

**Oracle® Retail Analytic Parameter Calculator for  
Regular Price Optimization**

User Guide for the RPAS Classic Client

Release 14.0

December 2013

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- Did you understand the context of the procedures?
- Did you find any errors in the information?
- Does the structure of the information help you with your tasks?
- Do you need different information or graphics? If so, where, and in what format?
- Are the examples correct? Do you need more examples?

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# Preface

This guide describes the Oracle Retail Analytic Parameter Calculator for Regular Price Optimization user interface. It provides step-by-step instructions to complete most tasks that can be performed throughout the user interface.

## Audience

This User Guide is for users and administrators of Oracle Retail Analytic Parameter Calculator for Regular Price Optimization. This includes merchandisers, buyers, business analysts, and administrative personnel.

## Documentation Accessibility

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## Related Documents

For more information, see the following documents in the Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Release 14.0 documentation set:

- *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Implementation Guide*
- *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Installation Guide*
- *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Release Notes*
- *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization User Guide for the RPAS Fusion Client*
- Oracle Retail Application Server documentation

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<https://support.oracle.com>

When contacting Customer Support, please provide the following:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

## Review Patch Documentation

When you install the application for the first time, you install either a base release (for example, 14.0) or a later patch release (for example, 14.0.1). If you are installing the base release, additional patch, and bundled hot fix releases, read the documentation for all releases that have occurred since the base release before you begin installation. Documentation for patch and bundled hot fix releases can contain critical information related to the base release, as well as information about code changes since the base release.

## Oracle Retail Documentation on the Oracle Technology Network

Documentation is packaged with each Oracle Retail product release. Oracle Retail product documentation is also available on the following Web site:

[http://www.oracle.com/technology/documentation/oracle\\_retail.html](http://www.oracle.com/technology/documentation/oracle_retail.html)

(Data Model documents are not available through Oracle Technology Network. These documents are packaged with released code, or you can obtain them through My Oracle Support.)

Documentation should be available on this Web site within a month after a product release.

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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# Introduction

Oracle Retail Analytic Parameter Calculator for Regular Price Optimization (APC-RPO) is an analytic application that enables you to generate price elasticities that are necessary for the Oracle Retail Regular Price Optimization application. Price elasticities include self elasticities, halo cross elasticities, and cannibalization cross elasticities.

This document introduces you to APC-RPO and describes how you can use the application. It also describes the worksheets and measures set up in the application. It includes the following chapters:

- [Chapter 1, "Introduction"](#) – The current chapter introduces you to the APC-RPO application and the related concepts. It also highlights how you can use the application taskflow.
- [Chapter 2, "Administration Workbook"](#) – This chapter describes the worksheets and measures included in the Administration workbook.
- [Chapter 3, "Maintenance Workbook"](#) – This chapter describes the worksheets and measures included in the Maintenance workbook.
- [Chapter 4, "Analysis and Approval Workbook"](#) – This chapter describes the worksheets and measures included in the Analysis and Approval workbook.

## About Regular Price Optimization

Oracle Retail Regular Price Optimization (RPO) enables users to optimize item prices and reach a desired goals, such as gross margin and revenue. To provide optimal results, the application requires item self elasticities, halo cross elasticities, and cannibalization cross elasticities as inputs. The APC-RPO application is designed to calculate and provide information on the elasticities to the RPO application.

## Getting Started with APC-RPO

The APC-RPO application includes the following workbook templates that enable you to set up parameters and, after the elasticities are calculated, review the calculated results:

- Administration Workbook
- Maintenance Workbook
- Analysis and Approval Workbook

The APC-RPO application provides the following business workflow:

1. Access the Administration workbook to set up the default parameters and threshold values. For more information on the measures and worksheets in the Administration workbook, see [Administration Workbook](#).
2. Access the Maintenance workbook to override the default parameters and threshold values at a specific item and location (price zone) intersection. For more information on the measures and worksheets in the Maintenance workbook, see [Maintenance Workbook](#).
3. After all the parameters are set up, the APC-RPO batch program is run. This batch program includes a sequence of scripts that take the historical inputs and the parameters you set up as inputs to calculate the price elasticities. For more information on the batch program, refer to the *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Implementation Guide*.
4. After the batch program is complete, information on all the price elasticities is made available through the measures included in the Analysis and Approval workbook. Access the Analysis and Approval workbook to review the statistics of data filtering, generated price elasticities, and the resolved elasticities at the lowest level. You can then adjust and approve the price elasticities. For more information on the measures and worksheets in the Analysis and Approval workbook, see [Analysis and Approval Workbook](#).

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**Note:** Only approved elasticities will be used in the parameter export file.

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## Accessing APC-RPO

APC-RPO is an Oracle Retail Predictive Application Server (RPAS)-based application. The APC-RPO solution is installed on an RPAS Server. To access the application, you must log on to one of the following RPAS Clients:

- RPAS Classic Client – This document describes how you can access and use APC-RPO from the RPAS Classic Client.
- RPAS Fusion Client – For more information on accessing and using APC-RPO from the RPAS Fusion Client, refer to the *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization User Guide for the Fusion Client*.

This section highlights the common tasks of logging on to a solution, opening an existing workbook, and creating new workbooks. It includes the following topics:

- [Logging On to APC-RPO](#)
- [Opening an Existing Workbook](#)
- [Creating a New Workbook](#)

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**Note:** In addition to the APC-RPO documentation, ensure that you also refer to the RPAS documentation for specific information on various base RPAS features.

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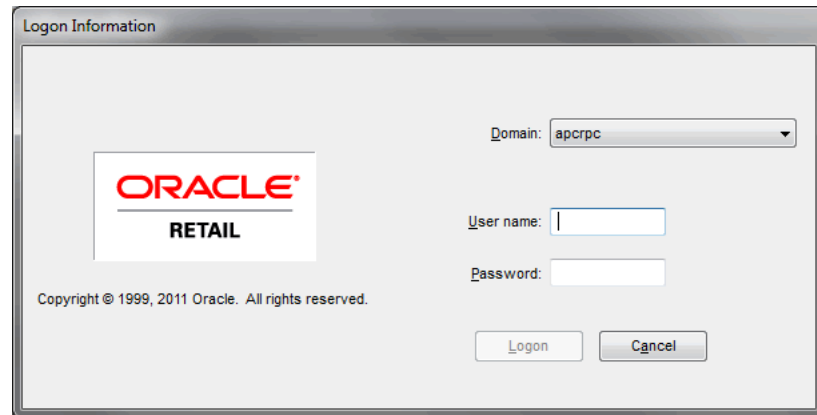
## Logging On to APC-RPO

To log on to the APC-RPO application using the RPAS Classic Client, perform the following steps:



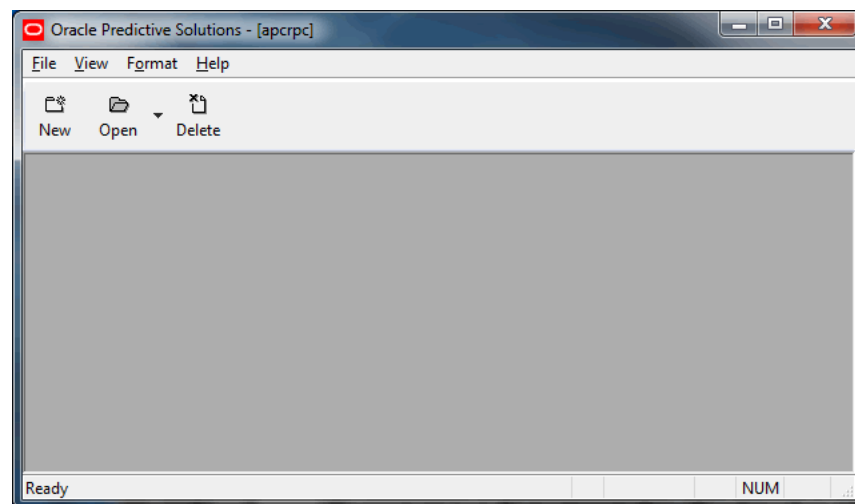
1. From the Windows Start menu, point to **Programs, Oracle Retail Predictive Solutions**, and then click **Oracle Predictive Solutions** to launch the RPAS Client. The Logon Information dialog box is displayed.

**Figure 1–1 Login Information Dialog Box**



2. In the Logon Information dialog box, enter the following information:
  - From the **Domain** drop-down list, select the domain name set for the APC-RPO application.
  - Enter your user name in the **User name** field and the associated password in the **Password** field.
3. Click **OK**. The Oracle Predictive Solutions screen is displayed.

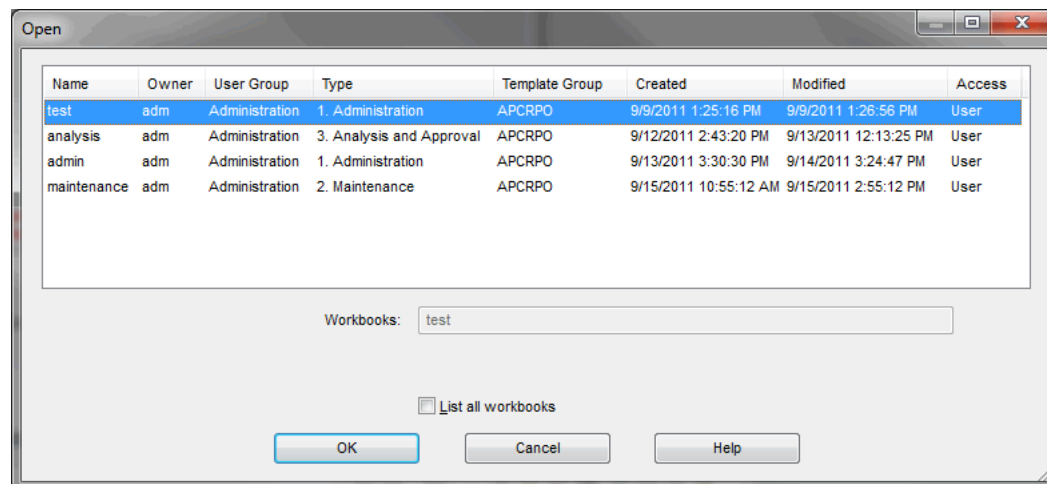
**Figure 1–2 Oracle Predictive Solutions Screen**



## Opening an Existing Workbook

To open an existing workbook, perform the following steps:

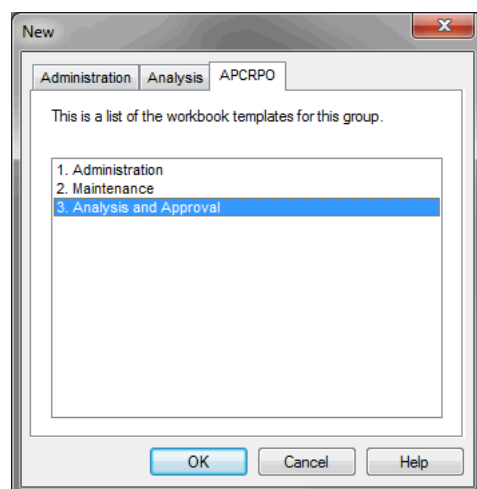
- After you have logged on to the RPAS Client, click **Open** from the toolbar. You can also click **Open** from the File menu. The Open dialog box is displayed and enables you to open one of the existing workbooks.

**Figure 1–3 Open Dialog Box**

## Creating a New Workbook

To create a new workbook, perform the following steps:

1. After you have logged on to the RPAS Client, click **New** from the toolbar. You can also click **New** from the File menu. The New dialog box is displayed.

**Figure 1–4 New Dialog Box**

2. In the New window, the **APCRPO** tab includes the list of workbook templates relevant to the APC-RPO application.
3. On the APCRPO tab, click the relevant workbook template to build a new workbook. For more information on each workbook, refer to the relevant chapter in this guide. Click **OK**.

If you selected **Administration** from the list, the Administration workbook is displayed directly. When you select **Maintenance** or **Analysis and Approval** from the list, a workbook wizard is displayed. This workbook wizard enables you to select and view specific (or all) item and price zone combination. For more information on opening a specific APC-RPO workbook, refer to the relevant chapter in this guide.

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**Note:** For more information on the other tabs that appear in the New dialog box, refer to the Oracle Retail Predictive Application Server documentation.

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## APC-RPO Concepts

This section highlights some of the commonly used analytical terms in the application and throughout this guide. It includes the following:

- [Advanced Parameter Calculator \(APC\)](#)
- [Cannibalization](#)
- [Cross Elasticity](#)
- [Elasticity](#)
- [First Differences](#)
- [HALO](#)
- [Raw Elasticity](#)
- [Regularized Elasticity](#)
- [Second Differences](#)
- [Self Elasticity](#)

### **Advanced Parameter Calculator (APC)**

Several Oracle Retail planning applications include an analytic APC module or integrate with a related APC application (such as APC-RPO). APC modules or applications enables users to calculate the necessary parameters required by an Oracle Retail planning application beforehand.

### **Cannibalization**

A measure of the amount in sales of a product that can replace the sales of another product.

### **Cross Elasticity**

The effect on the demand of a product because of a change in the price for a different product.

### **Elasticity**

The effect on the demand of a product because of change in the price for the same product.

### **First Differences**

First differences are calculated based on the difference of logarithms of gross sales units and the relevant average logarithm of gross sales units for a specific item/location. The same transformation is applied to ticket prices. First Differences are part of an intermediate step in the data filtering process.

### **HALO**

The measure of the amount in sales of a product that can enhance the sales of another product.

**Raw Elasticity**

In APC-RPO, raw elasticities are self elasticities at an intermediate stage of processing. It is calculated from the pre-processed filtered price and sales information. It represents all the items in a price zone.

**Regularized Elasticity**

In APC-RPO, a regularized elasticity is a raw elasticity that has been further processed and smoothed.

**Second Differences**

Second differences are calculated based on the difference between the first differences (logarithm of gross sales units and the logarithm of ticket prices) and the relevant averages for a specific department/week. Similar to first differences, the second differences are part of an intermediate step in the data filtering process.

**Self Elasticity**

This term is identical to "Elasticity." It is used to differentiate the term Elasticity from Cross Elasticity.

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## Administration Workbook

The Administration workbook enables you to set up parameters and escalation paths for the application. This chapter describes the worksheets and the relevant parameters that appear in the Administration workbook, which includes the following tabs:

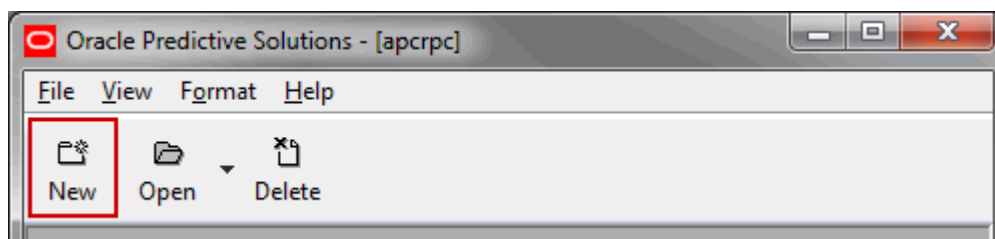
- [Setup Tab](#)
- [Escalation Path Management Tab](#)
- [Advanced Tab](#)

### Accessing the Administration Workbook

To access the Administration workbook, perform the following steps:

1. Log on to the RPAS Client. For more information, see [Logging On to APC-RPO](#).
2. From the toolbar or the File menu, click **New**. The New dialog box is displayed.

**Figure 2–1** New Icon in the RPAS Client Toolbar



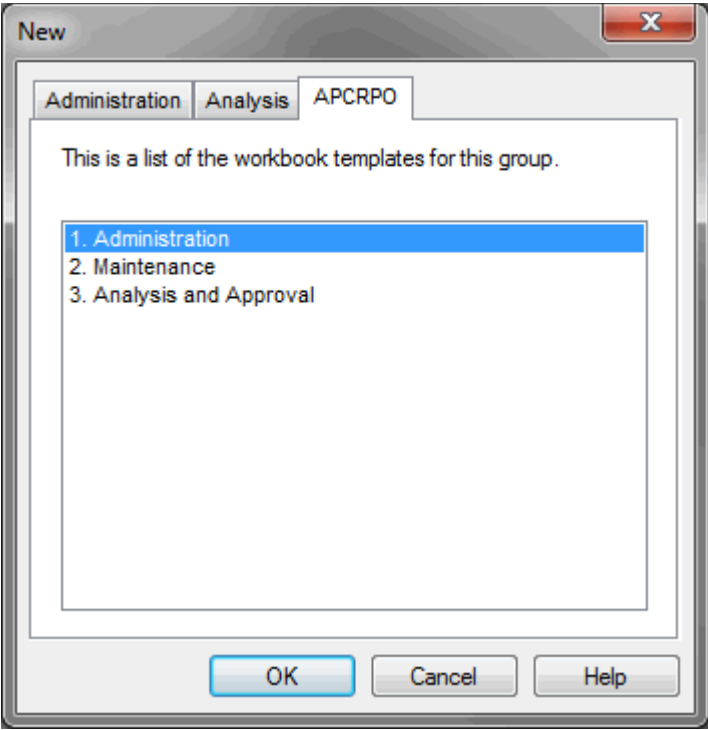
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**Note:** To open an existing workbook, click **Open** from the toolbar. You can also click **Open** from the **File** menu. The Open dialog box is displayed and enables you to open one of the existing workbooks.

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3. On the New dialog box, click the **APCRPO** tab.

Figure 2–2 New Dialog Box



- On the APCRPO tab, click **Administration** and then click **OK**.  
The workbook opens at the [Setup Tab](#).

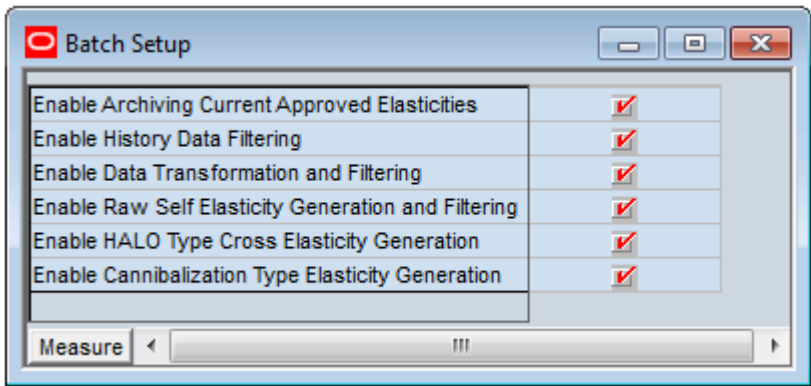
Setup Tab

The Setup tab includes the Batch Setup worksheet.

Batch Setup Worksheet

This worksheet provides you the ability to enable or disable data processes when the APC-RPO batch is run.

Figure 2–3 Batch Setup Worksheet



[Table 2–1](#) describes the measures in this worksheet:

**Table 2–1 Measures in the Batch Setup Worksheet**

Measure	Description
Enable Archiving Current Approved Elasticities	Select this check box to enable the archiving current approved elasticities process.
Enable History Data Filtering	Select this check box to enable the history data filtering process.
Enable Data Transformation and Filtering	Select this check box to enable the transformation and filtering process for the historical data.
Enable Raw Elasticity Generation and Filtering	Select this check box to enable the raw self elasticity generation and filtering process.
Enable HALO Type Cross Elasticity Generation	Select this check box to enable the halo type cross elasticity generation process.
Enable Cannibalization Type Elasticity Generation	Select this check box to enable the cannibalization type elasticity generation process.
Enable Self Elasticity Generation and Filtering	Select this check box to enable the self elasticity generation and filtering process.

After you have configured the batch setup, continue to the [Escalation Path Management Tab](#).

## Escalation Path Management Tab

The Escalation Path Management tab includes the Escalation Path worksheet.

### Escalation Path Worksheet

This worksheet enables you to set up the escalation path information. A set of four pre-configured escalation levels, in order of increasing priority, appear by default. The escalation level priority specifies the order of escalation level lookups.

**Figure 2–4 Escalation Path Worksheet**

	level 01	level 02	level 03	level 04	level 05	level 06	level 07
Escalation Level Label	L01 item	L02 class	L03 scat	L04 cat	L05 dept	L06 class/przn	L07 scat/przn
Elasticity Escalation Flag	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elasticity Escalation Path	1	2	3	4	5	6	7
Location Profile Escalation Flag	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Location Profile Escalation Path	0	0	0	0	0	1	2

[Table 2–2](#) describes the measures in this worksheet:

**Table 2–2 Measures in the Escalation Path Worksheet**

Measure	Description
Escalation Level Label	Use this measure to set a relevant label for each escalation level.

**Table 2–2 (Cont.) Measures in the Escalation Path Worksheet**

Measure	Description
Elasticity Escalation Flag	Use this measure to enable a particular escalation level. Select the check box under the relevant escalation level to include the level in the calculation.
Elasticity Escalation Path	Use this measure to set an order for the escalation level lookups. By default, the path is set to 1 through 4 starting from Level 01 to Level 04.
Location Profile Escalation Flag	Use this measure to indicate the escalation levels that will be calculated. Select the check box under the relevant escalation level to include the level in the calculation.
Location Profile Escalation Path	Use this measure to set an order for the profile escalation level lookups.

After you have configured the escalation paths, continue to the [Advanced Tab](#).

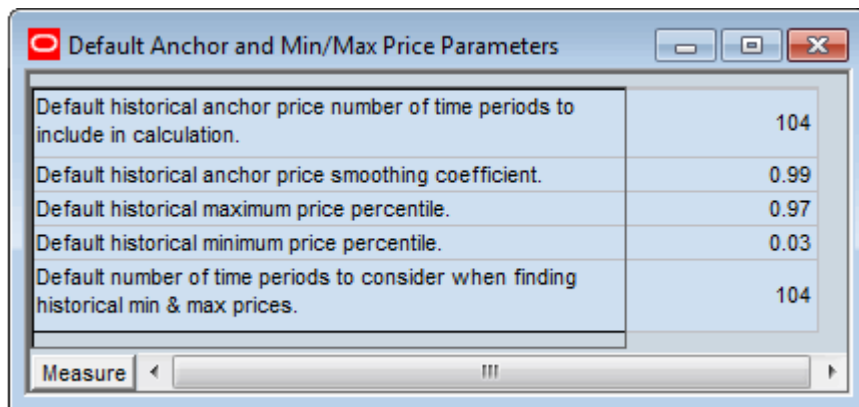
## Advanced Tab

The Advanced tab enables you to set or override the default values for various parameters. The parameters are organized in multiple worksheets:

- [Default Anchor and Min/Max Price Parameters Worksheet](#)
- [Default Data Transformation Parameters Worksheet](#)
- [Default HALO Elasticity Parameters Worksheet](#)
- [Default Historical Data Filtering Parameters Worksheet](#)
- [Default Raw Self-Elasticity Parameters Worksheet](#)
- [Default Cannibalization Parameters Worksheet](#)

### Default Anchor and Min/Max Price Parameters Worksheet

This worksheet enables you to set up parameters related to historical anchor and minimum/maximum prices.

**Figure 2–5 Default Anchor and Min/Max Price Parameters Worksheet**


Default historical anchor price number of time periods to include in calculation.	104
Default historical anchor price smoothing coefficient.	0.99
Default historical maximum price percentile.	0.97
Default historical minimum price percentile.	0.03
Default number of time periods to consider when finding historical min & max prices.	104

[Table 2–3](#) describes the measures in this worksheet:



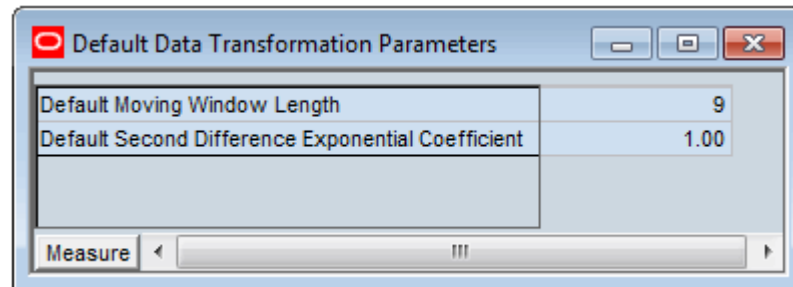
**Table 2–3 Measures in the Default Anchor and Min/Max Price Parameters Worksheet**

Measure	Description	Default Value
Default historical anchor price number of time periods to include in calculation	The number of weeks to consider, relative to the history end date, when calculating the anchor price.	104
Default historical anchor price smoothing coefficient	Exponential smoothing coefficient for blending the previous anchor price calculations with the new calculations.	0.99
Default historical maximum price percentile	The percentile at which the historical maximum price will be selected.	0.97
Default historical minimum price percentile	The percentile at which the historical minimum price will be selected.	0.03
Default number of time periods to consider when finding historical min & max prices.	The number of weeks to consider, relative to the history end date, when calculating the minimum and maximum historical prices.	104

After you have defined the anchor and price parameters, continue to the [Default Data Transformation Parameters Worksheet](#).

## Default Data Transformation Parameters Worksheet

This worksheet enables you to set up parameters related to data transformations.

**Figure 2–6 Default Data Transformation Parameters Worksheet**

[Table 2–4](#) describes the measures in this worksheet:

**Table 2–4 Measures in the Default Data Transformation Parameters Worksheet**

Measure	Description	Default Value
Default Moving Window Length	<p>To calculate the first difference, the price less the moving average of the price is needed. The window length determines the moving averaged prices.</p> <p>The default value of 18 describes how many weeks to look back and how many weeks to look forward. The moving window length includes the:</p> <ul style="list-style-type: none"> <li>■ Past 18 weeks</li> <li>■ Current week</li> <li>■ Next 18 weeks</li> </ul> <p>Thus, the moving window length is 37 (18+1+18) weeks.</p>	18
Default Second Difference Exponential Coefficient	After removing seasonality, it may be beneficial to exponentially smooth the second difference of some product/locations. The coefficient determines the degree of smoothing.	1.00

After you have defined the data transformation parameters, continue to the [Default HALO Elasticity Parameters Worksheet](#).

## Default HALO Elasticity Parameters Worksheet

This worksheet enables you to set up parameters related to HALO type elasticities.

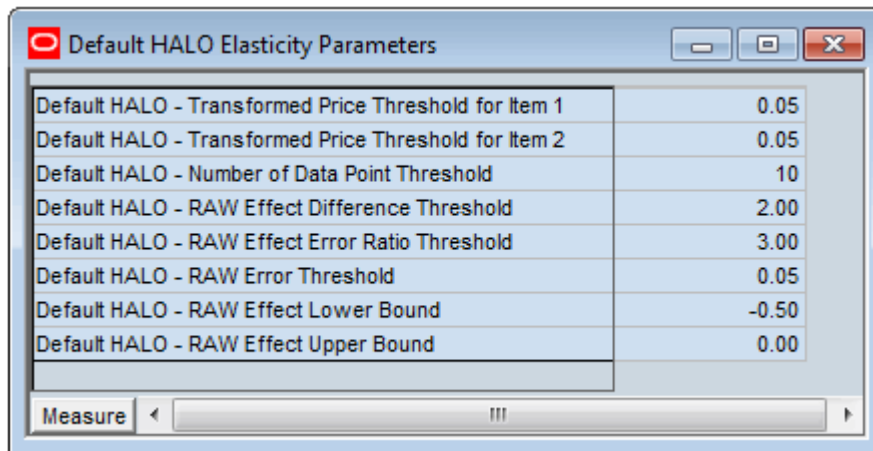
**Figure 2–7 Default HALO Elasticity Parameters Worksheet**

Table 2–5 describes the measures in this worksheet:

**Table 2–5 Measures in the Default HALO Elasticity Parameters Worksheet**

Measure	Description	Default Value
Default HALO - Transformed Price Threshold for Item 1	When calculating the effect of the price change of the second item on the demand of the first item, this value is the transformed price threshold for the first item. If the absolute value of the second difference of log price of the first item exceeds this threshold value, the corresponding data will be excluded from halo calculation.	0.05
Default HALO - Transformed Price Threshold for Item 2	When calculating the effect of the price change of the second item on the demand of the first item, this value is the transformed price threshold for the second item. If the absolute value of the second difference of log price of the second item is less than or equal to this threshold value, the corresponding data will be excluded from halo calculation.	0.05
Default HALO - Number of Data Point Threshold	The threshold value for the minimum number of data points required. Halo type cross elasticities that have data points lesser than this threshold value will be filtered out.	10
Default HALO - RAW Effect Difference Threshold	The threshold value for the difference between the halo type cross elasticities across the two time periods. If this difference exceeds the amount that results from the square root of the threshold value, then the halo type cross elasticities will be filtered out.	2
Default HALO - RAW Effect Error Ratio Threshold	The threshold value for the halo cross elasticity and standard error ratio. If a halo type cross elasticity has a value greater than this threshold value multiplied by the standard error for both time periods, then the halo type cross elasticity will be filtered out.	3
Default HALO - RAW Error Threshold	The standard error threshold value for the halo type cross elasticities. Halo type cross elasticities with standard error that exceed this threshold value will be filtered out.	0.05
Default HALO - RAW Effect Lower Bound	The lower threshold value for the halo type raw cross elasticities. Halo type cross elasticities lower than this threshold value will be filtered out.	-0.5
Default HALO - RAW Effect Upper Bound	The upper threshold value for the halo type raw cross elasticities. Halo type cross elasticities higher than this threshold value will be filtered out.	0

After you have defined the HALO elasticity parameters, continue to the [Default Historical Data Filtering Parameters Worksheet](#).

## Default Historical Data Filtering Parameters Worksheet

This worksheet enables you to set up parameters related to historical data filtering.

**Figure 2–8 Default Historical Data Filtering Parameters Worksheet**

Measure	Value
Default History Start Date	1/1/2008
Default History End Date	12/31/2011
Default POS Price and Ticket Price Difference % Threshold	0.05
Default Ticket Price Variation % Threshold	0.05
Default Minimum Average Sales	2.00
Default Price Variance Coefficient	0.05
Default High End Sales Curve	0.8
Default Low End Sales Curve	0.1

Table 2–6 describes the measures in this worksheet:

**Table 2–6 Measures in the Default Historical Data Filtering Parameters Worksheet**

Measure	Description	Default Value
History Start Date	The first date from the historical data to be used in the calculation.	NA
History End Date	The last date from the historical data to be used in the calculation.	NA
Default POS Price and Ticket Price Difference % Threshold	The threshold value (in percentage) of the difference between the Point of Sale (POS) price and ticket price. If the difference between the POS price and the ticket price exceeds this threshold value, the data will be filtered out.  <b>Note:</b> POS price is the gross sale amount divided by the gross sales units.	0.05
Default Ticket Price Variation % Threshold	The threshold value (in percentage) for the ticket price variations. If the difference between the minimum and maximum price values exceed this threshold value, the data will be filtered out.	0.05
Default Minimum Average Sales	This is the threshold for the filter that removes item/store combinations with average sales less than the defined threshold.	2
Default Price Variance Coefficient	This is the threshold for the filter that removes item/store combinations with price variance less than average price times said threshold.	0.05
Default High End Sales Curve	Determines what percentage of the cumulative sales should be kept at the end of the lifecycle.	0.8
Default Low End Sales Curve	Determines what percentage of the cumulative sales should be removed from the beginning of the lifecycle.	0.1

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**Note:** When left blank, values for the History Start Date and History End Date measures default to the start and end dates in the calendar.

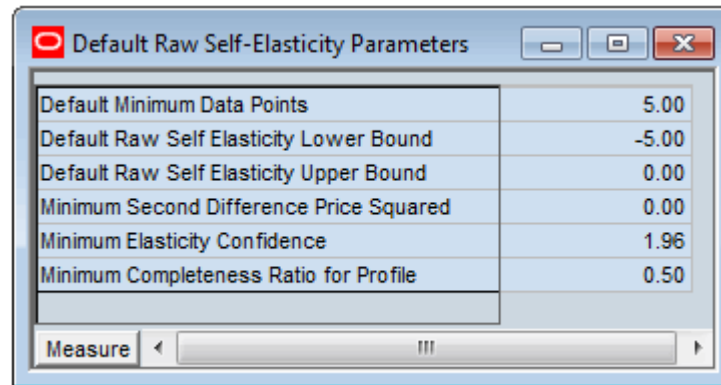
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After you have defined the historical data filtering parameters, continue to the [Default Raw Self-Elasticity Parameters Worksheet](#).

## Default Raw Self-Elasticity Parameters Worksheet

This worksheet enables you to set up parameters related to raw self-elasticities.

**Figure 2–9** *Default Raw Self-Elasticity Parameters Worksheet*



[Table 2–7](#) describes the measures in this worksheet:

**Table 2–7** *Measures in the Default Raw Self-Elasticity Parameters Worksheet*

Measure	Description	Default Value
Default Minimum Data Points	The threshold value for the minimum number of data points required. Items or locations with number of data points lesser than this threshold value are not included in the calculation.	5
Default Raw Self Elasticity Lower Bound	The lower threshold value for the raw self elasticities. Items or locations with raw self elasticities higher than this threshold value are not included in the calculation.	-1.5
Default Raw Self Elasticity Upper Bound	The upper threshold value for the raw self elasticities. Items or locations with raw self elasticities lower than this threshold value are not included in the calculation.	0.5
Minimum Second Difference Price Squared	This is a threshold that ensures that the second difference of the price is not zero.	0.00001
Minimum Elasticity Confidence	Defines the threshold used to determine if the elasticity at a certain level is reliable or if it should be escalated.	1.96
Minimum Completeness Ratio for Profile	This threshold determines if a location profile level is reliable or not. If at least the percentage of locations given by the threshold has reliable elasticity, the location profile is calculated.	0.5

After you have defined the raw self-elasticity parameters, continue to the [Default Cannibalization Parameters Worksheet](#).

## Default Cannibalization Parameters Worksheet

This worksheet enables you to set up parameters related to regularization and cannibalization.

**Figure 2–10** *Default Cannibalization Parameters Worksheet*

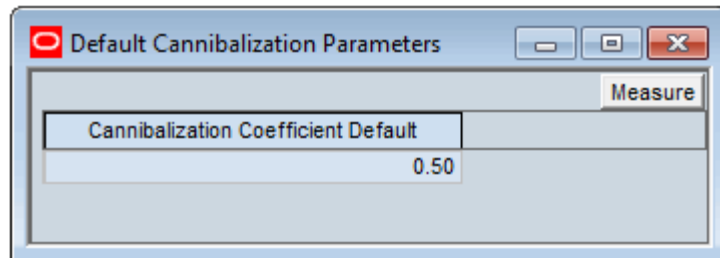


Table 2–8 describes the measures in this worksheet:

**Table 2–8** *Measures in the Default Cannibalization Parameters Worksheet*

Measure	Description	Default Value
Cannibalization Coefficient Default	The default value for the cannibalization co-efficient.	0.5

After you have defined the cannibalization parameters, save and commit the Administration workbook and open the [Maintenance Workbook](#).

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## Maintenance Workbook

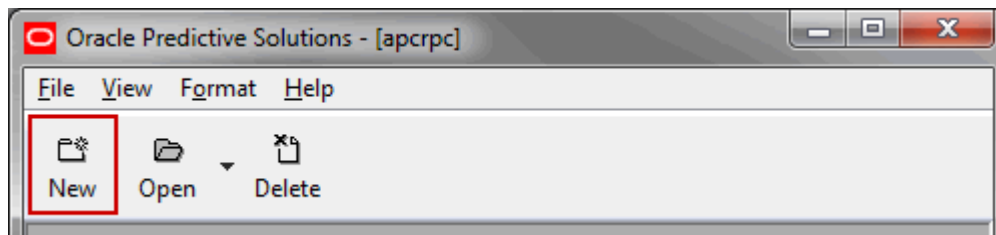
The Maintenance workbook enables you to override the default parameter values for an item or group of items at a specific price zone (location). This chapter describes the worksheets and the relevant parameters that appear in the Maintenance workbook.

### Accessing the Maintenance Workbook

To access the Maintenance workbook, perform the following steps:

1. Log on to the APC-RPO domain. For more information, see [Logging On to APC-RPO](#).
2. From the toolbar or the File menu, click **New**. The New dialog box is displayed.

**Figure 3–1** New Icon in the RPAS Client Toolbar

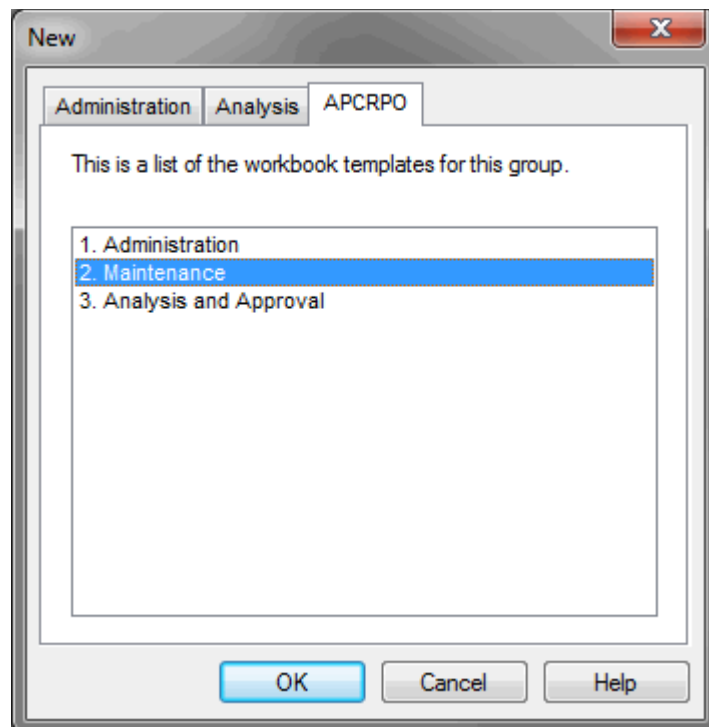


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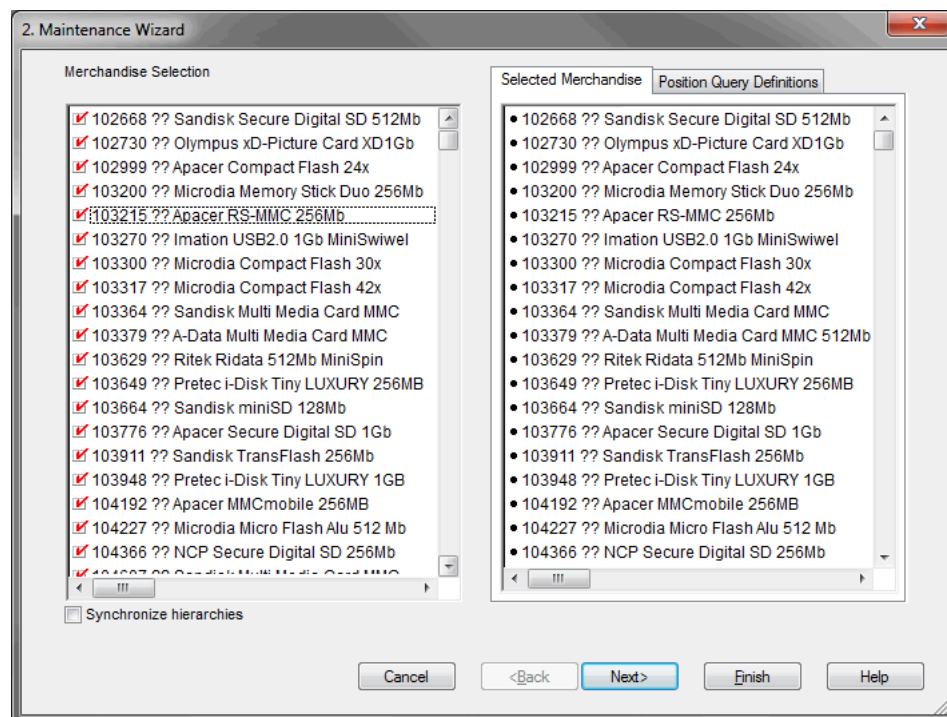
**Note:** To open an existing workbook, click **Open** from the toolbar. You can also click **Open** from the **File** menu. The Open dialog box is displayed and enables you to open one of the existing workbooks.

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3. On the New dialog box, click the **APCRPO** tab.
4. From the APCRPO tab, click **Maintenance** and then click **OK**. The Maintenance Wizard is displayed.

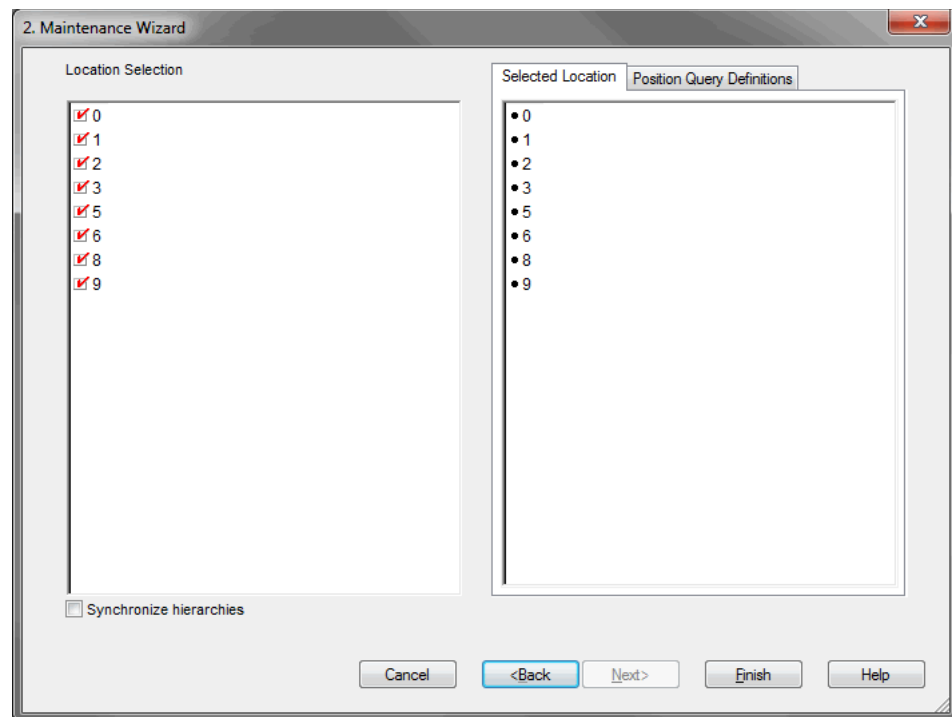
**Figure 3–2 New Dialog Box**

5. Select the items for which you want to override the parameters and click **Next**.

**Figure 3–3 Maintenance Wizard Screen to Select Items**

6. Select the relevant price zones and click **Finish**.



**Figure 3–4 Maintenance Wizard Screen to Select Price Zones**

The Maintenance workbook is displayed on the [Parameter Overrides Tab](#).

## Parameter Overrides Tab

The Parameter Overrides tab includes the following worksheets that enable you to override the parameters for specific items and price zone combinations:

- [Historical Data Filtering Parameters Worksheet](#)
- [Data Transformation and Filtering Override Parameters Worksheet](#)
- [Cannibalization Parameters Worksheet](#)
- [Escalation Path Override Worksheet](#)
- [HALO Elasticity Parameters Override Worksheet](#)
- [Raw Self Elasticity Worksheet](#)
- [Anchor and Min/Max Price Worksheet](#)

### Historical Data Filtering Parameters Worksheet

This worksheet enables you to override the default values for parameters related to historical data filtering.

**Figure 3–5 Historical Data Filtering Parameters Worksheet**

	Item 1	Item 2	Item 3	Item 4
History Start Date Override	1/1/2010	1/1/2010	1/1/2010	1/1/2010
History End Date Override	6/1/2011	6/1/2011	6/1/2011	6/1/2011
Fixed Ticket Price Period Length Threshold Override	4	4	4	4
Ticket Price Change % Threshold Override	0.10	0.10	0.10	0.10
POS Price and Ticket Price Difference % Threshold Override	0.08	0.08	0.08	0.08
Ticket Price Variation % Threshold Override	0.03	0.03	0.03	0.03
Minimum Average Sales Override	1.50	1.50	1.50	1.50
Price Variance Coefficient Override	0.07	0.07	0.07	0.07
High End Sales Curve Override	0.95	0.95	0.95	0.95
Low End Sales Curve Override	0.10	0.10	0.10	0.10

Table 3–1 describes the measures in this worksheet:

**Table 3–1 Measures in the Historical Data Filtering Parameters Worksheet**

Measure	Measure Description
History Start Date Override	The override of the value of the History Start Date measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . This override determines the first date in the history data to be included in the calculation.
History End Date Override	The override of the value of the History End Date measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . This override determines the last date in the history data to be included in the calculation.
Fixed Ticket Price Period Length Threshold Override	The threshold value for the minimum number of consecutive weeks of fixed ticket price. From the set time period, data with number of weeks less than this threshold value will be filtered out.
POS Price and Ticket Price Difference % Threshold Override	The threshold value (in percentage) of the difference between the POS price and ticket price. If the difference between the POS price and the ticket price exceeds this threshold value, the data will be filtered out.  <b>Note:</b> POS price is the gross sale amount divided by the gross sales units.
Ticket Price Change % Threshold Override	The threshold value (in percentage) for the ticket price changes to be considered as fixed price. Prices are considered fixed from week to week, when the price change is less than this threshold value.
Ticket Price Variation % Threshold Override	The threshold value (in percentage) for the ticket price variations. If the difference between the minimum and maximum price values exceed this threshold value, the data will be filtered out.

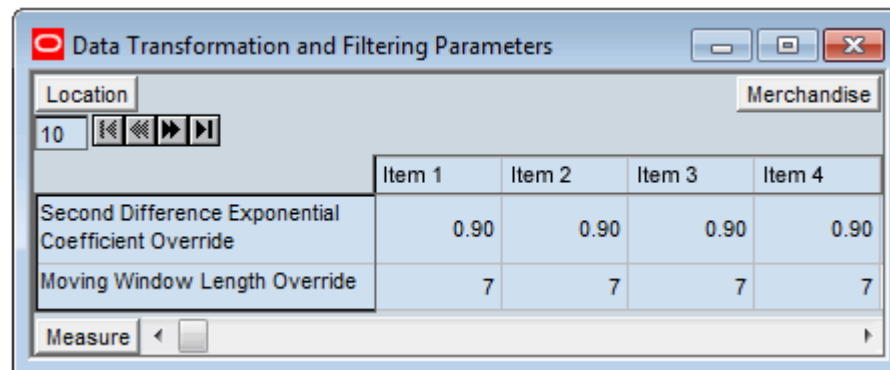
**Table 3–1 (Cont.) Measures in the Historical Data Filtering Parameters Worksheet**

Measure	Measure Description
Minimum Average Sales Override	The override of the value of the Minimum Average Sales measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . This is the threshold for the filter that removes item/store combinations with average sales less than the defined threshold.
Price Variance Coefficient Override	The override of the value of the Price Variance Coefficient measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . This is the threshold for the filter that removes item/store combinations with price variance less than average price times said threshold.
High End Sales Curve Override	The override of the value of the High End Sales Curve measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . Determines what percentage of the cumulative sales should be kept at the end of the lifecycle.
Low End Sales Curve Override	The override of the value of the Low End Sales Curve measure from the <a href="#">Default Historical Data Filtering Parameters Worksheet</a> . Determines what percentage of the cumulative sales should be removed from the beginning of the lifecycle.

After you have entered the historical data filtering parameters, continue to the [Data Transformation and Filtering Override Parameters Worksheet](#).

## Data Transformation and Filtering Override Parameters Worksheet

This worksheet enables you to override the default values for parameters related to data transformations.

**Figure 3–6 Data Transformation and Filtering Override Parameters Worksheet**

[Table 3–2](#) describes the measures in this worksheet:

**Table 3–2 Measures in the Data Transformation and Filtering Override Parameters Worksheet**

Measure	Measure Description
Second Difference Exponential Coefficient Override	The override of the value of the Second Difference Exponential Coefficient measure from the <a href="#">Default Data Transformation Parameters Worksheet</a> . After removing seasonality, it may be beneficial to exponentially smooth the second difference of some product/locations. The coefficient determines the degree of smoothing.

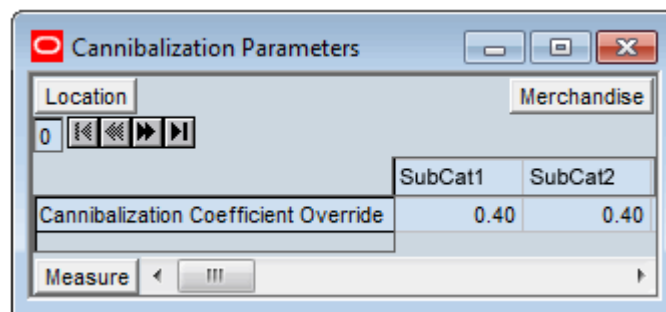
**Table 3–2 (Cont.) Measures in the Data Transformation and Filtering Override Parameters Worksheet**

Measure	Measure Description
Moving Window Length Override	The override of the value of the Moving Window Length measure from the <a href="#">Default Data Transformation Parameters Worksheet</a> . To calculate the first difference, the price less the moving average of the price is needed. The window length determines the moving averaged prices.
First Difference Data Points Override	The lower threshold value for the first difference data points. The number of non-zero first difference data for an item or location lower than this threshold value will be discarded.
Second Difference Data Point Threshold Override	The lower threshold value for the second difference data points. The number of non-zero first difference data for an product or week lower than this threshold value will be discarded.
Second Difference Upper Bound Threshold Override	The upper threshold value for the log ticket price second different data points. The data corresponding to the item or location week that have the absolute value higher than this threshold value will be discarded.

After you have entered the transformation and filtering overrides, continue to the [Cannibalization Parameters Worksheet](#).

## Cannibalization Parameters Worksheet

This worksheet enables you to override the default values for the cannibalization co-efficient parameter.

**Figure 3–7 Cannibalization Parameters Worksheet**

[Table 3–3](#) describes the measures in this worksheet:

**Table 3–3 Measures in the Cannibalization Parameters Worksheet**

Measure	Measure Description
Cannibalization Coefficient Override	The override value for the cannibalization co-efficient.

After you have entered the cannibalization parameters, continue to the [Escalation Path Override Worksheet](#).

## Escalation Path Override Worksheet

This worksheet enables you to override the default order for the escalation level lookups.

Figure 3–8 Escalation Path Override Worksheet

Escalation Path Override

Location

Merchandise

Escalation Levels

0

Dept 1

⏪

⏴

⏵

⏩

level 01

level 02

level 03

Elasticity Escalation Path Override

Location Profile Escalation Path Override

Measure

◀

|||

▶

Table 3–4 describes the measure in this worksheet:

Table 3–4 Measures in the Escalation Path Override Worksheet

Measure	Measure Description
Elasticity Escalation Path Override	Use this measure to override the value of the Elasticity Escalation Path measure in the <a href="#">Escalation Path Worksheet</a> . This override sets the default order for the escalation level lookups. By default, the path is set to 1 through 4 starting from Level 01 to Level 04.
Location Profile Escalation Path Override	Use this measure to override the value of the Location Profile Escalation Path measure in the <a href="#">Escalation Path Worksheet</a> . This override sets an order for the profile escalation level lookups

After you have entered the escalation path overrides, continue to the [HALO Elasticity Parameters Override Worksheet](#).

### HALO Elasticity Parameters Override Worksheet

This worksheet enables you to override the default values for the parameters related to HALO type elasticities.

**Note:**

To edit the HALO measures, change the level of the Product hierarchy to display all[Merchandise].

**Figure 3–9 HALO Elasticity Parameters Override Worksheet**

Table 3–5 describes the measures in this worksheet:

**Table 3–5 Measures in the HALO Elasticity Parameters Override Worksheet**

Measure	Measure Description
HALO - Number of Data Point Threshold Override	The threshold value for the minimum number of data points required. Halo type cross elasticities that have data points lesser than this threshold value will be filtered out.
HALO - Transformed Price Threshold for Item 1 Override	When calculating the effect of the price change of the second item on the demand of the first item, this value is the transformed price threshold for the first item. If the absolute value of the second difference of log price of the first item exceeds this threshold value, the corresponding data will be excluded from halo calculation.
HALO - Transformed Price Threshold for Item 2 Override	When calculating the effect of the price change of the second item on the demand of the first item, this value is the transformed price threshold for the second item. If the absolute value of the second difference of log price of the second item is less than or equal to this threshold value, the corresponding data will be excluded from halo calculation.
HALO - RAW Effect Difference Threshold Override	The threshold value for the difference between the halo type cross elasticities across the two time periods. If this difference exceeds the amount that results from the square root of the threshold value, then the halo type cross elasticities will be filtered out.
HALO - RAW Effect Error Ratio Threshold Override	The threshold value for the halo cross elasticity and standard error ratio. If a halo type cross elasticity has a value greater than this threshold value multiplied by the standard error for both time periods, then the halo type cross elasticity will be filtered out.
HALO - RAW Error Threshold Override	The standard error threshold value for the halo type cross elasticities. Halo type cross elasticities with standard error that exceed this threshold value will be filtered out.
HALO - RAW Effect Lower Bound Override	The lower threshold value for the halo type raw cross elasticities. Halo type cross elasticities lower than this threshold value will be filtered out.
HALO - RAW Effect Upper Bound Override	The upper threshold value for the halo type raw cross elasticities. Halo type cross elasticities higher than this threshold value will be filtered out.

After you have entered the HALO elasticity overrides, continue to the [Raw Self Elasticity Worksheet](#).

## Raw Self Elasticity Worksheet

This worksheet enables you to override the default values for parameters related to raw self elasticities.

**Figure 3–10 Raw Self Elasticity Worksheet**

Table 3–6 describes the measures in this worksheet:

**Table 3–6 Measures in the Raw Self Elasticity Worksheet**

Measure	Measure Description
Minimum Data Points Override	The threshold value for the minimum number of data points required. Items or locations with number of data points lesser than this threshold value are not included in the calculation.
Raw Self Elasticity Lower Bound Override	The upper threshold value for the RAW self elasticities. Items or locations with RAW self elasticities higher than this threshold value are not included in the calculation.
Raw Self Elasticity Upper Bound Override	The lower threshold value for the RAW self elasticities. Items or locations with RAW self elasticities lower than this threshold value are not included in the calculation.
Max Second Diff Log Price Override	The threshold value for the maximum second difference log ticket price. Items or locations with a second difference that exceed this threshold value are not included in the calculation.
Max allowed standard error for raw self-elasticities (override).	The threshold value for the maximum standard error allowed for RAW self-elasticities. Items or locations with a standard error that exceed this threshold value are not included in the calculation.

After you have entered the raw self elasticity parameters, continue to the [Anchor and Min/Max Price Worksheet](#).

## Anchor and Min/Max Price Worksheet

This worksheet enables you to override the default values for the parameters related to anchor and minimum/maximum ticket prices.

The NA value of the measures needs to be set to an invalid value for that parameter. And the value NA indicates that there is no override value.

**Figure 3–11 Anchor and Min/Max Price Worksheet**

	0	1	2	3
Override historical anchor price number of time periods to include in calculation.	2	2	2	2
Override historical anchor price smoothing	0.90	0.90	0.90	0.90
Override historical maximum price percentile.	0.95	0.95	0.95	0.95
Override historical minimum price percentile.	0.05	0.05	0.05	0.05
Override number of time periods to consider when finding historical min & max prices.	80	80	80	80

Table 3–7 describes the measures in this worksheet:

**Table 3–7 Measures in the Anchor and Min/Max Price Worksheet**

Measure	Measure Description
Override historical anchor price number of time periods to include in calculation.	The number of weeks to consider, relative to the history end date, when calculating the anchor price.
Override historical anchor price smoothing coefficient.	Exponential smoothing coefficient for blending the previous anchor price calculations with the new calculations.
Override historical maximum price percentile.	The percentile at which the historical maximum price is selected.
Override historical minimum price percentile.	The percentile at which the historical minimum price is selected.
Override number of time periods to consider when finding historical min & max prices.	The number of weeks to consider, relative to the history end date, when calculating the minimum and maximum historical prices.

After you have finished entering the anchor and minimum and maximum price parameters, commit and save the workbook. Before building the [Analysis and Approval Workbook](#), run the `apcrpo_batch.sh` script. This batch program includes a sequence of scripts that take the historical inputs and the parameters you set up as inputs to calculate the price elasticities. For more information, see the *Oracle Retail Analytic Parameter Calculator for Regular Price Optimization Implementation Guide*.



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## Analysis and Approval Workbook

After the batch processes are run, self-elasticities are generated. The Analysis and Approval workbook enables you to review the calculation results, approve, and override the elasticities. When you access the workbook, a workbook wizard is displayed that enables you to select and review all or group of items at specific price zones (locations).

The Analysis and Approval workbook includes the following tabs:

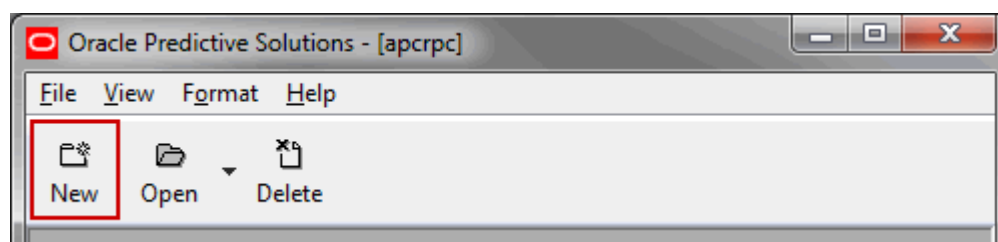
- [Data Preprocessing Analysis Tab](#)
- [Self Elasticity Analysis Tab](#)
- [Cannibalization Analysis Tab](#)
- [HALO Elasticity Analysis Tab](#)
- [Anchor and Min/Max Price Analysis Tab](#)

### Accessing the Analysis and Approval Workbook

To access the Analysis and Approval workbook, perform the following steps:

1. Log on to the APC-RPO domain. For more information, see [Logging On to APC-RPO](#).
2. From the toolbar or the File menu, click **New**.

**Figure 4–1** New Workbook Icon in the RPAS Classic Client Toolbar

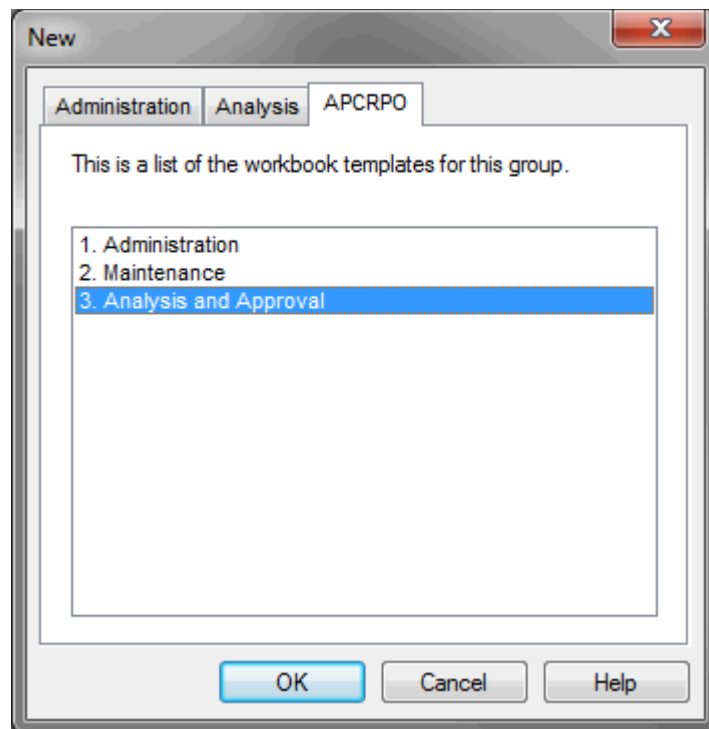


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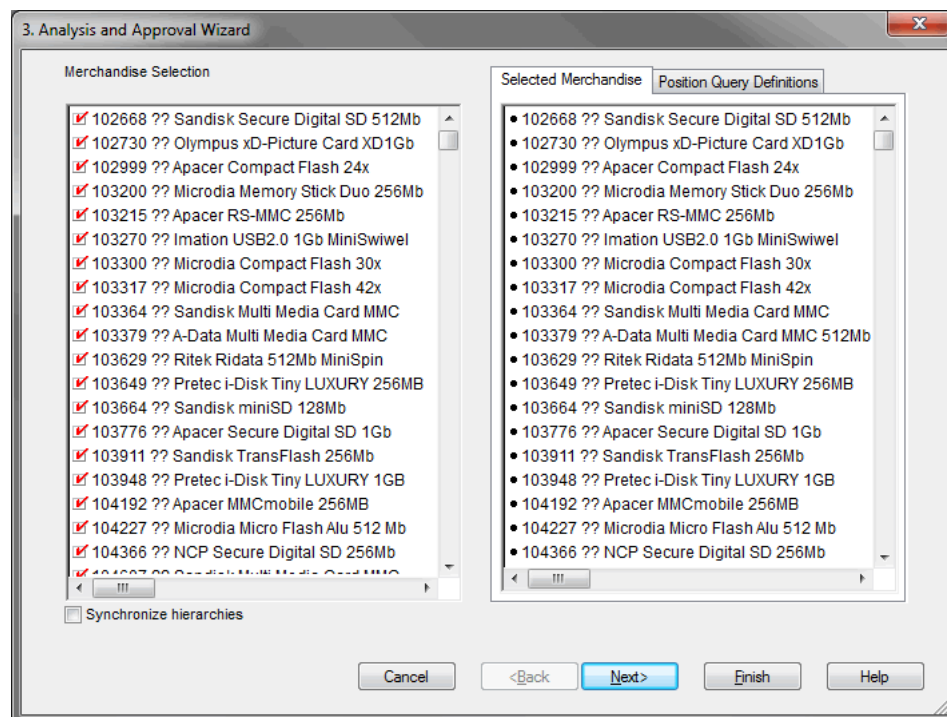
**Note:** To open an existing workbook, click **Open** from the toolbar. You can also click **Open** from the File menu. The Open dialog box is displayed and enables you to open one of the existing workbooks.

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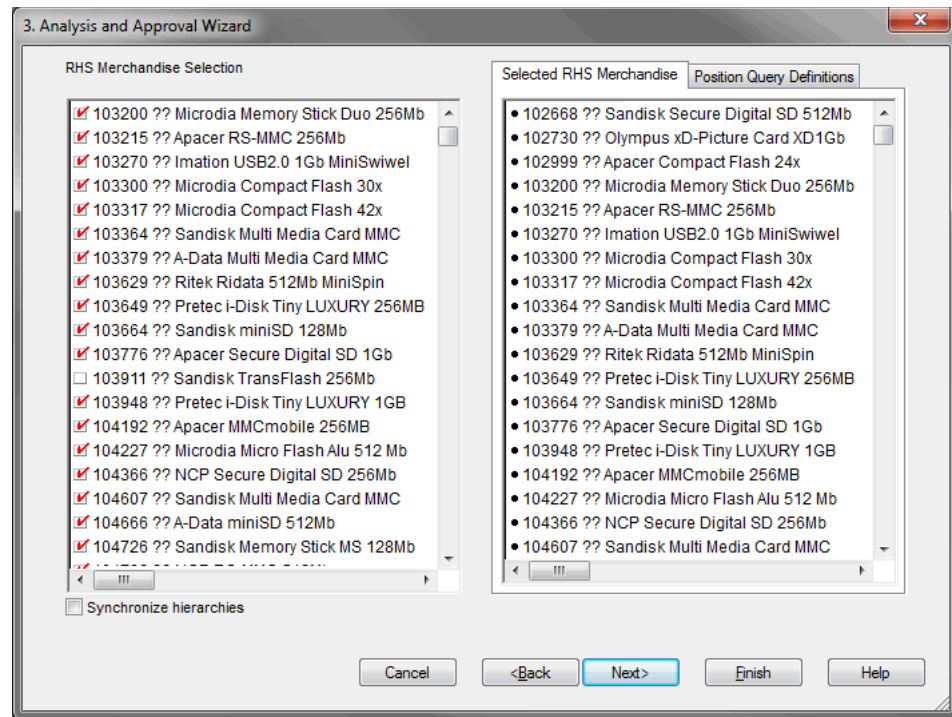
3. The New dialog box is displayed. From the APCRPO tab, click **Analysis and Approval** and then click **OK**.

**Figure 4–2 New Dialog Box**

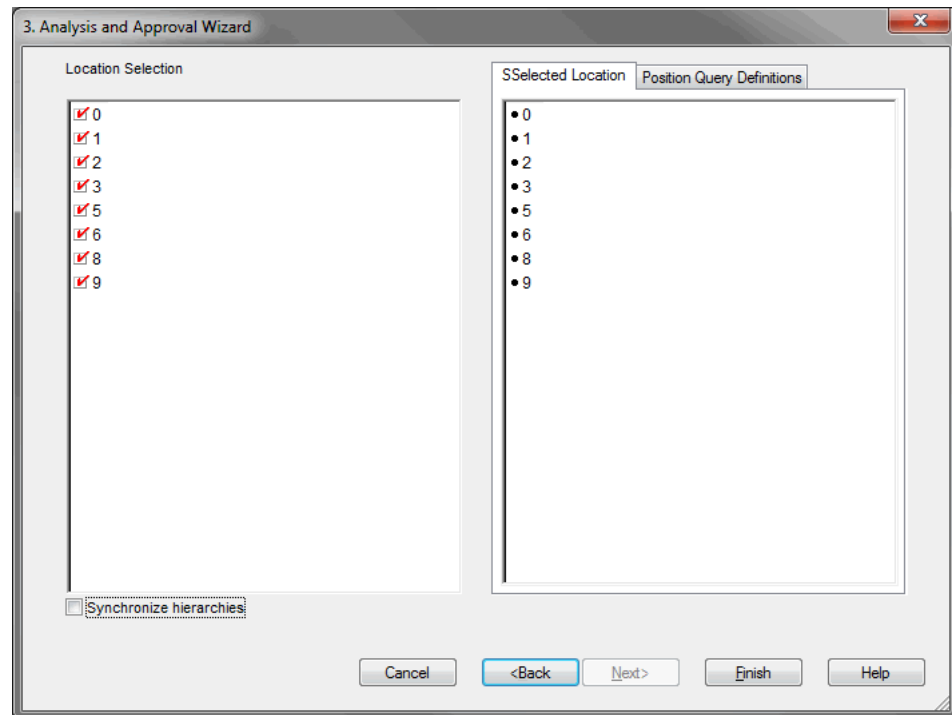
4. The Analysis and Approval Wizard opens. Select the items to override. Click **Next**.

**Figure 4–3 Analysis and Approval Wizard Screen to Select Items**

5. Select the items from the RHS hierarchy and click **Next**. The RHS hierarchy is a duplicate of the merchandise hierarchy set up to support cross-item elasticity.

**Figure 4–4 Analysis and Approval Wizard Screen to Select Items from RHS Hierarchy**

6. Select the relevant price zones, and click **Finish**. The workbook opens.

**Figure 4–5 Approval and Analysis Wizard Screen to Select Price Zones**

## Data Preprocessing Analysis Tab

The Data Preprocessing Analysis tab includes the following worksheet that displays the results of the historical data preprocessing:

- [Data Preprocessing Analysis Worksheet](#)

### Data Preprocessing Analysis Worksheet

This worksheet displays the results of the historical data preprocessing. It includes information at the POS intersection, without the calendar, to highlight the information filtered out at successive steps in preprocessing.

**Figure 4–6 Data Preprocessing Analysis Worksheet**

Category 1	
Num price data pts.	4474
Num price data pts retained as constant price periods.	2759
Num price data pts after filtering out price data < 0.	4474
Num price data pts after filtering out gross sales/gross units varies too much from price.	4474
Num price data pts after filtering out data that varies too far from min or max price.	4474
Num price data pts after filtering cumulative sales	2838
Num price data pts after filtering average sales	1516
Num price data pts after filtering price deviation	1159
Num price data pts after preprocessing.	1159

Table 4–1 describes the measures in this worksheet:

**Table 4–1 Measures in the Data Preprocessing Analysis Worksheet**

Measure	Measure Description
Num price data pts.	Number of price data points prior to any filtering.
Num price data pts retained as constant price periods.	Number of price data points retained as constant price periods.
Num price data pts after filtering out price data < 0.	Number of price data points after filtering out price data less than zero (0).
Num price data pts after filtering out gross sales/gross units varies too much from price.	Number of price data points after filtering out the gross revenue/gross units varying too far from price.
Num price data pts after filtering out data that varies too far from min or max price.	Number of price data points after filtering out the data that varies too far from the minimum or maximum price.
Num price data pts after filtering cumulative sales	This is a reporting measure that displays the number of data points available after the cumulative sales filter has been applied.

**Table 4–1 (Cont.) Measures in the Data Preprocessing Analysis Worksheet**

Measure	Measure Description
Num price data pts after filtering average sales	This is a reporting measure that displays the number of data points available after the average sales filter has been applied.
Num price data pts after filtering price deviation	This is a reporting measure that displays the number of data points available after the price deviation filter has been applied.
Num price data pts after preprocessing.	Number of price data points after filtering out stock outs. This is the final step in the preprocessing and represents the final count of price data points.

After reviewing and editing the data preprocessing parameters, continue to the [Self Elasticity Analysis Tab](#).

## Self Elasticity Analysis Tab

The Self Elasticity Analysis tab provides information on the calculated self elasticities. The worksheets in this tab display information at the item and price zone intersection. It includes the following worksheets:

- [Final Self Elasticity Worksheet](#)
- [Escalation Level Elasticity Worksheet](#)

### Final Self Elasticity Worksheet

This worksheet displays the self elasticity data of items in each location.

**Figure 4–7 Final Self Elasticity Worksheet**

	Item 1	Item 2	Item 3	Item 4
Final Self Elasticity	-0.11	-0.64	-3.46	-0.22
Selected Location Profile	L09 dept/przn	L09 dept/przn	L09 dept/przn	L09 dept/przn
Standard Error	0.04	0.02	0.98	0.05
T-Statistic	-2.81	-42.01	-3.53	-4.27

Table 4–2 describes the measures in this worksheet:

**Table 4–2 Measures in the Final Self Elasticity Worksheet**

Measure	Measure Description
Final Self Elasticity	Final calculated self elasticity at the item/price zone intersection.
Selected Location Profile	Displays the selected location profile level.
Standard Error	Standard error at the final level.

**Table 4–2 (Cont.) Measures in the Final Self Elasticity Worksheet**

Measure	Measure Description
T-Statistic	The t-statistic measure represents the ratio of the elasticity value and its standard error. For instance, if the elasticity value is -0.04 and the standard error is 0.0023, the t-statistic is $-0.04/0.0023 = -17.4$ .  T-statistics are at the final level.

After reviewing final self elasticity parameters, continue to the [Escalation Level Elasticity Worksheet](#).

## Escalation Level Elasticity Worksheet

This view provides information on the regularized elasticities at the base escalation level intersection (for example, item and price zone).

**Figure 4–8 Escalation Level Elasticity Worksheet**

Location		Merchandise		
0		Item 1	Item 2	Item 3
Level 01	Escalation Elasticity	0.00	0.00	0.00
	Escalation Standard Error	0.00	0.13	0.00
	Escalation Elasticity T-statistic	0.00	-0.74	0.00
	Escalation Profile Value	0.00	0.00	0.00
Level 02	Escalation Elasticity	-0.14	0.00	-4.30
	Escalation Standard Error	0.00	0.11	0.95
	Escalation Elasticity T-statistic	-3.48	-1.46	-4.40
	Escalation Profile Value	0.00	0.00	0.00
Level 03	Escalation Elasticity	-0.14	0.00	-4.30
	Escalation Standard Error	0.00	0.11	0.95
	Escalation Elasticity T-statistic	-3.48	-1.46	-4.40
	Escalation Profile Value	0.00	0.00	0.00

Table 4–3 describes the measures in this worksheet:

**Table 4–3 Measures in the Escalation Level Elasticity Worksheet**

Measure	Measure Description
Escalation Elasticity	Elasticity values by escalation level.
Escalation Standard Error	Elasticity standard error values by escalation level.
Escalation Elasticity T-statistic	Elasticity t-statistics values by escalation level.
Escalation Location Profile Value	Location profile values by escalation level.

After reviewing escalation level elasticity parameters, continue to the [Cannibalization Analysis Tab](#).

## Cannibalization Analysis Tab

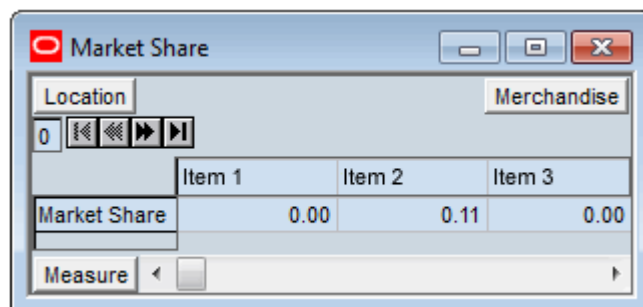
The Cannibalization Analysis tab provides information on the calculated market share and cannibalization effects. It includes two worksheets:

- [Market Share Worksheet](#)
- [Cannibalization Elasticity Analysis Worksheet](#)

### Market Share Worksheet

The Market Share worksheet provides information on the calculated market share effects. It displays information at the item and price zone intersection.

**Figure 4–9 Market Share Worksheet**



[Table 4–4](#) describes the measures in this worksheet:

**Table 4–4 Measures in the Market Share Worksheet**

Measure	Measure Description
Market Share	Market share relative to the other items within the class.

After reviewing the market share, continue to the [Cannibalization Elasticity Analysis Worksheet](#).

### Cannibalization Elasticity Analysis Worksheet

The Cannibalization Elasticity Analysis worksheet provides information on the calculated cannibalization effects. It displays information at the cross-item elasticity intersection.

**Figure 4–10 Cannibalization Elasticity Analysis Worksheet**

		Item 1	Item 2
Item 3	Cross-Item Elasticity (Cannibalization)	0.05	0.01
	Approved Cross-Item Elasticity (Cannibalization)	0.05	0.01
	Archived Cross-Item Elasticity (Cannibalization)	0.00	0.00
Item 4	Cross-Item Elasticity (Cannibalization)	0.02	0.03
	Approved Cross-Item Elasticity (Cannibalization)	0.02	0.03
	Archived Cross-Item Elasticity (Cannibalization)	0.00	0.00

Table 4–5 describes the measures in this worksheet:

**Table 4–5 Measures in the Cannibalization Elasticity Analysis Worksheet**

Measure	Measure Description
Cross-Item Elasticity (Cannibalization)	The cross-item elasticity (cannibalization).
Approved Cross-Item Elasticity (Cannibalization)	The approved cross-item elasticity (cannibalization).
Archived Cross-Item Elasticity (Cannibalization)	The last approved cross-item elasticity (cannibalization).

After reviewing and editing the cannibalization elasticity analysis parameters, continue to the [HALO Elasticity Analysis Tab](#).

## HALO Elasticity Analysis Tab

The HALO Elasticity Analysis tab provides information on the calculated HALO effects. It includes one worksheet:

- [HALO Elasticity Analysis Worksheet](#)

## HALO Elasticity Analysis Worksheet

The worksheet displays information at the halo effect intersection.



**Figure 4–11 HALO Elasticity Analysis Worksheet**

		Item 1	Item 2
Item 3	HALO Type Cross Item Elasticity	0.00	0.00
	HALO Elasticity Standard Error	0.00	0.00
	HALO Effective Data Points	0	0
	Approved HALO Type Cross Item Elasticity	0.00	0.00
	Archived HALO Type Cross Item Elasticity	0.00	0.00
Item 4	HALO Type Cross Item Elasticity	0.00	0.00
	HALO Elasticity Standard Error	0.00	0.00
	HALO Effective Data Points	0	0
	Approved HALO Type Cross Item Elasticity	0.00	0.00
	Archived HALO Type Cross Item Elasticity	0.00	0.00

Table 4–6 describes the measures in this worksheet:

**Table 4–6 Measures in the HALO Elasticity Analysis Worksheet**

Measure	Measure Description
HALO Type Cross-Item Elasticity	The calculated halo type cross-item elasticity.
HALO Elasticity Standard Error	The standard error in the calculation of the halo cross-item elasticity.
HALO Effective Data Point Count	The number of data points used in the calculation.
Approved HALO Type Cross-Item Elasticity	The approved halo type cross-item elasticity.
Archived HALO Type Cross-Item Elasticity	The last approved halo type cross-item elasticity.

After reviewing the HALO elasticity analysis parameters, continue to the [Anchor and Min/Max Price Analysis Tab](#).

## Anchor and Min/Max Price Analysis Tab

The Anchor and Min/Max Price Analysis tab includes the following worksheet:

- [Anchor and Min/Max Price Analysis Worksheet](#)

### Anchor and Min/Max Price Analysis Worksheet

The Anchor and Min/Max Price Analysis tab provides information on the historical anchor, and minimum and maximum ticket price.

**Figure 4–12 Anchor and Min/Max Price Analysis Worksheet**

Location	Merchandise	Item 1	Item 2	Item 3
0				
Historical anchor price.		0.00	899.00	0.00
Minimum historical ticket price.		0.00	899.00	0.00
Maximum historical ticket price.		0.00	1190.00	0.00
Max Price % Down		0.00	39.66	0.00
Max Price % Up		0.00	0.00	0.00

Measure < [ ] >

Table 4–7 describes the measures in the this worksheet:

**Table 4–7 Measures in the Anchor and Min/Max Price Analysis Worksheet**

Measure	Measure Description
Historical anchor price.	The calculated historical anchor price.
Minimum historical ticket price.	The calculated minimum historical ticket price.
Maximum historical ticket price.	The calculated maximum historical ticket price.
Max Price % Down	Displays the maximum percent price drop that happened in the price history.
Max Price % Up	Displays the maximum percent price increase that happened in the price history.