I Was Told There Would Be No Math: What Every Employment Lawyer Should Know About Statistical Proof In Employment Matters

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Agenda

- Statistical Analyses in Employment Matters
  - Litigation – Class Action/Systemic Discrimination
  - Non-Litigation - RIFs, OFCCP Audits
- Compensation
  - Comparison of Averages
  - Regression Analyses
- Employee Selections
  - Comparison of Selection Rates
  - Regression Analyses
- Statistically-Significant Results. What Next?
  - Litigation Context
  - Non-Litigation Context
- Wage & Hour Issues
- Best Practices

Appropriate Uses of Statistical Analysis

- Litigation Context
  - Class certification stage - commonality
  - Merits stage
  - Impact of *Wal-Mart v. Dukes* – one year later
- Class Action Readiness Context – Non-Litigation
  - Pro-active assessments of vulnerabilities
    - RIFs
    - Real-time assessments of other employment decisions
  - Key – prepare to act on adverse findings
- OFCCP Audit Context
  - Implications of proposed revised scheduling letter

Privilege Issues

- Litigation Context
- Non-Litigation Context
  - Analyses must be done at the direction of counsel for the purpose of providing legal advice
    - Not a routinized HR or business matter
    - Formalistic approach
  - HR and business leaders acting on legal advice, rather than Legal acting as decision-makers
  - Must tightly control communications – cannot share results broadly
    - Face-to-face meetings rather than email
    - Implications for process – HR and management challenge
    - Legal collects all documentation at end of process

Key Considerations

- Similarly-Situated Employees
  - Statistical analysis needs to compare employees who are similarly-situated
  - At what level are decisions made?
  - What factors were considered?
- Data Integrity
  - Availability of data to model the reality of the decision-making process
  - Data strengths and weaknesses
  - Likely affect on outcomes

Compensation

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Statistical Methods of Analyzing Compensation

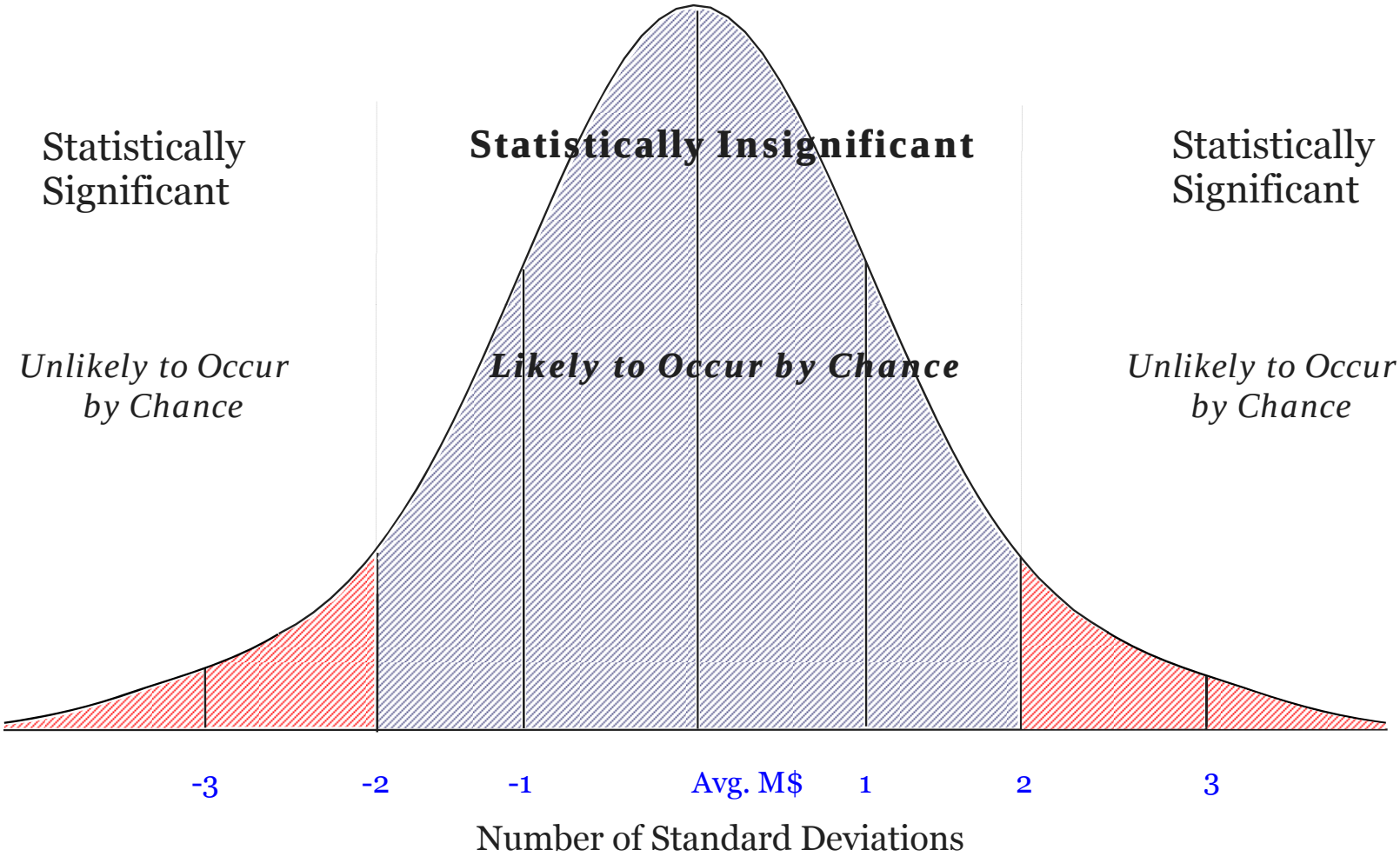
- Difference Between Averages

- Multiple Regression Analysis

Comparison of Averages

- Calculate the average salary of one grouping of employees.
  - Average Salary of Male Employees = $77,648
- Calculate the average salary of second grouping of employees.
  - Average Salary of Female Employees = $61,996
- Compute the difference between the average salary of the two groupings of employees.
  - Difference = -$15,652
- Is the difference statistically significant?

Statistical Significance



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Limitations of Average Salary Comparisons

- They do not control for other factors that are used to determine compensation levels
- Can be heavily influenced by unusual observations

Potential Determinants of Employee Pay

- Pay Grade / Pay Plan
- Job Title
- Years of company-specific experience
- Education
- Market pay rates
- Prior relevant experience
- Other (varies by employer)

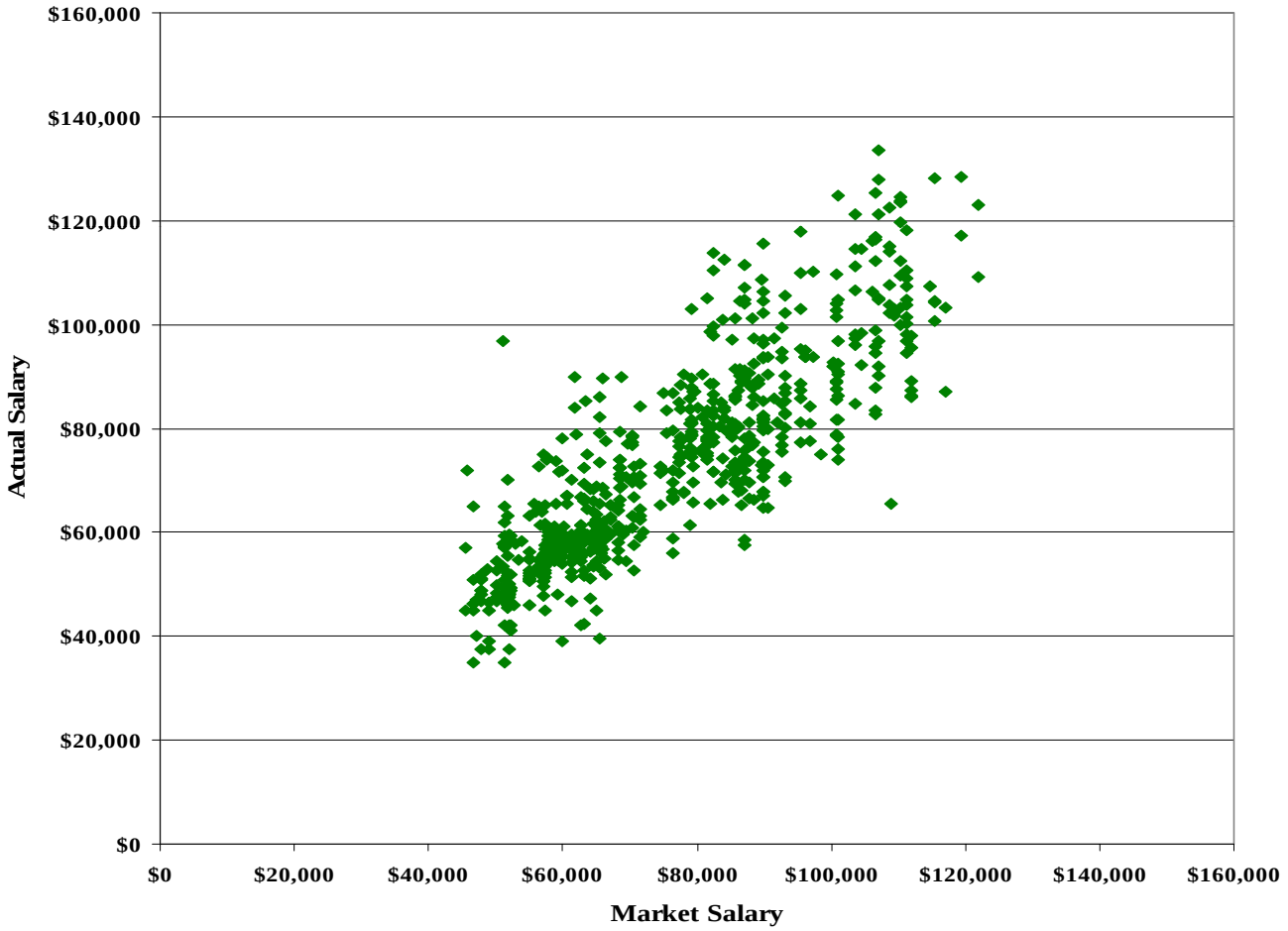
Regression Analysis

- Statistical method used to measure the relationship between variables.
  - Are they positively or negatively related?
  - How strongly are they related?
  - Are they significantly related?

- Regression analysis accounts for differences between groupings of employees with respect to factors that affect compensation
  - Then estimates average pay differential

Hypothetical Example - For Illustrative Purposes Only

Relationship Between Actual Salary and Market Salary



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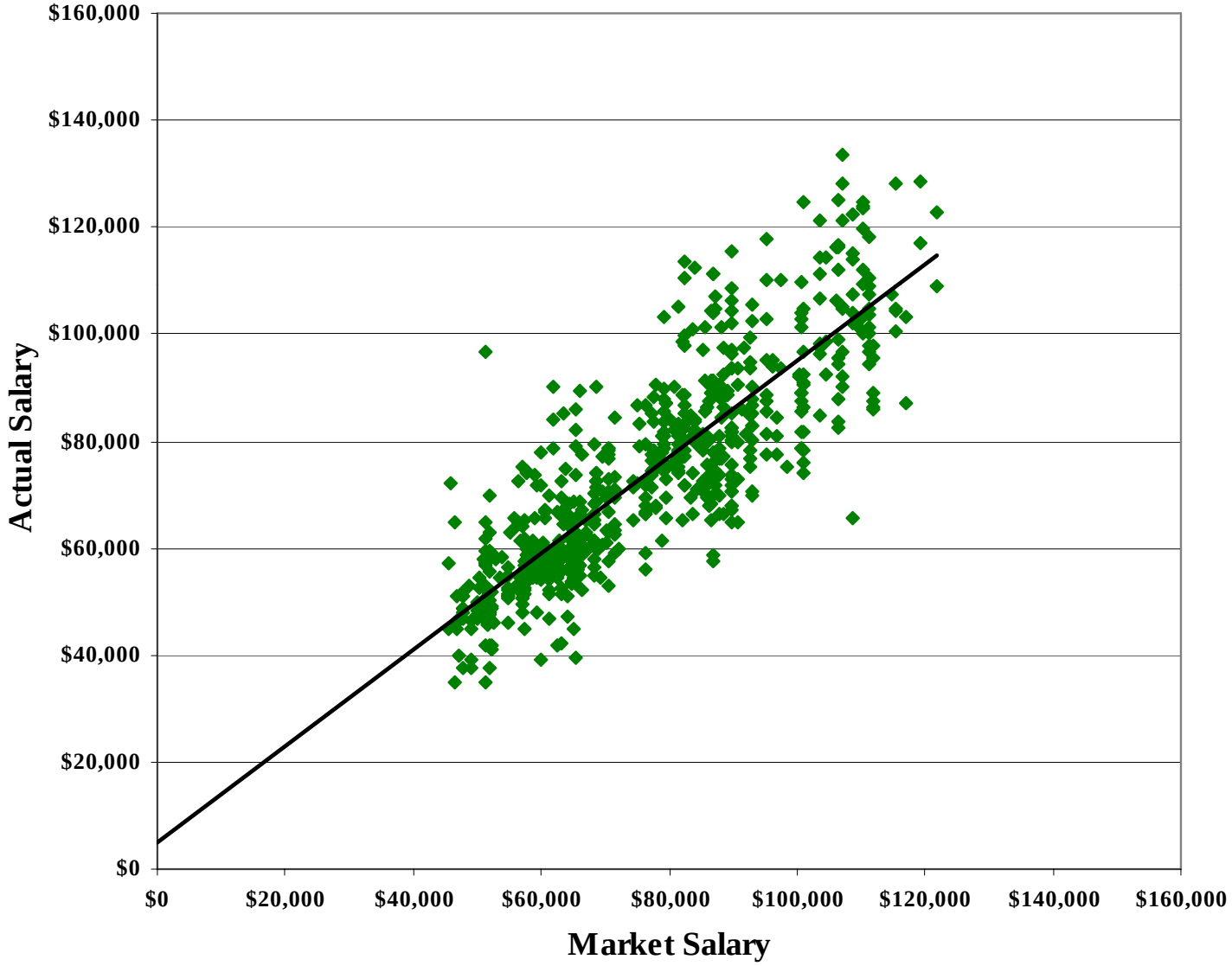
Estimated Simple Regression Line Relationship Between Actual Salary and Market Salary



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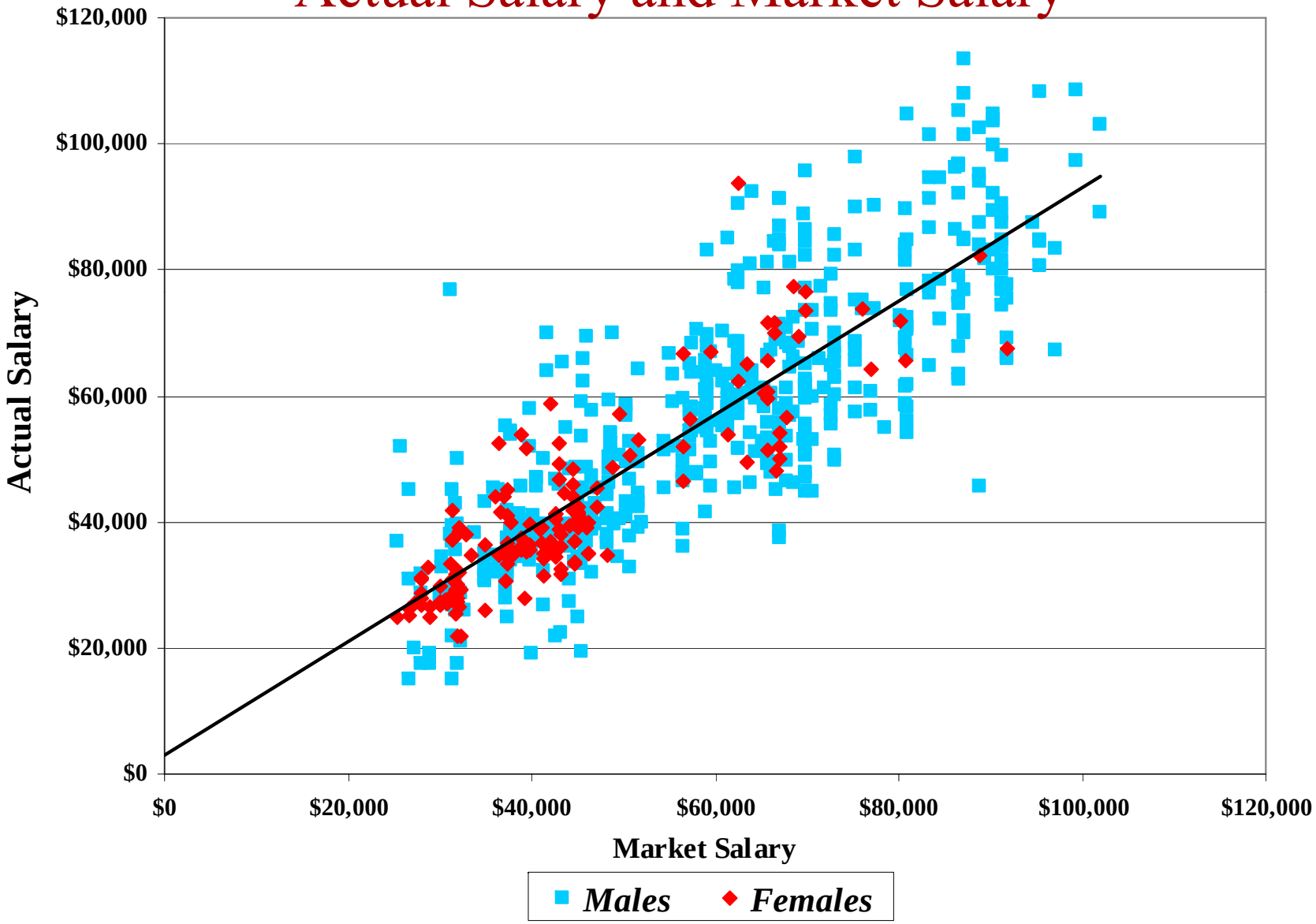
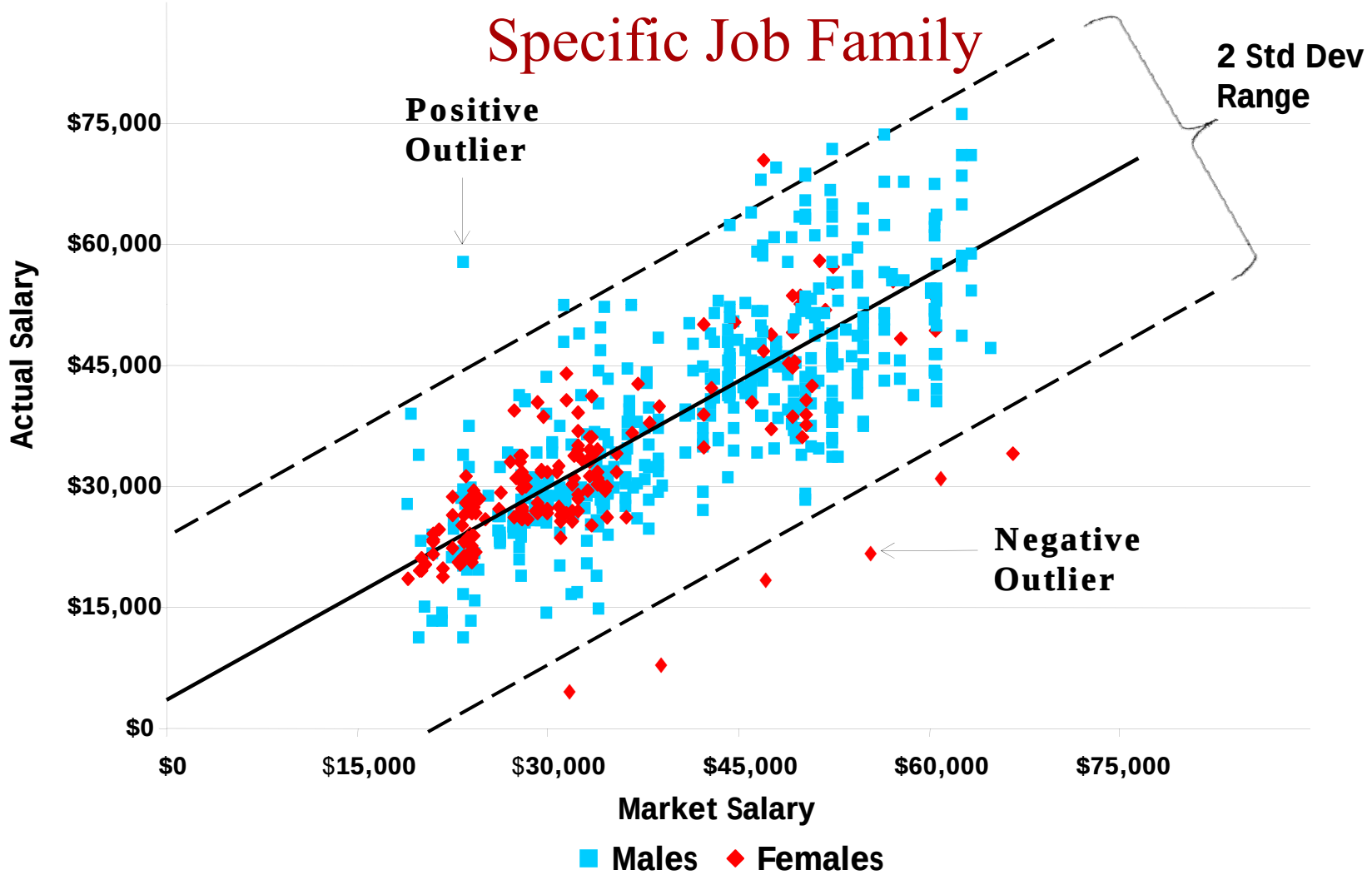


Hypothetical Example - For Illustrative Purposes Only

Actual v. Market Salary
Specific Job Family



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"Influential Observations"

- A few employees may contribute substantially more than others to the protected/unprotected salary gap.
  - These employees are called ***outliers***.
  - Employees who unduly influence the equation can be identified by using more advanced regression techniques.

Potential Explanations for Influential Employees

- The salaries of employees with the greatest influence can be investigated. Is it:
  - Measurement error?
  - Unusual compensation plans?
  - Unusual or atypical jobs?
  - Something else?
- If there are data problems they should be corrected.
- If there are individuals who have highly unusual compensation plans, then the model may not be appropriate for these employees.

Multiple Regression Analysis

Company ABC

Model	*Female/Male Salary Difference (Female Coefficient)*	*Number of Standard Dev. (t)*
1. Female	-$15,652	-11.23
2. Model 1 plus Pay Grade	-$10,956	-6.05
3. Model 2 plus Years of Experience Variable	-$ 2,385	-2.89
4. Model 3 plus Highest Level of Education Indicators	-$ 1,812	-2.31
5. Model 4 plus Admin Indicator	-$ 749	-1.42

Common Causes of Pay Disparities

- Pay decisions made in the past
  - Starting pay, merit increases, promotional increases, pay adjustments
- Performance evaluations vs. raises
- Job titles vs. actual responsibilities
- Comparisons of non-similarly-situated employees
- Natural attrition
- Mergers and acquisitions

Employment Selections

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Fisher's Exact Test

- Comparison of selection rates
  - Comparison group's status vs. selection status
- Selection rate of group vs. availability of group
- Small and large sample sizes

Fisher's Exact Test

	Layoff	Retain	Total
40 Plus	40	20	**60**
LT 40	60	62	**122**
Total	**100**	**82**	**182**

Statistically Significant at 2.22 Standard Deviations

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Regression Analysis

- Selection decisions usually based on multiple factors
  - Experience
  - Qualifications
  - Market factors
  - Organizational unit
  - Occupation/Job title
  - Other

- Logistic Regression
  - Does the protected group have a significantly greater/lesser probability of being selected after accounting for other factors that affect the selection decision?

Logistic Regression is Used When the Dependent Variable is Zero or 1

- Selected (1) or Not (0)
- Hired (1) or Not (0)
- Terminated (1) or Not (0)
- Promoted (1) or Not (0)
- Yes/No (It happened (1) or it did not (0))

We want to determine the probability of selection.

How likely is it that someone will be selected?

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Hypothetical Example - For Illustrative Purposes Only

Logistic Regression

Analysis of Layoffs
Score Sheet Data
40+ vs. LT 40

```
Logit estimates                                   Number of obs   =        182
                                                  LR chi2(9)      =      83.36
                                                  Prob > chi2     =     0.0000
Log likelihood = -55.417889                       Pseudo R2       =     0.4293

------------------------------------------------------------------------------
       Promo | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     40 plus |   1.053792   1.142523     1.00   0.317     .5539251    6.203987
    eval_pts |   1.284233   .0611108     5.26   0.000     1.169874    1.409771
     tig_pts |    1.91386   .4146098     3.00   0.003     1.251727    2.926244
      ed_pts |   1.298449   .0743026     4.56   0.000     1.160688     1.45256
   train_pts |   1.269783   .0871221     3.48   0.000      1.11001    1.452553
     Grade F |   .0023249   .0029475    -4.78   0.000     .0001937    .0278975
     Grade G |   .0004915    .000816    -4.59   0.000      .000019    .0127251
          DC |   1.937040   17.32524     3.21   0.001     3.151807    113.7797
          LA |   .0816028   .0842755    -2.43   0.015     .0107802    .6177112
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Statistically Significant Results in Litigation or Audit Context: Then What?

- Does the model accurately reflect decision-making process?
- Data correct?
- Outliers?
- Correct statistical methods?
- Correct computer programs?
- Identify the source of disparity – focus on segment of workforce to limit liability & damages

Statistically Significant Results in Non-Litigation Context: Then What?

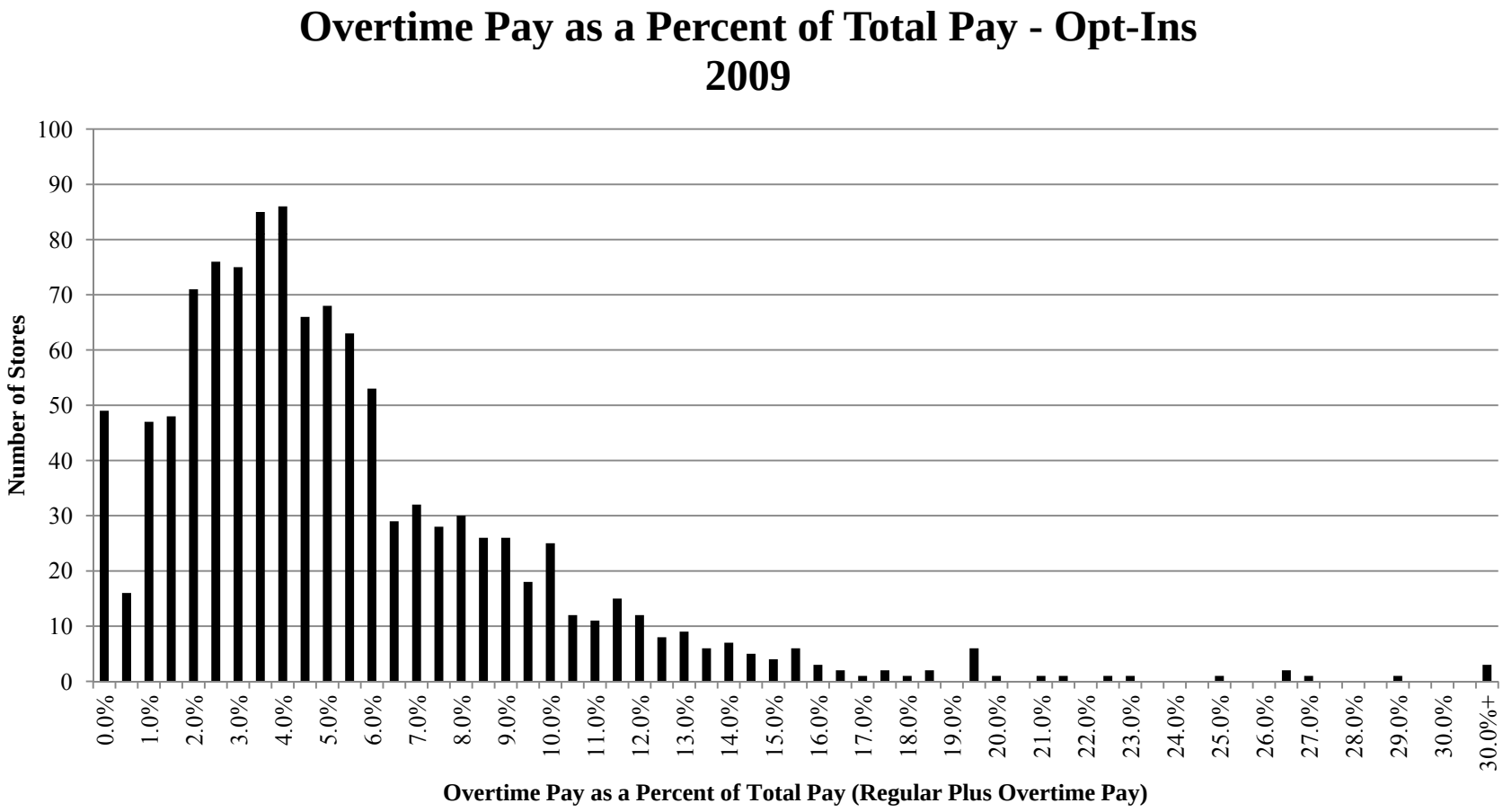
- Same considerations, plus others driven by context
- Review/revisit decisions and criteria
  - "Validation" of results
  - Revise selection or reward decisions, make pay adjustments
- Identify process improvement opportunities
  - Targeted training – focus on sources of disparities
  - Narrow range of discretion, revise selection criteria
- Identify the source of disparity – focus on segment of workforce to limit liability & damages

Wage & Hour

Allegations of Wage & Hour Violations

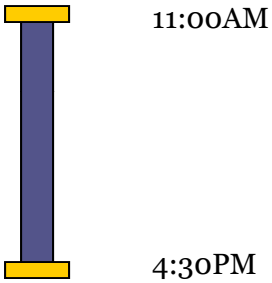
- Plaintiff/Agency Approaches
  - Misclassification, Off-the-clock
    - Both depend on measures of work time
  - Reliance on claims of named plaintiffs or claimants as being representative
  - Take advantage of shortcomings in employers' data

Commonality – Class Cert



Example: Meal Break Violation?

Date	Time of Swipe	Type	Edited
10/26	11:00AM	In	No
10/26	4:30PM	Out	No



- A typical timekeeping system will interpret this sequence of swipes as 5.5 hours of work.
- The same sequence of swipes may be used to support an allegation that there was a meal period violation because there is no record of a meal period taken during the shift.

Example: Meal Break Violation?

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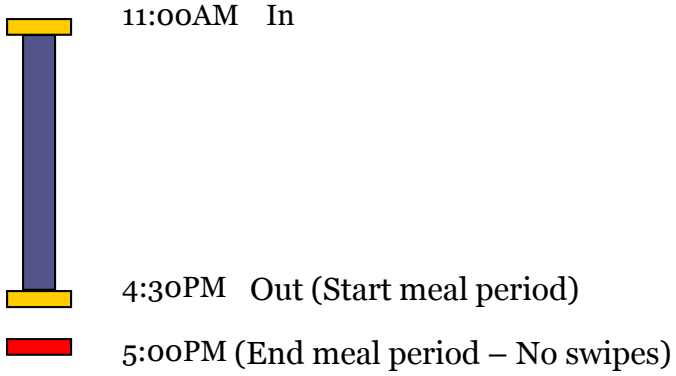
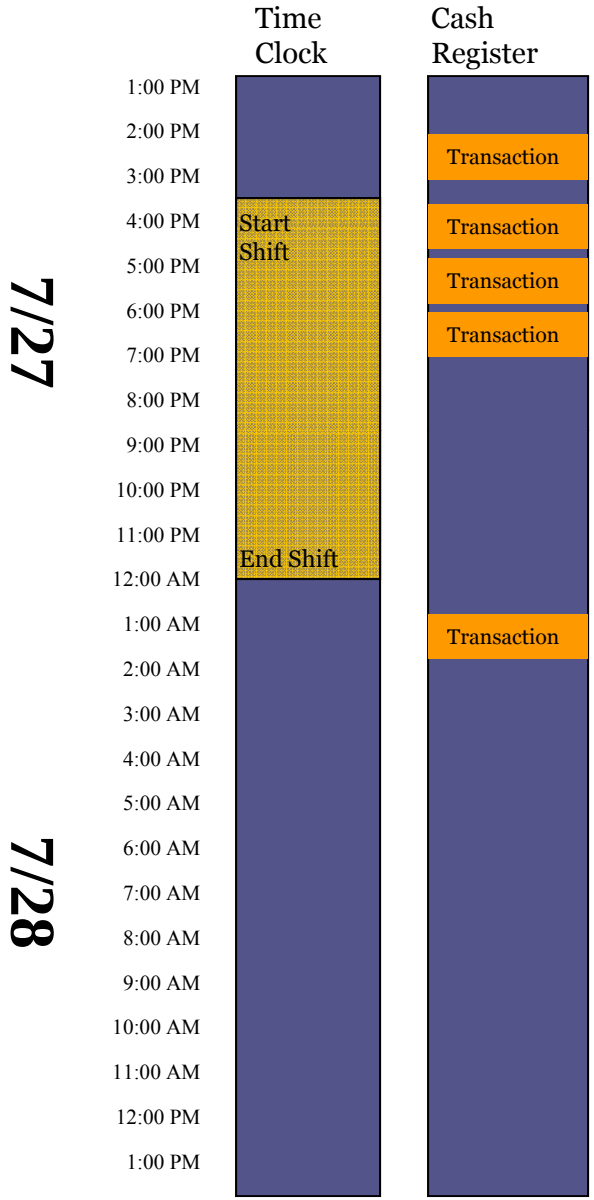


- To leave early, the employee took a meal period at the end of the shift.
- The employee did not want to take a break that day (waiver).
- The employee took the break yet forgot to swipe for it.

Example: Off-the-Clock Work?



Allegations of Wage & Hour Violations

- Suggestions for employers
  - Understand and document employee classification decisions
  - Review quality of data and policies
  - Proactive confidential analyses
    - Off-the-clock
    - Meal and Rest break violations
    - Correct calculation of overtime rate
    - Minimum wage violations
    - Time-shaving
    - If problems, company-wide or isolated to rogue manager?

Best Practices

- Data maintenance
- Know where you stand
  - Regular assessments, directed by counsel
  - Focus on compensation, selection decisions, and wage and hour
- Comparisons of similarly-situated employees
  - Job titles vs. actual responsibilities
- Validate performance evaluation process – key selection decision and variable in other regression models
- Justify starting salary levels – capture justifications
- Be prepared to act upon adverse findings

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