



# Technology Manager's Radar Screen: Monitoring Competitors' Innovation Performance

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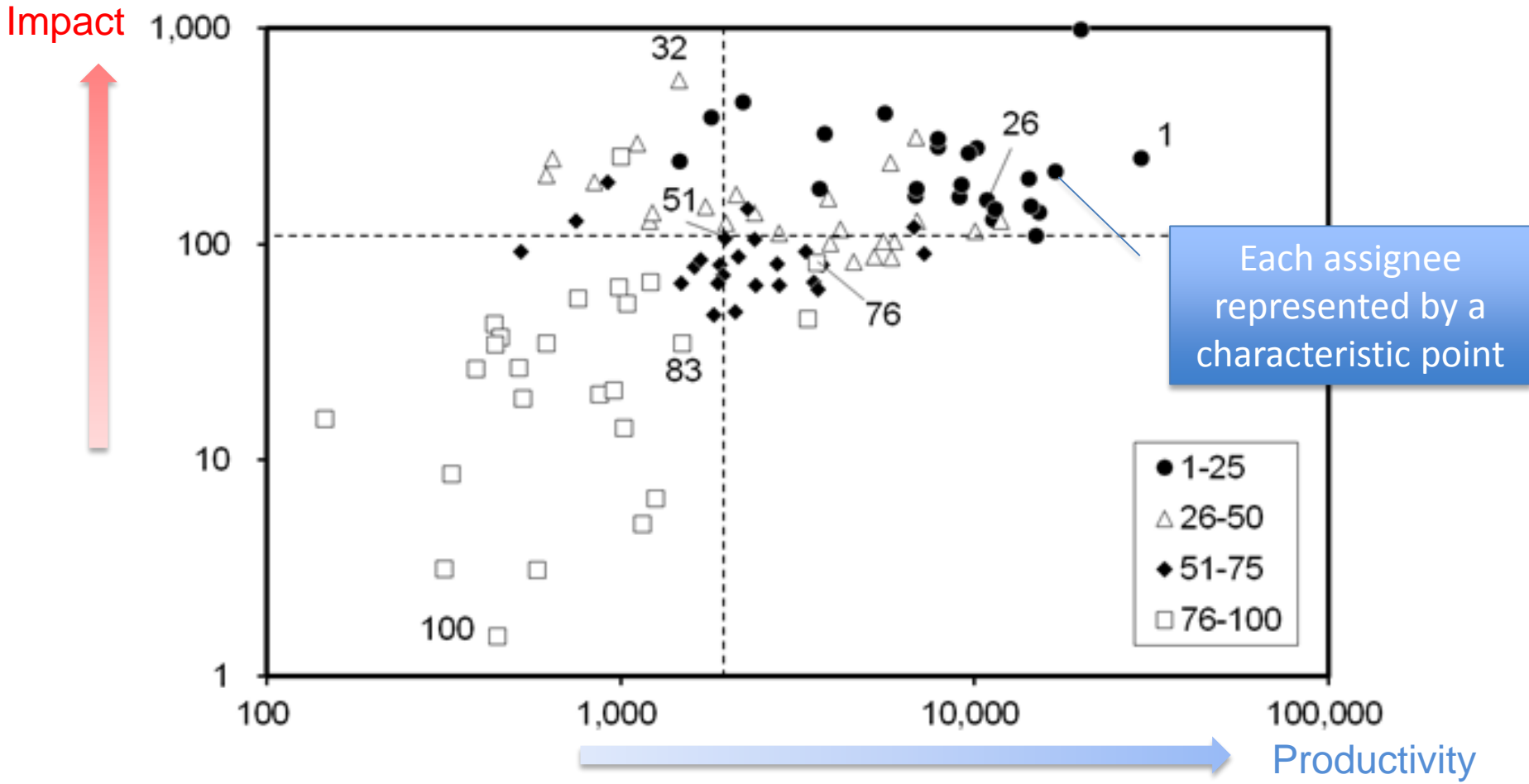


# Agenda

- What radar screen?
- Geometric interpretation of  $h$ -index
- Area centroids
- Static view
- Dynamic view

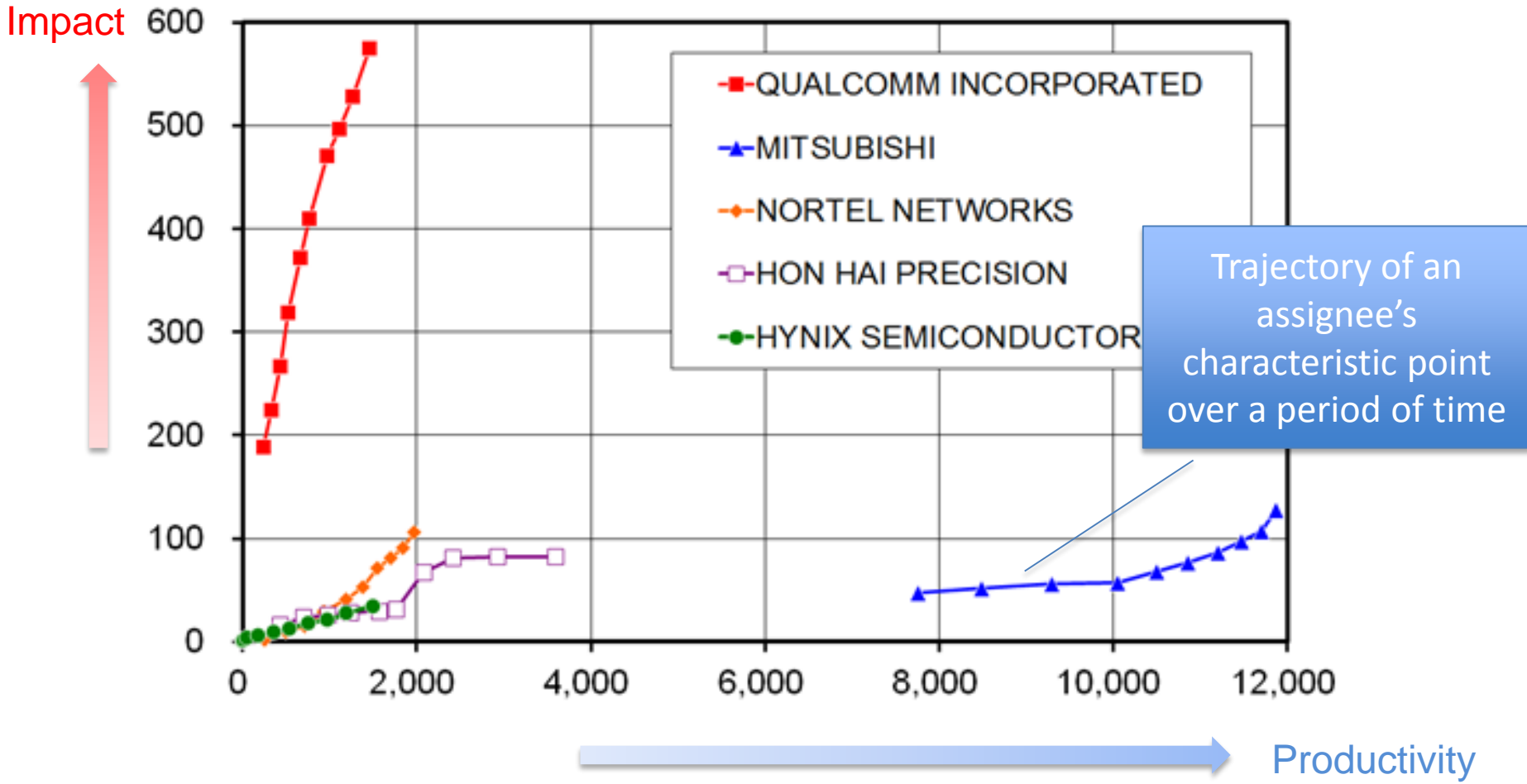


# Radar Screen: Static View





# Radar Screen: Dynamic View



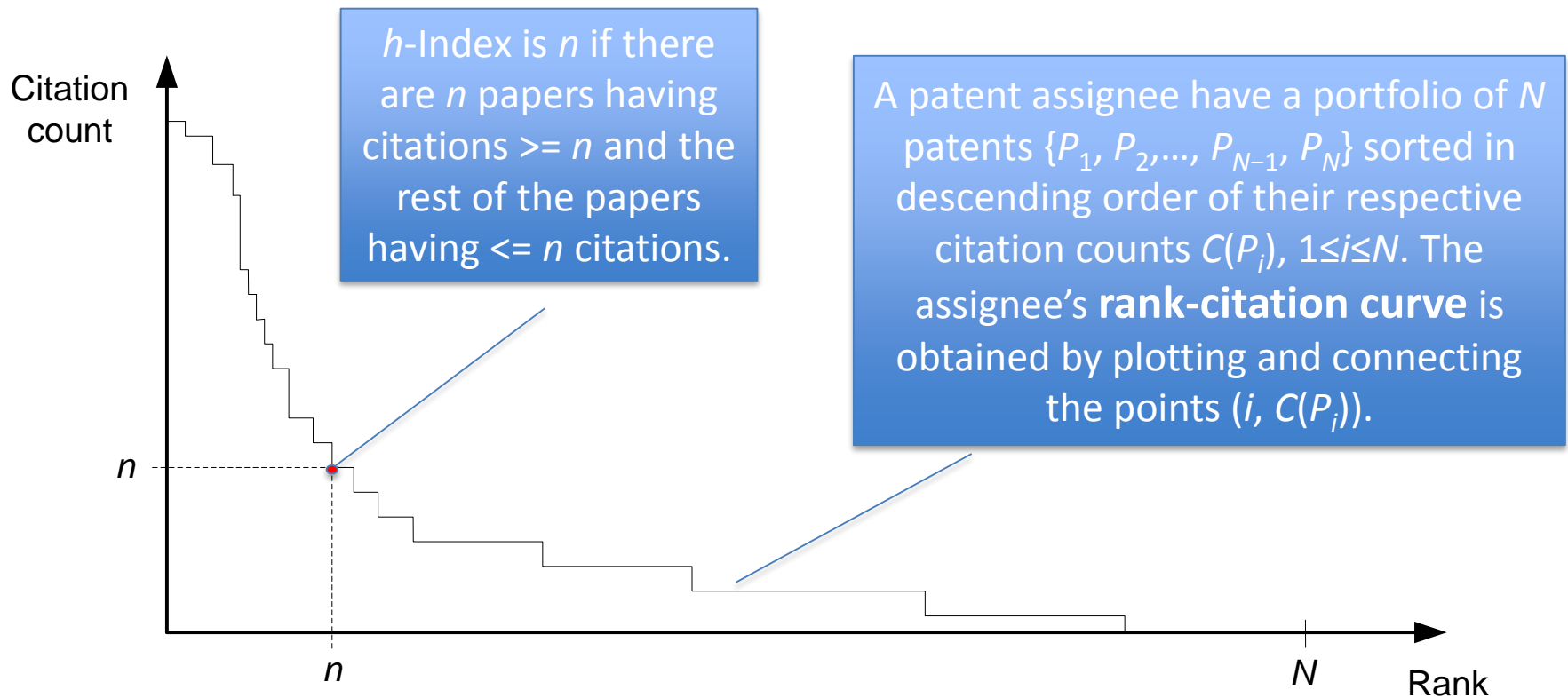


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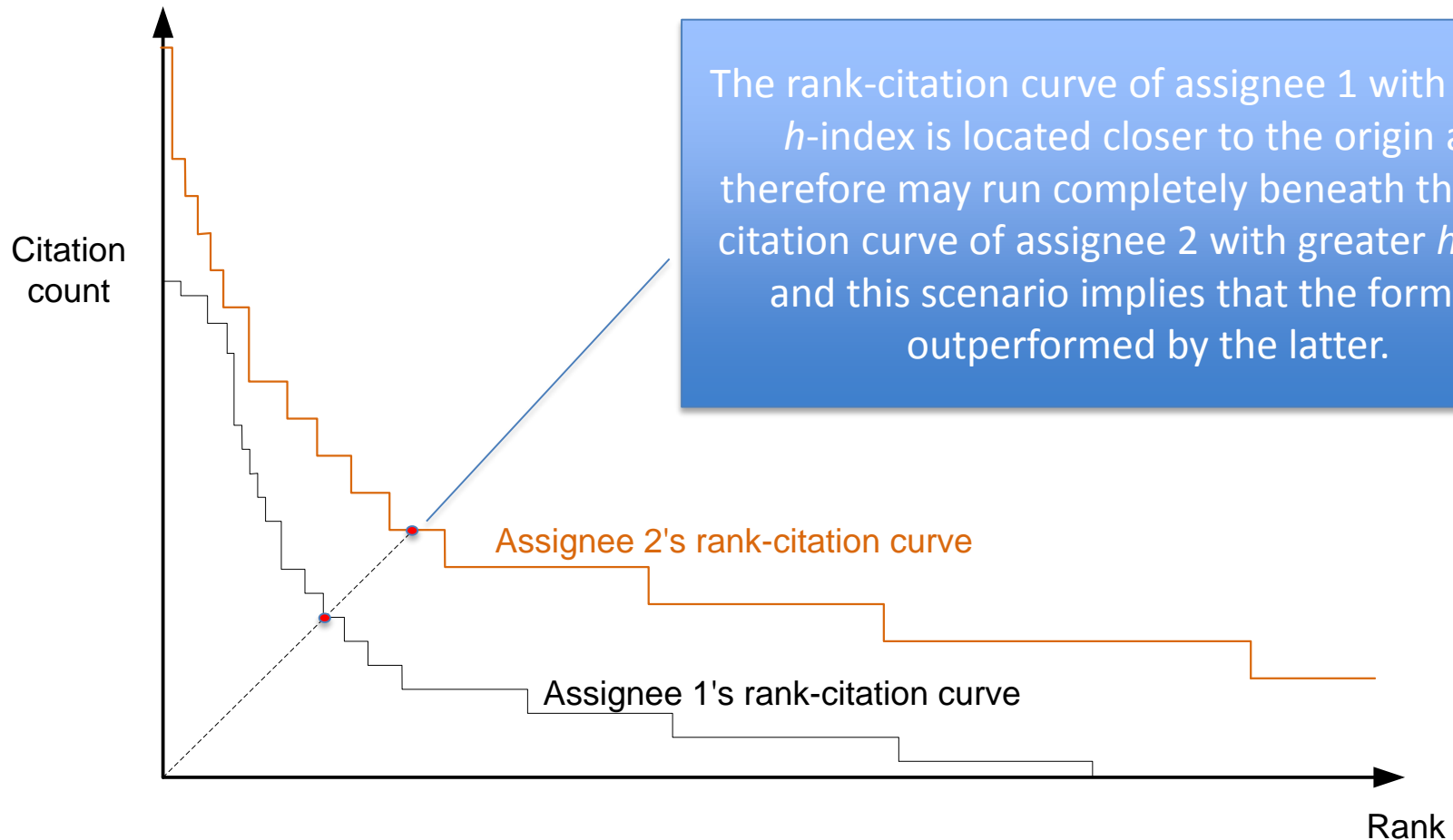


# Geometric Interpretation of $h$ -Index





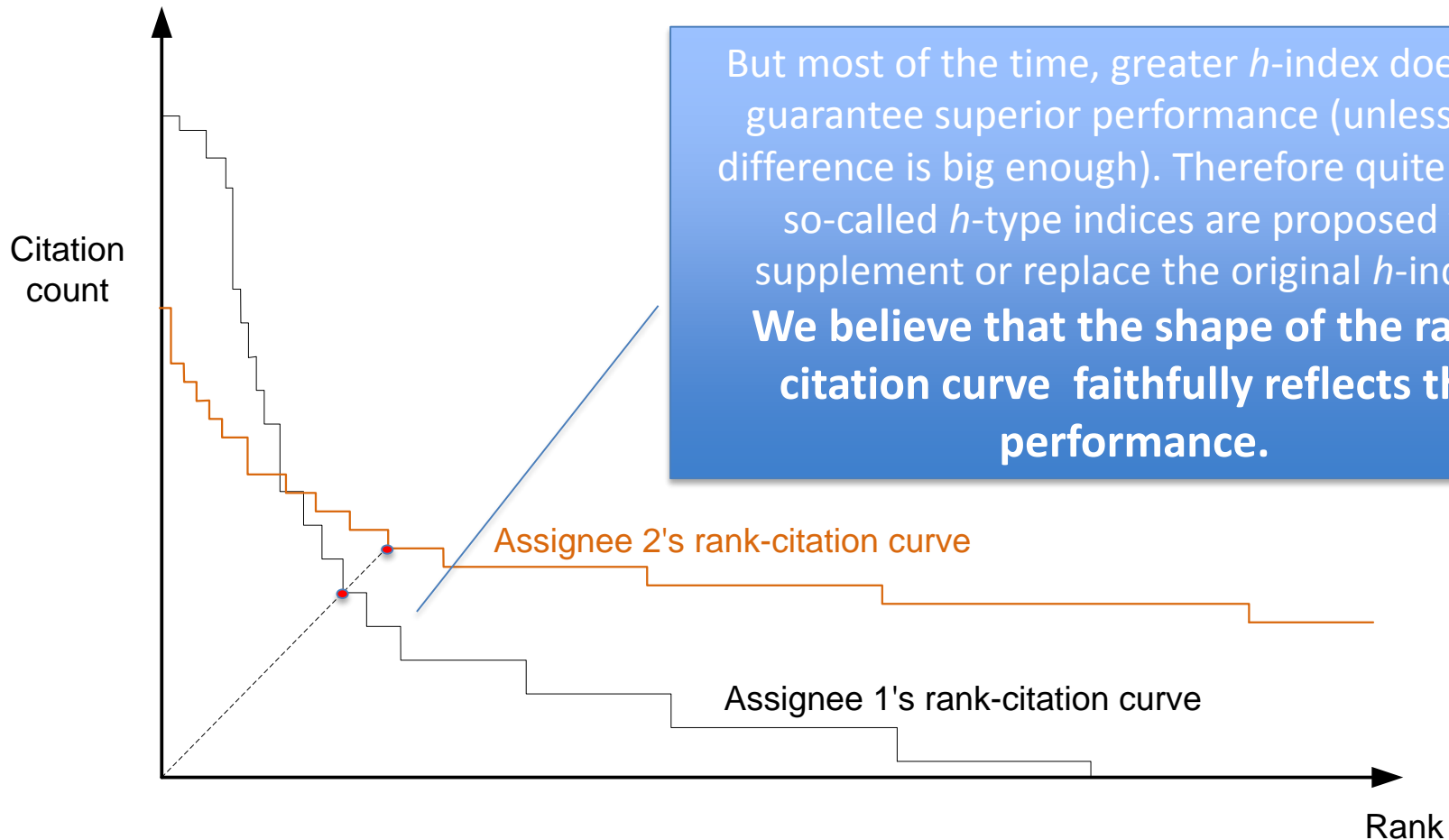
# Geometric Interpretation of $h$ -Index







# Geometric Interpretation of $h$ -Index



But most of the time, greater  $h$ -index does not guarantee superior performance (unless the difference is big enough). Therefore quite a few so-called  $h$ -type indices are proposed to supplement or replace the original  $h$ -index. **We believe that the shape of the rank-citation curve faithfully reflects the performance.**



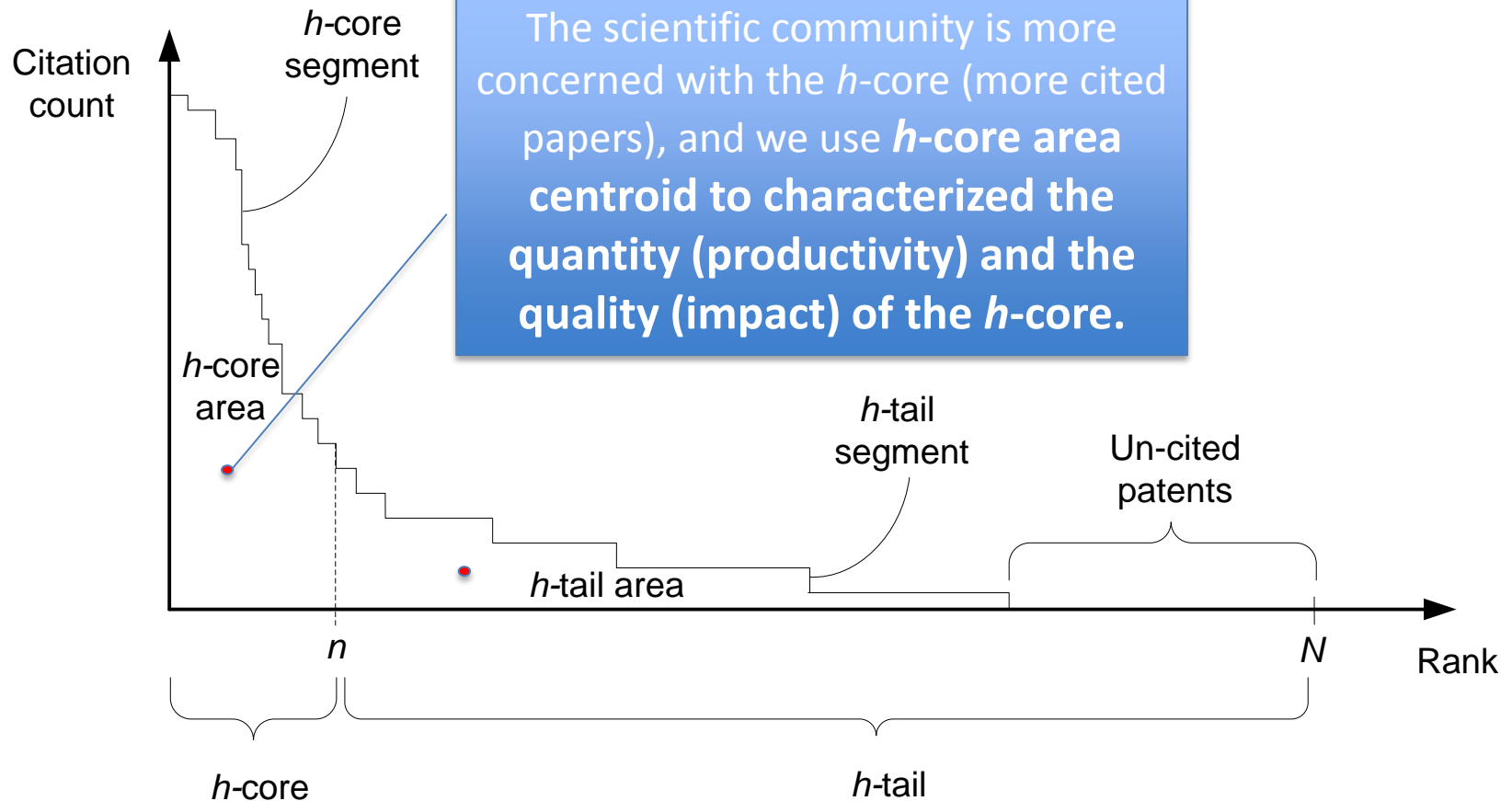


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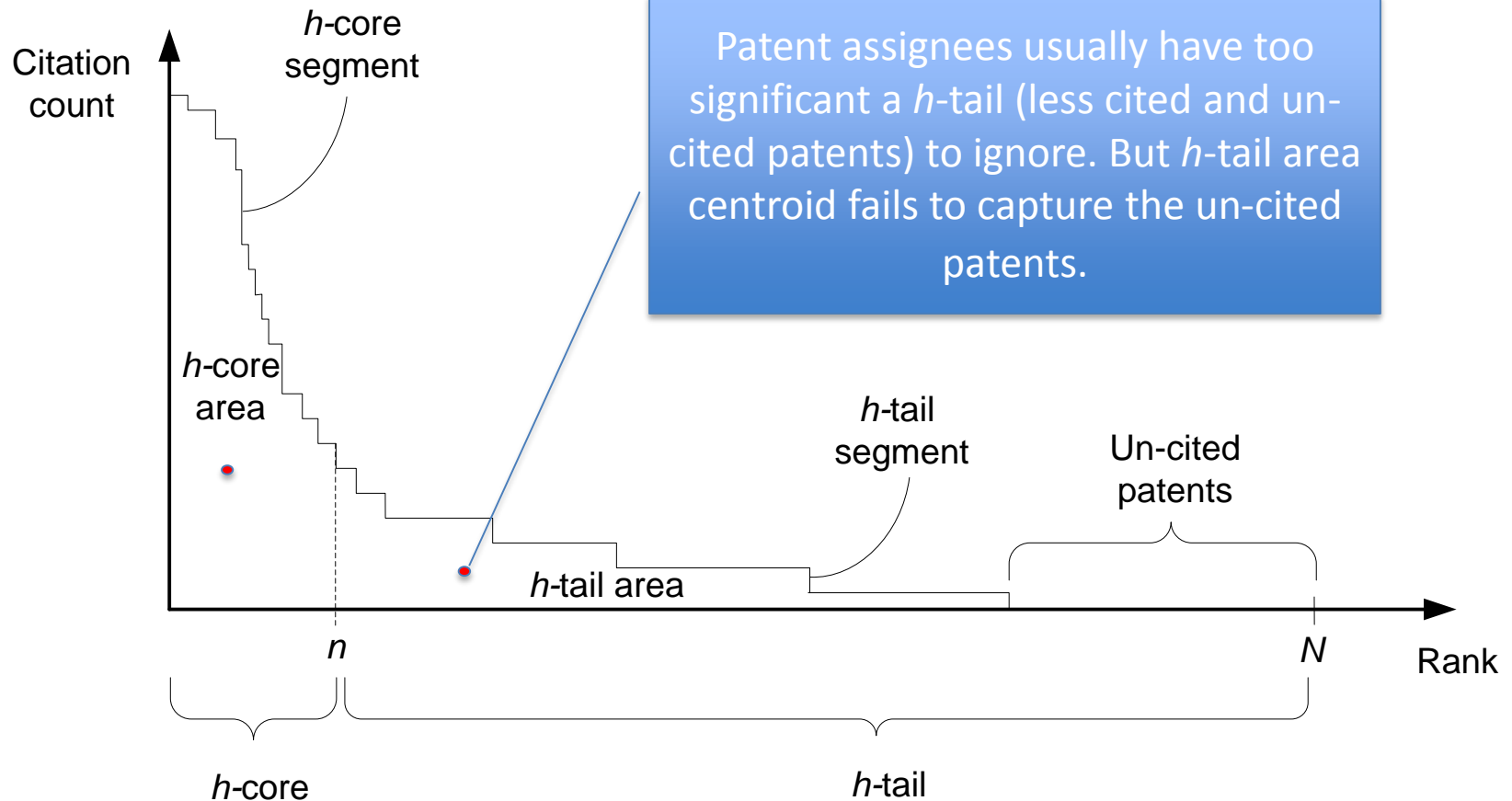


# Area Centroids





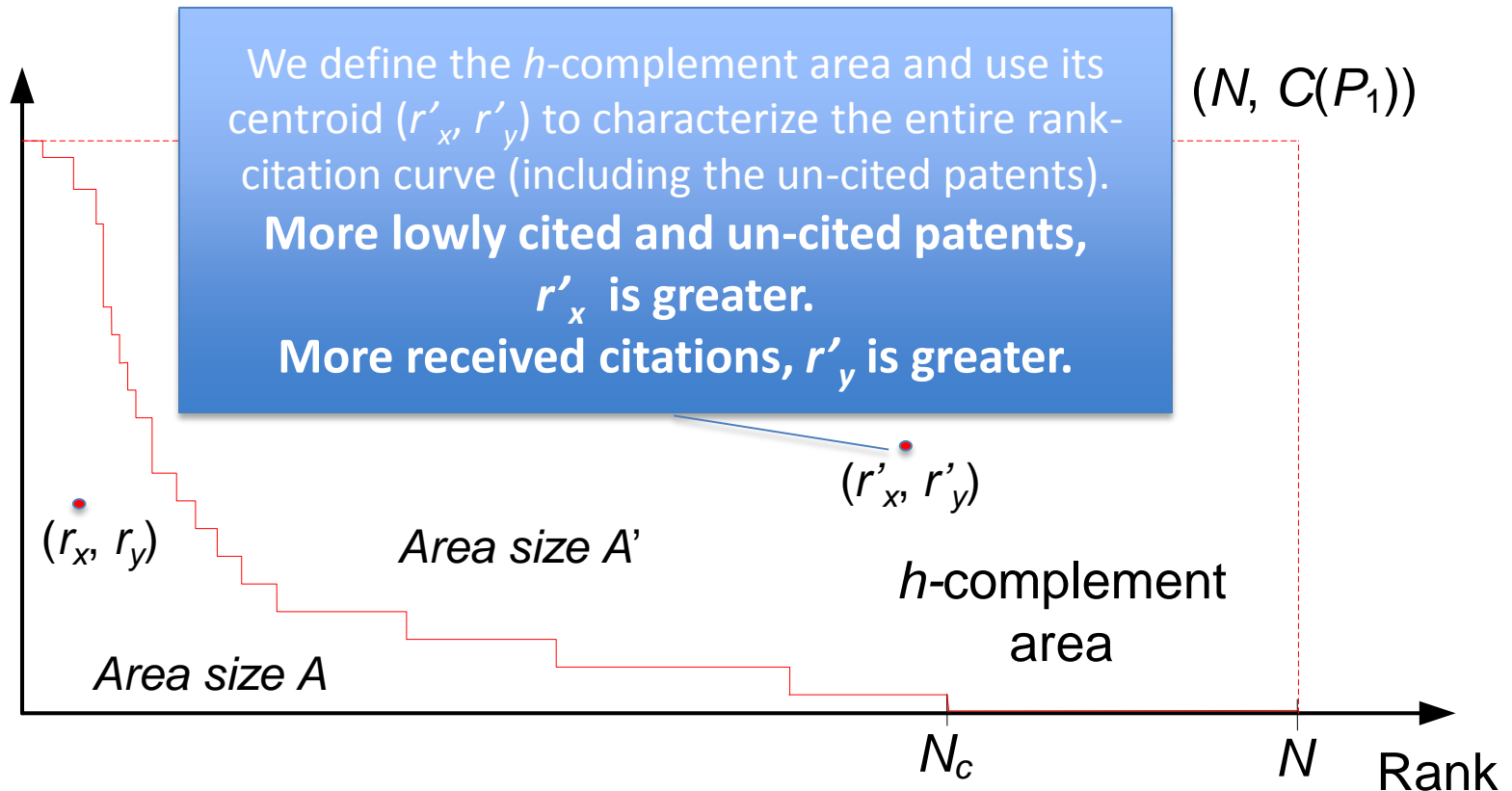
# Area Centroids





# Area Centroids

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# Area Centroids

- We can easily obtain  $h$ -complement area centroid as follows:

$$\frac{C(P_1)}{2} = \frac{r_y A + r_y' A'}{A + A'} = \frac{r_y A + r_y' A'}{N \cdot C(P_1)};$$

$$\frac{N}{2} = \frac{r_x A + r_x' A'}{A + A'} = \frac{r_x A + r_x' A'}{N \cdot C(P_1)}.$$



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# Static View

Impact

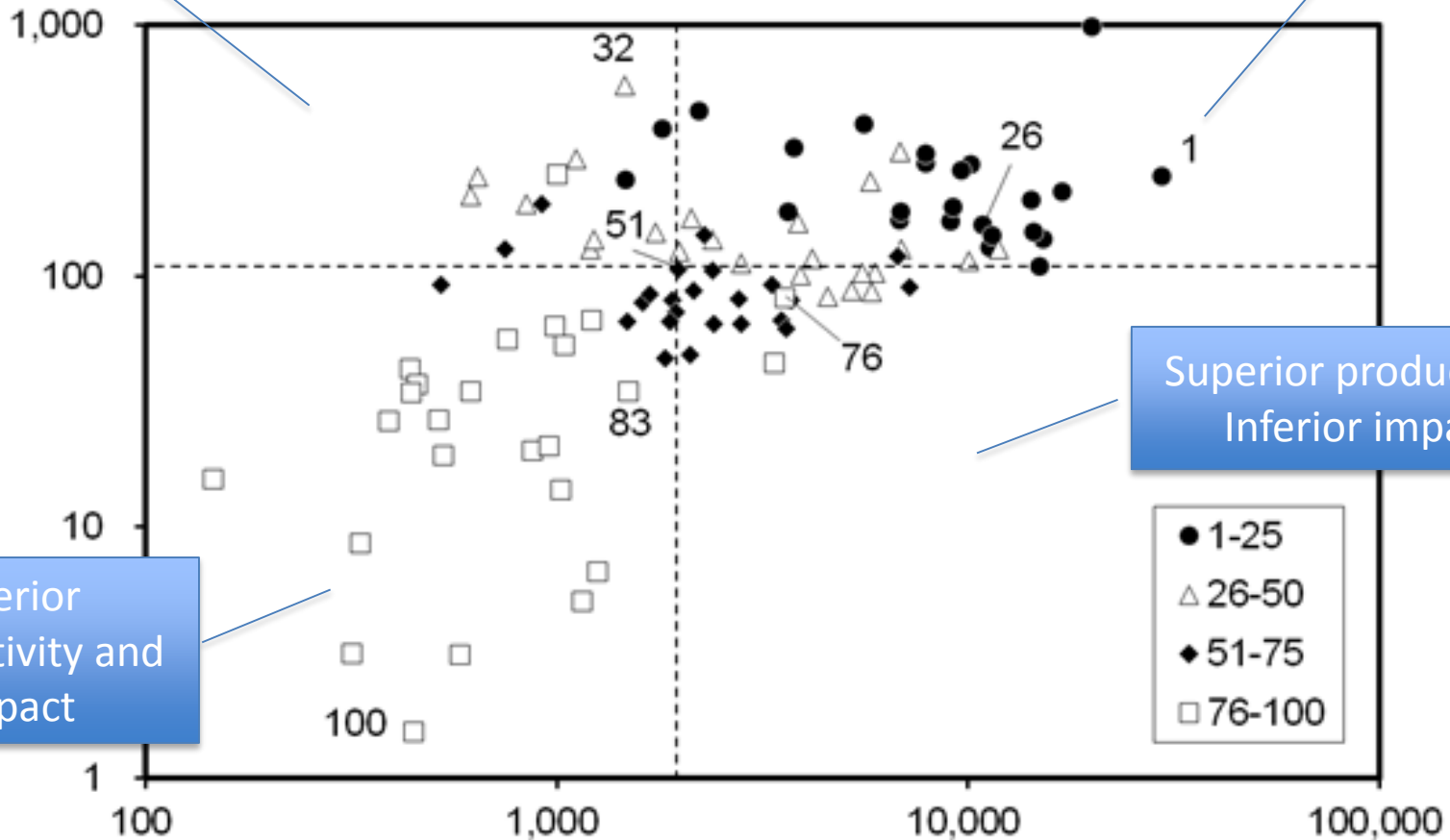


Inferior productivity  
 Superior impact

Superior  
 productivity and  
 impact

Superior productivity  
 Inferior impact

Inferior  
 productivity and  
 impact

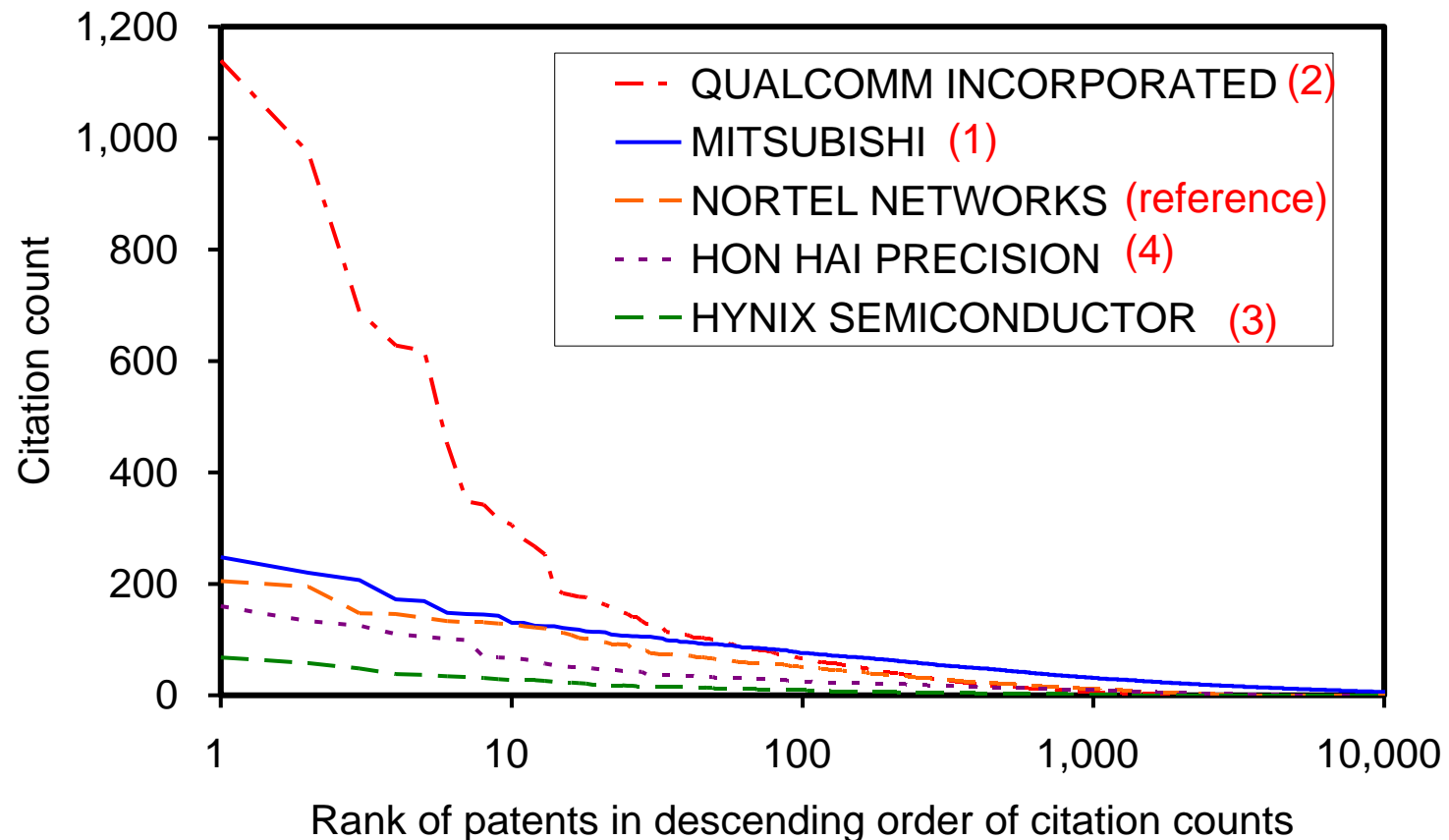


Productivity





# Static View



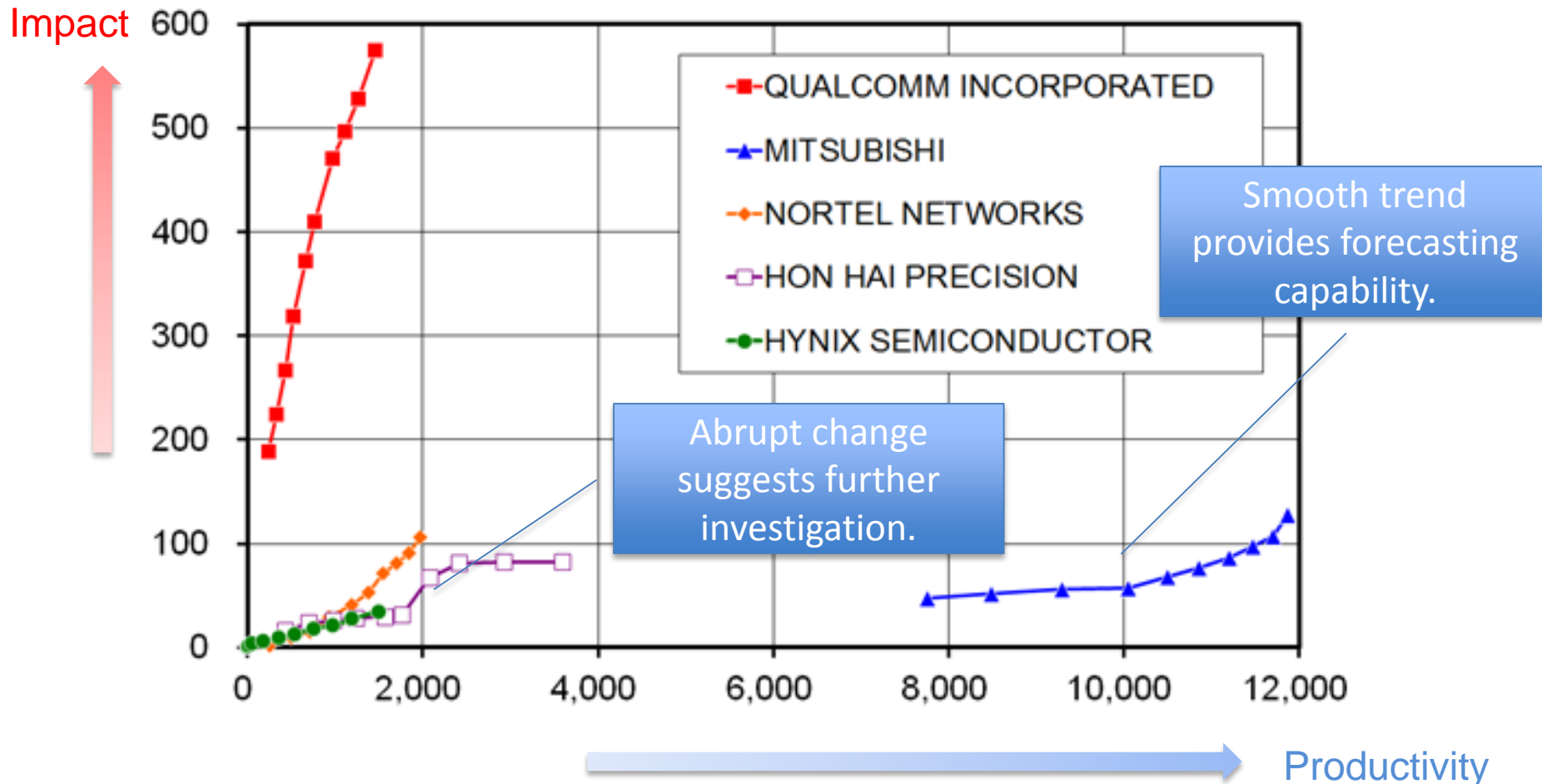


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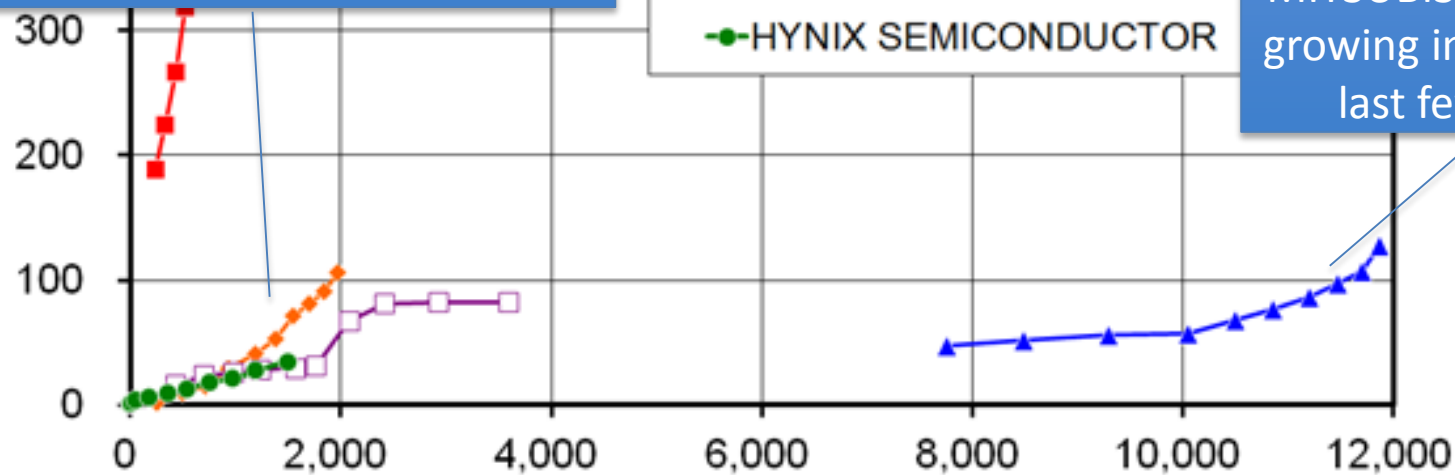
# Dynamic View



## Dynamic View

Compared to HON HAI, NORTEL was inferior in terms of productivity and impact before 2003. Yet, NORTEL caught up pretty fast in terms of impact. NORTEL NETWORKS' un-cited patents played a diminishing role as their percentage to the total number of patents dropped from 801 (44%) in 2003 to 780 (20%) in 2009.

MITSUBISHI's un-cited patents play an even diminishing role as their percentage to the total number of patents dropped from 3,516 (23%) in 2000 to 3,349 (14%) in 2009. This explains MITSUBISHI's sharper growing impact in the last few years.



Productivity



# Summary

- A technology manager can conveniently determine the affiliated organization's position among a group of competitors.
- The technology manager can also determine where the performance difference lies and the degree of such difference.
- The two-dimensional approach is a valuable tool for tracking and monitoring how competitors' innovation performance evolves over a period of time.
- A steady trend manifested by the trajectory can provide a technology manager forecasting capability to the competitor's future performance by extrapolating this trend.



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Thank you.