

Does More Coverage Mean Better Tests?

I. About the paper.

A. 2009 paper from Microsoft and Avaya.

B. Published in

*3rd International Symposium on Empirical
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II. The paper addresses a fundamental question:

Does increased code coverage make tests better?

- A.** Authors perform detailed analysis of two large and dissimilar code bases.
- B.** One at Microsoft, another at Avaya, Inc.

- C. Conclusion is that increased coverage *does in fact lead to better tests.*
- D. "Better" means fewer *field-reported* problems
- E. Authors support conclusions with a detailed description of methodology and results.
- F. At the end, they make some very interesting observations about their results.

Research results on code coverage, cont'd

"Despite dramatic differences between the two industrial projects under study we found that *code coverage was associated with fewer field failures* This strongly suggests that code coverage is a sensible and practical measure of test effectiveness."

Research results on code coverage, cont'd

"[They found] an *increase in coverage leads to a proportional decrease in fault potential.*"

Research results on code coverage, cont'd

"Disappointingly (?), there is *no indication of diminishing returns* (when an additional increase in coverage brings smaller decrease in fault potential)."

Research results on code coverage, cont'd

"What appears to be even more disappointing, is the finding that additional *increases in coverage come with exponentially increasing effort.*

Therefore, for many projects it may be impractical to achieve complete coverage."