

# Report on Bachelor / Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

<b>Student:</b>	<b>Petr Čala</b>
<b>Advisor:</b>	<b>PhDr. Zuzana Havránková, Ph.D.</b>
<b>Title of the thesis:</b>	<b>Do money rewards motivate people? A Meta-Analysis</b>

## **OVERALL ASSESSMENT** (provided in English, Czech, or Slovak):

*Please provide a short summary of the thesis, your assessment of each of the four key categories, and an overall evaluation and suggested questions for the discussion. The minimum length of the report is 300 words.*

### **Short summary**

The bachelor thesis by Petr Čala presents the meta-analysis on the relation between rewards and individual performance. The author collects 1568 estimates of the effect of incentives on performance reported in 44 studies. Because individual studies use different measures of performance and evaluate the relationship using different specifications, the collected estimates are not directly comparable and need to be transformed to partial correlation coefficients. The author categorizes the effect into four main types to remedy the problem of effect generalization, so to a large extent, the conversion is conducted competently. The author reports noticeable publication bias in the literature: positive and statistically significant estimates of the incentives' effect on performance are preferentially selected for publication. After correcting for publication bias, persistent evidence for negligible yet highly significant rewards-motivation effect beyond bias remains in the literature. The author collects and uses 34 different study characteristics to analyze the systematic heterogeneity among the reported coefficients.

### **Contribution**

Even though the proposed topic is not novel (the relation has been repeatedly studied in psychology and there exist 11 different meta-analyses already published on this topic), the author goes beyond the scope of existing synthetical studies and filters out the studies published only in economic journals, so the contribution is apparent. It is notable that even with a different data set and estimation techniques the author still finds results that correspond to the findings of Jenkins et al. (1998) and indirectly support the theory discussed by Deci (1971), Cameron & Pierce (1994), Tang & Hall (1995).

### **Methods**

The author uses both classical meta-regression methods (funnel plot, Funnel Asymmetry - Precision Effect tests), and also applies recently developed techniques for publication bias correction: weighted average of adequately powered estimates proposed by John Ioannidis (2017), Top10 method by Stanley (2010), stem-based correction by Furukawa (2019, MIT WP), Andrews-Kasy selection model, caliper test, endogenous kink method by Bom & Rachinger (2019). To address model uncertainty intrinsic to meta-analysis the author uses Bayesian model averaging with novel priors and also frequentist model averaging.

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It is essential to consider that the standard error can be endogenous to the reported estimate in meta-regression methods. The author utilizes the number of observations used in the primary study as a natural instrument and also applies the up-to-date p-uniform technique by van Aert & van Assen (2020).

In the thesis, Petr uses quantitative techniques that were not covered in the bachelor studies at IES and he shows a solid understanding of the concepts he works with. Hence I assume Petr Čala had to learn numerous concepts additionally, which I believe is a remarkable achievement for the bachelor thesis.

I have a minor comment regarding the WAAP technique. Stanley *et al.* (2017) notice that the main limitation of the WAAP method is in its unfeasibility when being applied to datasets where there are no sufficiently powered studies. Can't the winsorized sample which the author uses be an example of such a dataset? It is unclear from the description whether the author utilizes unwinsorized data. I couldn't find this information in Table 4.2 either.

## Literature

The author provides a detailed review of both the theoretical studies as well as empirical literature assessing the relationship between incentives and performance. As far as I can tell, all relevant studies in the text are properly referenced.

## Manuscript form

The thesis is written in good English and typeset competently in LaTeX. Perhaps the style can be improved (in some places the text is a bit hard to follow, and some phrases sound non-academic, such as "*more than 2.5x larger*"; "*particularly fascinating results*", ), but it's very solid considering this is a bachelor's thesis. The manuscript is well structured, all parts are linked together logically. The minor issues are:

- some information seems to be missing from Table 4.2. I couldn't find the number of observations and studies used for the calculations. This may be of particular importance, for example, in the case of using the WAAP technique for publication bias correction, as I mentioned earlier.
- there isn't even a mention of Figure 3.1 in the main text. What can be concluded from the box plot of PCC's across studies?
- the Appendices contain two full paragraphs of text describing definitive search query and additional Bayesian model averaging specifications. This is a bit confusing to me. It might be better to include the information about the search query and BMA specifications in the main text of the thesis.

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## Overall evaluation and suggested questions for the discussion during the defense

Petr Čala has conducted a very interesting research and the conclusions he presents are important for the literature. In my opinion, the thesis by Petr Čala fulfills the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University, I recommend it for the defense and suggest a grade A.

### Suggested question:

The best practice partial correlation coefficient estimate is 0.046. What does it say about the strength of the relationship? What should be the value of PCC to get a strong relationship?

The results of the Urkund analysis do not indicate significant text similarity with other available sources.

### **SUMMARY OF POINTS AWARDED** (for details, see below):

CATEGORY	POINTS
Contribution (max. 30 points)	28
Methods (max. 30 points)	29
Literature (max. 20 points)	19
Manuscript Form (max. 20 points)	15
<b>TOTAL POINTS</b> (max. 100 points)	<b>91</b>
<b>GRADE</b> (A – B – C – D – E – F)	<b>A</b>

**NAME OF THE REFEREE:** Mgr.Ing. Kseniya Bortnikova

**DATE OF EVALUATION:** 26.05.2021

Digitally signed (26.05.2021)  
Kseniya Bortnikova

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**Referee Signature**

**EXPLANATION OF CATEGORIES AND SCALE:**

**CONTRIBUTION:** *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

**METHODS:** *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

**LITERATURE REVIEW:** *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

**MANUSCRIPT FORM:** *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

**Overall grading:**

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F