**Reference Guide**

**Sample Only**

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**Revision 3.0**

**Dynamo**

# ISMT E-130 – Spreadsheet Models for Managers

**COURSE PROJECT**

## “Dynamo”Reference guide

1. How the calculation works

**Input Streams**

The first input stream is thenumber ofstores opened per quarter. In the second input stream is thenumber of warehousesopened per quarter. In the third input stream the percentage increase or decrease in all costs. This input stream can be used to simulate rising costs in an inflationary environment. The input streams appear on the “IP” worksheet.

**Cumulative Input Streams**

The first cumulative input stream is thenumber ofstores opened per quarter. The second cumulative input stream is thenumber of warehousesopened per quarter. The third cumulative input stream is the percentage increase or decrease in all costs. These streams will show the number of stores, warehouses, or change in costs total up until that point in time. The cumulative input streams appear on the “IP” worksheet.

**Intermediate Calculations**

TotalAveSalesPQ is the Sum of the average sales per quarter for retail.

DistPrice – Distribution Price is Sales Price \* 50% then increased by 20% for each magazine and newspaper.

AveDistPQ is the Average Distribution per Quarter is AveSalesPQ \* 60% TotalDistAveSalesPQ is the Sum of the average sales per quarter for distribution.

RetailNonSalExpPQ equals (store rent + store utilities + store insurance + contract services + advertising)

DistNonSalExpPQ equals (warehouse rent + warehouse utilities + warehouse insurance + accounting services + truck cost)

Manager Hours per Week equals Managers hours per week \* warehouse open hours per week.

**Parameters**

AveSalesPQ – Average sales per quarter of each magazine and newspaper.

Parameters for the model, located on the “IP” worksheet, include;

SalesPrice is the Sales Price per Type of Magazine and newspaper

SalesPercentage – Cost of Goods Sold for warehouse good prices.

DistPercentage – Distribution Percentage is the markup for the distribution side.

DistSalesPercentage – Distribution Sales Percentage is the percentage of numbers of type of publication that were distributed to each location.

RetailStoreClerk is the Retail Store Clerk’s wage in dollars per hour

WareHouseManager is the Warehouse Manager’s wage in dollars per hour

TruckDriver is the Truck Driver’s wage in dollars per hour.

ClerkPerStore – Indicates how many Retail Clerks are on duty during open hours.

StoreOpenHoursPerWeek is the Total open hours per week for the retail store.

OpenWeeksPQ is the Total open weeks per quarter for the retail store.

MgrHoursPQ is the Number of estimated hours per week for the warehouse manager times the number of weeks in the quarter.

MgrHoursPerWeek is the estimated number of hours per week for the warehouse manager.

WareHouseOpenWeeksPQ is the Number of weeks in the quarter the warehouse will be open.

StoreRentPQ is the Rent for the retail operation per quarter.

StoreUtilitiesPQ is the Utility bill for retail operation per quarter.

RetailInsPQ is the Insurance bill for retail operation per quarter.

ContractServPQ is the Outsource accounting bill for retail operation for one quarter.

RetailAdPQ is the Retail advertising per quarter.

WarehouseRentPQ is the Rent for the warehouse operation per quarter.

UtilitiesPQ is the Utility bill for warehouse operation per quarter.

InsurancePQ is the Insurance bill for warehouse operation per quarter.

OutsourceServPQ is the Outsource accounting bill for one warehouse operation for one quarter.

TruckCostsPQ are Trucking costs for one warehouse operation per quarter.

Tax Rate is the tax rate for all operations.

AveUnsold is the unsold inventory rate for all operations.

**Revenue**

The “Rev” worksheet calculates total retail and total warehouse revenue per quarter. The calculation is based on a sales estimate for one store (Rev1Store) and one distribution center (Rev1Dist) and multiplying by the input streams cumulative new stores and cumulative warehouses respectively. Details are following;

Rev1Store is Total revenue for one store = Sum of (SalesPrice\*AveSalesPQ) for all items in the retail operation.

ItemRev is SalesPrice\*AveSalesPQ for all items

GrossRevPQ is Cum New Stores \* The average revenue of 1 store.

UnsoldPQ is GrossRevPQ\*AveUnsold

NetRetRev is GrossRevPQ-UnsoldPQ

DistItemRev is Average Sales per QTR \* Price Per Item

Rev1Dist is Total revenue for one distribution center = Sum of (AveDistPQ\*IP!DistPrice) for all items in the retail operation.

GrossDistRevPQis the CumDistribution\*Rev1Dist

TotalRevPQ-NetRetRev+GrossDistRevPQ

**Hire Stream**

The “HireStream” worksheet shows total staff costs for Clerks, Managers, and Truckdrivers per quarter by multiplying the Cumulative New Stores by the cost of each position. These are each multiplied by the Cumulative Increase in Costs, and then totaled to give Total Staff Costs (Total Staff Costs PQ).

TruckDriverHoursPerWeek uses the following formula -

If CumDistribution < 25 use 50.

If Cumdistribution < 50 use 80.

If Cumdistribution < 75 use 120.

If greater than 75 use 150.

TruckDriverHoursPerQtr is the Truck Driver Hours Per Week \* Weeks Per Quarter

CumClerk (IP!CumNewStores\*HireStream!ClerkCost1StorePQ)\*(1+IP!CumIncrCosts)

CumMgr is theMgrCostPQ\*(1+IP!CumIncrCosts)

CumTruckDriver-(TruckDriverHoursPQ\*TrkDriverPerHour)\*(1+IP!CumIncrCosts)

TotalStaffCostsPerQtr-SUM(CumClerk,CumMgr,CumTruckDriver)

**Inventory Analysis**

The “InvAlys” worksheet shows total retail and distribution inventory costs per quarter by calculating Gross Revenue Per Quarter multiplied by the Sales Percentage.

This is then multiplied by the Cumulative Increase in Costs. Formulas for calculations are below.

RetailCOGS is (Gross Rev PQ \* Sales Percentage) \* (1 + CumIncrease Costs)

DistributionCOGS is(Gross Dist Rev Per Qtr/ 1 + DistPercentage)\*(1+CumIncrCosts)

RetDistCOGS is (RetailCOGS+DistributionCOGS)

**Expenses**

The “Exp” worksheet shows total expenses for retail and distribution operations per quarter by adding all expenses for both retail and distribution in the TotalRetailExp and TotalDistExp rows. As shown below, the Cumulative New Stores and Cumulative Distribution Centers are multiplied by the expenses per quarter for each store and warehouse to give Total Retail Expenses and Total Distribution Expenses.

These include Non-Salary expenses (Rent and Insurance, for example), staff expenses, and inventory expenses.

CumRetailNonSalExpPQ is (Cum New Stores \* Retail Non Sales Exp PQ)\*(1+ CumIncrCosts)

CumRetailStaffPQ is Hire Streams of Cum Clerk

CumInventoryPQ1 is InvAlys!RetailCOGS"

TotalRetailExp is SUM(CumRetailNonSalExpPQ, CumRetailStaffPQ, CumInventoryPQ1)

CumDistributionNonSalExpPQ is (CumDistribution \* Dist Non Sales Exp PQ) \* (1 + CumIncr Costs)

CumWhseMgrPQ is Cumulative Cost of Warehouse Managers

CumTruckDriverPQ is Cumulative cost of Truck Driver totals

CumInventoryPQ2 is Cumulative DistributionCOGS totals

TotalDistExp is SUM(Cumulative Distribution Non Salary Expenses PQ + Cumulative Cost of Warehouse Managers + Cumulative cost of Truck Drivers + Cumulative Distribution COGS)

**Income Statement**

The “IncomeStatement” worksheet shows Gross Profits, Total Operating Expenses, Operating Profit and Net Income per quarter by using the following; The Income Statement uses the following calculations to project Net Income Per Quarter; Adding The Total Revenue (Total Revenue Per Quarter) from the Revenue Tab minus the Cost of Goods Sold (RetDistCOGS) from the InvAlys Tab to equal Gross Profit. The Total Operating Expenses section sums the Retail and Distribution Operating Expenses from the “Exp” tab. The Operating Profit equals Gross Profit minus Total Operating Expenses. Taxes are calculated by multiplying Operating Profit by the tax rate located on the IP tab. Finally, Net Income Per Quarter is calculated by subtracting the Operating Profit from the Taxes.

Revenue- Total Revenue Per Quarter from the Revenue tab.

CostOfGoodsSoldAll- Sum of the Retail and Distribution Cost of Goods Sold.

GrossProfit- Revenue is the Cost Of Goods Sold All

RetailOperatingExpenses- All Retail Expenses from the Exp tab.

DistributionOperatingExpenses- All Distribution Expenses from the Exp tab.

TotalOperatingExpenses- Sum of Retail Expenses and Distribution Expenses.

OperatingProfit- GrossProfit minus Total Operating Expenses

Taxes- Operating Profit multiplied by the TaxRate on the IP Tab.

NetIncomePQ- Operating Profit minus Taxes.

**Cash Flow Analysis**

The “CashFlowAnalysis” worksheet shows total Cash Flow per quarter by calculating the following; Cash from Income takes the total revenue per quarter from the revenue total. The next item (NonTaxCashExpPaid) adds the Cost of Goods Sold from the Income Statement with the Operating Expenses from the Income Statement. Taxes Expenses Paid per Quarter simply takes the tax total from each quarter from the Income Statement. Finally, the End Balance (EndBal) is the Cash Flow total for each quarter.

BegBal is the last quarter’s ending balance for cash flow. Cash from Income is Rev!TotalRevPQ (Total Revenue per quarter from Revenue tab) NonTaxCashExpPaid- IncomeStatement!CostOfGoodsSoldAll+IncomeStatement!TotalOperatingExpenses

TaxExpensePaidPQ-IncomeStatement!Taxes

EndBal-(BegBal+CashfromIncome)-(NonTaxCashExpPaid+TaxExpensePaidPQ)

1. **How to locate inputs, outputs and intermediate results**

The Input Streams for the model are present in the “IP” worksheet with a blue title bar and are entered through the following input names:

* NewStoresOpenedPQ in units of numbers
* NewDistributionLocationsPQ in units of numbers
* PercentageIncrAllCosts in units of percentage

All parameters are located in the section called Parameters / Parameter Blocks with a blue title bar. Team Dynamo has organized the parameters into 10 different parameter blocks, beneath the Input Streams on the “IP” tab.

* Retail Revenue per Location in dollars
* Distribution Revenue per Location in dollars
* Labor Costs Per Hour in dollars
* Retail Labor in hours
* Warehouse Labor in hours
* Non Salary Retail Expenses One Location PQ in dollars
* Non Salary Distribution Expenses One Location PQ in dollars
* Taxes in dollars
* Unsold Inventory in dollars

The Output Streams are located on the “CashFlowAnalysis” and “Income Statement” worksheets with a blue title bar and use the following names:

* NetIncomePQ in dollars is on the “Income Statement” worksheet.
* EndBal in dollars is on the “CashFlowAnalysis” worksheet.

Input and output streams use turquoise cells.

1. **How to locate inputs, outputs and intermediate results**

Dynamo’s color coding works as follows; Parameters are yellow, Input Streams are turquoise, and calculations are white. Input streams and the parameters sections all have blue title bars labeling these sections. The individual parameter blocks have light blue shading, located on the “IP” tab. Abbreviations that are used in the model include PQ, for Per Quarter, Cum for Cumulative, Dist for Distribution, Mgr for Manager, Exp for expense and Ave for Average. Examples of these are CumDistribution for Cumulative Distribution, AveSalesPQ for Average Sales per Quarter, DistPrice for Distribution Price, MgrHoursPQ for Manager Hours per Quarter, and AveDistPQ for Average Distribution per Quarter.

1. **How to make changes**

To add an additional input stream, put in the stream name you wish to use below the existing streams. Fill the 12 input stream cells with the stream data. A corresponding cumulative input stream will be required in the cumulative input streams section.

To add a new product, for example, a new magazine or newspaper, add the product name to the Retail Operations per Location section. Then a sales price (SalesPrice) and estimated average sales per quarter (AveSalesPQ) should be assigned to the new product. Perform these steps on the corresponding Distribution Revenue per Location section, adding a title, Distribution Price (DistPrice), and an average distribution per quarter (AveDistPQ).

**Appendix**

**Range Name Range ReferenceScope**

AveDistPQ =IP!$B$29:$F$29 Global

AveFashionMag =IP!$E$22 Global

AveNews =IP!$B$22 Global

AveNewsMag =IP!$D$22 Global

AveSalesFashionMag =IP!$E$22 Global

AveSalesNews =IP!$B$22 Global

AveSalesNewsMag =IP!$D$22 Global

AveSalesPQ =IP!$B$23:$F$23 Global

AveSalesSportsMag =IP!$F$23 Global

AveSalesTabloids =IP!$C$23 Global

AveSportsMag =IP!$F$23 Global

AveTabloids =IP!$C$23 Global

AveUnsold =IP!$B$78 Global

ClerkPerStore =IP!$B$45 Global

ContractServPQ =IP!$B$60 Global

CumDistribution =IP!$B$16:$M$16 Global

CumIncrCosts =IP!$B$17:$M$17 Global

CumNewStores =IP!$B$15:$M$15 Global

DistNonSalExpPQ =IP!$B$72 Global

DistPercentage =IP!$B$34 Global

DistPrice =IP!$B$28:$F$28 Global

DistributionLocationsPQ =IP!$B$10:$M$10 Global

DistSalesPercentage =IP!$B$35 Global

InsurancePQ =IP!$B$68 Global

MgrHoursPQ =IP!$B$52 Global

NewStoresOpenedPQ =IP!$B$9:$M$9 Global

OpenWeeksPQ =IP!$B$47 Global

OutsourceServPQ =IP!$B$69 Global

PercentageIncrAllCosts =IP!$B$11:$M$11 Global

PrintTypes =IP!$D$8:$D$14 Global

RetailAdPQ =IP!$B$61 Global

RetailInsPQ =IP!$B$59 Global

RetailNonSalExpPQ =IP!$B$63 Global

RetailStoreClerk =IP!$B$39 Global

SalesPercentage =IP!$B$33 Global

SPFashionMag =IP!$E$22 Global

SPNews =IP!$B$22 Global

SPNewsMag =IP!$D$22 Global

SPSportsMag =IP!$F$22 Global

SPTabloids =IP!$C$22 Global

StoreOpenHoursPerWeek =IP!$B$47 Global

StoreRentPQ =IP!$B$57 Global

StoreUtilitiesPQ =IP!$B$58 Global

TaxRate =IP!$B$75 Global

TotalAveSalesPQ =IP!$B$25 Global

TruckCostsPQ =IP!$B$70 Global

TruckDriver =IP!$B$41 Global

UtilitiesPQ =IP!$B$67 Global

WareHouseManager =IP!$B$40 Global

WarehouseRentPQ =IP!$B$66 Global

DistItemRev =Rev!$B$7:$F$7

GrossDistRevPQ =Rev!$B$22:$M$22

GrossRevPQ =Rev!$B$10:$M$10

NetRetRev =Rev!$B$12:$M$12

Rev1Dist =Rev!$G$17

Rev1Store =Rev!$G$7

TotalRevPQ =Rev!$B$24:$M$24

UnsoldPQ =Rev!$B$11:$M$11

ClerkCost1StorePQ =HireStream!$B$8

ClerkCostPerHour =HireStream!$B$7

ClerkHoursPQ =HireStream!$B$6

CumClerk =HireStream!$B$19:$M$19

CumMgr =HireStream!$B$20:$M$20

CumTruckDriver =HireStream!$B$21:$M$21

TotalStaffCostsPQ =HireStream!$B$22:$M$22

TrkDriverPerHour =HireStream!$I$7

TruckDriverHoursPerWeek =HireStream!$B$11:$M$11

TruckDriverHoursPQ =HireStream!$B$12:$M$12

WksPQ =HireStream!$I$6

WrhsMgrHoursPQ =HireStream!$F$6

DistributionCOGS =InvAlys!$B$10:$M$10

RetailCOGS =InvAlys!$B$7:$M$7

RetDistCOGS =InvAlys!$B$13:$M$13

CumDistributionNonSalExpPQ=Exp!$B$12:$M$12

CumInventoryPQ1 =Exp!$B$15:$M$15

CumInventoryPQ2 =Exp!$B$6:$M$6

CumRetailNonSalExpPQ =Exp!$B$6:$M$6

CumRetailStaffPQ =Exp!$B$7:$M$7

CumTruckDriverPQ =Exp!$B$14:$M$14

CumWhseMgrPQ =Exp!$B$13:$M$13

GrossProfit =IncomeStatement!B9:M$9

OperatingProfit =IncomeStatement!B17:M17

Revenue =IncomeStatement!$B$7:$M$7

Taxes =IncomeStatement!$B$19:$M$19

TotalOperatingExpenses =IncomeStatement!B15:M15

BegBal =CashFlowAnalysis!$C$6:$N$6

CashfromIncome =CashFlowAnalysis!$C$7:$N$7

NonTaxCashExpPaid =CashFlowAnalysis!$C$8:$N$8

TaxExpensePaidPQ =CashFlowAnalysis!$C9$:$N$9

EndBal =CashFlowAnalysis!$C10$:$N$10