Research Study Literature - Menggunakan Metode Meta Analysis

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Figure 1. The absolute number and percentage of publications on meta-analysis in the database PsycINFO in the last 30 years.
Source: Professor Herb Marsh, Oxford University, online search of ISI database, Feb. 2008.
What is a meta-analysis? (1)

Gene Glass 1976:

“Meta-analysis refers to the analysis of analyses”

Quantitative synthesis of data extracted from a systematic review
Methods of pooling study results

- Narrative procedure (conventional critical review method)
- Vote-counting method (significant results marked “+”, converse “–” and no significant results “neutral”)
- Combined tests (combining the probabilities obtain from two or more independent studies)
Systematic Reviews & Meta-analysis

• Systematic review is the entire process of collecting, reviewing and presenting all available evidence

• Meta-analysis is the statistical technique involved in extracting and combining data to produce a summary result
Literature reviews - conceptual relations

- Narrative reviews
- Systematic reviews
- Meta-analyses
Aim of a meta-analysis

- To increase power
- To improve precision
- To answer questions not posed by the individual studies
- To settle controversies arising from apparently conflicting studies or
- To generate new hypothesis
Meta-Analysis Steps

- Obtain relevant studies
- Extraction of data from individual study
- Convert test statistics into effect sizes
- Compute mean effect size
- Correct effect sizes for sources of error
- Determine if effect size is significant
- Determine if effect can be generalized or if there are moderators
Data Analysis Technique

- This research use meta-analysis to test the hypotheses.

- Step to conduct meta analysis:
  1. Collect the amount of effect size ($r$) in every studies used as the sample.
  2. Compute the mean correlation using this formula: $\bar{r} = \frac{\sum(N_i r_i)}{\sum N_i}$
  3. Determine the 95 percent confidence interval:
     \[ [\bar{r} - S_p Z_{0.975}, \bar{r} + S_p Z_{0.975}] \approx [\bar{r} - S_p(1.96), \bar{r} + S_p(1.96)] \]
  4. Test the heterogeneity to look for moderating variable:
     \[ X^2_{k-1} = \frac{N_s s^2_r}{(1 - \bar{r}^2)^2} = \frac{S^2_r}{S^2_e} \]
Criteria for Hypotheses Testing

1. The magnitude between independent and dependent variable is measured using the amount of mean correlation.

2. Hypothesis is rejected when the confidential interval show insignificant result (the area of acceptance is only when the sign of min and max are the same, both positive or both negative).

3. The direction of relationship between independent variables and dependent variable is generated by the sign of mean correlation.

4. Heterogeneity is tested using chi-square. And further, sub group test is performed.

Note: Significance level (α) for this research is maximum 10% (0.01)
Contoh Analisis Meta

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META-ANALISIS:
FAKTOR-FAKTOR YANG MEMPENGARUHI NILAI PERUSAHAAN DI INDONESIA
Peluang riset menggunakan analisis meta di Indonesia

- kinerja perusahaan
- kepercayaan investor
- pengungkapan perusahaan
- kepuasan kerja akuntan
- kualitas pelaporan keuangan
- Relevansi nilai
Practical Meta-Analysis Effect Size Calculator

This is a web-based effect-size calculator. It is designed to facilitate the computation of effect sizes for meta-analysis. Four effect size types can be computed from various input data: the standardized mean difference, the correlation coefficient, the odds ratio, and the risk ratio.

This calculator is a companion to the 2001 book by Mark W. Lipsey and David B. Wilson, Practical Meta-analysis, published by Sage. An older Excel-based version of the calculator can be found at http://mason.gmu.edu/~dwilsonb/mna.html. Additional tools for performing meta-analysis can also be found at that web address.
Weaknesses of Meta-Analysis

- Methodologically sophisticated and expensive
- Potential ignoring of contextual effects not easily quantified; e.g. historical/environmental placement of research
- Potential improper mixing of studies
- Averages hiding important subgroupings
- Improperly weighting studies with different methodological strength/rigor