

A Best Evidence Synthesis on the Link Between Budgetary Participation and Managerial Performance

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Cahier du FARGO n° 1101002

Octobre 2010

Abstract : Using the best evidence synthesis method [Slavin, (1995)], we find out an accurate summary on the link between budgetary participation (BP) and managerial performance (MP). The use of selection criteria allowed to decrease the heterogeneity. Our results report the presence of the heterogeneity by cultural and industrial contingencies. American surveys reveal a significant positive link but suffer from heterogeneity of the sample. Under the sample homogeneity principle, Australian surveys reveal a non-significant negative link and only Taiwanese surveys reveal a positive and significant link. This last result has to encourage researchers to continue the study of publicly traded firms in the Taiwan Stock Exchange to study the causal link between the two variables with a Granger test and to study the evolution of this link over time in other countries.

Key words: best evidence synthesis ; budgetary participation ; managerial performance ; meta-analysis ; subgroup analysis.

JEL Classification : M49 ; C89

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1. Introduction

“A few writers refer to comparing or combining apples and oranges, but the meta-analytic mixtures are usually too heterogeneous to be described with only two fruits. Other writers, with lower levels of enthusiasm or reverence, talk about rotten fruits or even less savoury substances.” [Feinstein, (1995): 72]. Feinstein's citation is helpful to understand that selectivity is much more attractive than combining heterogeneous papers into a standard meta-analysis that lacks the scientific precautions offered by individual results from randomised trials.

Meta-analysis is a quantitative method of combining the results of independent studies and of synthesizing all the summaries and the conclusions usable to evaluate notably effectiveness of a managerial practice. This type of syntheses differs from traditional reviews of literature using a narrative format to summarise the results of studies on a topic to draw conclusions or inform theory.

In accounting literature, meta-analysis was used to aggregate results in numerous fields [Ahmed and Courtis, (1999); Hay *et al.*, (2006); Trotman and Wood, (1991); among others]. To the best of our knowledge, two meta-analyses [Derfuss, (2009), Greenberg *et al.*, (1994)] and many reviews of literature were written about the link between budgetary participation and managerial performance [see for example: Chalos and Poon, (2001); Shields and Shields, (1998)].

Budgetary participation (BP hereafter) is usually defined as “a process in which a manager is involved with, and has influence on, the determination of his or her budget” [Shields and Shields, (1998): 49]. A *budget* is an expression of company expectations presented in economic terms for a future time period [Samuelson, (1973): 31]. An usual budgetary participation assessment is Milani's scale which measures the perceived influence of a “budgetee” on a budget [Milani, (1975)].

Employee's *performance* has been defined as “the degree to which successful role achievement is accomplished” [Ferris, (1977): 610]. The usual *managerial performance* (MP hereafter) questionnaire is based on the results of a survey conducted by Mahoney *et al.* (1963, 1965) that measures eight performance dimensions (planning, investigating, coordinating, evaluating, supervising, staffing, negotiating, representing). This questionnaire provides an overall measure of performance. Mahoney's and Milani's scales were used by most of studies investigating the link between BP and MP.

Derfuss (2009) found that BP and MP are significantly and positively linked. Moreover, the link between BP and MP seems contingent on industry differences. Nevertheless, Derfuss' meta-analysis on this link includes heterogeneous results and only papers published in English language. Following Feinstein (1995), it could be interesting to combine only the quantitative results based on randomised samples.

Our research question is the following one: **is Derfuss' meta-analysis result valid when the only trials based on randomised samples are combined?** By selecting studies with “randomised sample” criterion, we did a “best evidence synthesis” [Slavin, (1995)].

Best evidence synthesis is “a response to concerns about misleading conclusions from meta-analyses” [Slavin, (1995): 11]. Following Slavin, if a literature contains some studies high in internal and external validity, thus lower quality studies had to be excluded from the combination of the results. According to Feinstein (1995), studies using randomised samples are more homogeneous and could be aggregated in a meta-analysis.

The rest of the paper is organized as follows. Section 2 describes the data and the used method. Section 3 presents the empirical results. Section 4 discusses them and section 5 concludes.

2. Data and method

2.1. Process of studies collection

Firstly, we collected papers from existing reviews of literature and meta-analyses [Banović, (2005); Shields and Shields, (1998); Chalos and Poon, (2001); Derfuss, (2009)]. Then, the first draft was published in the *Muenchen RePec* base of working papers. Thus, our paper appeared in *scholar.google.com* and related papers were collected. These new papers were included in the first draft. This procedure has been iterated until stability of our base of papers on the link between BP and MP.

Finally, we based our synthesis on the list of papers which appears in [appendix](#). Seventy-six papers were gathered. Some papers have not statistical results and others have unusable results in a meta-analysis

because of lack of precisions. Our meta-analysis considers more papers than the one by Derfuss (2009) and our method differs.

2.2. Methods and criteria

To ensure reproducibility of our results, our best evidence synthesis used fixed-effect model of meta-analysis [Hedges and Olkin, (1985)]. Their statistical procedure is recognised in many scientific fields. The result of our first draft was computed in a spreadsheet. Then, a triangulation of the results was done by using “rmeta”: an R package for meta-analysis.

We excluded the following papers from our best evidence synthesis:

- Studies which do not use Milani's measure of budgetary participation [Milani, (1975)] and Mahoney's one of managerial performance [Mahoney *et al.*, (1963, 1965)]. This exclusion avoids the combination of papers which use different measure scales.
- Laboratory experiments that have low external validity.

After filtering with these two criteria, our base of papers gathered forty-four trials. For the best evidence synthesis, following Feinstein (1995), we used a criterion to exclude the studies which are not based on a randomised sample. Thus, the best evidence synthesis is only based on fifteen randomised trial results coming from the papers summed up in table 1. Randomised-sample results that do not use Milani's and Mahoney's scales [Breux (2004); Chong *et al.* (2006); Dunk, (1995), Kobori, (2006)] or which presentation of the results is not enough clear to be used [Abdullah, (1998); Chong and Chong, (2002)] are excluded from the analysis.

Sometimes, the use of selection criteria cannot eliminate heterogeneity between individual studies. If the heterogeneity test rejects the homogeneity null hypothesis, one will use subgroup analysis or one will assess the quality of trials. Nevertheless, evaluation of the methodological quality of a study is a difficult burden [Cho and Bero, (1994)]. Moreover, the use of quality score is highly criticized in literature [Moher *et al.*, (1995); among many others]. Thus, subgroup analysis seems to be a better research strategy.

Table 1 – Papers used for the best evidence synthesis

Randomised-sample papers	Firm description / Sector	Country	Use of Milani (1975) and Mahoney <i>et al.</i> (1963, 1965) scales
Brownell, Dunk (1991)	Manufacturing companies	Australia – Sydney	x
Chalos, Poon (2001)	Listed companies	USA (supposed)	x
Chong, Bateman (2000)	Manufacturing companies	Australia	x
Dunk (1990)	Manufacturing companies	UK	x
Dunk (1993)	Manufacturing companies	Australia – Sydney	x
Hoque, Brosnan (2007)	Coal mining companies	Australia	x
Kren (1992)	Manufacturing companies	USA	x
Lau, Buckland (2000)	Mining companies	Norway	x
Lau, Low, Eggleton (1995)	Manufacturing companies	Singapore	x
Lau, Tan (1998)	Financial institutions	Australia / Singapore	x
Ni, Su (2001)	Large and small companies	Taiwan	x
Ni, Su, Chung, Cheng (2005)	Manufacturing companies	Taiwan	x
Quirin, O'Bryan, Donnelly (2004)	Large companies	USA	x
Su, Lin (2007)	Manufacturing companies	Taiwan	x
Subramaniam, Ashkanasy (2001)	Food manufacturing companies	Australia	x

The presence of cultural contingencies was studied in the literature [Frucot and Shearon, (1991); Lau *et al.*, (1995); Tsui, (2001)]. The link between BP and MP depends on cultural variables. Thus, if the homogeneity null hypothesis is rejected, it will be useful to make an analysis of differences between cultural subgroups in order to study the causes of the heterogeneity.

The heterogeneity reduction could help to see the impact of other variables on the relationship

between BP and MP and to make some recommendations for further research.

3. Results

Our final sample is then of 15 results. The summary effect is about -0.0165 (95% confidence interval = [-0.0345, 0.0015]). One cannot rely on this result because of the presence of heterogeneity among results (estimated heterogeneity variance: 0.013, p-value = 0; test for heterogeneity: $\chi^2(13) = 58.76$, p-value = 0). The results of these heterogeneity tests has to be compared to the ones without the measurement scale criterion (estimated heterogeneity variance = 0.011, p-value = 0; Test for heterogeneity: $\chi^2(18) = 67.51$, p-value = 0). This criterion decreases the heterogeneity, but the homogeneity of the individual results is not significant.

Following Frucot and Shearon (1991), Lau *et al.* (1995) and Tsui (2001), a cultural subgroup analysis was computed. The subgroups are the following: Australian managers (5 randomised-sample results using Milani's and Mahoney *et al's* scales), American ones (3) and Taiwanese ones (3). The studies based on survey of managers from other countries were excluded from the subgroup analysis, because of the lack of studies from some political territories.

From the Australian subgroup synthesis, it appears a non-significant negative link between BP and MP (summary effect = -0.0184 with 95% CI = [-0.0865, 0.0496]). One can rely on this subgroup synthesis because of non rejection of the homogeneity null hypothesis (estimated heterogeneity variance = 0.0022, p-value = 0.263; test for heterogeneity: $\chi^2(4) = 5.24$, p-value = 0.2633). The result seems to be more homogeneous. Hoque and Brosnan's paper increases the heterogeneity (Figure 1): sectoral and industrial contingencies could explain this.

From the American subgroup synthesis, it appears a significant positive link between BP and MP (summary effect = 0.242 , 95% CI = [0.12, 0.364]). One cannot rely on this subgroup best evidence synthesis because of rejection of the homogeneity null hypothesis at the 5% level of significance (estimated heterogeneity variance = 0.025, p-value = 0.044; test for heterogeneity: $\chi^2(4) = 6.26$, p-value = 0.0437). The synthesis plot shows a tendency (Figure 2). But because of the lack of homogeneity between these individual results, one cannot infer something about this temporal tendency.

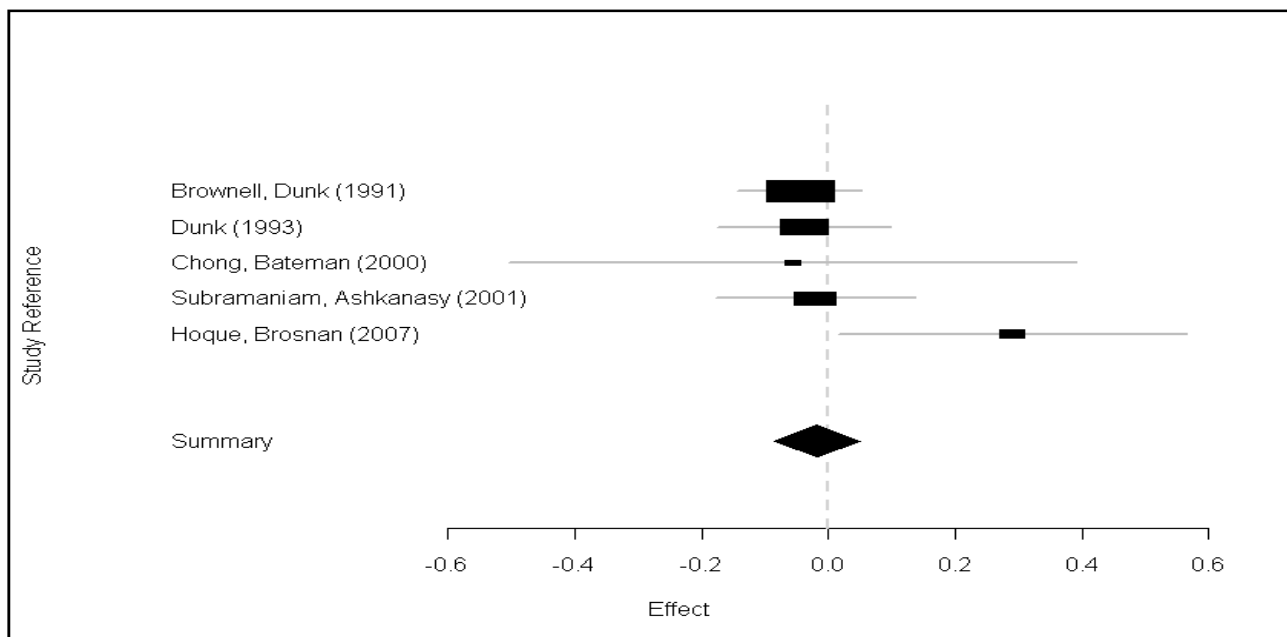


Figure 1 – Best evidence synthesis of the Australian results

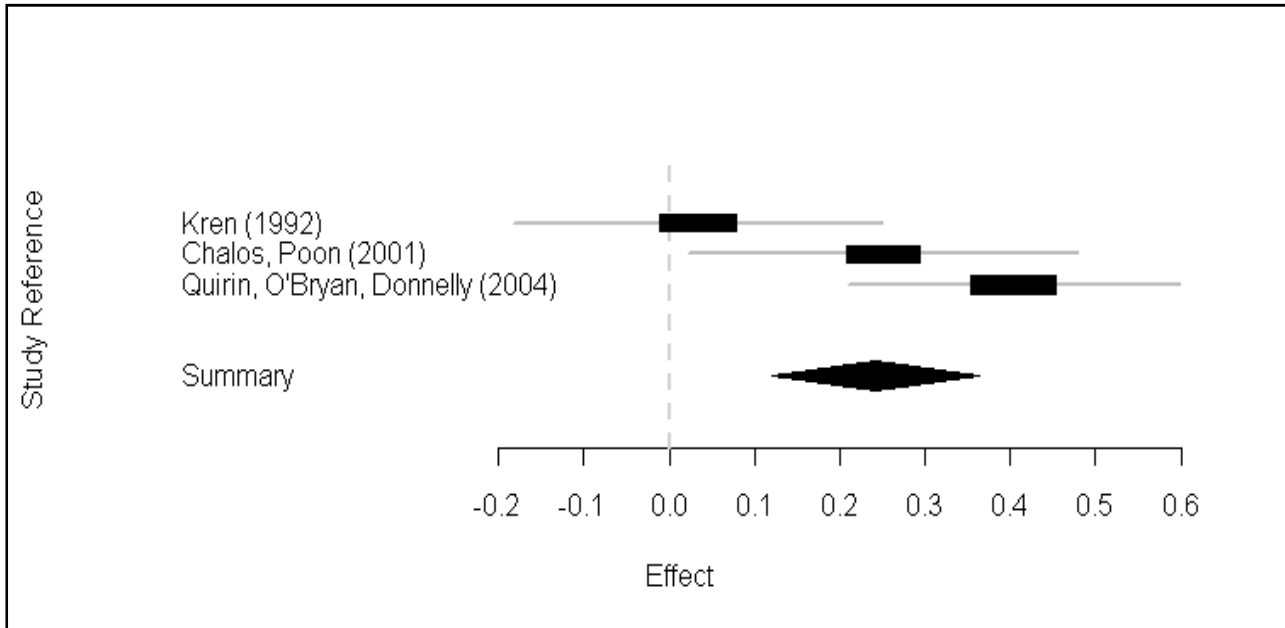


Figure 2 – Best evidence synthesis of the American results

From the Taiwanese subgroup synthesis, it appears a significant positive link between the studied variables (summary effect = 0.109, 95% CI = [0.0301, 0.188]). One can rely on this subgroup result because of non rejection of the homogeneity null hypothesis at the 5% level of significance (estimated heterogeneity variance: 0.0093, p-value = 0.057; test for heterogeneity: $\chi^2(2) = 5.72$, p-value = 0.0571). The synthesis plot shows the same tendency (Figure 3) as the American subgroup one (Figure 2). The relation between BP and MP evolves positively over time.

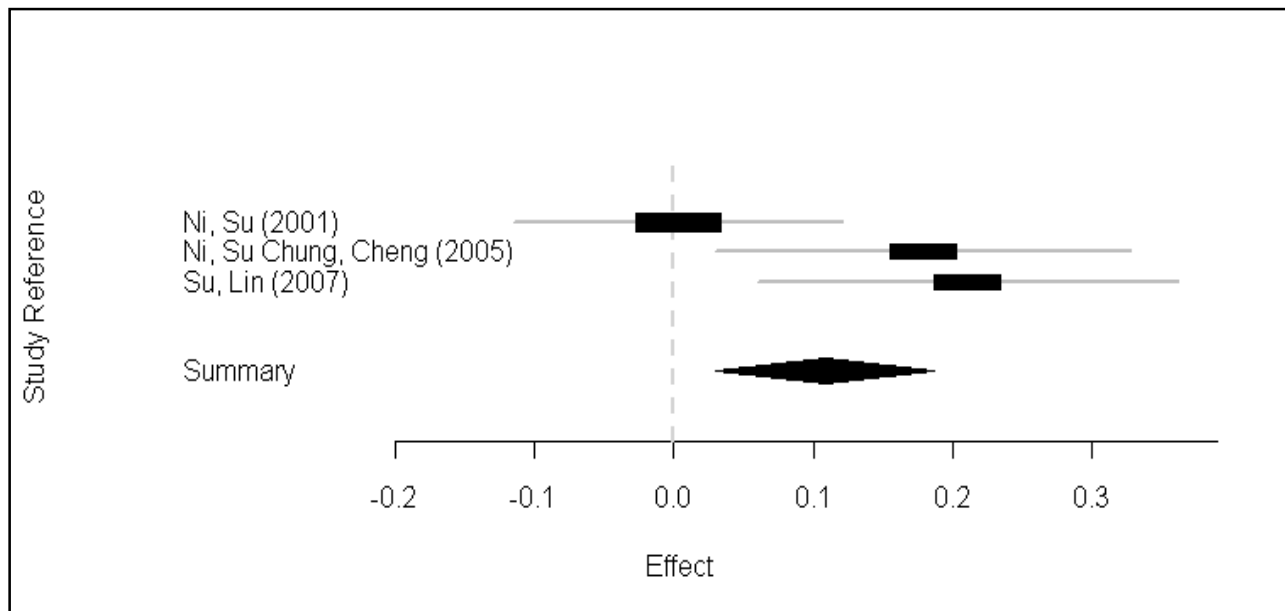


Figure 3 – Best evidence synthesis of the Taiwanese results

4. Comments and further research

From these results, it is possible to highlight and to comment three of them. Firstly, the Australian synthesis shows a non-significant negative link between BP and MP that sheds lights on a cultural

particularity in Australia: participating in budget determination has no effect on managerial performance. Secondly, the synthesis of the Taiwanese subgroup is really interesting because the sample is the same through studies: publicly traded firms in the Taiwan Stock Exchange. Thus, the time dependency of the link between BP and MP is shown when the effects of cultural and industrial contingencies are under control. Thirdly, Derfuss' results cannot be rejected following our analyses. In fact, in the best evidence synthesis of American subgroup, the lack of control on industrials contingencies could be linked to higher heterogeneity than in the Australian and Taiwanese subgroup.

Based on these comments, it is possible to give a recommendation for further research. The time dependency of the link between BP and MP was inferred from a limited field: the publicly traded firms in Taiwan Stock Exchange from 2001 to 2007. One should examine the robustness of this result:

- in the long-run, by surveying annually traded firms in the Taiwan Stock Exchange during twenty years or more. Then, one will be able to show the evolution over time of the causal link between BP and MP with a Granger test of causality;
- between countries, studying the same firm populations over time (in different political territories).

5. Conclusion

Finally, after having shown that meta-analysis based on the selection of homogeneous individual results is better than "meta-analytic mixtures (...) usually too heterogeneous" [Feinstein, (1995): 72], we justified the use of some selection criteria. Moreover, if the combined results are still significantly heterogeneous, it will be justified to combine papers by cultural subgroups.

The best evidence synthesis using "randomised-sample" and "same measurement scales" criteria is heterogeneous. Thus, we have analysed cultural subgroup syntheses. On the base of our subgroup syntheses, it seems that cultural and industrial contingencies are highly plausible. Whereas the Australian subgroup analysis exhibits a negative but non-significant link between BP and MP, the Taiwanese subgroup analysis exhibits a positive and significant one. Both results are based on homogeneous studies.

Moreover, the synthesis based on survey of managers of publicly traded firms in Taiwan Stock Exchange from 2001 to 2007, is significantly positive and homogeneous. From this subgroup synthesis, it appears that the link between BP and MP is time dependent.

This time dependency has to be confirmed in further research. One could use the Taiwanese Stock Exchange as a basis to observe the long-run evolution and to test the causal link between BP and MP with Granger's causality test or, if expectations play a role, Sims' one [Granger, (1969); Sims, (1980)]. One could replicate the Taiwanese synthesis result by studying this link on the same populations of companies over time in different political territories.

Last but not least, Derfuss' results cannot be rejected following our subgroup analysis. In fact, in the best evidence synthesis of American subgroup, the lack of control on industrial contingencies could be linked to higher heterogeneity than in the Taiwanese and Australian subgroups.

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Appendix

The literature on the link between BP and MP (Some of them are not usable for our analysis as explained) [top](#)

<i>Studies</i>	<i>Samples</i>	<i>Randomised-sample</i>	<i>Budgetary participation measurement scale</i>	<i>Managerial performance measurement scale</i>
<i>Abdullah, 1998</i>	79 Australian managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Agbejule and Saarikoski, 2006</i>	83 Finnish managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Alam and Mia, 2006</i>	113 Bangladeshi NGO managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Aranya, 1990</i>	97 Canadian managers	No	Personal scale	Personal scale
<i>Arifin, 2007</i>	44 Indonesian managers	No	Personal scale	Personal scale
<i>Bass and Leavitt, 1963</i>	3 experiments with 36 managers (USA supposed)	Yes (supposed)	Personal scale	Personal scale
<i>Bento and White, 2006</i>	64 American managers	No	Chow (1999) adapted from Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Breaux, 2004</i>	197 AICPA members (USA)	Yes	Clinton and Hunton (2001)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell, 1981</i>	Experiment with 46 students and 48 managers (USA)	No	Personal scale	Personal scale
<i>Brownell, 1982a</i>	38 American managers	No	Hofstede (1967) and Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell, 1982b</i>	40 American managers	No	Hofstede (1967) and Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell, 1983</i>	46 (supposed Australian) managers	No	Hofstede (1967) and Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell, 1985</i>	61 (supposed Australian) managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell and Dunk, 1991</i>	79 Australian managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell and Hirst, 1986</i>	76 Australian managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell and McInnes, 1986</i>	108 (supposed American) managers	No	Hofstede (1967) and Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Brownell and Merchant, 1990</i>	146 (supposed American) production managers	No	Adapted from Swieriga and Moncur (1975)	Personal scale
<i>Chalos and Haka, 1989</i>	Experiment with 240 M.B.A. students (USA)	Yes	Personal scale	Personal scale

	supposed)				
<i>Chalos and Poon, 2001</i>	72 (supposed American) marketing managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Chenhall and Brownell, 1988</i>	33 (supposed American) managers	No	Milani (1975)		Personal scale
<i>Cherrington and Cherrington, 1973</i>	Experiment with 230 business students (USA supposed)	No	Personal scale		Personal scale
<i>Chong and Bateman 2000</i>	79 Australian managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Chong and Chong, 2002</i>	79 Australian managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Chong, Eggleton and Leong, 2006</i>	74 Australian managers	Yes	Adapted from Milani (1975)		Personal scale, consistent with Merchant (1981)
<i>Dunk, 1989</i>	26 managers from North UK	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Dunk, 1990</i>	26 managers from North UK	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Dunk, 1993</i>	78 American managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Dunk, 1995</i>	78 Australian managers	Yes	Milani (1975)		Adapted from Merchant (1981, 1984) and from Brownell and Merchant (1990)
<i>Eker, 2009</i>	150 Turkish managers	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Frucot and Shearon, 1991</i>	83 Mexican managers	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Frucot and White, 2006</i>	178 American managers	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965) and Heneman (1974)
<i>Godener and Fornerino, 2009</i>	155 French managers	No	Adapted from Godener and Fornerino (2005)		Adapted from Govindarajan and Gupta (1985)
<i>Govindarajan 1986</i>	77 (supposed American) managers	No	Swieringa and Moncur (1974)		Mahoney <i>et al.</i> (1963, 1965)
<i>Gul, Tsui, Kwok and Fong, 1995</i>	37 managers from Hong Kong	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Hassel and Cunningham, 1996</i>	36 Finnish managers and 31 foreign managers	No	Adapted from Milani (1975)		Adapted from Govindarajan (1984) and from Gupta and Govindarajan (1984)
<i>Hirst, 1987</i>	44 Australian managers	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Hoque and Brosnan, 2007</i>	55 Australian managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Jermias and Setiawan, 2008</i>	204 Indonesian public managers	No	Adapted from Vroom and Mann (1960)		Adapted from Mahoney <i>et al.</i> (1963, 1965)
<i>Kenis, 1979</i>	169 American managers	No	Personal scale		Personal scale
<i>Kobori, 2006</i>	81 Taiwanese managers	Yes	Hofstede (1967)		Mahoney <i>et al.</i> (1963, 1965)
<i>Kren, 1992</i>	80 American managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Lau and Buckland, 2000</i>	71 Norwegian managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Lau and Lim, 2002</i>	83 Australian managers	No	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)
<i>Lau, Low and Eggleton, 1995</i>	112 Singaporean managers	Yes	Milani (1975)		Mahoney <i>et al.</i> (1963, 1965)

<i>Lau and Tan, 1998</i>	104 Australian managers and 85 Singaporean managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Leach-López, Stammerjohan and Lee, 2009</i>	71 South Korean managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Leach-López, Stammerjohan and McNair, 2007</i>	45 Mexican and 98 American managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Lindquist, 1995</i>	Experiment with 86 students (USA supposed)	Yes	Personal scale	Personal scale
<i>Merchant, 1981</i>	19 American companies	No	Personal scale	Personal scale
<i>Merchant, 1984</i>	170 American managers	No	Personal scale	Personal scale
<i>Mia, 1988</i>	51 Australian managers	No	Milani (1975)	Personal scale
<i>Mia, 1989</i>	62 New Zealander managers	No	Milani (1975)	Personal scale
<i>Mia and Patiar, 2002</i>	52 Australian managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Milani, 1975</i>	81 (supposed American) foremen	No	Milani (1975)	Personal scale
<i>Ni and Su, 2001</i>	205 Taiwanese managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Ni, Su, Chung and Cheng, 2005</i>	155 Taiwanese managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Nouri and Parker, 1998</i>	135 American managers	No	Milani (1975)	Govindarajan and Gupta (1985)
<i>Orpen, 1992</i>	136 Australian managers	No	Milani (1975)	Personal scale
<i>Otley and Pollanen, 2000</i>	121 Canadian managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Parker and Kyj, 2006</i>	70 (supposed American) managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Quirin, O'Bryan and Donnelly 2004</i>	98 American managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Sheely Heath and Brown, 2007</i>	256 American employees	Yes	Milani (1975)	Fraser (1995)
<i>Shields, Deng and Kato, 2000</i>	358 Japanese engineers	No	Adapted from Shields and Young (1993)	Personal scale
<i>Shields and Young 1993</i>	98 American corporate controllers	No	Personal scale	Personal scale
<i>Su, 2001 (published in Ni, Su and Su, 2003)</i>	194 Japanese and Taiwanese managers in Taiwan	Yes	Hofstede (1967)	Mahoney <i>et al.</i> (1963, 1965)
<i>Su and Lin, 2007</i>	168 Taiwanese managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Subramaniam and Ashkanasy, 2001</i>	114 Australian managers	Yes	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)
<i>Taylor, Abdul-Hamid and Mohd-Sanusi, 2008</i>	81 Malaysian managers from a local public administration	No	Milani (1975)	Adapted from Mahoney <i>et al.</i> (1963, 1965)
<i>Tiller, 1983</i>	Experiment with 150	Yes	Personal scale	Personal scale

	students in psychology (USA supposed)				
<i>Tintri, 2002</i>	53 (supposed Indonesian) managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)	
<i>Tsamenyi and Mills, 2002</i>	89 Ghanaian managers	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)	
<i>Tsui, 2001</i>	89 managers from Hong Kong	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)	
<i>Wentzel, 2002</i>	74 (supposed American) managers in a large hospital	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)	
<i>Winata and Mia, 2005</i>	74 Australian managers	No	Adapted from Milani (1975)	Personal scale	
<i>Yahya, Ahmad and Fatima, 2008</i>	111 Malaysian managers from the Ministry of Defence	No	Milani (1975)	Mahoney <i>et al.</i> (1963, 1965)	
<i>Yuen, 2007</i>	216 Chinese public managers	No	Milani (1975) (supposed)	Mahoney <i>et al.</i> (1963, 1965)	