SAS® GLOBAL FORUM 2017

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Supplier Negotiations Optimized with SAS Enterprise Guide

Save Time and Money

USERS PROGRAM

Supplier Negotiations Optimized with SAS Enterprise Guide

Cameron Jagoe, Dr. Denise J. McManus
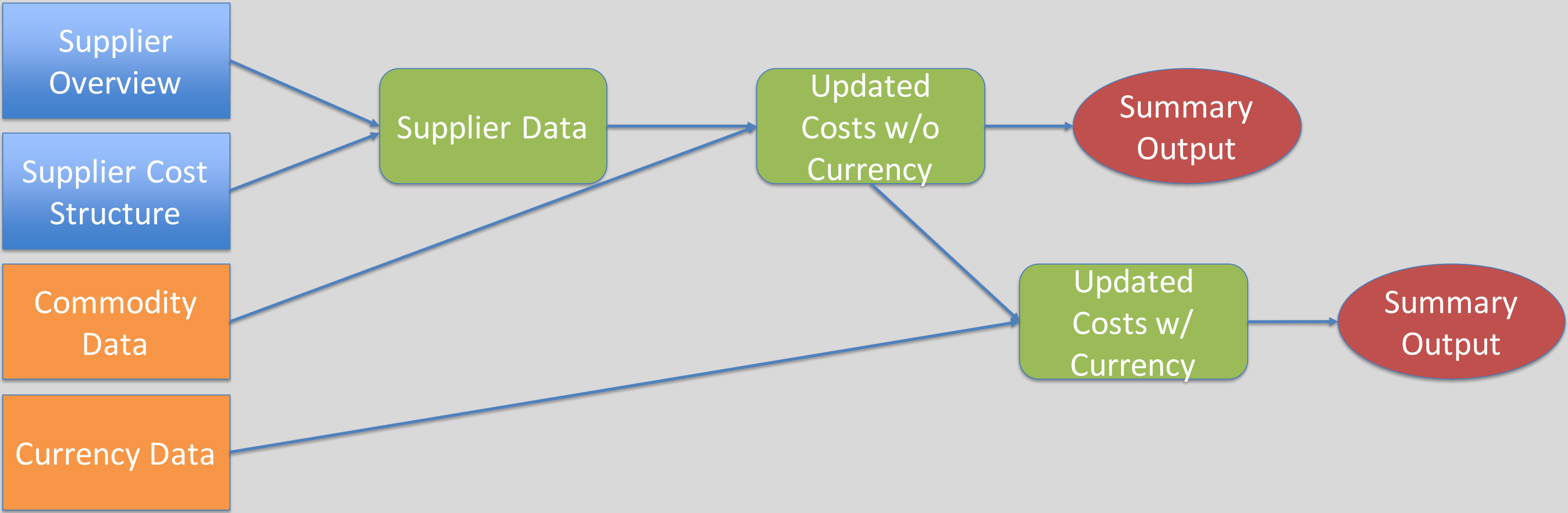
The University of Alabama

ABSTRACT

Every sourcing and procurement department has limited resources to execute on realizing productivity (cost savings). In practice, a large portion of organizations simply schedule yearly pricing negotiations with their main suppliers, and do not deviate from that approach unless there is a very large swing in the underlying commodity. Using cost data gleaned from previous quotes and SAS Enterprise Guide, we can put in place a program and methodology that moves the practice from "gut instinct" to quantifiable and justifiable models that can easily be updated on a monthly basis. From these updated models, we can print a report of suppliers or categories to approach for cost downs, and suppliers or categories that we should work to hold current pricing. By having all cost models, commodity data and reporting functions within SAS EG, we are able to not only increase the precision and effectiveness of our negotiations, but also vastly decrease the load of repetitive work that has been traditionally placed on the supporting analysts. Now the analyst can execute the program, send the initial reports to the management team, and be leveraged for other projects and tasks. Moreover, the management team can have confidence in the analysis and the recommended plan of action.

METHODS

The goal of this project was to have a program that an analyst or manager could run on a monthly basis with minimal work, while still maintaining a high level of flexibility in the input data. To accomplish this, we constructed the program entirely within Enterprise Guide. This includes all data transformations, manipulations and cleansing. With this architecture our analyst can simply update two excel files (in orange), and then enter EG and run the program.
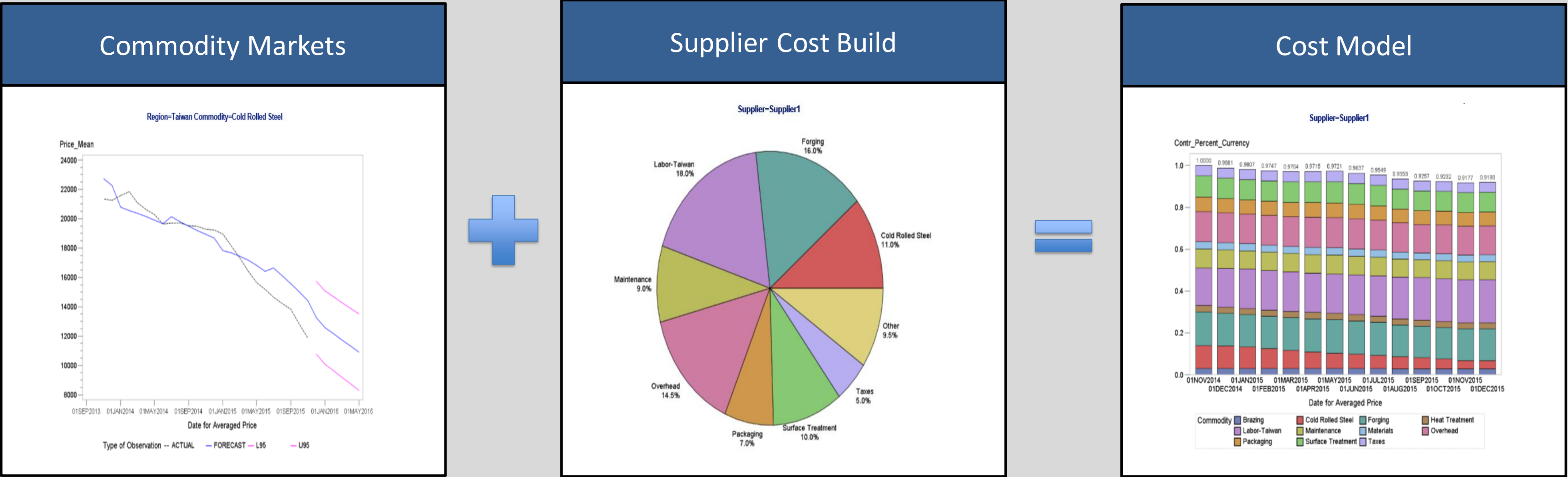
Figure 1, Simplified Program Flow

METHODS (cont)

With those two files updated, the program can then join all supplier data to its relevant commodity data and currency data. For commodities or cost drivers that are not contained in the commodity file, the program either imputes it value based on the nearest commodity value based on date, or assigns it a constant that will not effect the end result.

Once all values are assigned, the program then locates the starting date values for each individual supplier (in our case varying between October 2013 and May 2015), and computes the percent change for each cost driver from that start date. The same process is also completed for the change in currency exchange rate.

Finally with all percent changes computed relative to each supplier's date baseline, the new cost structures are recalculated, and output as a stacked bar chart by date.

Figure 2, Outline of Program Methodology

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METHODS (cont)

After the baseline models are developed, the program builds forecasts for each cost driver. Using these forecasts a forward looking cost model is calculated for each supplier.

Figure 3, Example Forecast and Example Forecasted Cost Model
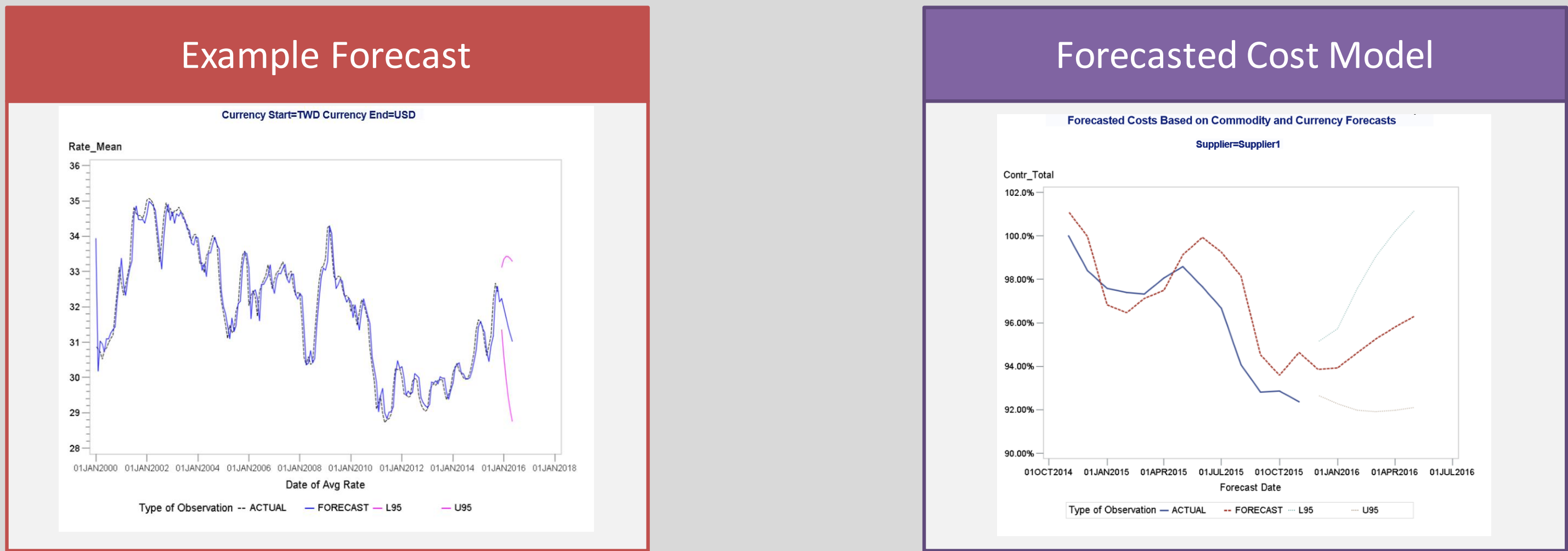
Next the program outputs an Executive summary dashboard. To insure that the dashboard can be accessed and viewed by all relevant parties, it was saved as a pdf through the ODS system.
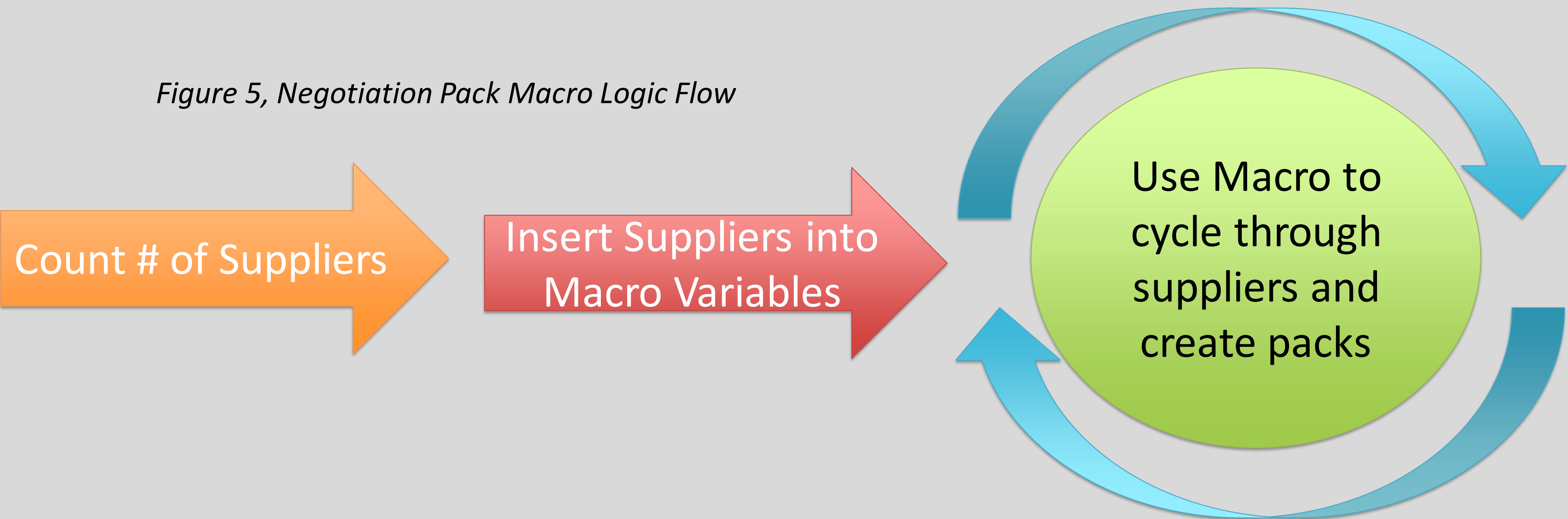
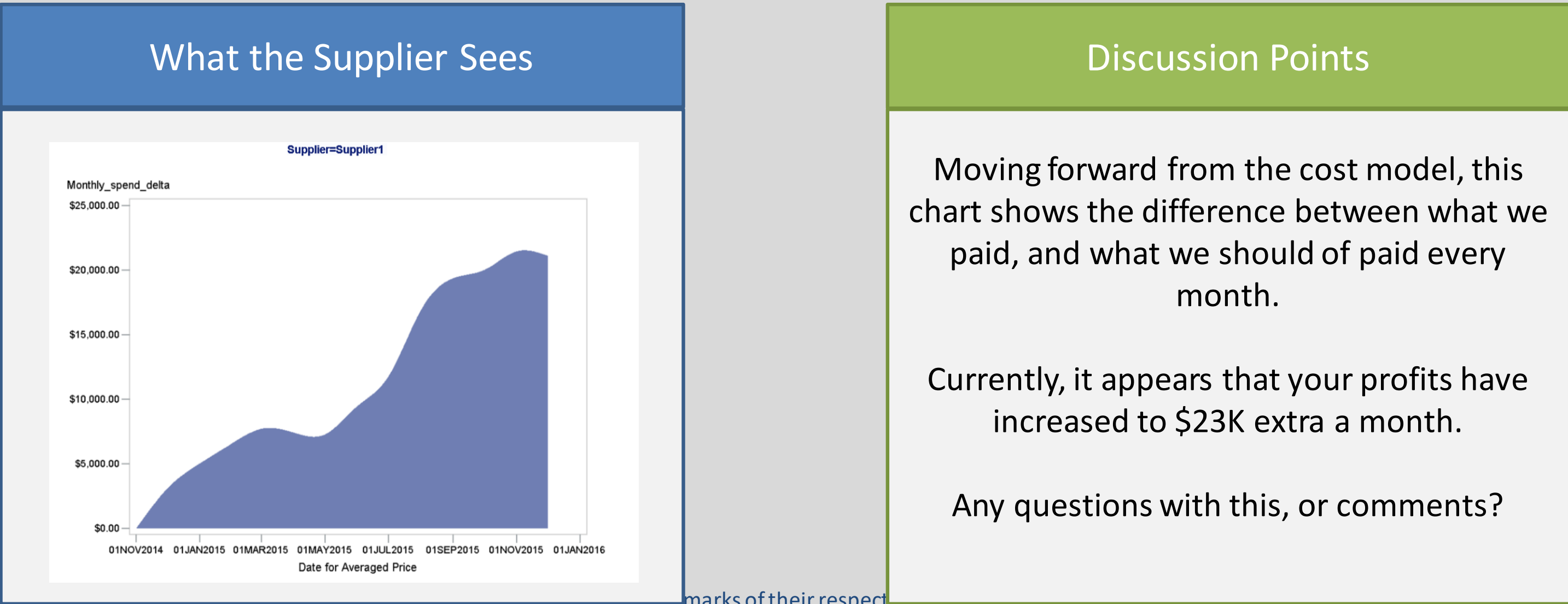*Figure 4, Executive Summary Layout*
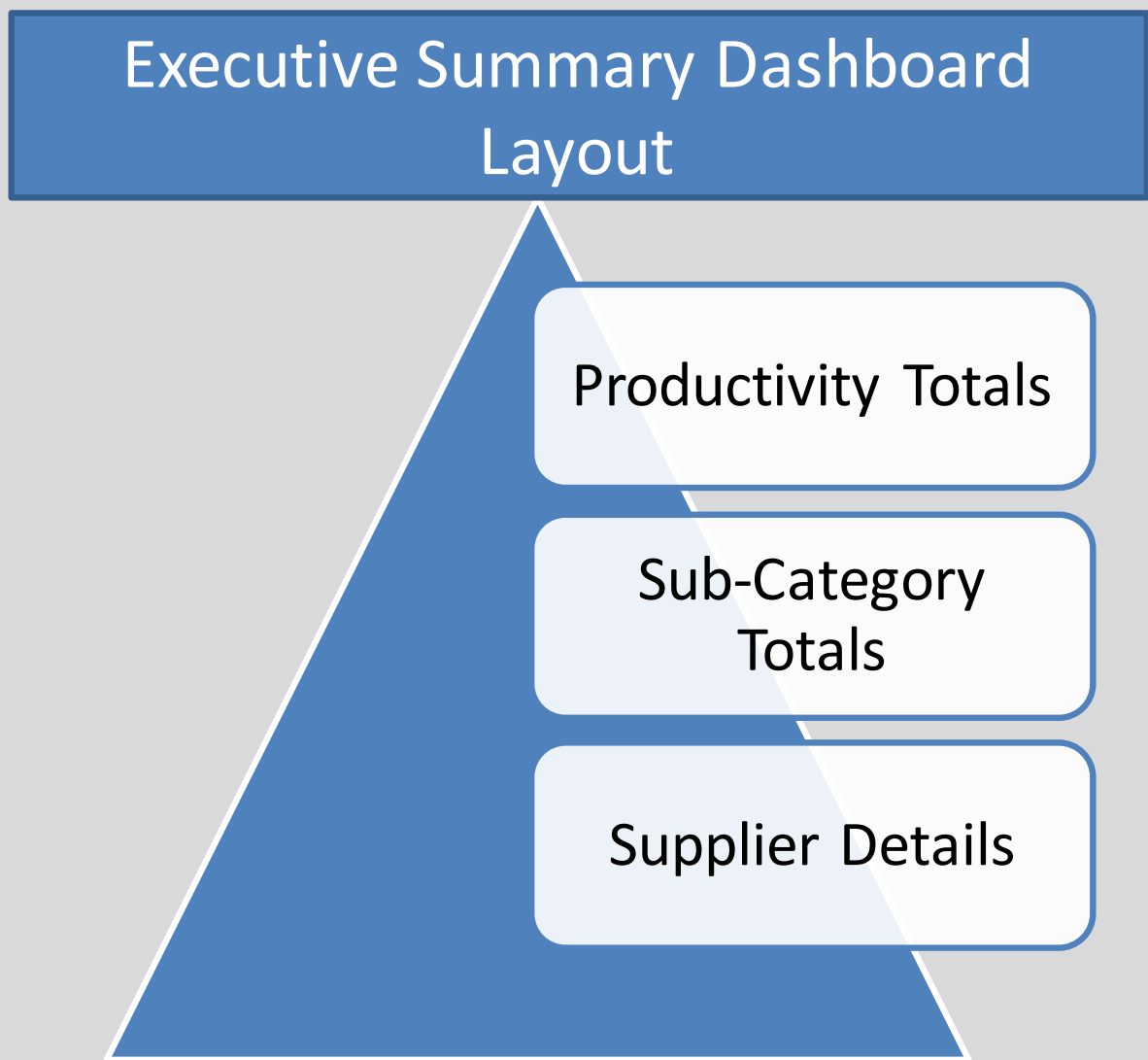
METHODS (cont)

To create individualized negotiations packs for each suppliers, while retaining full program flexibility, required the writing of a macro program. As with the summary dashboard, these packs were saved as pdfs through ODS.

Figure 5, Negotiation Pack Macro Logic Flow

Count # of Suppliers → Insert Suppliers into Macro Variables → Use Macro to cycle through suppliers and create packs

These negotiation packs include historical/forecasted graphs of all cost drivers, the current cost build, the forecasted cost build, and a plot of the difference in "should-cost" and actual cost over time. The sourcing team can use these packs as a guide and reference during negotiations, as they contain the majority of information relevant to the pricing discussion.

Figure 6, Negotiation Pack Example Page: Monthly Spend Differences

What the Supplier Sees

Discussion Points

Moving forward from the cost model, this chart shows the difference between what we paid, and what we should of paid every month.

Currently, it appears that your profits have increased to $23K extra a month.

Any questions with this, or comments?

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RESULTS

The two tables below summarize the results we were able to deliver utilizing the proof-of-concept of this methodology during negotiations in December 2015. The proof-of-concept was developed using excel, and took roughly two weeks to build. In contrast, the SAS version only required three days of work from start to finish. Furthermore, if updated models and negotiations packs are needed, the SAS version can provide those in several minutes, whereas the Excel version would take roughly one week.

Figure 7, Methodology Field Results, December 2015

Planned Negotiations

- 45 Suppliers
- 4 Suppliers have not responded to annual "asks" in multiple years.
- $2M productivity target based on old methodology.

New Methodology Results

- $12.5M annual productivity estimated from new process.
- All suppliers responded, and provided team with ancillary benefits (better terms, etc).
- $9.8M annual productivity captured. A 490% increase over original target.

CONCLUSIONS

While these cost builds are not overly sophisticated, they have proven to be extraordinarily effective in negotiations. By providing an automated, validated, method for determining and viewing the current and projected cost landscape, the sourcing team can devote less resources to basic analysis, while still improving the analytical foundation of their decisions and negotiations.
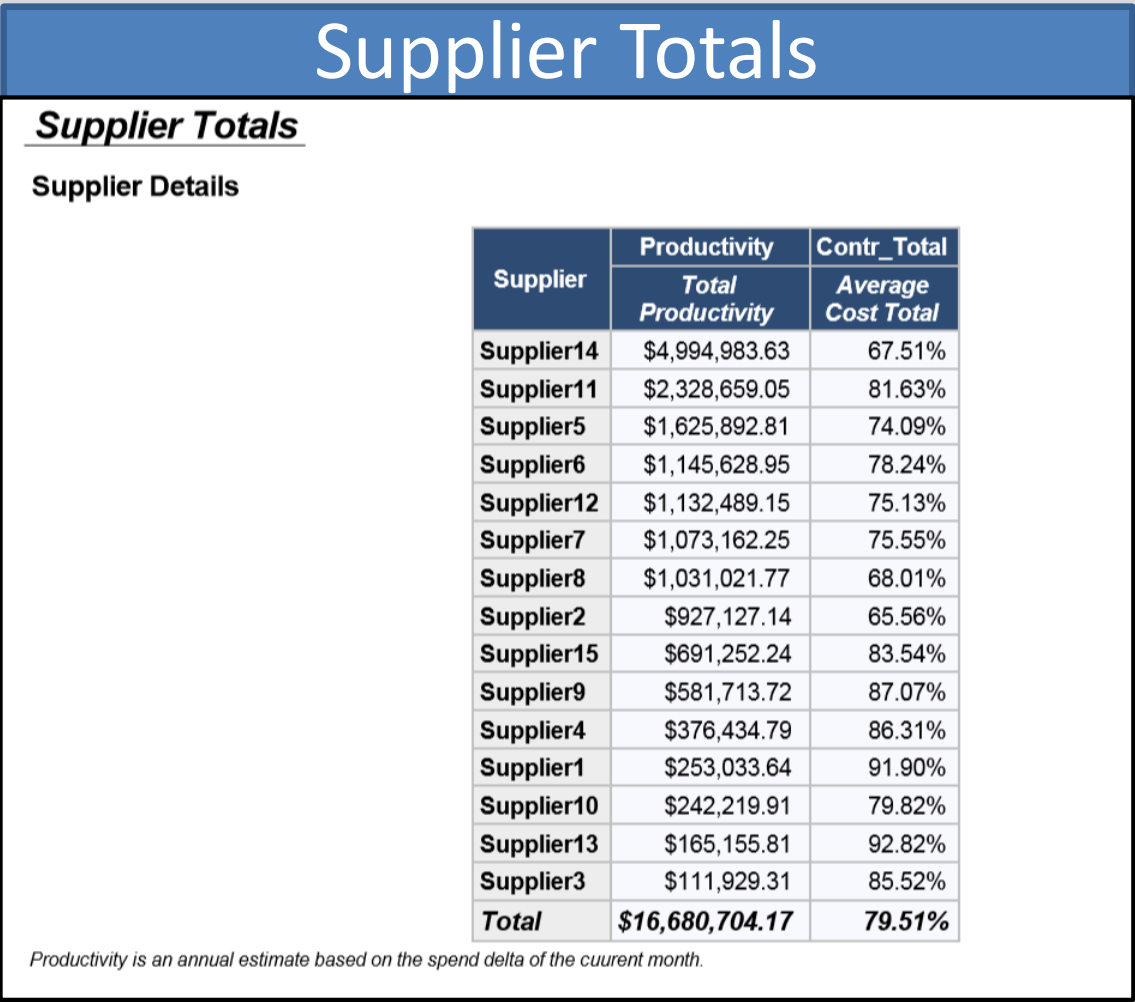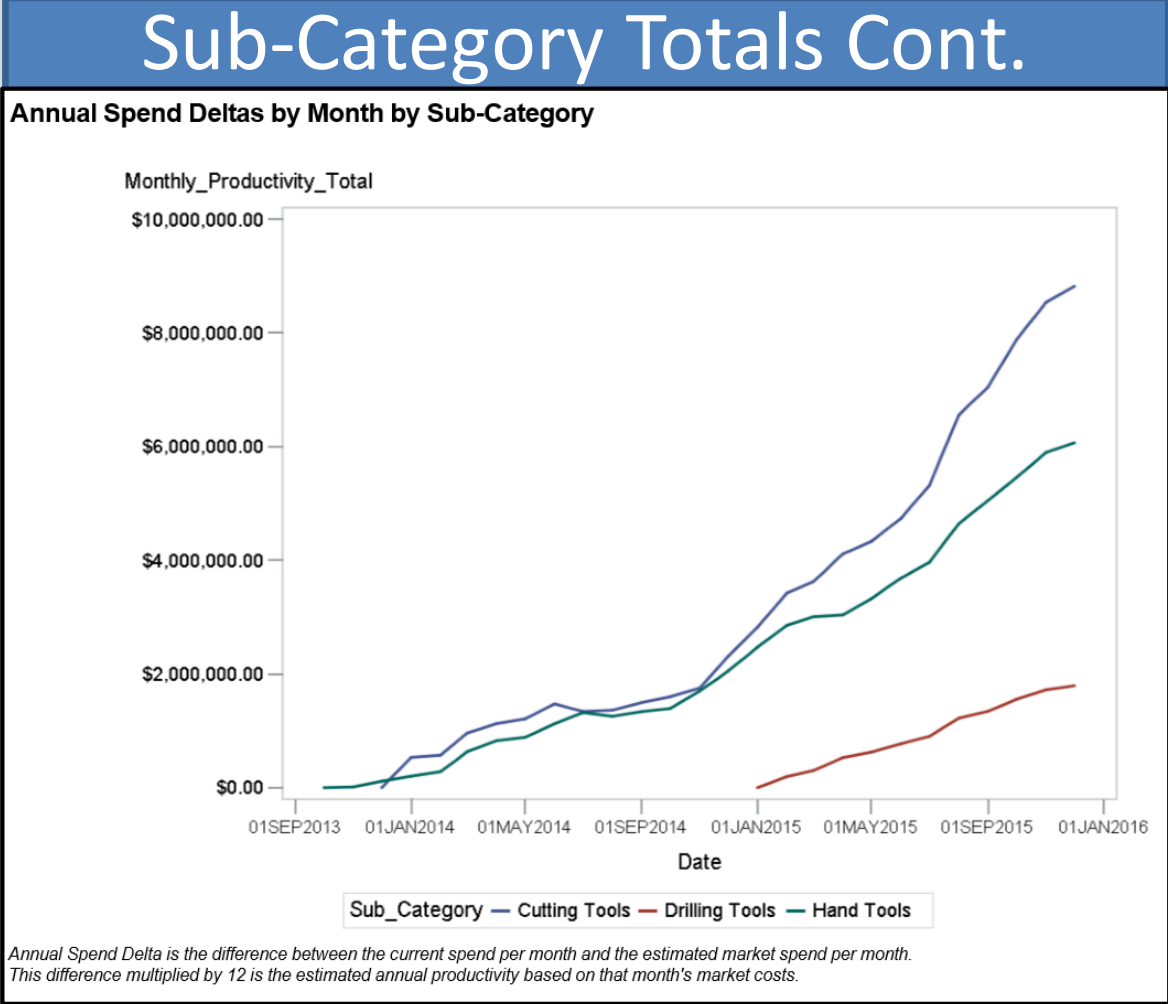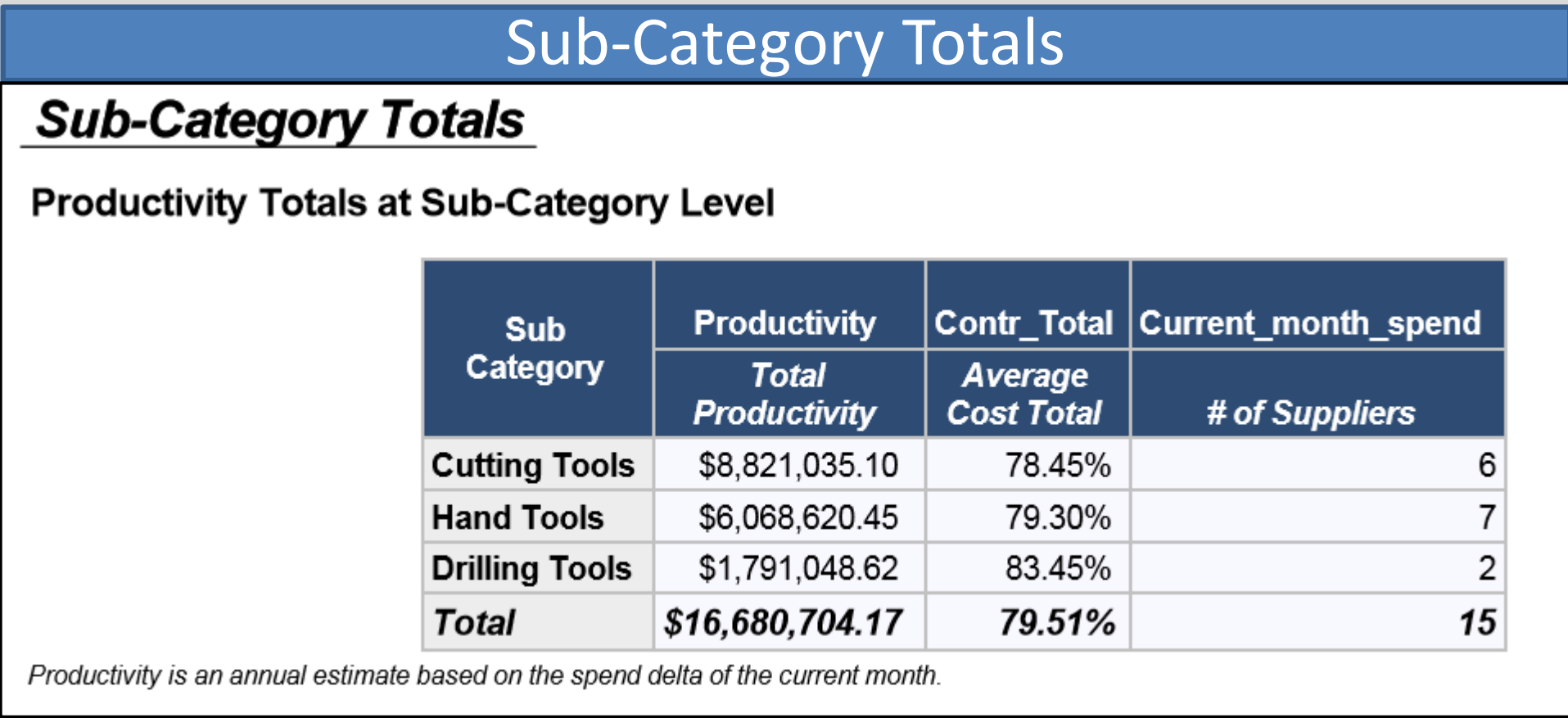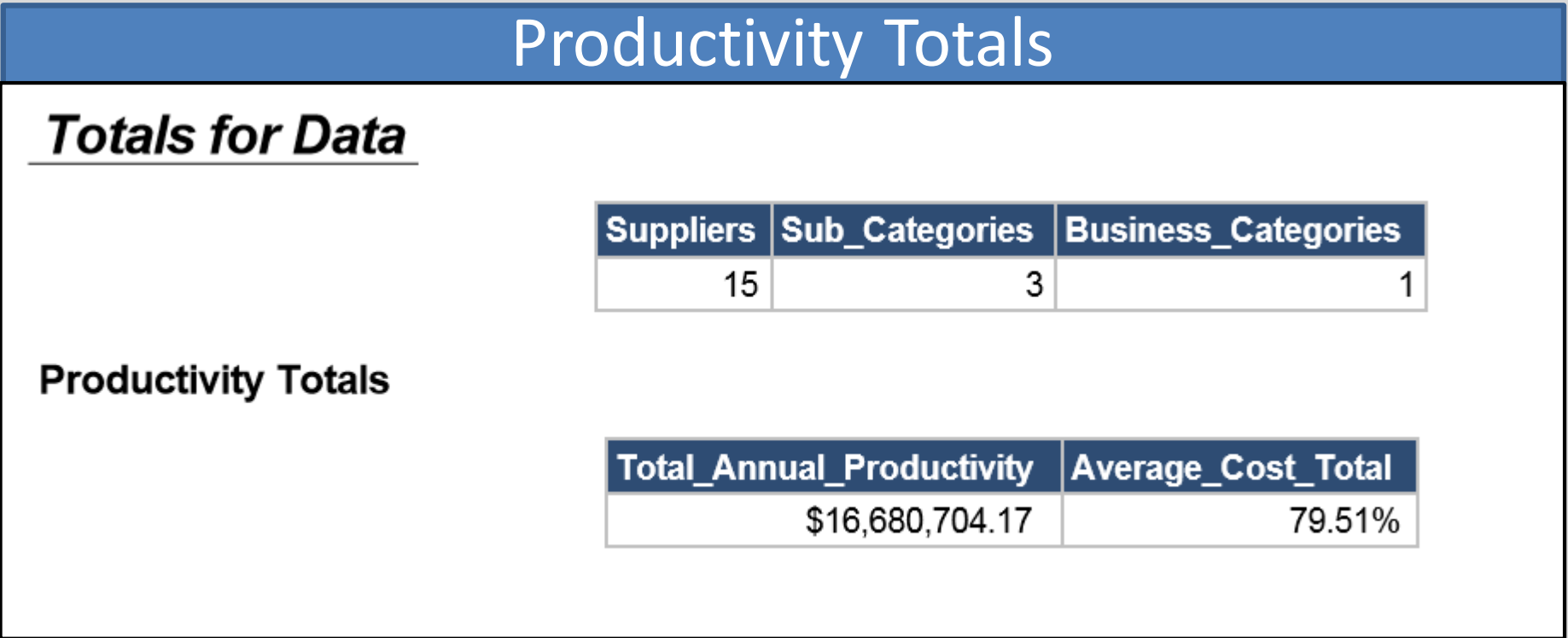
Net takeaway?

SAS EG → Saves Time → Saves Money

Leads to BETTER Decisions

REFERENCES

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Executive Dashboard Examples

Productivity Totals

Totals for Data

Suppliers	Sub_Categories	Business_Categories
15	3	1

Productivity Totals

Total_Annual_Productivity	Average_Cost_Total
$16,680,704.17	79.51%

Sub-Category Totals

Sub-Category Totals

Productivity Totals at Sub-Category Level

Sub Category	Productivity Total Productivity	Contr_Total Average Cost Total	Current_month_spend # of Suppliers
Cutting Tools	$8,821,035.10	78.45%	6
Hand Tools	$6,068,620.45	79.30%	7
Drilling Tools	$1,791,048.62	83.45%	2
Total	$16,680,704.17	79.51%	15

Productivity is an annual estimate based on the spend delta of the current month.

Sub-Category Totals Cont.

Annual Spend Deltas by Month by Sub-Category

Monthly_Productivity_Total

Annual Spend Delta is the difference between the current spend per month and the estimated market spend per month. This difference multiplied by 12 is the estimated annual productivity based on that month's market costs.

Supplier Totals

Supplier Totals

Supplier Details

Supplier	Productivity Total Productivity	Contr_Total Average Cost Total
Supplier14	$4,994,983.63	67.51%
Supplier11	$2,328,659.05	81.63%
Supplier5	$1,625,892.81	74.09%
Supplier6	$1,145,628.95	78.24%
Supplier12	$1,132,489.15	75.13%
Supplier7	$1,073,162.25	75.55%
Supplier8	$1,031,021.77	68.01%
Supplier2	$927,127.14	65.56%
Supplier15	$691,252.24	83.54%
Supplier9	$581,713.72	87.07%
Supplier4	$376,434.79	86.31%
Supplier1	$253,033.64	91.90%
Supplier10	$242,219.91	79.82%
Supplier13	$165,155.81	92.82%
Supplier3	$111,929.31	85.52%
Total	$16,680,704.17	79.51%

Productivity is an annual estimate based on the spend delta of the current month.

ODS Custom Template (example)

```
ods escapechar="~";
%let heading1=~S={font_size=16pt font_style=italic font_weight=bold
text_decoration=underline}~;
%let heading2=~S={font_size=12pt font_weight=bold}~;
%let footnote1=~S={font_size=8pt font_style=italic}~;


proc template;
    define crosstabs base.freq.crosstabfreqs;
        define header myheader;
            text ' ';
        end;
    end;
run;
proc template;
    define style mystyle;
        parent=styles.htmlblue;
        class body /
            backgroundcolor=white
            color=black
            fontfamily="Arial, Helvetica, Helv";
        class usertext /
            backgroundcolor=white
            color=black
            borderstyle=none
            fontfamily="Arial, Helvetica, Helv";
        class header /
            backgroundcolor=stgb
            color=white
            fontfamily="Arial, Helvetica, Helv"
            fontsize=10pt;
```

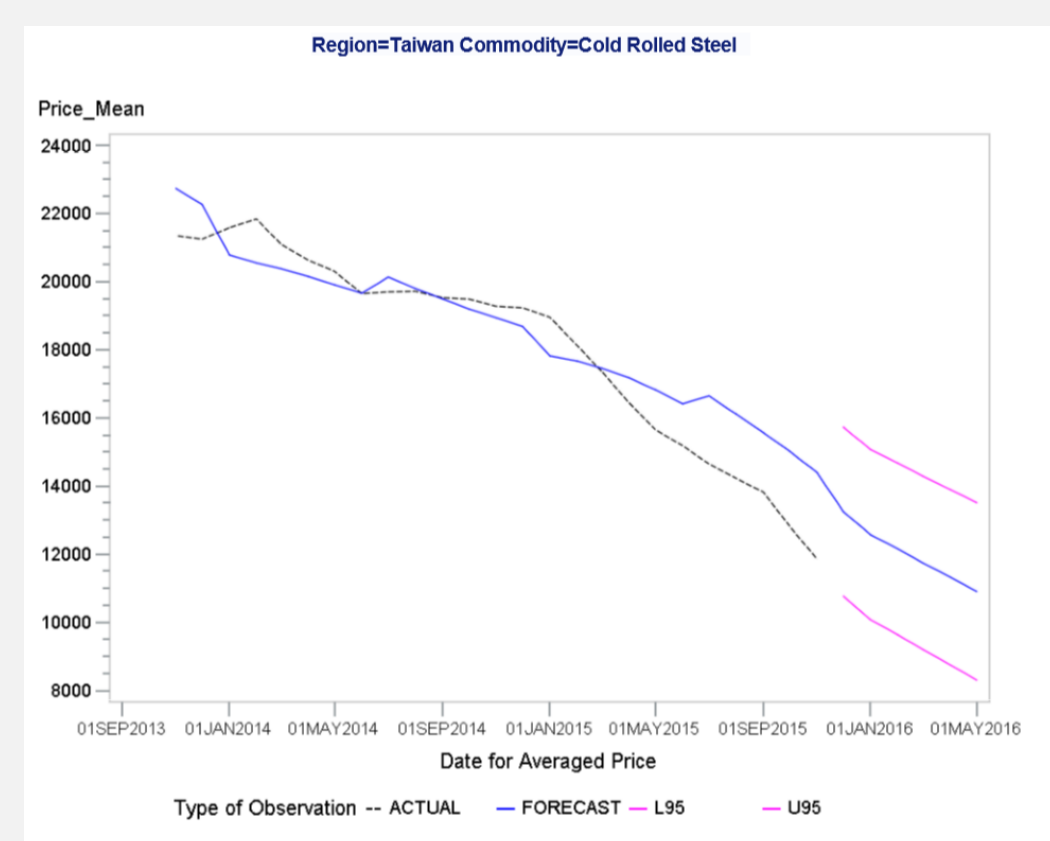# Supplier Negotiations Optimized with SAS Enterprise Guide

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Example Supplier Negotiation Pack Pages

Commodity Pricing

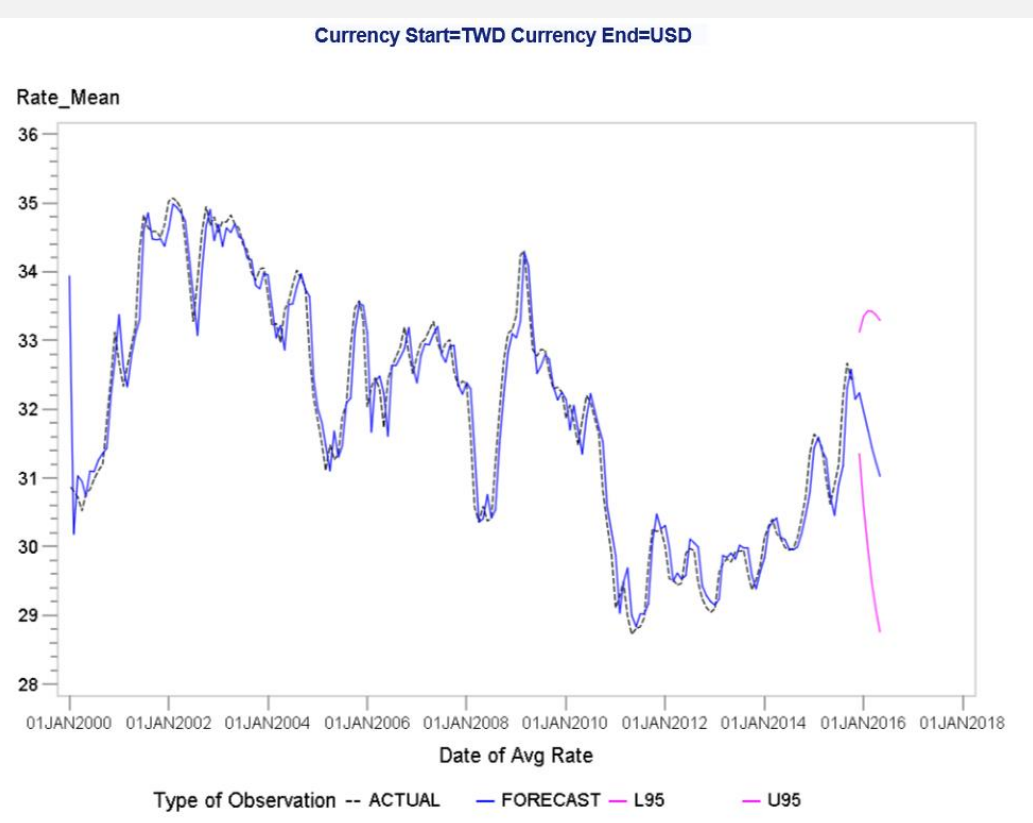| What the Supplier Sees |
| --- |

Discussion Points

This is what we are seeing in the Taiwanese steel market.

Do you agree with what's shown here?

What trends, or pricing have you seen from your purchasing?
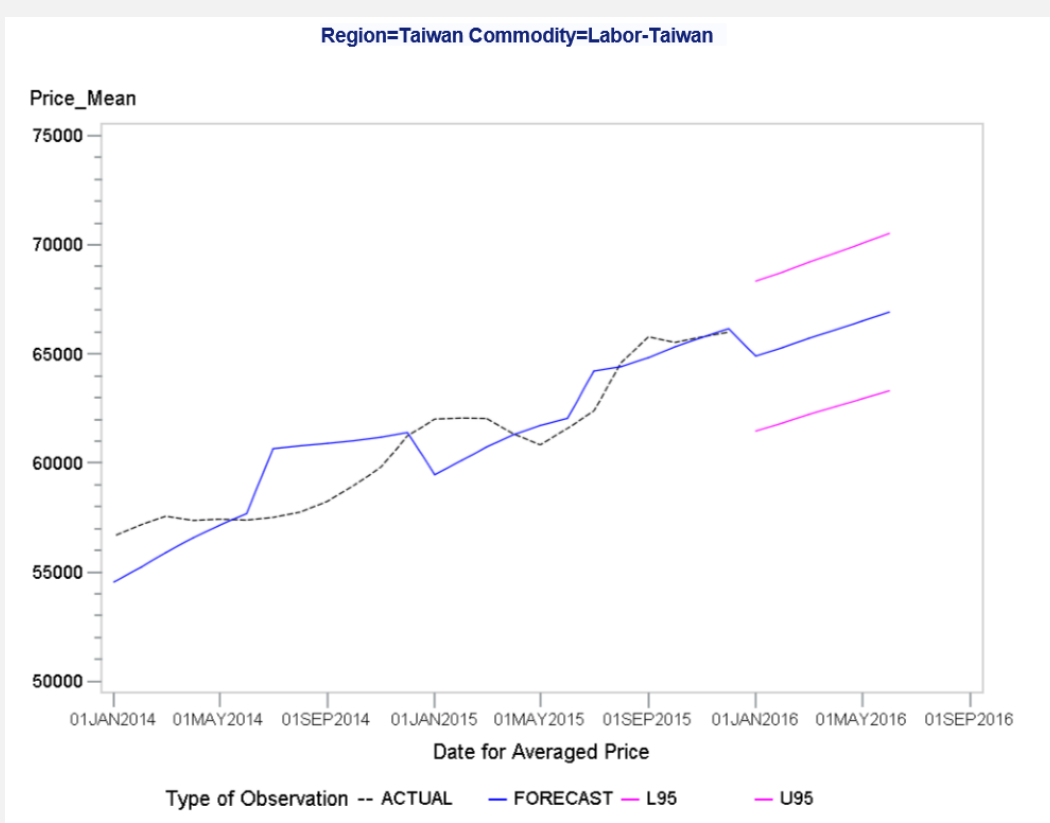
Currency Rates

What the Supplier Sees

Discussion Points

According to the banks, this is how the Taiwanese Dollar has traded with the US Dollar.

Do you agree with what's shown here?

What trends, or rates have you seen from your sources?

Labor Rates

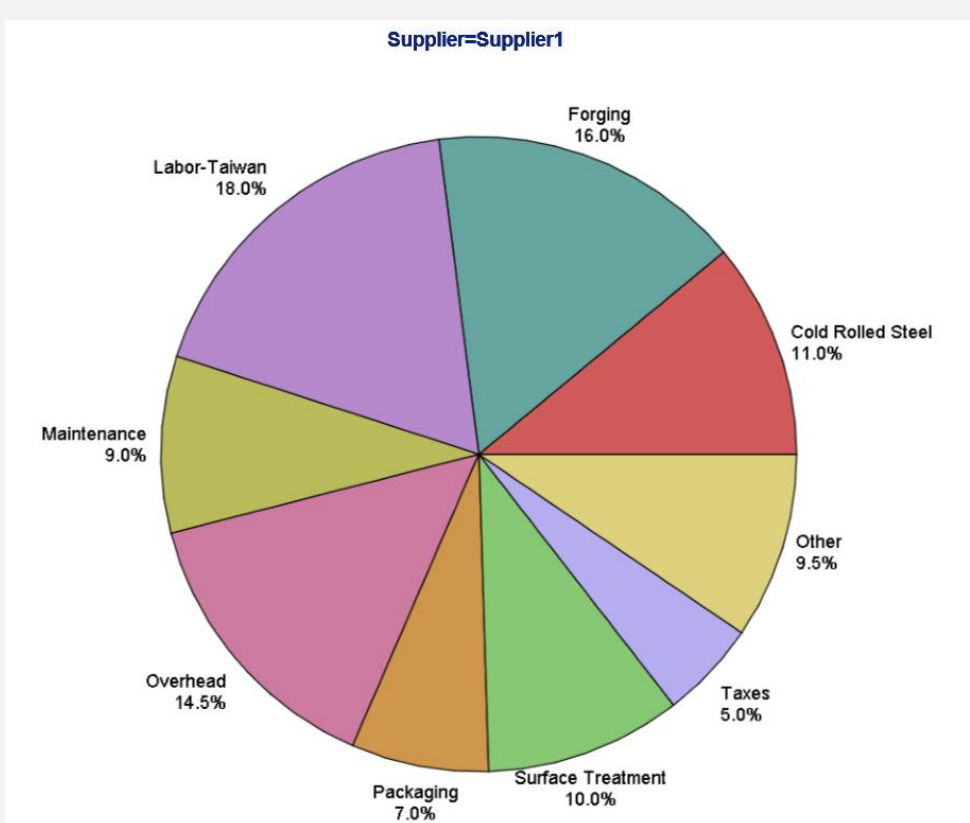| What the Supplier Sees |
| --- |

Discussion Points

This is what we have experienced with the Taiwanese labor market for manufacturing.

Do you agree with what's shown here?

What trends, or rates have you seen from your own hiring?

Cost Build

What the Supplier Sees

Discussion Points

This chart shows the estimated average cost on your pricing for each cost driver. It is based upon prior RFQs, and discussions.

Do you agree with what's shown here?

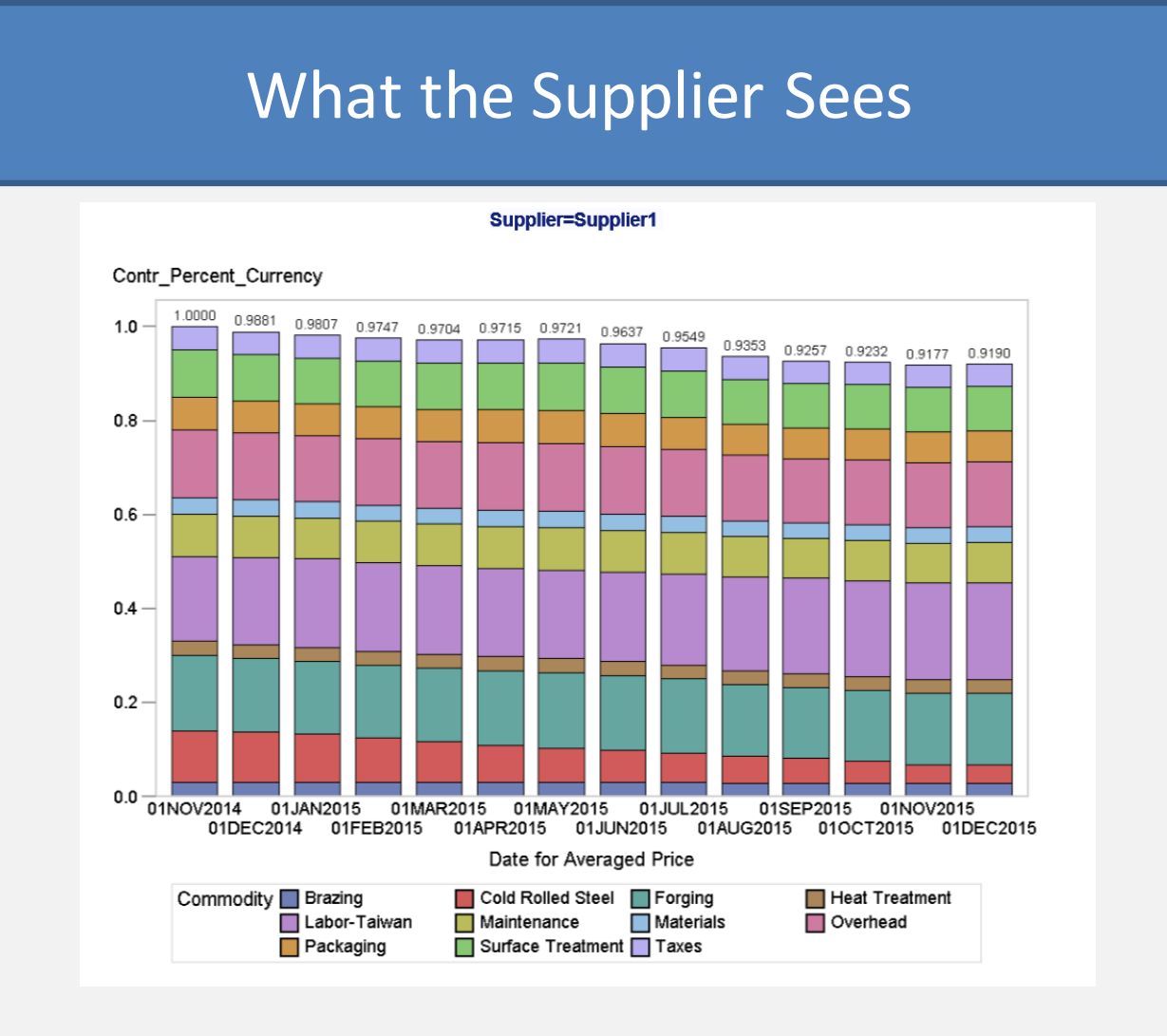Any questions with this, or comments?

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Example Supplier Negotiation Pack Pages (cont)
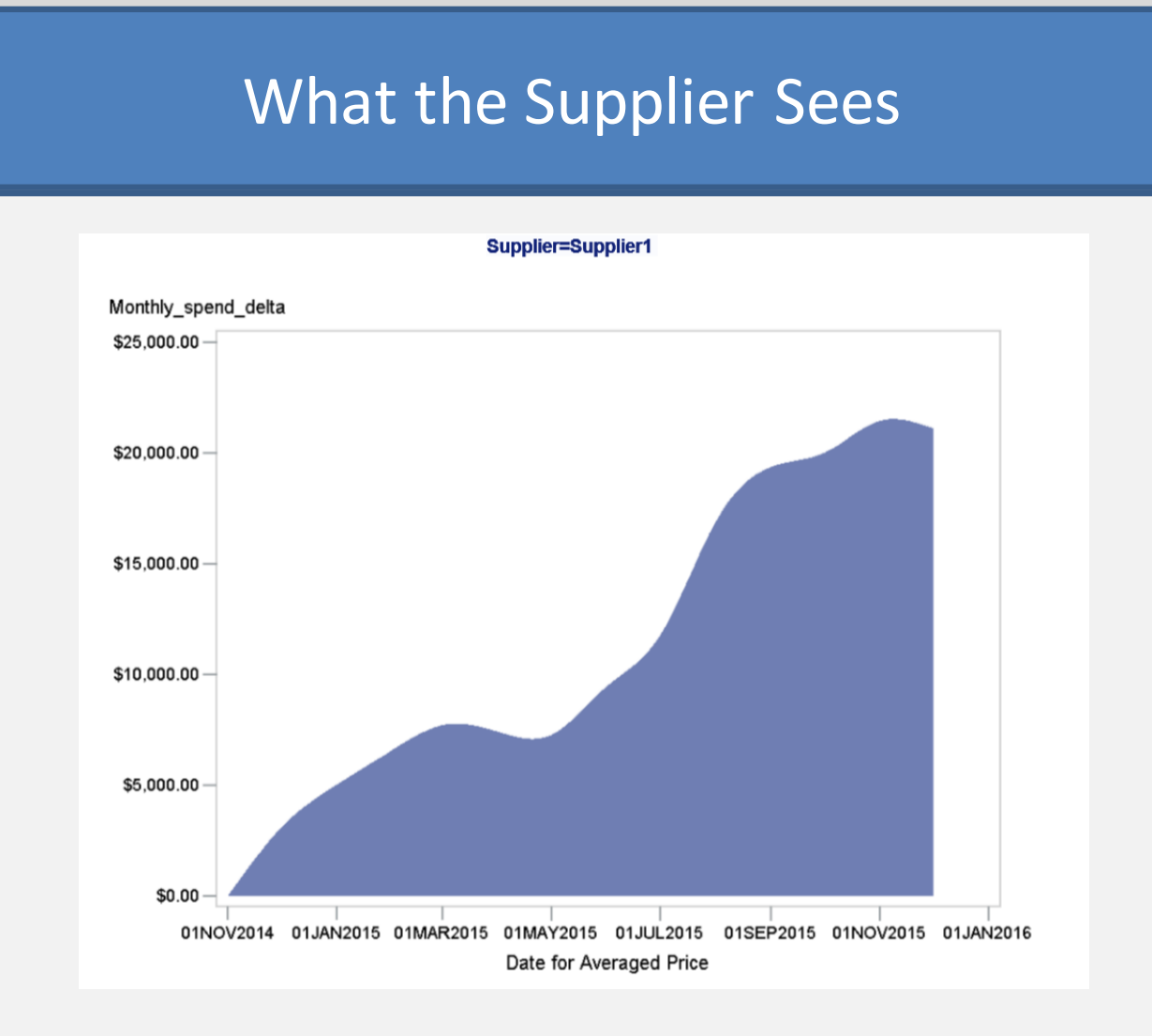
Cost Model

What the Supplier Sees

Discussion Points

Based on the prior commodity costs, this chart shows how your cost structure should changed over time.

This chart has your costs starting at 100% from the date of our last negotiations.

Do you agree with what's shown here? Any questions with this, or comments?

Monthly Spend Delta

What the Supplier Sees

Discussion Points

Moving forward from the cost model, this chart shows the difference between what we paid, and what we should of paid every month.

Currently, it appears that your profits have increased to $23K extra a month.

Any questions with this, or comments?

Negotiation Pack Macro Code (example)

```sas
/* create macro variables for execution of the macro supplierpack */
proc sql;
        select cats(count(distinct supplier)) into :suppcount
        from 'SUPPLIER COST BUILDS'n;
quit;

proc sql ;
        select distinct supplier into :supp1-:supp&suppcount
        from 'SUPPLIER COST BUILDS'n;
quit;


%macro supplierpack;

%do iter=1 %to &suppcount;

/* Saving to PDF File */

ods pdf file="C:\Users\cejagoe\Documents\&&supp&iter CostNegotiationPack.pdf"
style=mystyle;
ods noproctitle;


/*Forecasts of Commodities and Currencies */
TITLE1 "Basic Forecasting";
TITLE2 "Forecasts";
TITLE3 "Plot of Forecast from Additive Winters Method (using PROC FORECAST)";
PROC GPLOT DATA = WORK.COMM_FORECAST NOCACHE;
        PLOT (Price_Mean) * Date = _TYPE_ /;
        SYMBOL1 I=JOIN V=NONE C=BLACK L=4;
        SYMBOL2 I=JOIN V=NONE C=BLUE L=1;
        SYMBOL3 I=JOIN V=NONE C=MAGENTA L=1;
        SYMBOL4 I=JOIN V=NONE C=MAGENTA L=1;
        WHERE _TYPE_ ^= 'RESIDUAL' & _TYPE_ ^= 'STD';
        BY Region Commodity;
RUN;
```

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Commodity Data Imputation Code

```sas
proc sql;
        create table commodity_data_prep as
        select *,
        min(date) as earliest_comm_date, max(date) as latest_comm_date
        from summ_commodity_date_create
        group by commodity, region;
quit;
proc sql;
        create table comm_data_summ_prep as
        select a.region, a.currency, a.commodity, a.units, a.date,
a.earliest_comm_date, a.latest_comm_date, a.price_mean, b.price_mean as
earliest_price
        from commodity_data_prep as a
        left join
        (select region, commodity, price_mean, date
        from summ_commodity_date_create) as b
        on b.date=a.earliest_comm_date and b.region=a.region and
                b.commodity=a.commodity
        order by a.region, a.commodity, a.date;
quit;
proc sql;
        create table comm_data_summ as
        select a.region, a.currency, a.commodity, a.units, a.date,
a.earliest_comm_date, a.latest_comm_date, a.price_mean, a.earliest_price,
b.price_mean as latest_price
        from comm_data_summ_prep as a
        left join
        (select region, commodity, price_mean, date
        from summ_commodity_date_create) as b
        on b.date=a.latest_comm_date and b.region=a.region and
                b.commodity=a.commodity
        order by a.region, a.commodity, a.date;
quit;
```
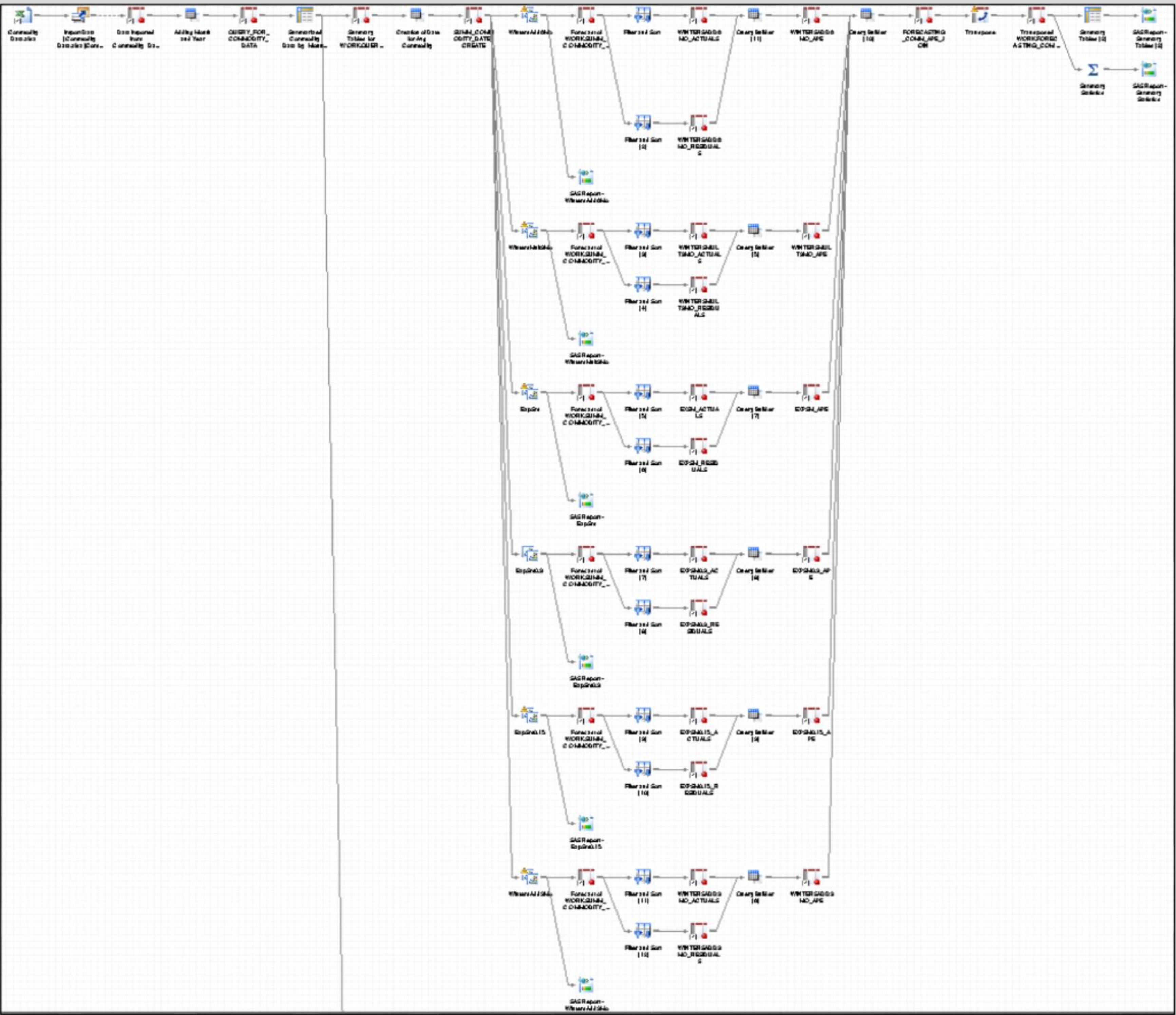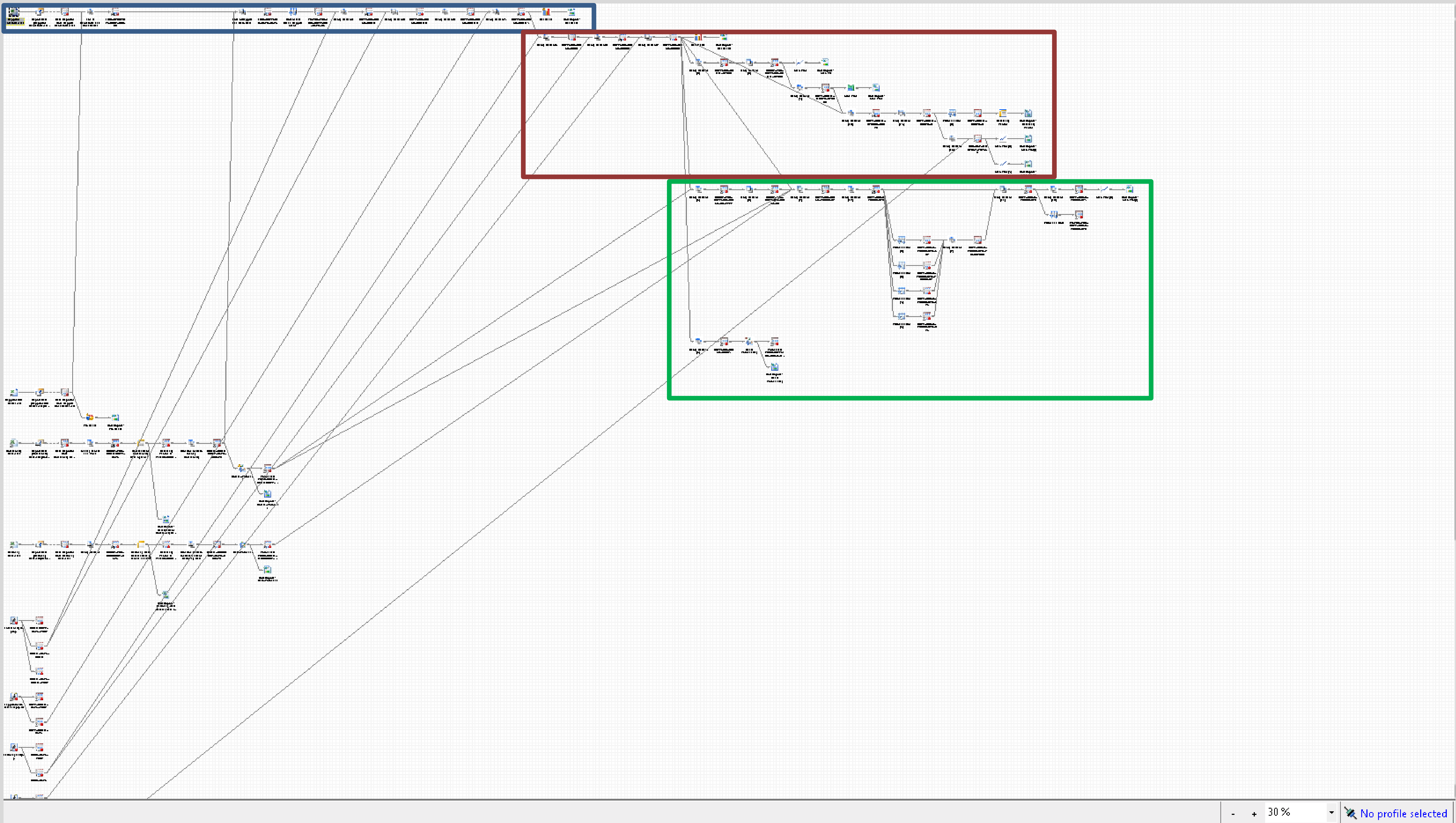
Process Flow for Estimated Commodity Forecasts

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Commodity Data Imputation Code

Blue Box:
Calculates the cost models without the effects of the currency markets.

Red Box:
Calculates the cost models with the effects of the currency markets.

Green Box:
Calculates the forecasted cost models. These forecasts are the amalgamation of the Individual forecasts for each cost driver, and include the forecasted rates and the 95% confidence bounds for the Forecasts.

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