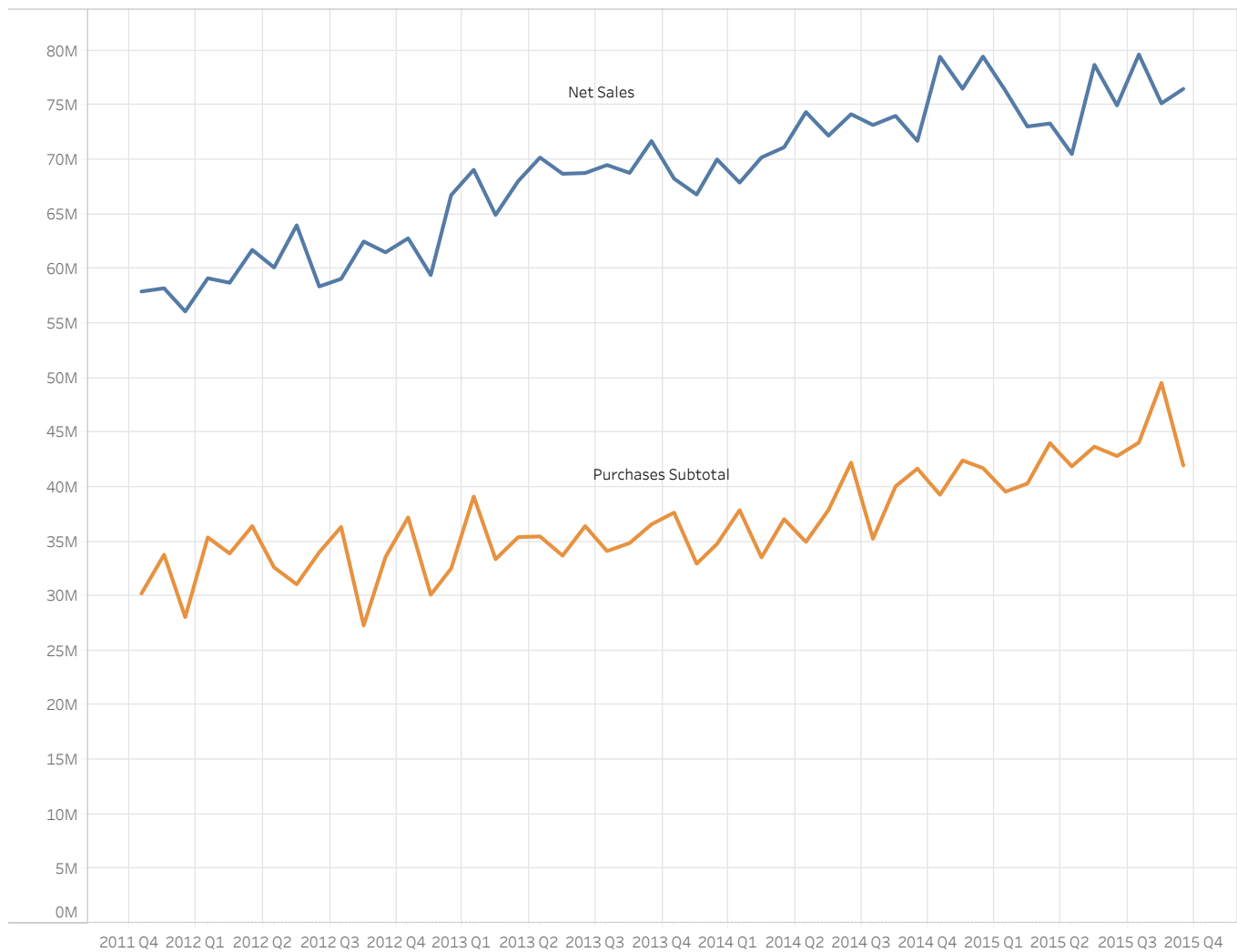


# Fraud Risks

Abnormal increase in purchases subtotals over time - may indicate kickback. The figure below compares net sales to purchases subtotals. Generally, net sales and purchases subtotals should be fairly consistent over time - is that the case here? If we look closely, we can find that there are some periods where purchases subtotals increase while net sales decrease.

With the dual combination of net sales (blue bars) and purchases subtotals (orange circles), the figure below shows the most ob..

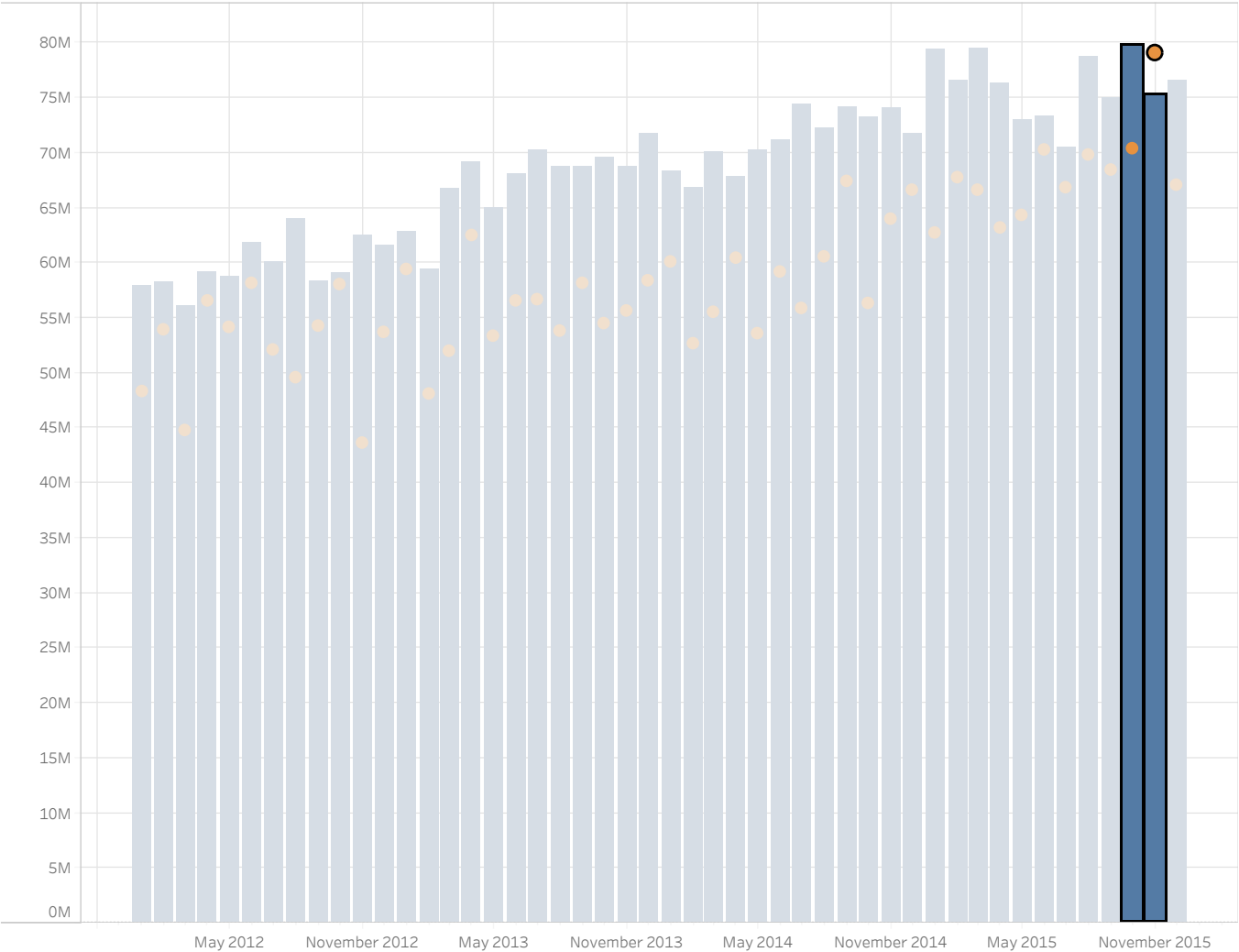


# Fraud Risks

Abnormal increase in purchases subtotals over time..

With the dual combination of net sales (blue bars) and purchases subtotals (orange circles), the figure below shows the most obvious inconsistency between sales and purchases: from October 2015 to November 2015, net sales decrease and purchases subtotal increase a lot and even become higher than net sales in November.

Let's take a look at the relationship between net sales and pu..



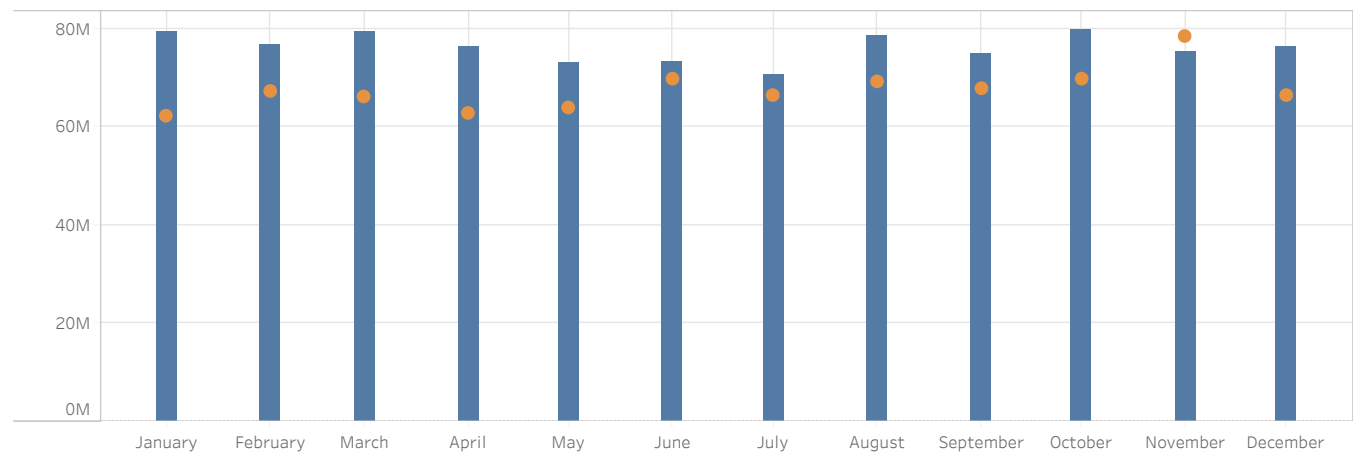
# Fraud Risks

With the dual combination of..

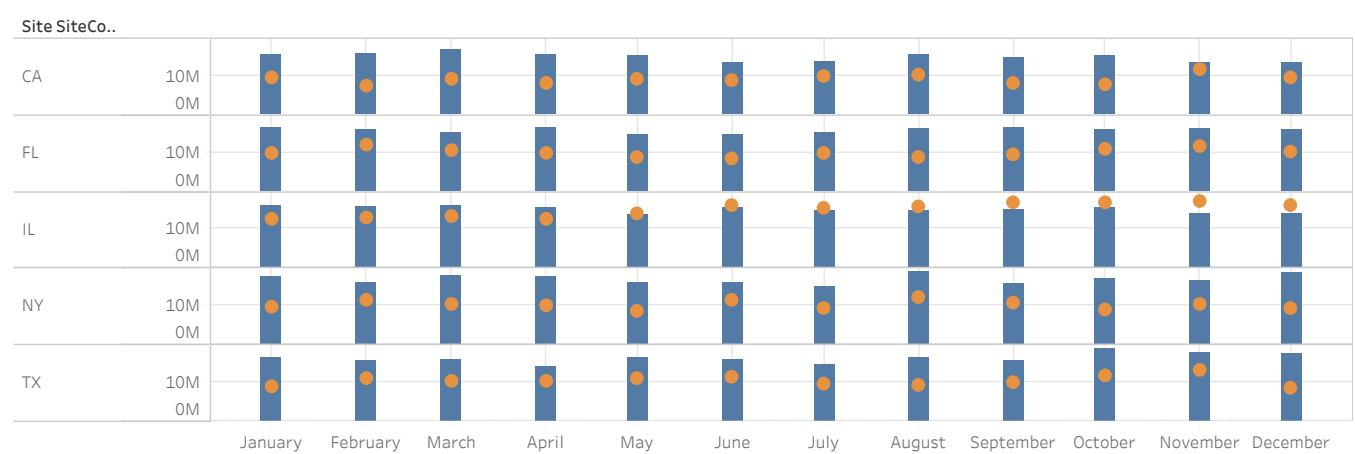
Let's take a look at the relationship between net sales and purchases subtotals in 2015 at company level. The comparison is more clear. Now at specific sites, does the relation between net sales and purchases subtotals look abnormal?

Purchases look abnormal in Illinois. What may cause t..

Company Level (2015)



Site Level (2015)



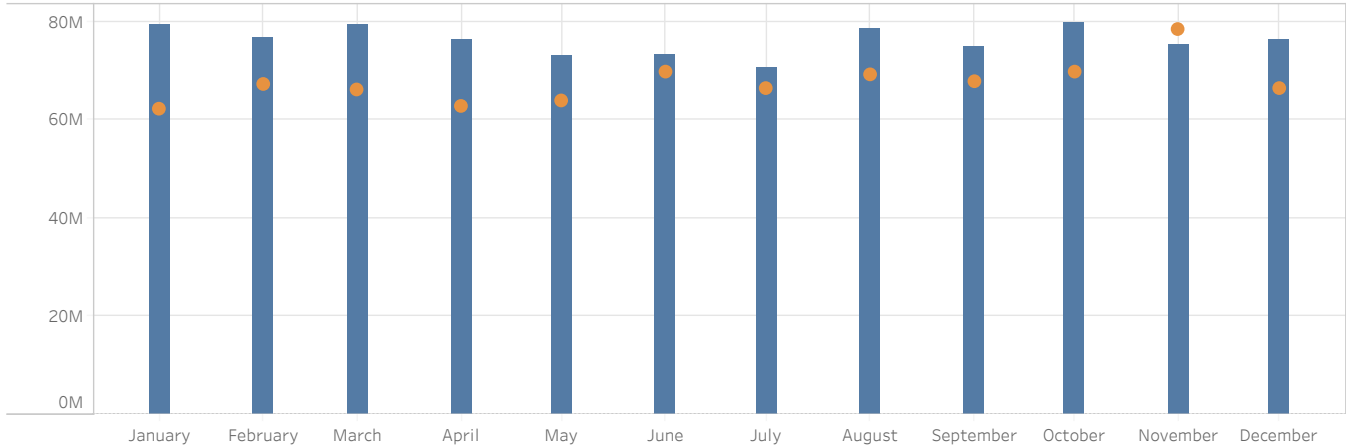
## Fraud Risks

Let's take  
a look at  
the  
relationsh.

Purchases look abnormal in Illinois. What may cause the abnormality in Illinois?

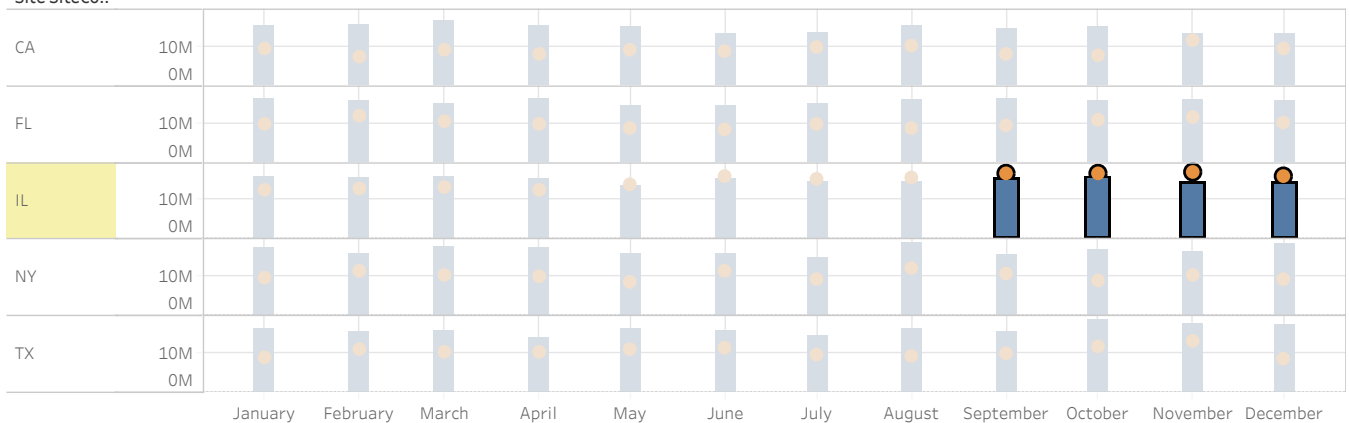
One possibility is that something goes wrong ..

Company Level (2015)



Site Level (2015)

Site SiteCo..

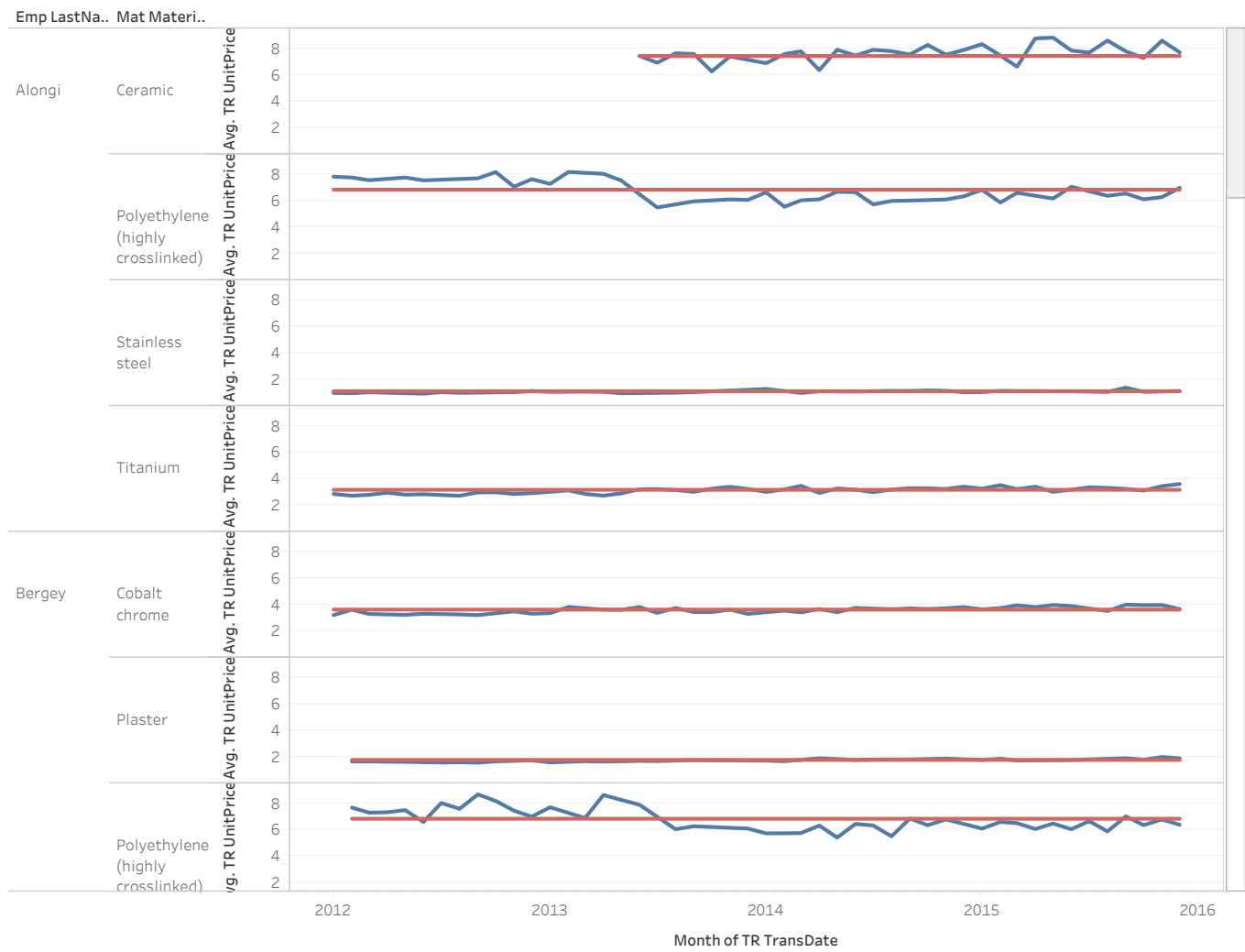


Fraud Risks

Purchases look abnormal in Illinois. What ma..

One possibility is that something goes wrong during the process that product managers purchase raw materials in Illinois. Let's first look at the comparison between average item unit prices (red lines) and average purchase unit price (blue lines).

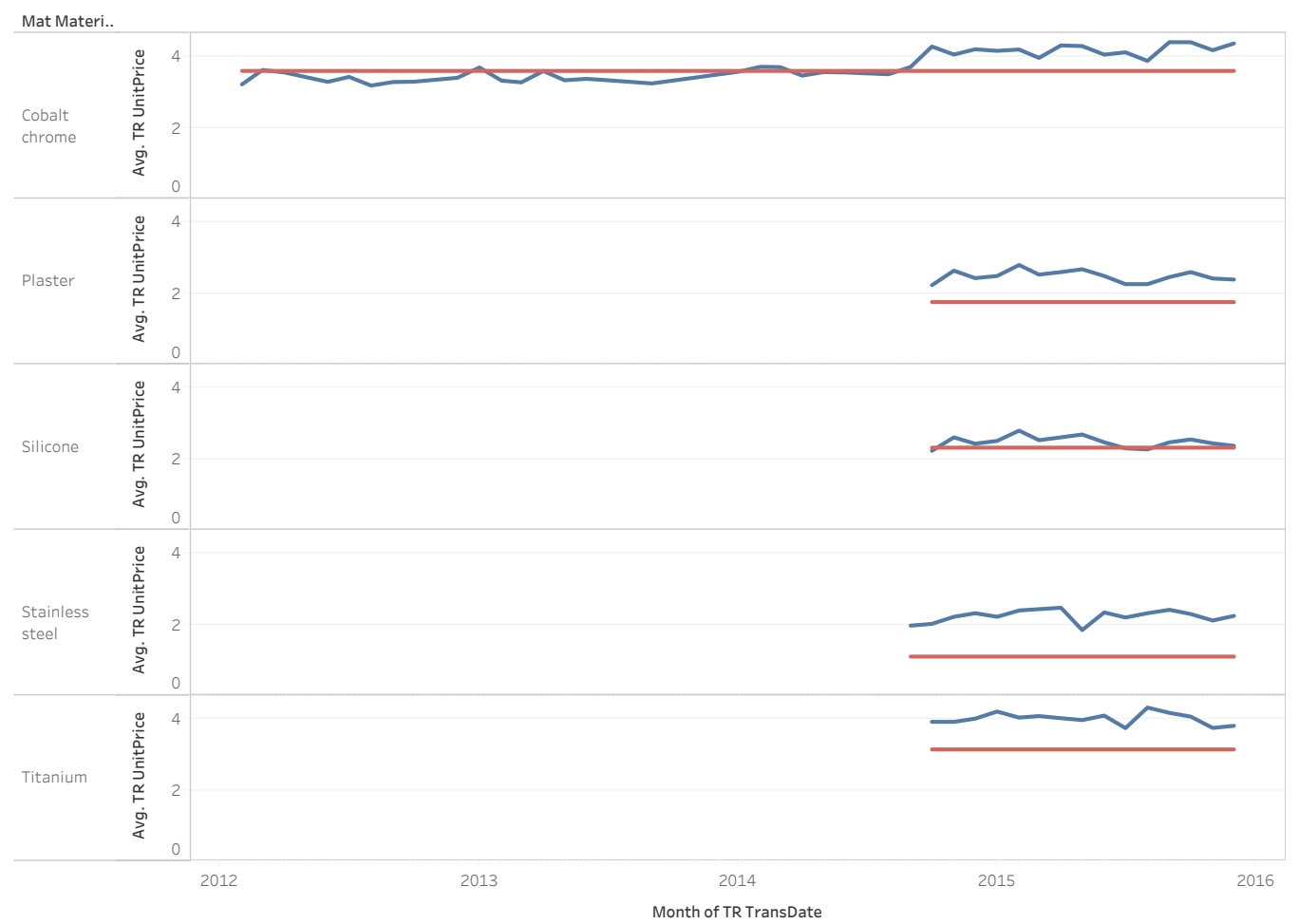
With specifically discovering, we can see that in Illino..



# Fraud Risks

One possibility is that something goes wro..	With specifically discovering, we can see that in Illinois, a product manager named Henderson has an abnormal increase in raw materials purchases unit costs compared to average item unit price. This abnormality may indicate the kickback associated with high fraud risk. (In this way, his performance can be improved so that he can get bonus as well.)	By the way, even if there seems to be some inconsistenc..
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## Henderson’s Raw Material Purchase (IL)



# Fraud Risks

With speci  
fically disc  
overin...

By the way, even if there seems to be some inconsistencies between average unit price of Polyethylene (highly crosslinked) and average purchase unit price, this may because of the fluctuations (first increase and then decrease) among the unit price of Polyethylene (highly crosslinked) itself. And the trends are similar for every product managers, so it is more likely to be normal.

We've proven  
that  
abnormal  
increase in  
raw materia..

## Polyethylene (Highly Crosslinked)



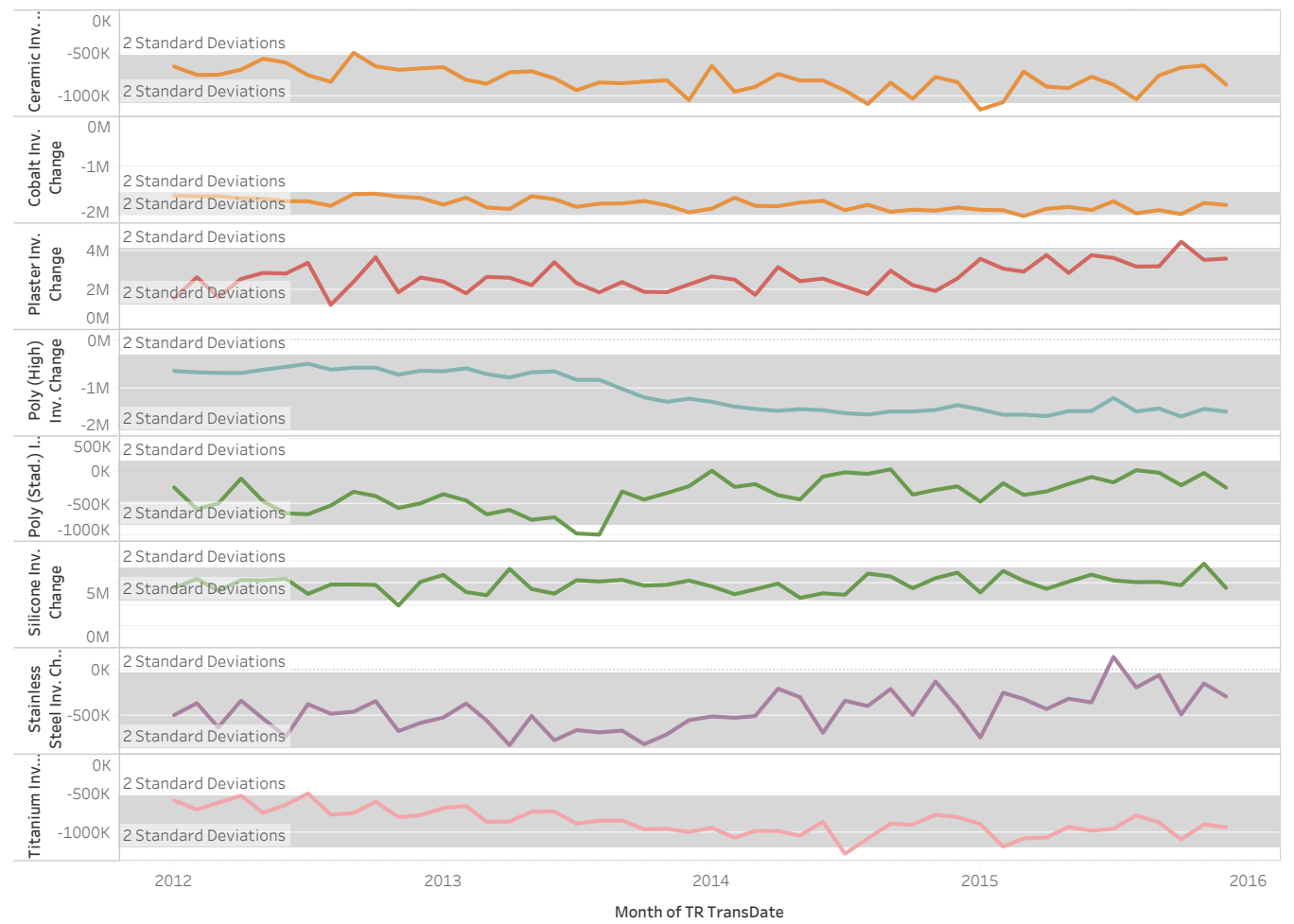
Fraud Risks

By the way, even if there seems to be some i..

We've proven that abnormal increase in raw materials purchases unit costs tends to be one driver of kickback. Now, let's take another look at whether abnormality in volume levels can be the factor of kickback. With the figure below, we can find that there are some unusual increase in inventory levels, under 2 standard deviations in our control charts. These abnormal increases indicate that the company is purchasing more raw materials than those they use.

Looking carefully, we can know that the plaster and ..

Overall Inv Changes





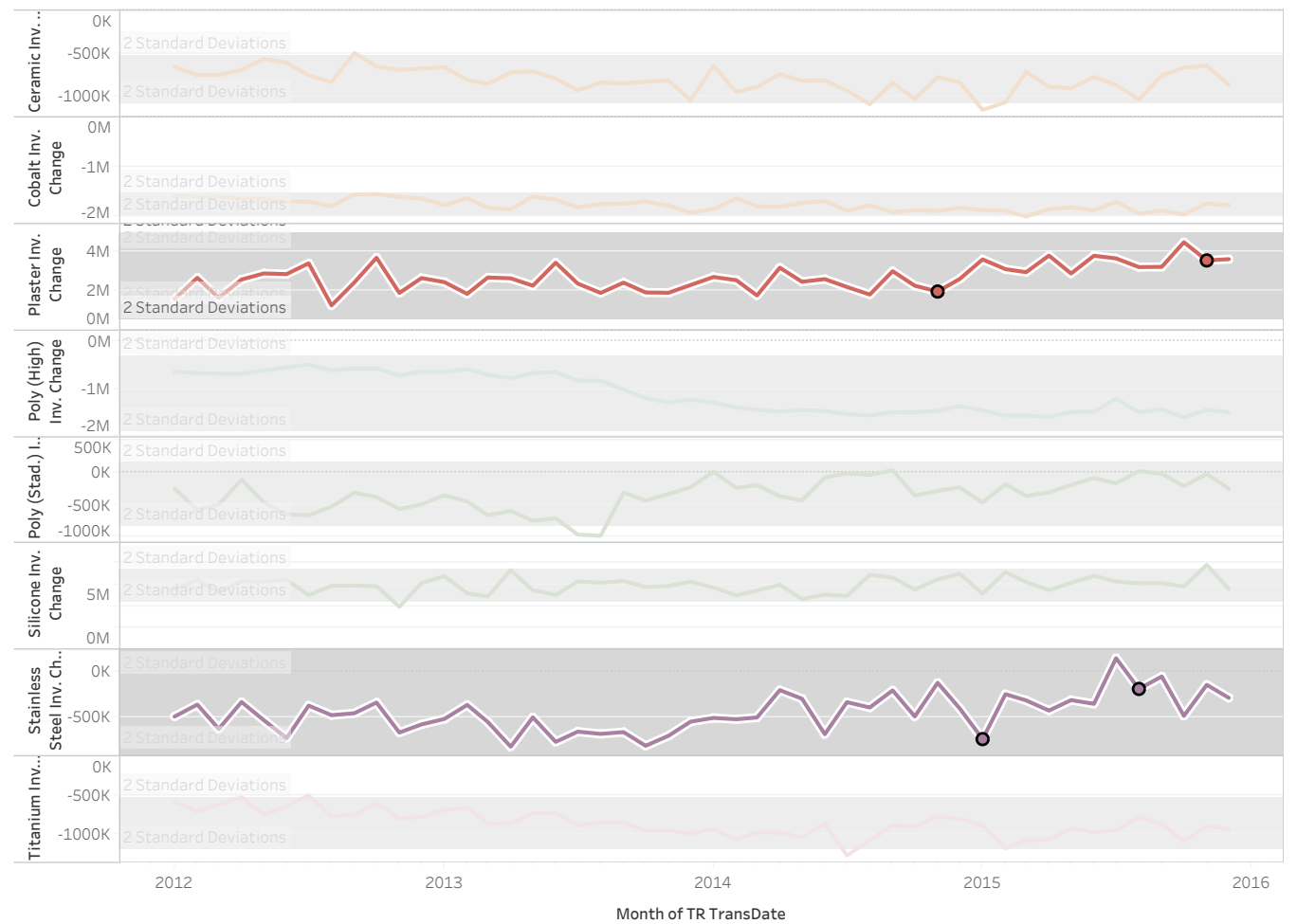
# Fraud Risks

We've proven that abnormal increase i..

Looking carefully, we can know that the plaster and stainless steel encounter the obviously abnormal increase in the inventory levels during the specific time periods.

Let's first look the changes in purchase levels of pla..

## Overall Inv Changes



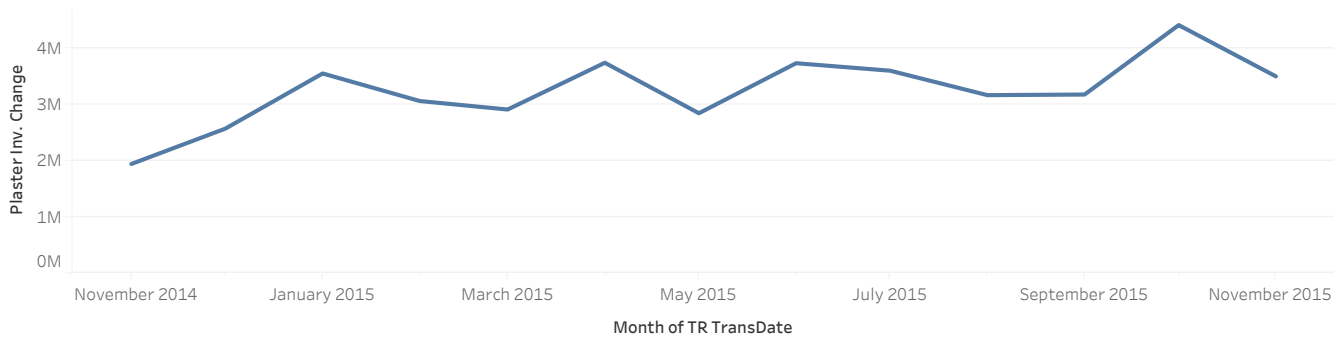
# Fraud Risks

Looking carefully, we can know that the plast..

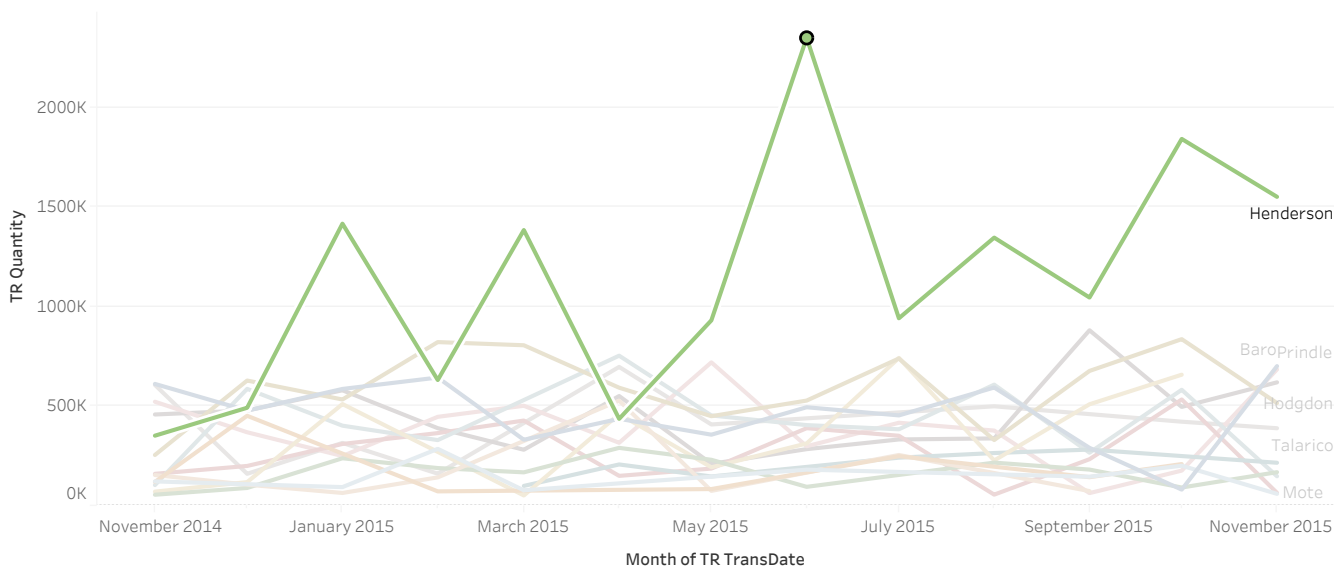
Let's first look the changes in purchase levels of plaster for each product manager. From November 2014 to November 2015, plaster encounters abnormal increase in inventory levels. During the same period, we find that compared to others, a product manager named Henderson has an unusual increase in the purchase levels. This tends to be the main driver for the abnormal increase in inventory level of plaster.

Let's then look at stainless steel. From January 201..

Inventory Change of Plaster (Nov 2014-Nov 2015)



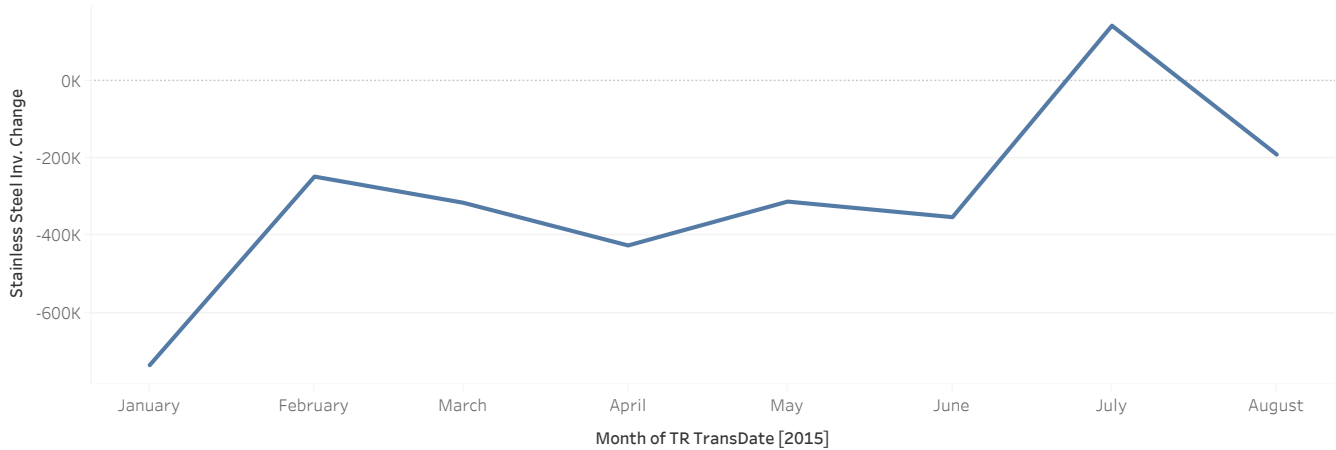
Product Manager's Plaster Purchase (Nov 2014-Nov 2015)



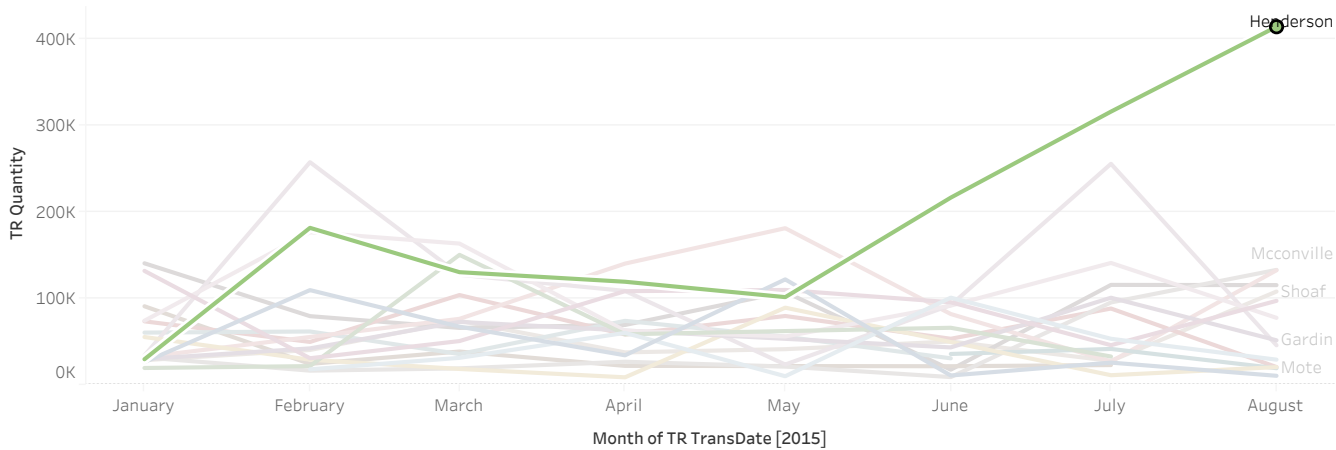
# Fraud Risks

Let's first look the changes in purchase levels of ..	Let's then look at stainless steel. From January 2015 to August 2015, stainless steel encounters abnormal increase in inventory levels. During the same period, we find that compared to others, a product manager named Henderson has an the most suspicious increase in the purchase levels. This tends to be the main driver for the abnormal increase in inventory level of stainless steel.	CONCLUSION: Based on the overall analysis, there is abn..
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Inventory Change of Stainless Steel (Jan 2015-Aug 2015)



Product Manager's Stainless Steel Purchase (Jan 2015-Aug 2015)

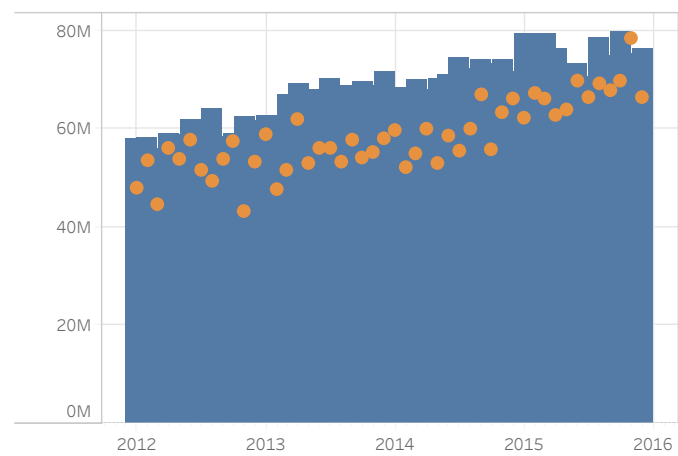


# Fraud Risks

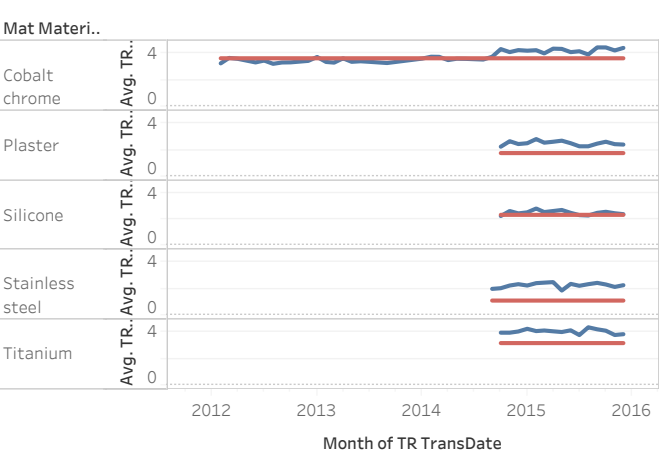
Let's then look at stainless steel. From January 2015 to August 2015, stainless steel encounters abnormal increase in inventory leve..

CONCLUSION: Based on the overall analysis, there is abnormal increase in purchases subtotals. With digging into site level and product manager level, we discover the abnormal purchase behavior of Henderson related to raw materials purchases unit cost (Illinois) and inventory levels, indicating kickback. Since we do not have relevant data, we now cannot figure out whether there is abnormal reduction in payment period.

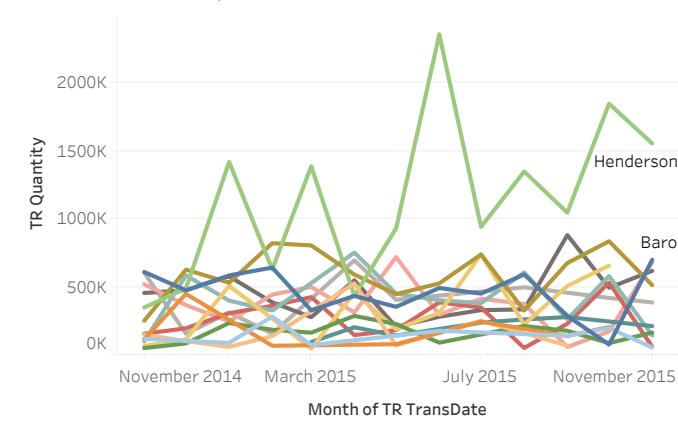
Abnormal Increase in Purchases Subtotals



Henderson’s Raw Material Purchase (IL)



Product Manager’s Plaster Purchase (Nov 2014-Nov 2015)



Product Manager’s Stainless Steel Purchase (Jan 2015-Aug 2015)

