# Appendix

In this Appendix, we provide flow-chart depictions of the actions of the network agents. We divide the actions into three types: buyer's action, suppliers' action and raw supplier's actions. Note "suppliers" here refer to all non-raw material suppliers and "raw suppliers" here refer to all raw material suppliers.

In order to improve readability, we remove the details associated with "Supplier-Comprehensive" step from the "Buyer's Logic" flow chart and provide them toward the end in a separate process flow. Similarly, we remove the details associated with "Raw Supplier Comprehensive" and provide them at the end in a separate process flow.

Below we provide a directory of the flowcharts provided in this Appendix. Note that the word "Only" at the end of the model name is to denote a somewhat independent path. However, these independent path models are not 100% orthogonal. For example, in every independent path model, there is an element of acceptance or rejection and as such they are not truly independent from the acceptance or rejection path model.

- Buyer's Logic
- Learning Logic
- Supplier-Cost Reduction Only
- Supplier-Switching Only
- Supplier-Rejection Only
- Supplier-Acceptance Only
- Raw Supplier-Cost Reduction Only
- Raw Supplier-Switching Only*
- Raw Supplier-Rejection Only
- Raw Supplier-Acceptance Only
- Supplier-Comprehensive
- Raw Supplier-Comprehensive

*Note that although raw material suppliers do not have the option to switch suppliers themselves, they are subject to interactions with downstream buyer when switching happens, which indirectly impacts downstream buyers. Thus, we include this interaction into the flowchart.

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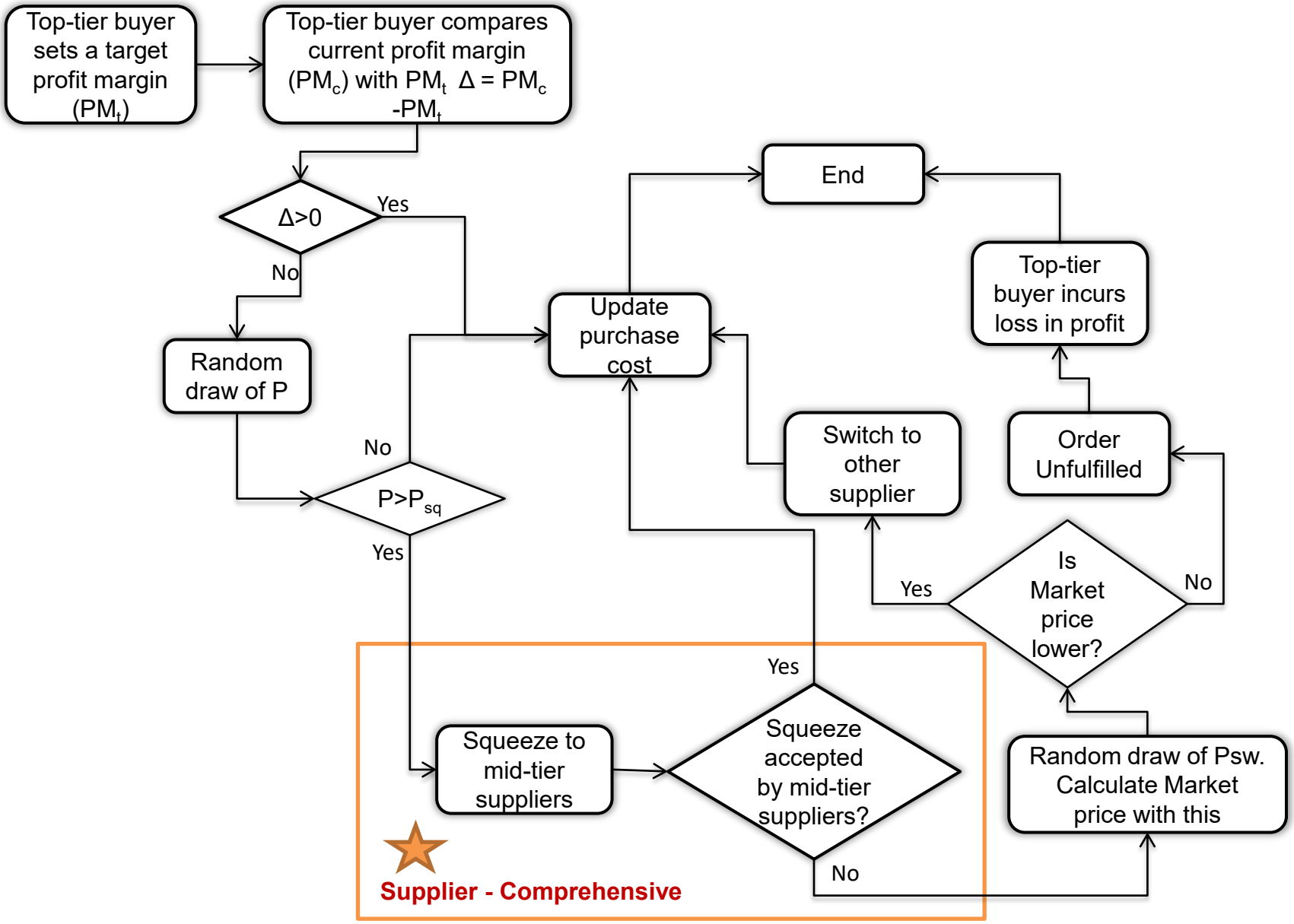
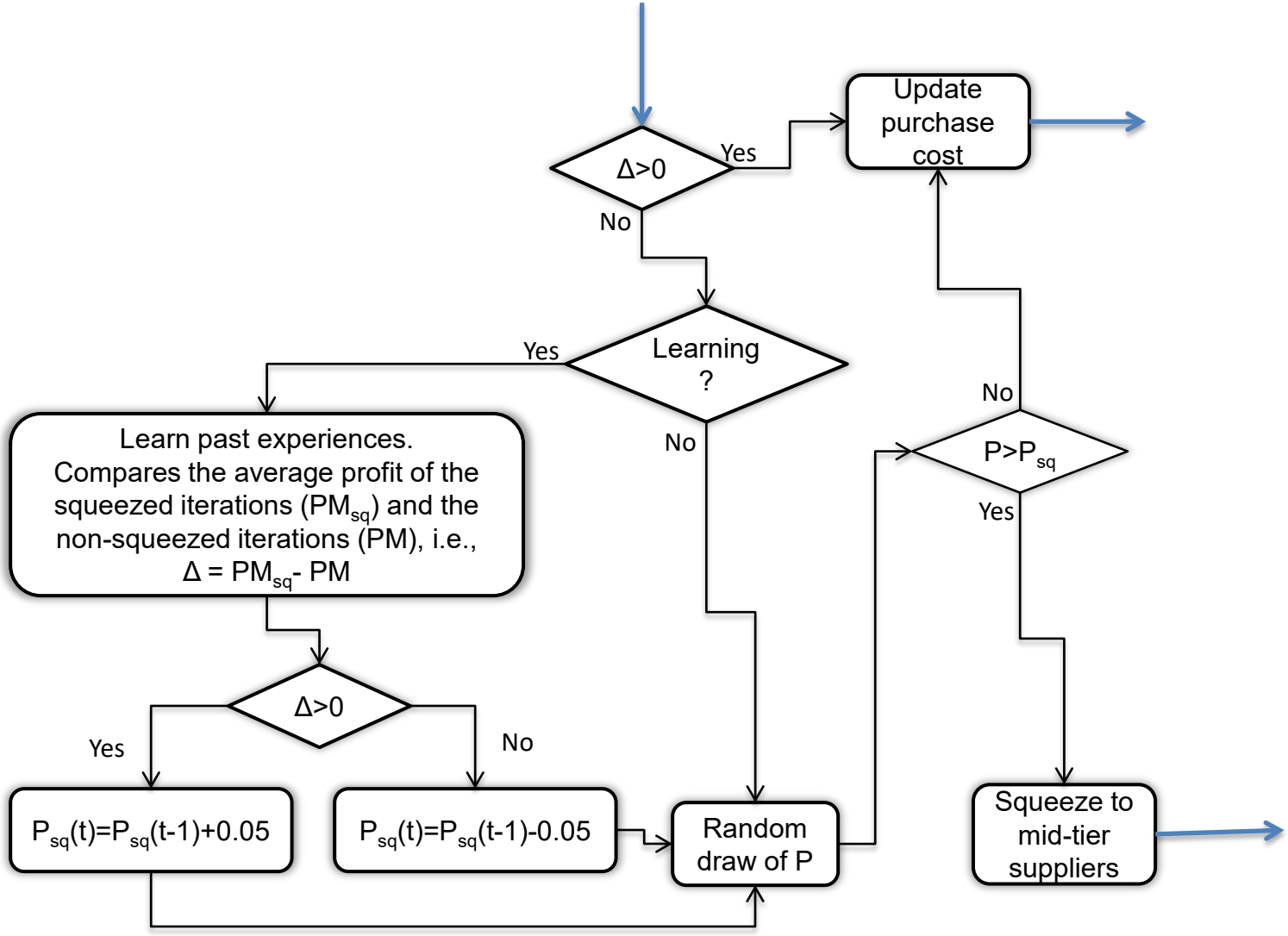
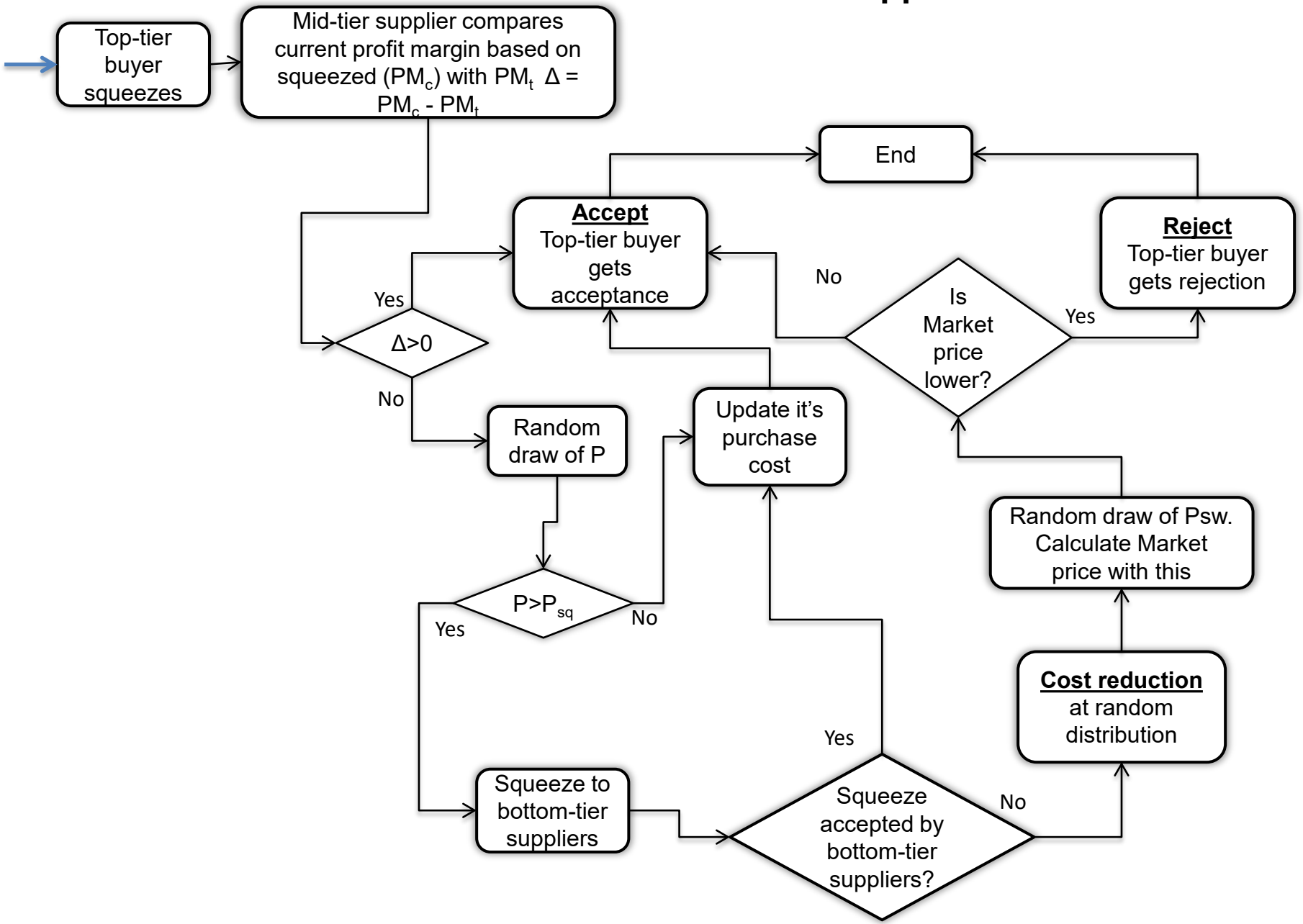
# Buyer's Logic



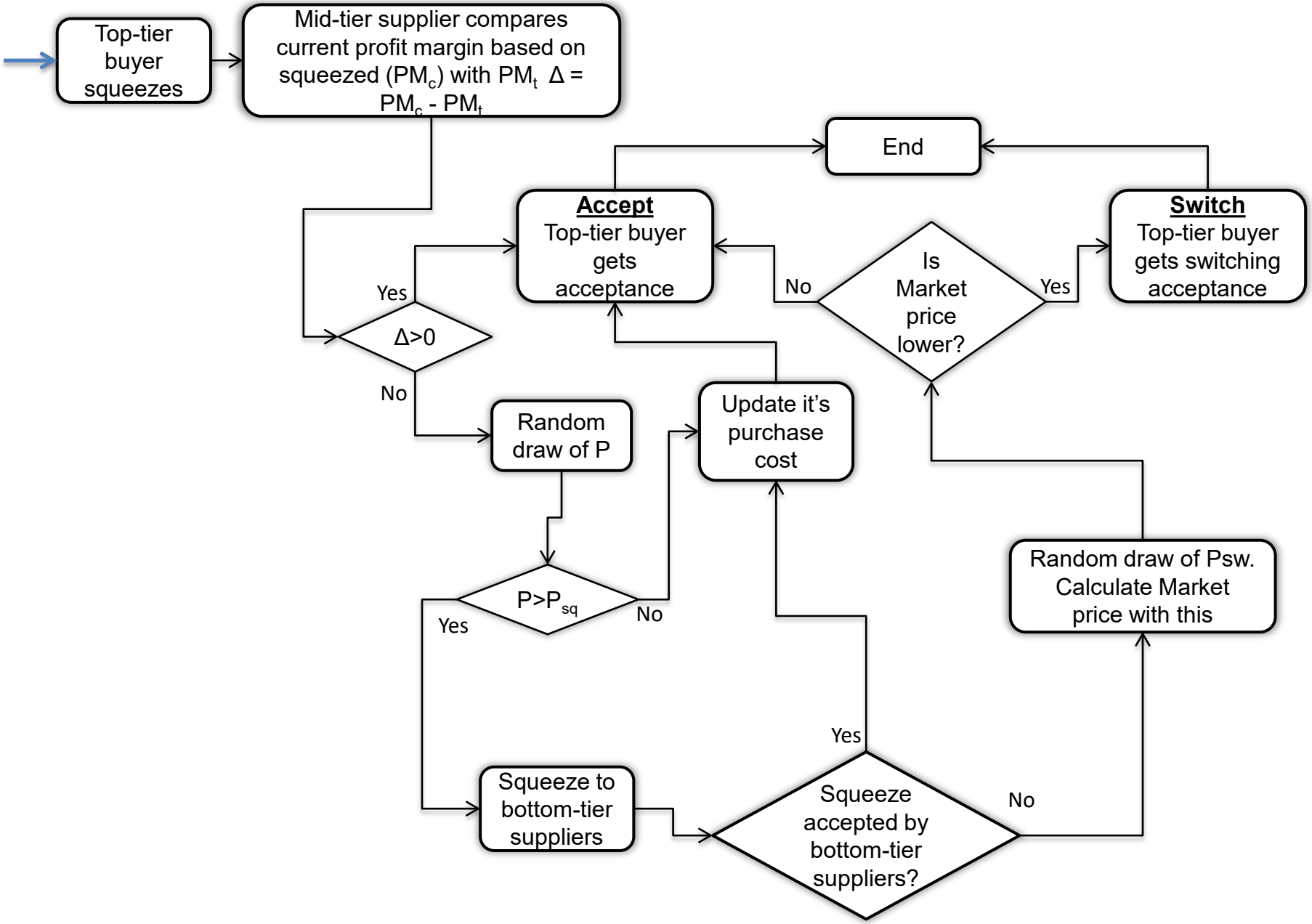
# Learning Logic



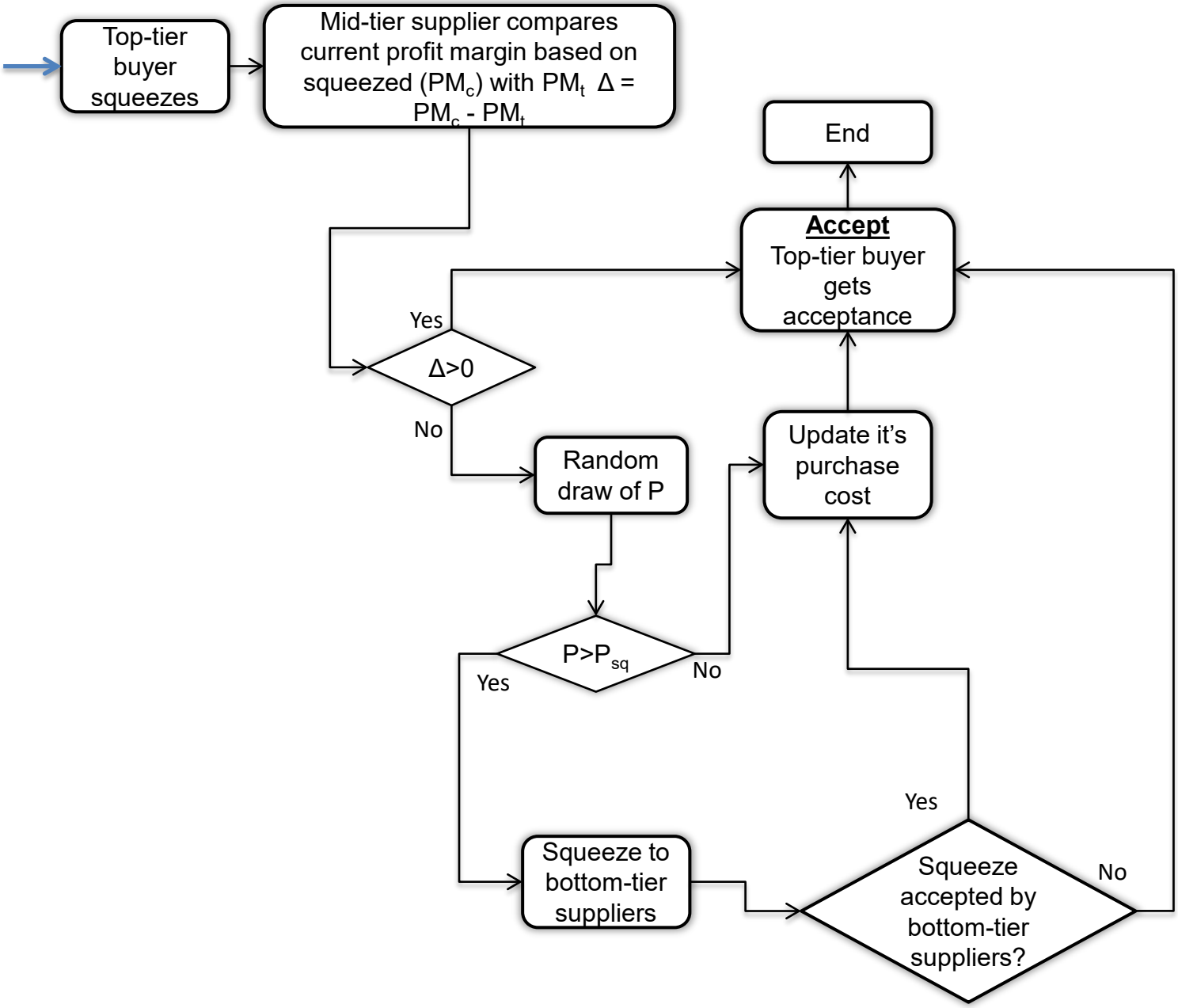
# Supplier - Cost Reduction Only



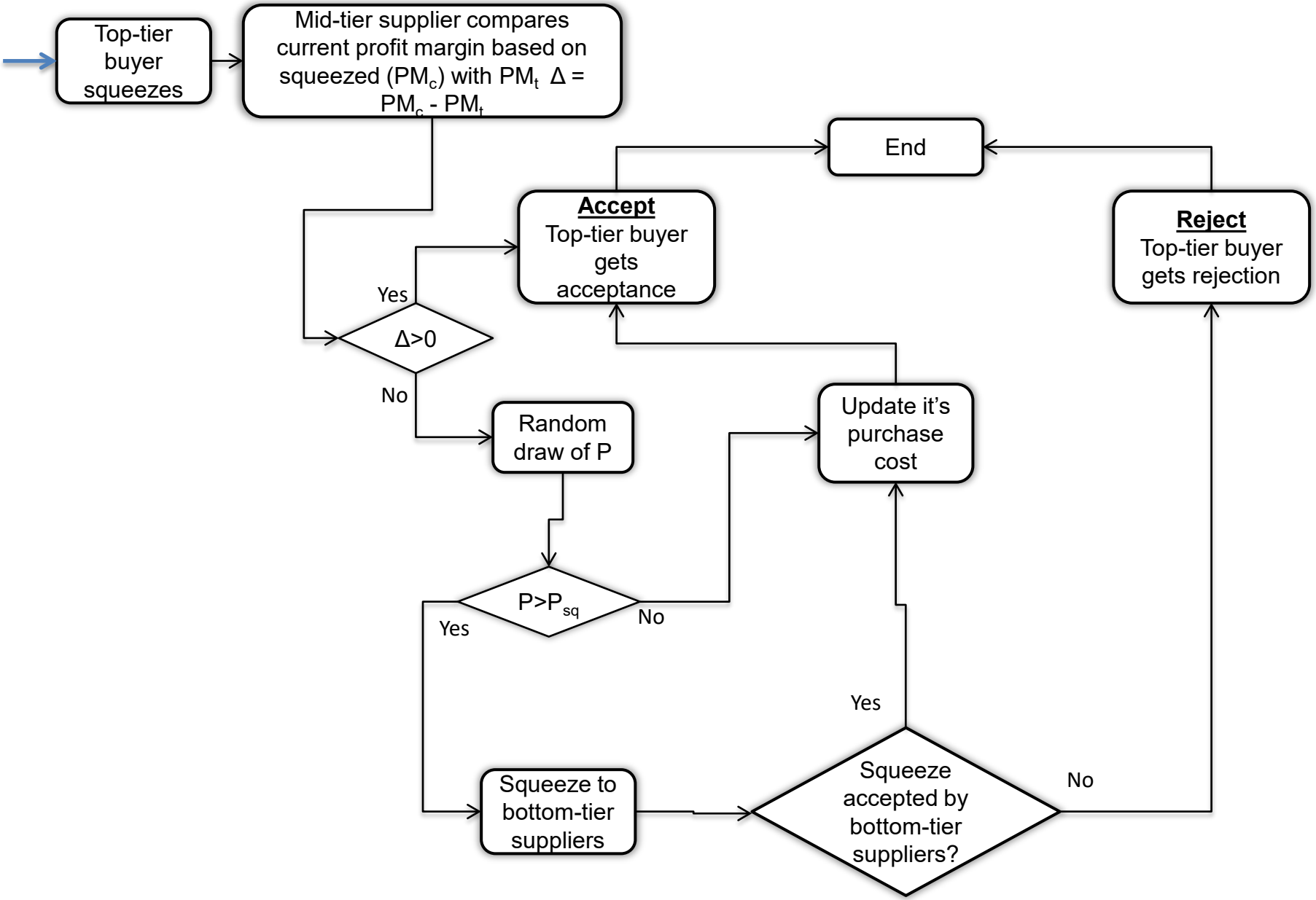
# Supplier - Switching Only



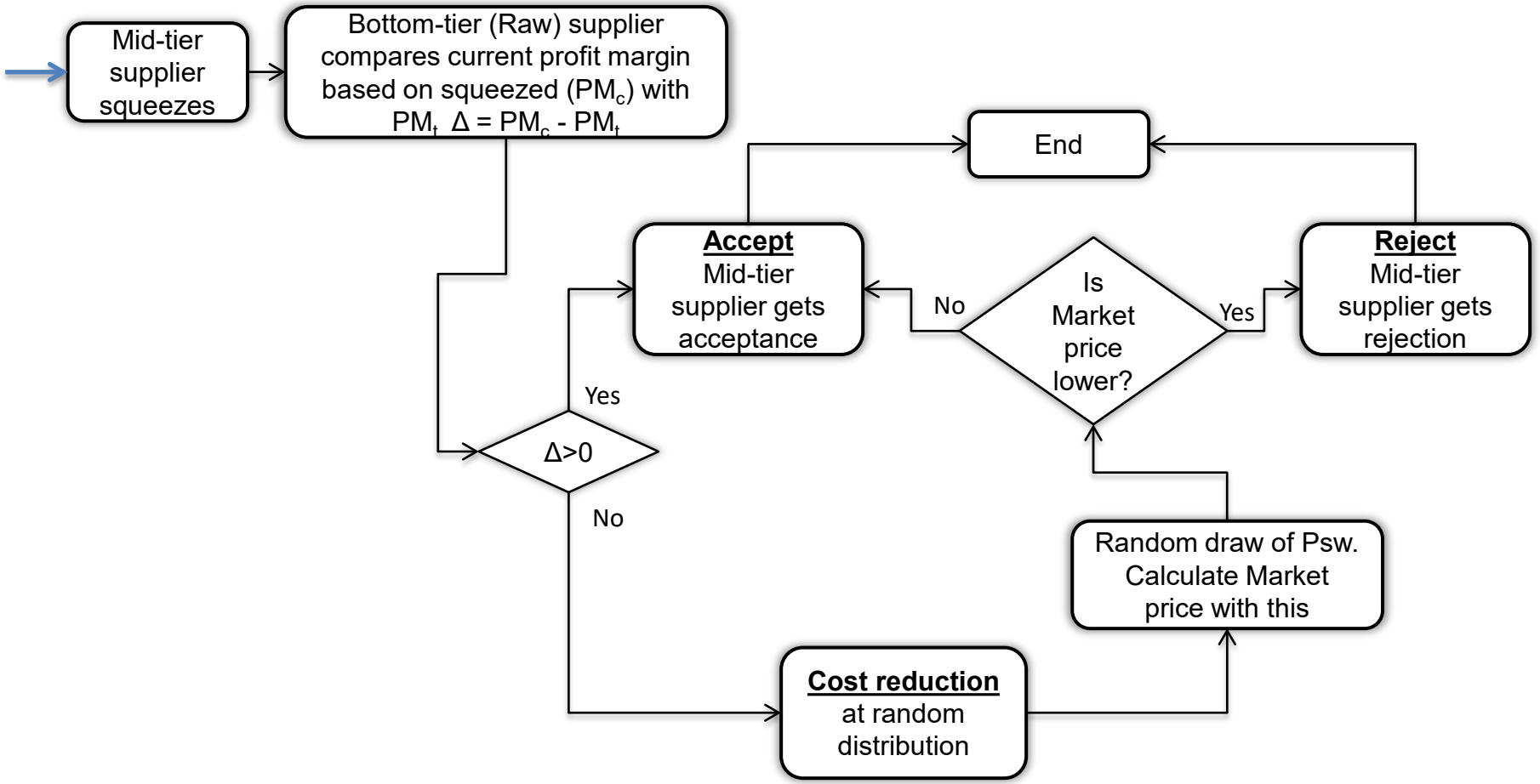
# Supplier - Accept Only



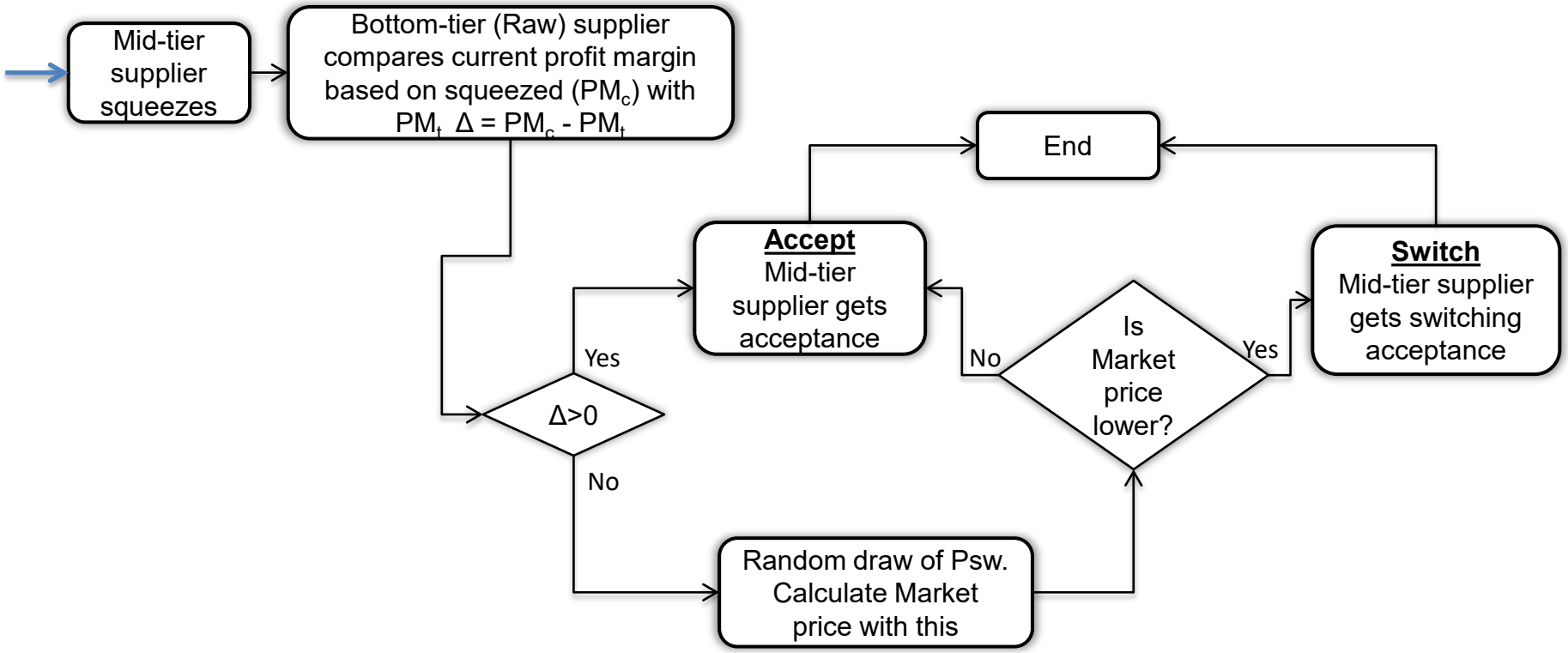
# Supplier - Rejection Only



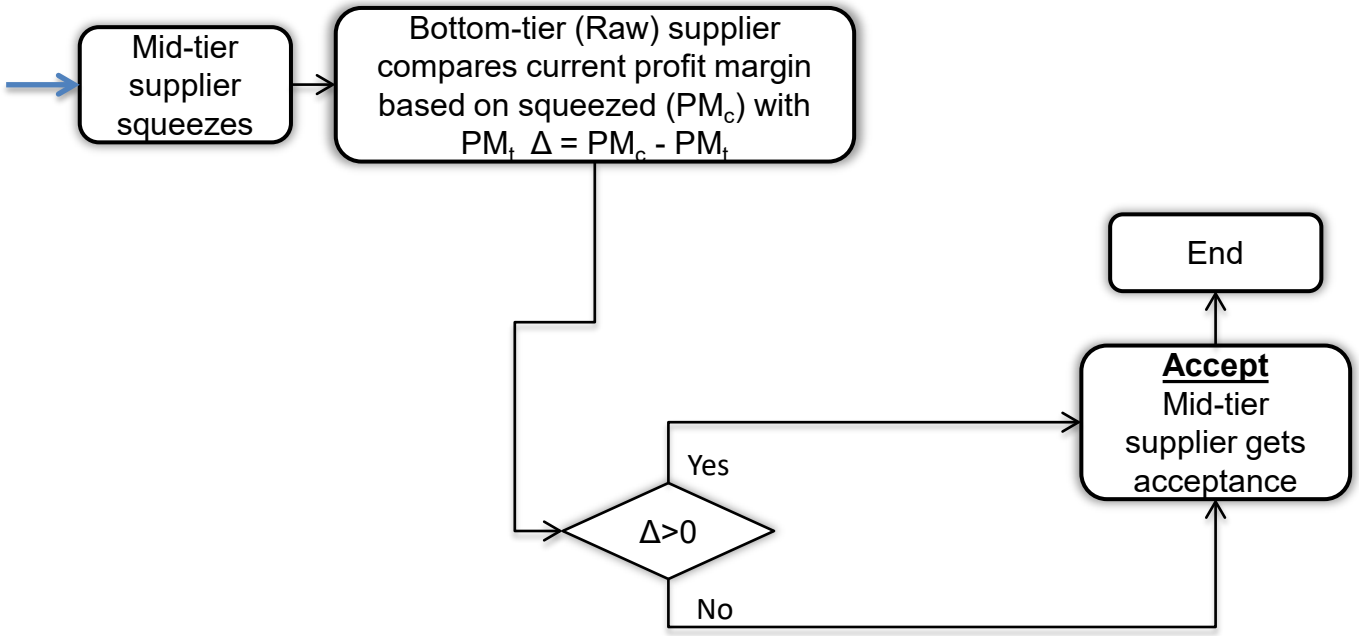
# Raw Supplier - Cost Reduction Only



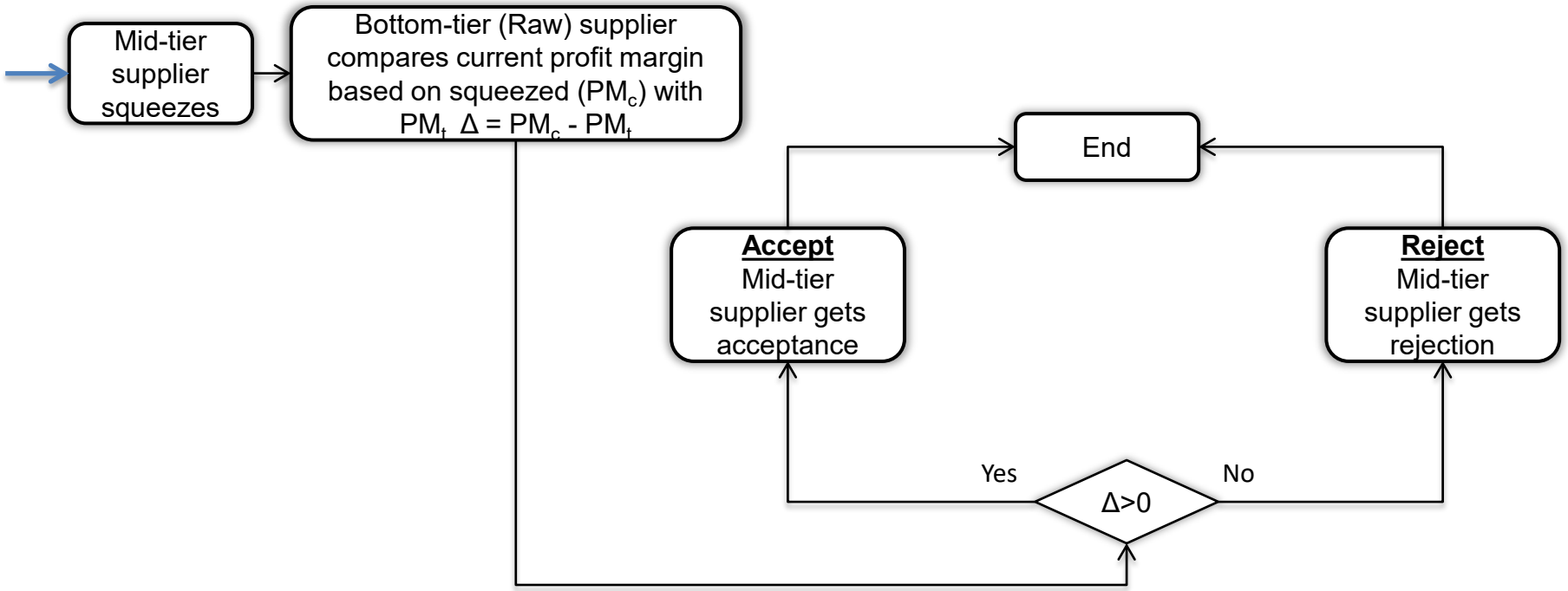
# Raw Supplier - Switching Only

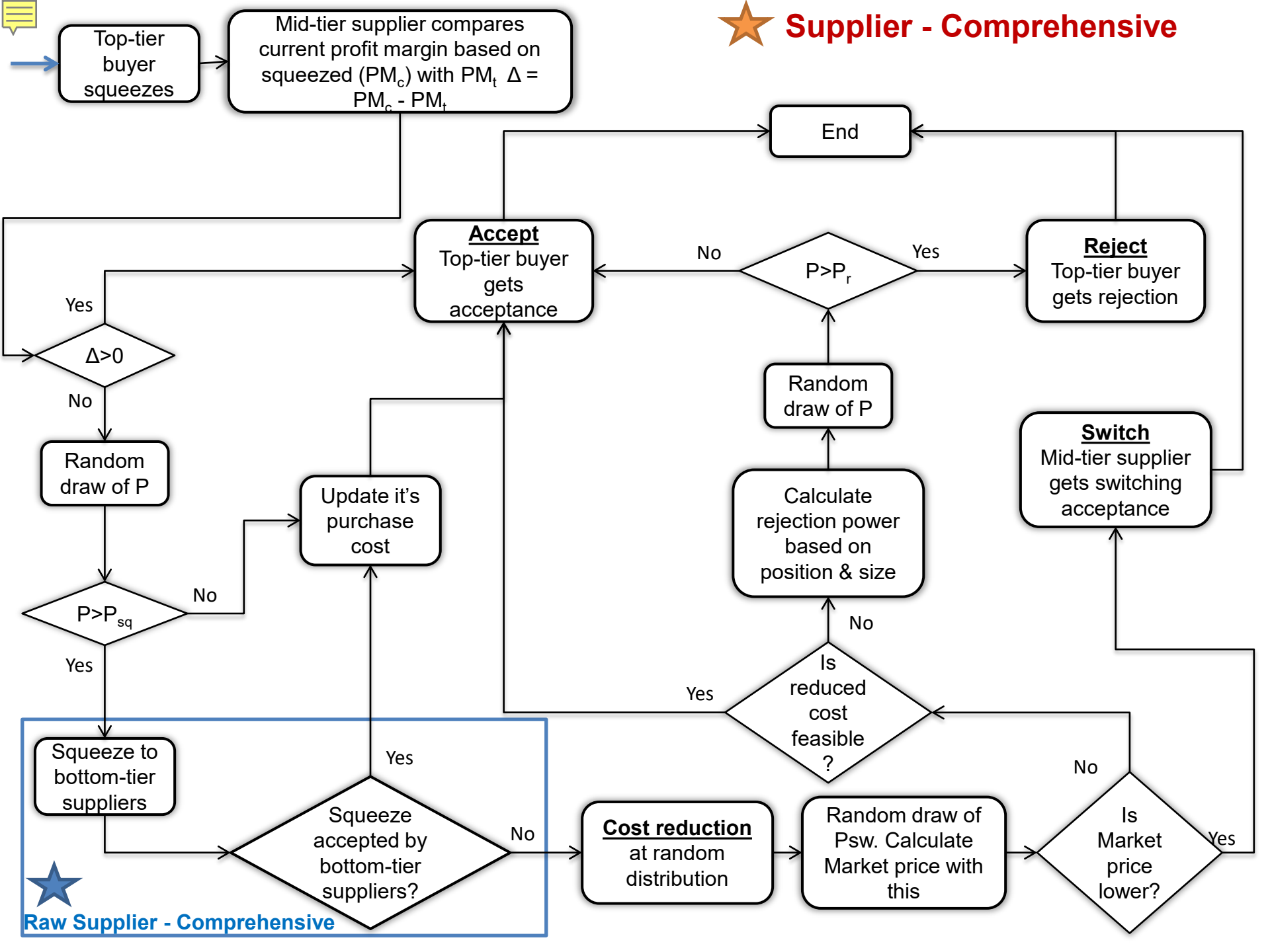


# Raw Supplier – Accept Only



# Raw Supplier – Rejection Only




Supplier - Comprehensive
Top-tier buyer squeezes
Mid-tier supplier compares current profit margin based on squeezed ($PM_c$) with $PM_t$ $\Delta = PM_c - PM_t$
End
Accept
Top-tier buyer gets acceptance
No
$P>P_r$
Yes
Reject
Top-tier buyer gets rejection
Yes
$\Delta>0$
No
Random draw of P
Update it's purchase cost
$P>P_{sq}$
No
Yes
Random draw of P
Calculate rejection power based on position & size
Switch
Mid-tier supplier gets switching acceptance
No
Is reduced cost feasible ?
Yes
Squeeze to bottom-tier suppliers
Yes
Squeeze accepted by bottom-tier suppliers?
No
Cost reduction
at random distribution
Random draw of Psw. Calculate Market price with this
No
Is Market price lower?
Yes
Raw Supplier - Comprehensive

# Raw Supplier - Comprehensive

