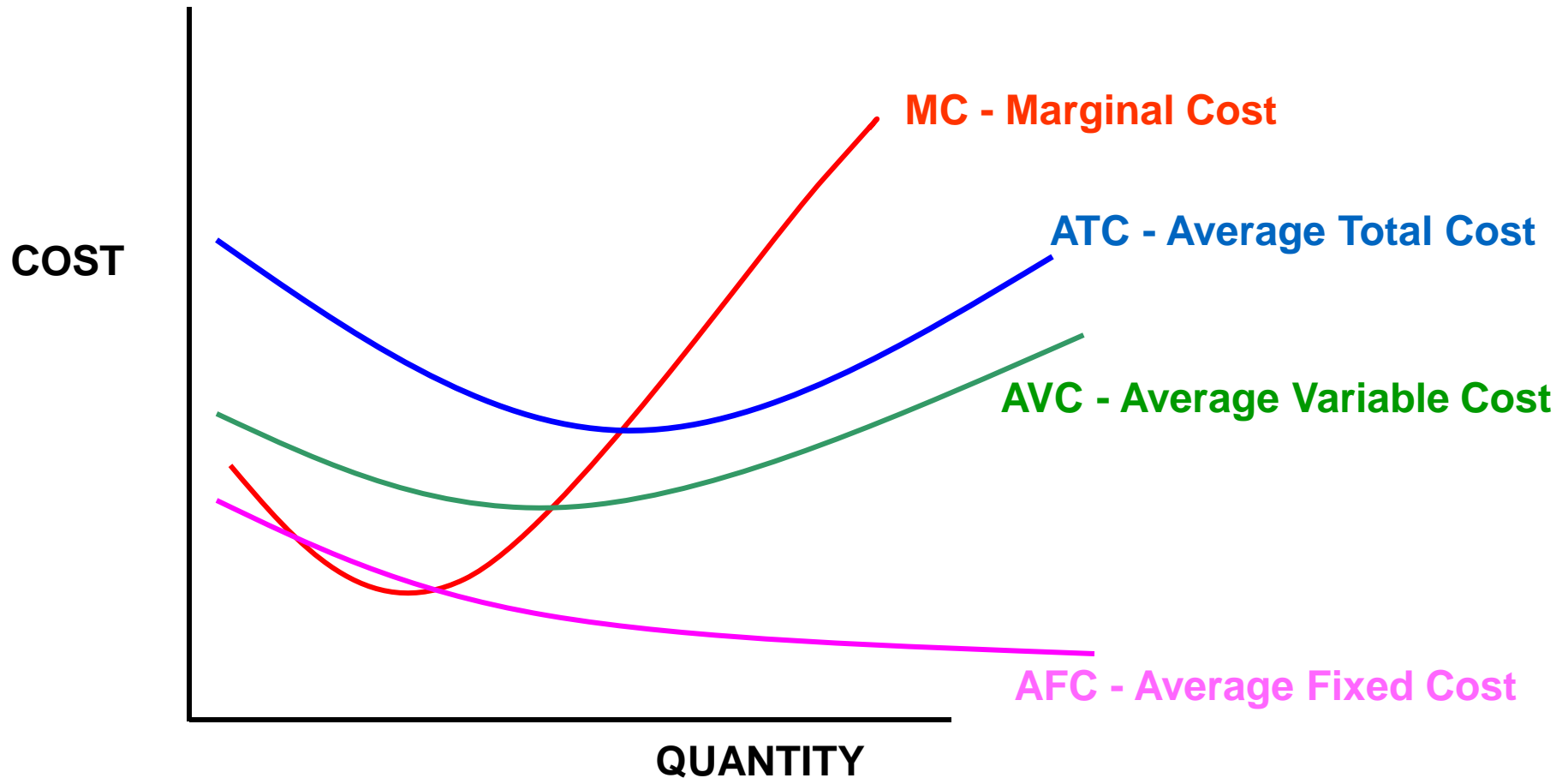


# Cost Curves

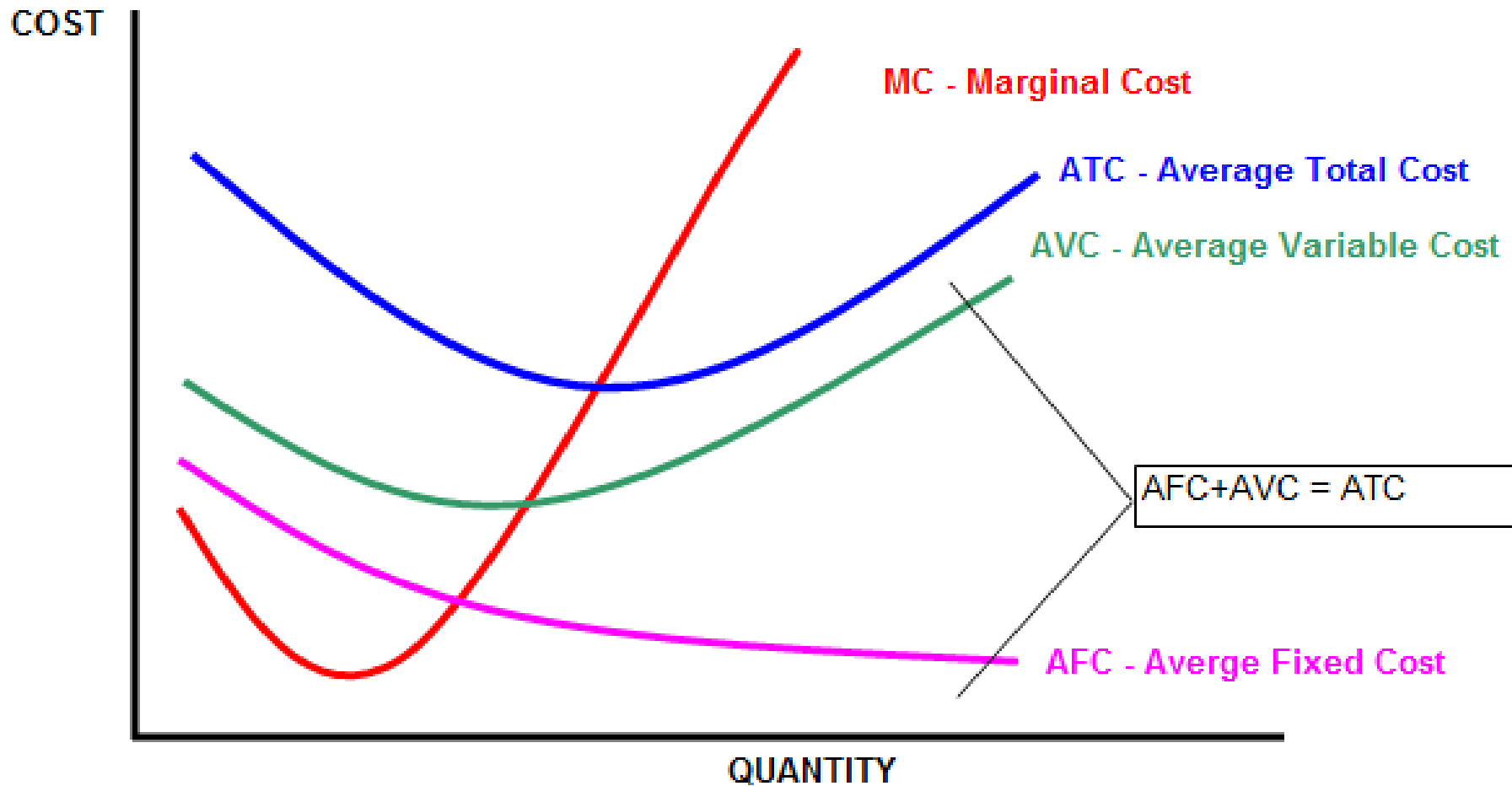
- Enables dynamic analysis of actual costs
- Qualifies/disqualifies maximum production levels
- Allows you to find the optimal point of production (minimizing cost)
- Difficult to understand
  - Marginal costs
  - Average costs
  - Fixed costs
  - Total costs



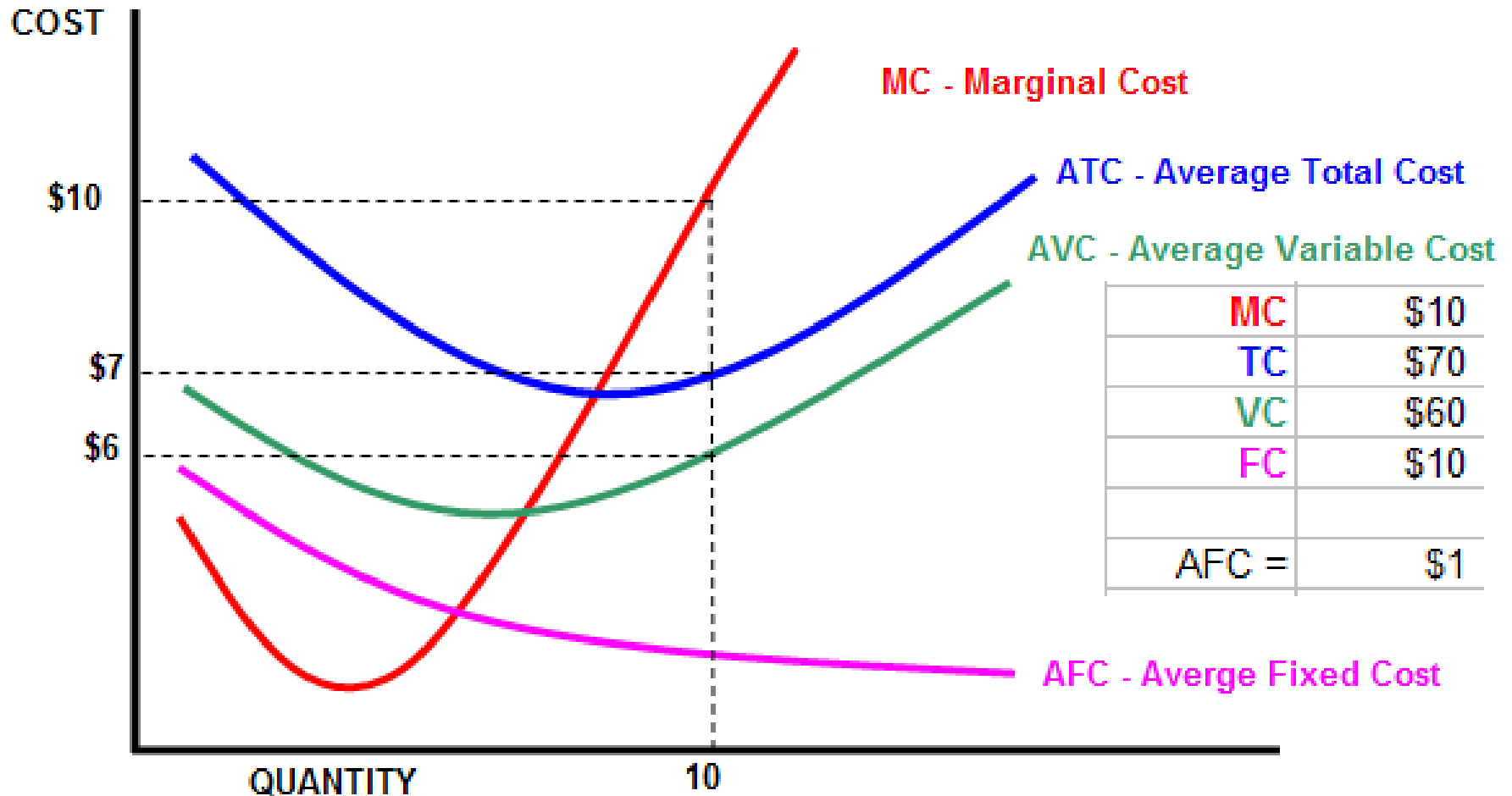
# Basic Cost Curve Model



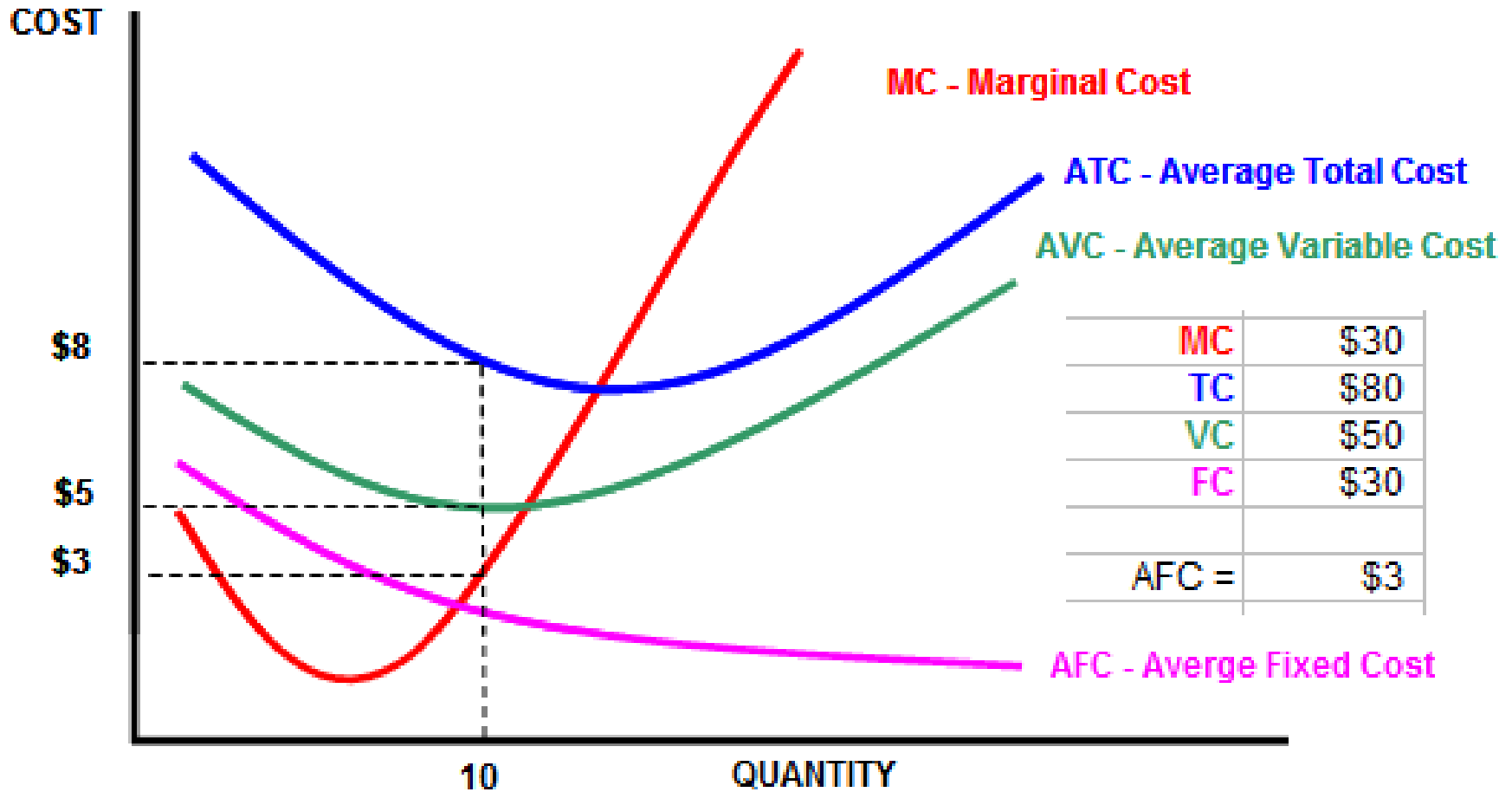
# Basic Cost Curve Model



# Using Costs Curves



# Using Costs Curves



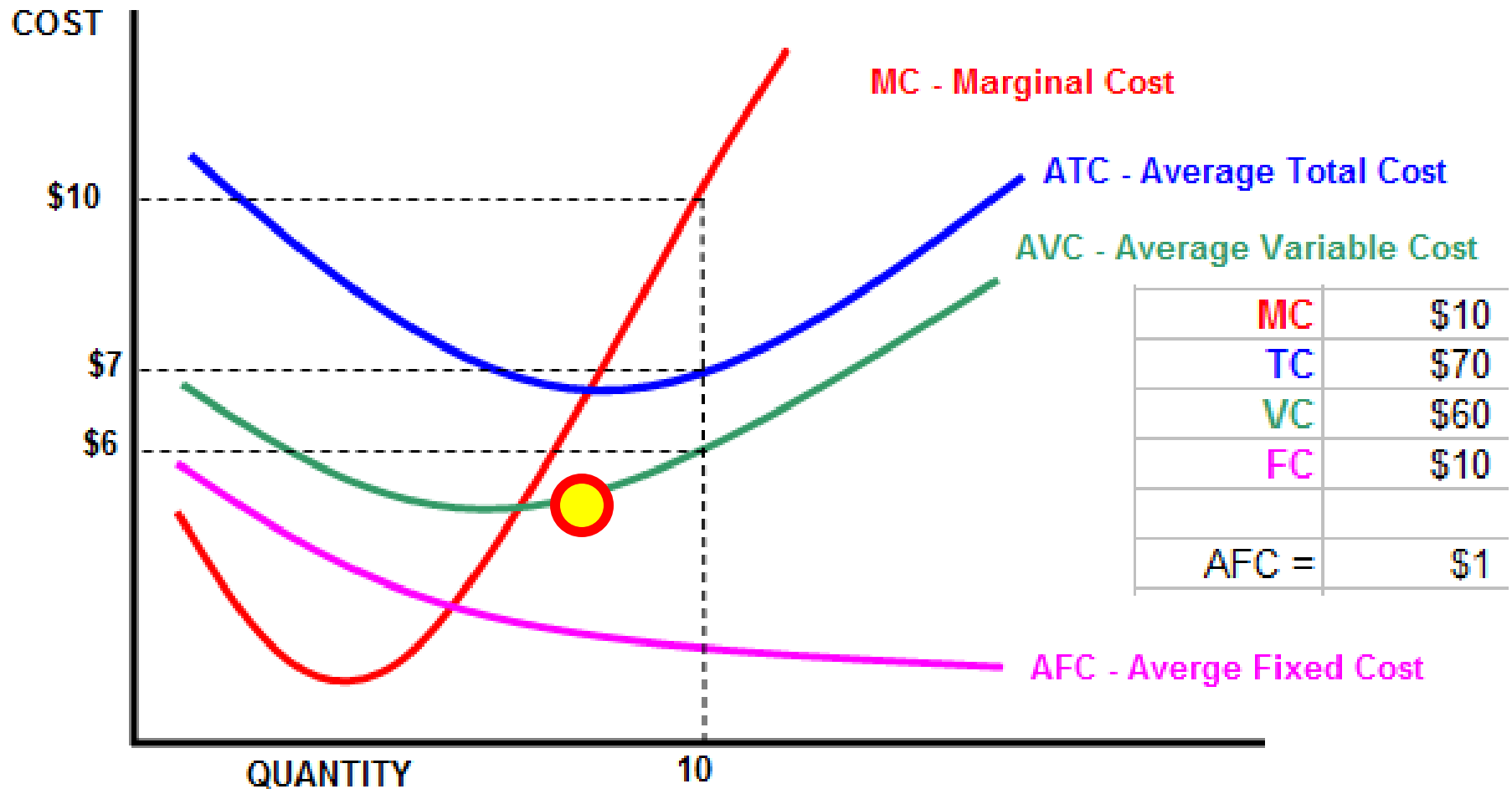


# Simply

- Evaluate on a cost per unit savings, not an annual payback on investment
- Efficiency, cost to produce, is evaluated as needed
- As costs change, then model changes

	Start	>FC
MC	\$30	\$15
TC	\$80	\$65
VC	\$50	\$50
FC	\$30	\$15
AFC =	\$3	\$1.50

# Using Costs Curves



***For More Information:***

**jhedges@opex.com**

**www.opex.com**

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