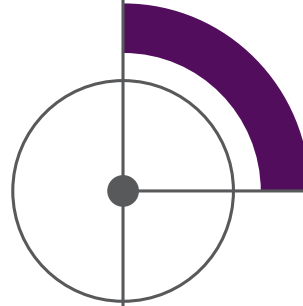


**CIPD**

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# FINANCIAL INCENTIVES

An evidence  
review

**Scientific summary**  
January 2022

The CIPD is the professional body for HR and people development. The registered charity champions better work and working lives and has been setting the benchmark for excellence in people and organisation development for more than 100 years. It has more than 160,000 members across the world, provides thought leadership through independent research on the world of work, and offers professional training and accreditation for those working in HR and learning and development.

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# 1 Background

One way in which employers attempt to enhance organisational effectiveness and performance is through performance management systems that use financial incentives (in particular: annual bonus programmes) designed to positively impact employees' motivation and, consequently, performance. Although this assumption makes sense from a managerial perspective, it is yet unclear whether it is supported (or contradicted) by scientific evidence. This review presents an overview of a rapid evidence assessment (REA) on the scientific evidence related to this assumption.

## 2 What is a rapid evidence assessment (REA)?

Evidence reviews come in many forms. One of the best known is the conventional literature review, which provides an overview of the relevant scientific literature published on a topic. However, a conventional literature review's trustworthiness is often low: clear criteria for inclusion are often lacking and studies are selected based on the researcher's personal preferences. As a result, conventional literature reviews are prone to severe bias. This is why REAs are used. REAs use a systematic methodology to identify comprehensively the most relevant studies on a given topic, and to select studies to include based on explicit criteria. In addition, two independent reviewers assess the methodological quality of the studies included using explicit criteria. In contrast to a conventional literature review, REAs are transparent, verifiable, and reproducible, and, as a result, the likelihood of bias is considerably smaller.

## 3 Main question: What does the review address?

*What is known in the research literature about the impact of financial incentives on employee motivation and performance?*

Other issues raised, which will form the basis of our conclusion to questions above, are:

- 1 What counts as a financial incentive (what is it)?
- 2 What is the assumed logic model (how is it supposed to enhance motivation and performance)?
- 3 What is the overall effect of financial incentives on motivation and performance?
- 4 What is known about the (positive or negative) effect of possible moderators and/or mediators (for example, type of employee – knowledge workers vs manual workers)?

## 4 Methods

### Search strategy: How was the research evidence obtained?

Four databases were used to identify studies: ABI/INFORM Global, Business Source Premier, PsycINFO, and Google Scholar. Our search applied the following general search filters:

- 1 scholarly journals, peer-reviewed
- 2 published in the period 2000 to 2019 (meta-analyses and systematic reviews)
- 3 published 2010 to 2019 (single studies)
- 4 articles in English.

A search was conducted using combinations of various search terms, including 'financial incentive', 'financial reward', 'monetary reward', 'incentive plan', 'bonus pay', 'annual bonus', and 'variable pay'. We conducted 16 different search queries and screened the titles and abstracts of 300+ studies. We

limited our search for single studies to those published more recently, on the grounds that the meta-analyses would cover the older studies. An overview of all search terms and queries is provided in Appendix 1.

### **Selection process: How were studies selected?**

Study selection took place in two phases. First, titles and abstracts of the 300+ studies identified were screened for relevance. In case of doubt or lack of information, the study was included. Duplicate publications were removed. This first phase yielded 25 meta-analyses and 19 primary studies. Second, studies were selected based on the full text of the article using these inclusion criteria:

- 1 type of studies: focusing on quantitative, empirical studies
- 2 measurement: only studies in which relationships among financial incentives and motivation and/or performance outcomes were quantitatively measured
- 3 context: only studies related to workplace settings
- 4 level of trustworthiness: only studies that were graded level C or above (see below).

This second phase yielded a total number of six meta-analyses, representing more than 400 primary studies. We also included nine more recent primary studies. An overview of the selection process is provided in Appendix 2.

## **5 Critical appraisal: What is the quality of the studies included?**

The overall quality of the studies included in this REA was from moderate to high. Of the six meta-analyses included, four included controlled studies and were therefore graded level A. Of the nine primary studies included, six involved controlled before–after studies and were therefore graded level B or higher.

It should be noted, however, that both the ecological validity (type of organisations) and population validity (type of employees) of the high-quality studies were rather low, because most were set in an artificial context and involved students. As a result, one must be cautious in generalising the findings of such studies to the context and population of this REA, that is, knowledge workers with an annual bonus.

An overview of all studies included and their year of publication, research design, sample size, population, main findings, effect sizes and limitations is provided in Appendix 3.

## **6 Main findings**

### **Question 1: What counts as an incentive?**

In the domain of management, incentives can be defined as ‘...plans that have predetermined criteria and standards, as well as understood policies for determining and allocating rewards’ (Greene 2011). Incentives include all forms of rewards (and punishments) that are based on an employee’s performance. Promotions, grades, awards, praise, and recognition are therefore all incentives. Financial incentives such as money, bonus plans, or stock options are the most commonly used (Cerasoli et al 2014). Some authors make a technical distinction between incentives and rewards. They refer to incentives as (financial) stimuli that are offered/promised in advance, and rewards as that which are offered only after a given performance (Garbers and Konradt 2014). In the scientific literature and management practice, however, these terms are usually used interchangeably.

### **Question 2: What is the assumed logic model: How are financial incentives supposed to enhance motivation and performance?**

In the domain of management and business, it is widely believed that financial incentives are an effective way to change employee behaviour. The assumption is that financial incentives increase the motivation to work harder and subsequently perform better. Numerous psychological theories on human motivation have been used to explain this effect, such as reinforcement theory (Fester and Skinner 1957), self-determination theory (Deci and Ryan 1985), expectancy theory (Vroom 1964), agency theory (Baiman 1982), equity theory (Adams 1965), and goal-setting theory (Locke et al 1988). A comprehensive overview of these theories is provided by Garbers and Konradt (2014). Here, we focus on the two theories offering the most compelling explanation for the presumed positive effects of financial incentives: reinforcement theory and self-determination theory.

Reinforcement theory reflects the premises of classical behaviourism (Pavlov 1927): behaviours followed by favourable consequences become more likely in future, and behaviours followed by unfavourable consequences become less likely. Thus, if high performance (behaviour) is rewarded with a financial bonus (favourable consequence), high performance becomes more likely. As we explain in our evidence review of [work motivation](#), reinforcement theory is limited as a general motivation theory, because it only considers external stimuli and ignores more internal psychological processes. Nonetheless, it's a good explanation for why financial incentives motivate. Self-determination theory states that the motivation to engage in a behaviour can be either controlled or autonomous. Controlled motivation (that is, external motivation) comes from external sources such as financial incentives, whereas autonomous motivation (that is, intrinsic motivation) comes from the interest or enjoyability inherent in the behaviour (Ryan and Deci 2000). As such, offering people a financial incentive increases their (controlled) motivation, and as a result will enhance their performance, especially for non-interesting tasks. However, a number of influential scientists, such as Deci and Ryan (1985), Pfeffer (1998), and the best-selling author Dan Pink (2009), have suggested that an employee's intrinsic motivation actually can be negatively affected by financial incentives. Importantly, the potential for adverse effects from financial incentives on intrinsic motivation are argued to apply to directly performance-salient incentives (for example, a bonus for project completion), rather than to indirectly performance-salient incentives (for example, base salary or training courses offered as benefits).

### **Question 3: What is the overall effect of financial incentives on employee motivation and performance?**

#### **Finding 1: Financial incentives have a moderate to large positive effect on employees' motivation and performance (Level AA).**

In the past three decades, a large number of high-quality studies and meta-analyses in the psychological, educational, medical, and business areas have shown that financial incentives are indeed strongly and positively related to individual performance. In fact, a meta-analysis of 45 controlled studies found that performance gains for financial incentives were double those of the average gains of non-financial incentives (Condly et al 2003). However, the effect is contingent on several moderating factors, as described in the following findings. This REA did not find studies examining the 'dose response' relationship between the level of the financial incentive and its impact on motivation and performance (that is, on what size of incentive is optimal).

#### **Finding 2: Financial incentives do not affect intrinsic motivation (Level AA).**

Despite the claims of numerous scholars and management authors, a large number of controlled studies have demonstrated that, in general, financial incentives appear to have no adverse effect on the intrinsic motivation of employees (Cameron et al 2001; Cerasoli et al 2014; Condly et al 2003; Garbers and Konradt 2014; Lohmann et al 2018). However, a recent randomised controlled study found that intrinsic motivation may decrease when financial incentives are perceived by employees as exploitative (Carpenter and Dolifka 2017).

## **Question 4: What is known about the effect of moderators and/or mediators?**

**Finding 3: Financial incentives tend to increase performance of non-interesting tasks but may decrease performance of interesting tasks (Level A).**

Financial incentives are found to have a strong positive effect on performance in cases of non-interesting tasks, but they tend to have a small or even negative effect in the cases of interesting tasks (Cameron et al 2001). This effect could be attributed to a 'crowding out' effect where financial incentives erode intrinsic motivation, but evidence for this mechanism remains inconclusive (Cerasoli et al 2014; Shaw and Gupta 2015).

**Finding 4: The effect of financial incentives on performance is larger for highly complex tasks than for less complex tasks (Level AA).**

It has been argued by both practitioners and academics that financial incentives only affect performance in simple tasks where increased effort directly improves performance. In regard to very complex tasks, additional effort is often not enough to solve the task because complex cognitive processes are involved, not merely more time or speed, and therefore it is assumed that in those situations financial incentives cannot improve performance. However, a meta-analysis based on 146 controlled studies found that financial incentives are even more effective in highly complex tasks than in medium- or low-complexity tasks (Garbers and Konradt 2014).

**Finding 5: Financial incentives that are not (or are loosely) tied to a level of performance can negatively affect performance (Level A).**

A large number of controlled studies show that financial incentives can have a negative effect on performance when offered without specifying a performance standard, that is, for merely completing a task (Cameron et al 2001). A meta-analysis of 145 studies also finds that when financial incentives are directly tied to performance, intrinsic motivation is less important to performance than when incentives are not, or only indirectly, tied to performance (Cerasoli et al 2014).

**Finding 6: No difference was found between competitive vs non-competitive incentive schemes (Level A).**

A meta-analysis of 45 controlled studies found no difference between programmes where only the highest performers get incentives (competitive schemes) and programmes where all employees who increased performance receive an incentive (non-competitive schemes) (Condly et al 2003).

**Finding 7: The effect of team-based financial incentives on performance is larger than for individual-based incentives, with equitably distributed rewards resulting in higher performance than equally distributed rewards (Level AA).**

**Finding 8: The effect of team-based financial incentives on performance decreases with the number of team members (Level AA).**

A large number of high-quality studies and meta-analyses demonstrate that team-based incentives (rewarding employees as teams) have a larger effect on performance compared with individually based incentives (Condly et al 2003; Garbers and Konradt 2014). Further, equitably distributed rewards (that is, when individual performance within team performance is an indicator for the size of the individual reward) tend to have a higher impact on performance than when rewards are distributed equally (that is, uniformly among team members). This effect, however, decreases as the number of team members increases (Garbers and Konradt 2014).

**Finding 9: The effect of financial incentives increases when participative performance goal-setting is applied (Level C).**

A longitudinal study found that when performance goals are set in participation with employees, financial incentives tend to have a larger effect (Anderson et al 2010). A possible explanation for this finding is that the goal-setting process itself may have a motivational effect. In addition, by participating in the goal-setting process, employees may add expertise and/or contextual knowledge that improves the appropriateness of the goal. It is argued that participative goal-setting combined with goal-based incentives may reduce the goals set due to self-interested motives, but the empirical evidence for this assertion is mixed (see, for example, Anderson et al 2010; Guthrie and Hollensbe 2004).

**Finding 10: The effect of financial incentives on the performance of professionals is moderated by the perceived importance of the performance goals (Level B).**

**Finding 11: The effect of financial incentives on performance is moderated by professionals' perceptions of the incentive's effect on their autonomy (Level B).**

A controlled before–after study, in which the impact of financial incentives on the performance of highly educated professionals (for example, surgeons or engineers) was assessed over a three-year period, found that the impact is moderated by how the professionals perceive the importance of the assigned performance goals in relation to their professional values and objectives. The greater their belief that the assigned goals are important, the greater the effect of the incentives. This effect is also moderated by whether professionals feel the incentives plan impedes their professional autonomy. The greater their belief that the incentive plan undermines their autonomy, the weaker the impact of incentives on performance (Young et al 2015).

**Finding 12: The effect of financial incentives is mediated by employee perception of procedural justice (Level A).**

**Finding 13: When bonuses are fairly distributed, financial incentives enhance employee intrinsic motivation and performance (Level C).**

A large number of high-quality studies and meta-analyses consistently demonstrate that employee perception of fairness is a mediator (prerequisite) for the effectiveness of a wide range of interventions aimed to enhance performance, such as performance appraisal, feedback, rewards, recognition, promotion, and financial incentives (for example, Cohen-Charash and Spector 2001; Viswesvaran et al 2002; Shaw et al 2003). Indeed, several studies examining the effect of rewards show that treating employees arbitrarily and unfairly has a corrosive effect on their motivation and subsequent performance (for example, Bareket-Bojmel et al 2017). In academia, the notion of fairness is often referred to as procedural (process) and distributive (outcomes) justice. Procedural justice reflects *‘the perceived fairness of decision-making processes and the degree to which they are consistent, accurate, unbiased, and open to voice and input’* (Colquitt et al 2013). Distributive justice refers to whether the allocation of resources or incentives is perceived as fair. When procedures are perceived as fair, reactions tend to be favourable, largely irrespective of the outcome (Colquitt et al 2013). In the realm of financial incentives, a recent longitudinal study found that when bonuses are fairly distributed, financial incentives make employees feel more competent and autonomous, which in turn fosters greater intrinsic motivation, and consequently better work performance (Landry et al 2017).

**Finding 14: Perceived manager discretion moderates the positive relationship between bonus level and procedural fairness (Level A).**



Managers can use their discretion to decide who and how much they reward. A recent randomised controlled study demonstrates that the motivational value of an incentive is moderated by how their manager’s use of discretion is perceived by employees. If manager discretion is perceived as procedurally fair, the motivational value of the incentive is stronger (Hewett and Leroy 2019).

**Finding 15:** The rating method used to determine whether a performance standard is met has a moderating effect on perceived fairness (Level A).

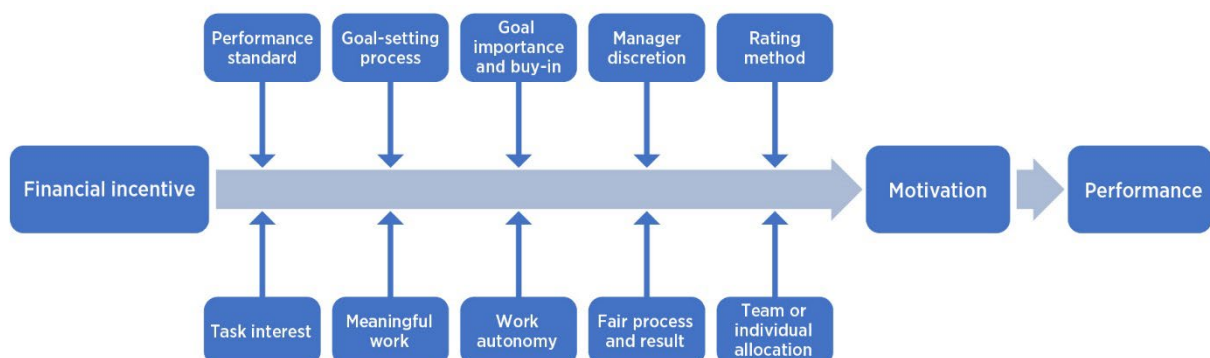
**Finding 16:** The relationship between the weight given to subjective performance measures and perceptions of fairness follows an inverted U-shape (Level C).

In the domain of performance appraisal, several high-quality studies demonstrate that the rating method used to determine whether a performance standard has been met (and thus whether a financial incentive should be given) has a moderating effect on employee perceptions of fairness. For example, a randomised controlled study (Bartol et al 2001) found that rating segmentation (that is, the number of alternative appraisal categories available for rating employee performance) affects perception of fairness. More specifically, moderate segmentation (five categories) resulted in higher perceived fairness, self-efficacy, and higher goals than a low segmentation (three categories). Another randomised controlled study demonstrated that a substantially lower degree of fairness was reported when forced distribution rating was used (Schleicher et al 2009).

Although subjective measures are generally considered inaccurate and prone to bias, a longitudinal study examining the impact of annual bonuses on performance found that when no subjective measures were used to determine whether performance targets are met, employees perceived the rating procedure as unfair. However, when a performance evaluation puts a lot of weight on subjective measures, employees also perceived the rating procedure as unfair. Thus, a performance evaluation that allows for some use of subjective measures improves fairness perceptions (Voußem et al 2016), but total reliance on subjective measures can be detrimental to fairness. A possible explanation is that managers can use their discretion on subjective measures to reward employees for their effort on dimensions that are value-enhancing but difficult to capture objectively (for example, leadership quality, personal integrity, support to colleagues, or teamwork). Further, managers can adjust bonus payments to account for uncontrollable factors on objective measures. However, because evaluations on subjective dimensions are based on personal observations and assessments by the manager, they also introduce the possibility of distorted ratings. As such, too much weight on subjective measures can undermine trust in the evaluating manager and, thus, reduce fairness perceptions ((Voußem et al 2016).

## 7 Conclusion

**Figure 1: Moderators affecting the outcomes of incentives**



The scientific research literature strongly supports the claim that financial incentives are an effective way to enhance the motivation and performance of employees. This positive effect, however, is moderated by several contextual factors, such as type of task, rating method, and perceived fairness.

## 8 Limitations

This REA aims to provide a balanced assessment of what is known in the scientific literature about the effect of financial incentives on the motivation and performance of employees by using the systematic review method to search and critically appraise empirical studies. In order to be 'rapid', concessions were made in relation to the breadth and depth of the search process, such as the exclusion of unpublished studies, the use of a limited number of databases, and a focus on empirical research published in the period 2000 to 2020. As a consequence, some relevant studies may have been missed.

A second limitation concerns the critical appraisal of the studies included, which did not incorporate a comprehensive review of the psychometric properties of their tests, scales, and questionnaires.

A third limitation concerns the focus on meta-analyses and high-quality studies, that is, studies with a control group and/or longitudinal studies. For this reason, cross-sectional studies were excluded. As a consequence, new, promising findings relevant for practice may have been missed.

Finally, as previously mentioned, both the ecological validity (type of organisations) and population validity (type of employees) of the included primary studies were rather low, because most were set in an artificial context and involved students. As a result, one must be cautious in generalising the findings of such studies to the context and population of this REA, that is, knowledge workers with an annual bonus.

Given these limitations, care must be taken not to present the findings presented in this REA as conclusive.

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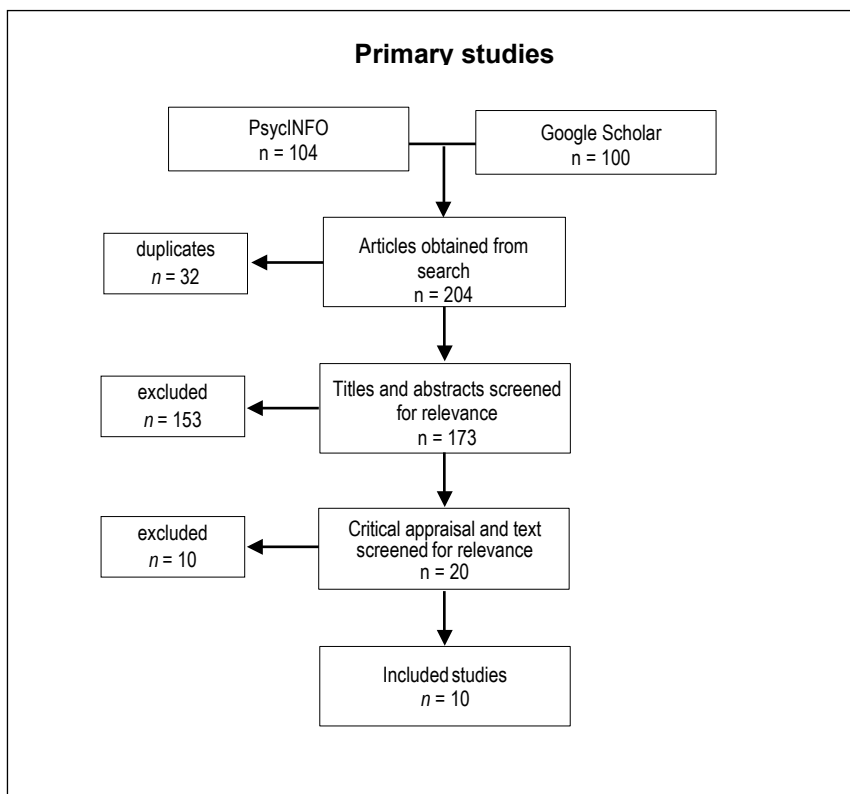
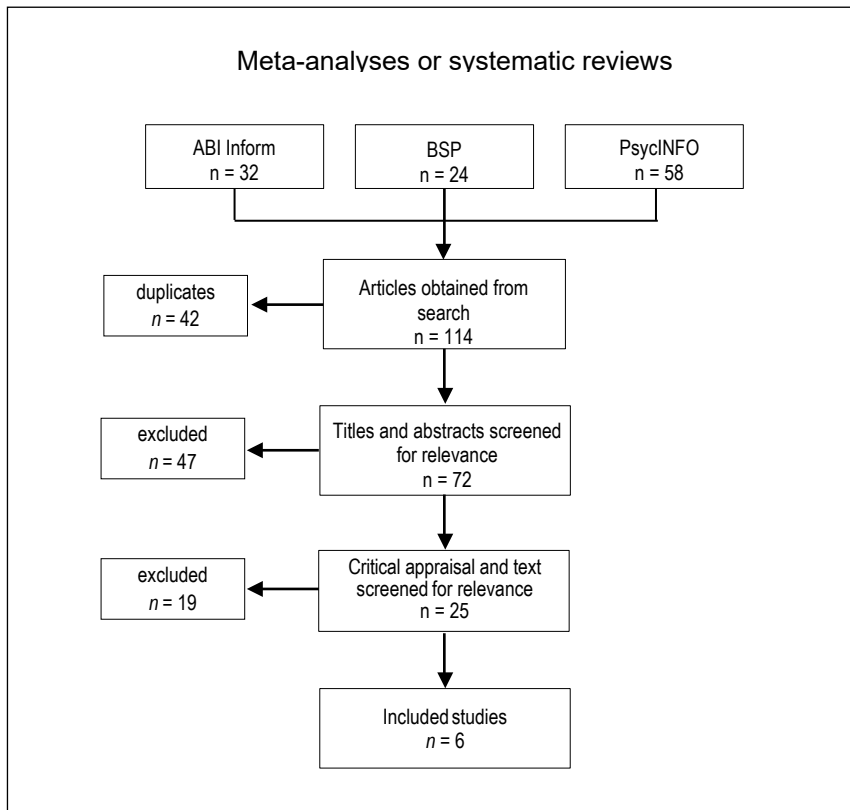
## Appendices

### Appendix 1: Search terms and results – Financial incentives

ABI/Inform Global, Business Source Elite, PsycINFO, peer-reviewed, English language, scholarly journals, Feb 2020

Search terms	ABI	BSP	PSY
1. ti('financial incentive*') OR ab('financial incentive*')	1,823	1,861	1,200
2. ti('financial reward*') OR ab('financial reward*')	390	398	316
3. ti('incentive pay') OR ab('incentive pay')	452	562	135
4. ti('incentive plan*') OR ab('incentive plan*')	307	429	65
5. ti('monetary reward*') OR ab('monetary reward*')	336	394	1,332
6. ti('monetary incentive*') OR ab('monetary incentive*')	616	658	1,070
7. ti('bonus pay*') OR ab('bonus pay*')	228	272	47
8. ti('bonus scheme*') OR ab('bonus scheme*')	72	88	9
9. ti('bonus plan*') OR ab('bonus plan*')	143	173	12
10. ti('variable pay*') OR ab('variable pay*')	29	184	50
11. ti(bonus*) AND ti(motivat*)	7	9	7
12. ti(bonus*) AND ti(perform*)	57	54	15
13. ti('annual bonus*') OR ab('annual bonus*')	42	19	2
14. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	4,208	4,792	4,041
15. Filter meta-analysis or systematic review	<b>32</b>	<b>24</b>	<b>58</b>
16. Filter controlled and/or longitudinal studies, limit > 2010	-	-	<b>104</b>
17. Additional search Google Scholar: 'financial incentive', 'incentive plan', 'monetary reward', 'executive compensation', 'performance related pay', 'bonus plan', 'annual bonus', 'merit pay', 'financial reward', etc. > first 100 results		<b>100</b>	

## Appendix 2: Study selection



## Appendix 3: Critical appraisal

### Effect sizes: Cohen's rule of thumb

To determine the magnitude of an effect, we applied Cohen's rules of thumb (Cohen 1988). According to Cohen, a 'small' effect is an effect only visible through careful examination. A 'medium' effect is 'visible to the naked eye of the careful observer'. Finally, a 'large' effect is one that anybody can easily see because it is substantial.

Effect size	Small	Medium	Large
Standardized mean difference: $d, \Delta, g$	$\leq .20$	.50	$\geq .80$
ANOVA: $\eta^2, \omega^2$	$\leq .01$	.06	$\geq .14$
Chi-square: $\omega^2$	$\leq .10$	.30	$\geq .50$
Correlation: $r, \rho$	$\leq .10$	.30	$\geq .50$
Correlation: $r^2$	$\leq .01$	.09	$\geq .25$
Simple regression: $\beta$	$\leq .10$	.30	$\geq .50$
Multiple regression: $\beta$	$\leq .20$	.50	$\geq .80$
Multiple regression: $R^2$	$\leq .02$	.13	$\geq .26$

First author and year	Design included studies and sample size	Sector/ Population	Main findings	Effect sizes	Limitations	Level
1. Cameron, 2001	meta-analysis of experimental, controlled and non-controlled studies k = 145	mixed	1. Rewards (tangible and verbal) given for low-interest tasks enhance intrinsic motivation 2a. On high-interest tasks, verbal rewards produce positive effects on intrinsic motivation and self-reported task interest 2b. Negative effects are found when the rewards are tangible, expected (offered beforehand), and loosely tied to level of performance  Note: tangible rewards = eg money, candy, gold stars; verbal rewards = eg praise, approval, positive feedback	1. $d = .28$ 2a. $d = .31$ 2b. $d = -.17, -.18, \text{ and } -.35$	No critical appraisal of studies included  No clear distinction between types of tangible rewards  Most studies concerned experiments in an artificial setting	A
2. Cerasoli, 2014	meta-analysis, design of included studies not reported k = 183	mixed	1. Intrinsic motivation is a medium to strong predictor of performance (H1) 2. The correlation between intrinsic motivation and performance is stronger for quality performance than for quantity performance (H2) 3a. Intrinsic motivation is a better predictor for (H3a) quality of performance, whereas (3b) financial incentives are a better predictor for (H3b) quantity of performance  Note: financial incentive = any prize, credit, bonus, or financial compensation	1. $\rho = .26$ 2. quality perf $\rho = .35$ quantity perf $\rho = .26$ 3a. $\beta = .35$ vs $.06$ 3b. $\beta = .33$ vs $.24$	No critical appraisal of studies included  No clear distinction between types of financial incentives	C
3. Condly, 2003	meta-analysis of both experimental and non-experimental (controlled field studies with a pre-measure) k = 45	mixed	1. The overall average effect on performance of all type of incentive programmes is moderate to large 2. The performance gains for money were double those of the average gains produced by non-money but tangible gifts 3. No difference was found between competitive vs non-competitive incentive system (programmes where only the highest performers get incentives vs programmes where everyone who increased performance receives incentives) 4. The longer the duration of an incentive programme, the greater the performance gains realised. (Long term > 6 months; intermediate = 1 to 6 months; short term < 1 month) 5. Team-directed incentives had a markedly superior effect on performance compared with individually directed incentives 6. Incentives for physical work have a somewhat larger effect compared with incentives for cognitive work (note: unclear whether this involved financial or non-financial incentives) 7. No difference was found between qualitative and quantitative performance outcomes	1. $d = .65$ (22% perf gain) 2. money: $d = .79$ (27% perf gain) vs non-money: $d = .38$ (13% perf gain) 3. ns 4. long term $d = 1.28$ (44% perf gain) intermediate $d = .85$ (29% perf gain) short term $d = .58$ (20% perf gain) 5. team $d = 1.44$ (48% perf gain)	No description of search strategy used  No critical appraisal of studies included  The number of monetary incentive studies was more than four times the number of other (non-monetary) studies	A



				<p>individual <math>d = .55</math> (19% perf gain)</p> <p>6. cognitive <math>d = .60</math> (20% perf gain)</p> <p>manual <math>d = .88</math> (30% perf gain)</p> <p>7. <math>d = .63</math> vs .76 ns</p>		
4. Garbers, 2014	meta-analysis of controlled studies and lab experiments $k = 146$	mixed	<p>1a. The overall effect size of individual financial incentives on performance was positive, but larger for qualitative (1b) than for quantitative (1c) performance measures, and smaller for (1d) low-complexity tasks than for (1e) medium- and (f) high-complexity tasks</p> <p>2. The overall effect size of team-based financial incentives on performance was larger than for (1a) individual-based incentives, with equitably distributed rewards resulting in higher performance than equally distributed rewards</p> <p>3. The effect of team-based financial rewards on performance decreases with the amount of team members</p>	<p>1a. <math>g = .32</math> 1b. <math>g = .39</math> 1c. <math>g = .28</math> 1d. <math>g = .19</math> 1e. <math>g = .36</math> 1f. <math>g = .37</math></p> <p>2. <math>g = .45</math></p>	No serious limitations	AA
5. Jenkins, 1998	meta-analysis, lab experiments and controlled studies included $k = 39$	mixed (mostly college students)	Financial incentives were not related to (1a) performance quality but had a moderate correlation with (1b) performance quantity	<p>1a. <math>\rho = .08</math> (3% perf gain)</p> <p>1b. <math>\rho = .34</math> (12% perf gain)</p>	<p>Search strategy somewhat unclear</p> <p>No critical appraisal of studies included</p>	A
6. Stajkovic, 1997	meta-analysis, design of studies not reported $k = 9$	mixed	Financial incentives have a larger impact on performance for industrial organisations (compared with service organisations)	$d = 1.36$ vs .42	<p>Limited search</p> <p>No critical appraisal of studies included</p> <p>Small sample (3 ind. and 6 serv. organisations)</p>	D

## Data extraction table – single studies

First author and year	Design included studies and sample size	Sector/Population	Main findings	Effect sizes	Limitations	Level
1. Anderson, 2010	longitudinal (pre–post) study (10 quarters) n = store managers of 61 stores	store managers of stores of a large US retail firm	<p>1. Goal-based pay-for-performance bonus plans increase goal performance when participative goal-setting is applied (H1)</p> <p>2. Goal-based pay-for-performance bonus plans lower goals but increase goal accuracy when participative goal-setting is applied (H2)</p> <p>3. When store managers participate in setting the goals, they both negatively (due to self-interested motives) and positively (due to added expertise/contextual knowledge) affect the goal outcome (H3–5)</p> <p>Note: the bonus in the new bonus plan was approximately 40% of the total salary (in the old plan: 7%)</p>	unclear, only unstandardised coefficients are provided	<p>Number of managers and employees unclear</p> <p>Complex economic calculations and statistics</p>	C
2. Bareket-Bojmel, 2014	RCT n = 156	technicians (mostly male) at a global high-tech semiconductor company working at a fabrication plant in Israel	<p>1. All types of short-term bonuses (cash, family meal vouchers, and verbal rewards) increased performance by over 5% (H1)</p> <p>2. Non-monetary short-term bonuses had a slight advantage over monetary bonuses</p> <p>3. The removal of the bonuses led to decreased productivity for monetary bonuses but not for the verbal reward (H3 and 4)</p> <p>4. This negative effect of monetary short-term bonuses diminished when a cash bonus was chosen by employees rather than granted by default</p> <p>Note: the financial incentive was the equivalent of \$25,-</p>	not reported	Given the population, setting, and type of incentive, findings may be hard to generalise	A
3. Belle, 2015	RCT (vignette study!) n = 295	public service managers working for the Italian central government	<p>1. Monetary incentives did not enhance effort among civil servants (H1)</p> <p>2. The effect of monetary incentives on job effort is weaker for civil servants with higher levels of intrinsic motivation at the baseline (H2) – note: the higher the intrinsic motivation and the higher the bonus, the weaker the job effort</p> <p>3. The effect of monetary incentives on job effort is stronger for civil servants with higher levels of extrinsic motivation at the baseline</p> <p>Note: bonuses were max 50% of the total salary</p>	<p>1 = ns</p> <p>2 &amp; 3: not reported (only SDs)</p>	<p>Artificial setting</p> <p>Outcome was the change in 'job effort' between the pre-test and post-test states as subjectively reported by the participants</p>	B
4. Carpenter, 2017	RCT (principal agent game) n = 80	college students	<p>1. Intrinsic motivation can be crowded out when financial incentives are perceived as exploitative</p>	unclear	Artificial setting and tasks	A

5. Guthrie, 2004	RCT (lab study) n = 270	undergraduate students drawn from management courses at a large Midwestern university	<p>1. When asked to specify a goal, groups receiving a portion of their pay contingent on performance set higher goals relative to groups under a fixed-pay plan (H2a)</p> <p>2. Chosen group goal level partially mediates the relationship between group incentives and group performance (H2b)</p> <p>3. Relative to groups under a fixed-pay plan, groups receiving a portion of their pay contingent on performance will exhibit greater goal commitment (H3a)</p> <p>4. Group goal commitment will partially mediate the relationship between group incentives and group performance (3b)</p>	<p>1. <math>\beta = .19</math></p> <p>3. <math>\beta = .15</math></p>	<p>Artificial setting, may be hard to generalise to knowledge workers with an annual bonus</p> <p>Uses Baron and Kenny to test for mediating effects</p>	A
6. Hewett, 2019	S1: RCT (online experiment) n = 88 S2: cross-sectional survey with control of the DV n = 155	S1: MBA students at a university in the Netherlands S2: Highly educated knowledge workers, type of org unclear	<p>1. Perceived manager discretion moderates the positive relationship between bonus level and procedural fairness such that the relationship is stronger when discretion is high (H1)</p> <p>2. Perceived manager discretion moderates the indirect relationship between bonus level and intrinsic motivation through perceptions of procedural fairness (H2)</p> <p>Thus: Perceived manager discretion can indirectly enhance the motivational value of the incentive, through procedural fairness. From a practical perspective, the findings suggest that perceptions of manager discretion can enhance the ability of incentives to sort the 'good' from the 'less good' employees</p>	<p>S1: not reported</p> <p>S2: 1. <math>\beta = 0.26</math> 2. = small</p>	S1: Artificial (but realistic) setting	A/C
7. Landry, 2017	S1: cross-sectional study n = 130 S2: longitudinal (time-lagged) study n = 144 S3: cross-sectional study with 3 time points n = 142	S1: Greek workers (not specified) S2: Employees from a Canadian technology company S3: employees from a French Canadian organisation in the financial sector	<p>1. Distributive justice moderates the relation between financial incentives and competence need satisfaction, such that the relation is stronger when distributive justice is high (H4a)</p> <p>2. Distributive justice moderates the relation between financial incentives and autonomy need satisfaction, such that the relation is stronger when distributive justice is high (H4b)</p> <p>Thus: When bonuses are fairly distributed, using financial incentives makes employees feel more competent and autonomous, which in turn fosters greater intrinsic motivation, and consequently better work performance</p>	<p>S1: small betas</p> <p>S2: only unstandardised betas are reported</p> <p>S3: 1: not measured 2: <math>\beta = .28</math></p>	No serious limitations	D/C/C
8. Lohman, 2018	Controlled before-after (2 years) study n = 70 +71	Health workers in Malawi	Health workers consistently indicated high levels of autonomous motivation at baseline, which remained stable over time. No impact of performance-based financial incentives (bonus payments) on autonomous motivation could be detected	0	No serious limitations	B

9. Voußem, 2015	Time-ordered cross-sectional study n = 156	Members of the finance function at companies in German-speaking countries	<p>1. The association between the weight on subjective performance measures in annual bonus contracting and perceptions of distributive fairness follows an inverted U-shape (H1a)</p> <p>2. The association between the weight on subjective performance measures in annual bonus contracting and perceptions of procedural fairness follows an inverted U-shape (H1b)</p> <p>3. The association between the achievement of bonus targets and perceptions of distributive fairness is positive (H2a)</p> <p>4. There is no association between the achievement of bonus targets and perceptions of procedural fairness (H2b)</p>	<p>1 &amp; 2: na</p> <p>3 &amp; 4: unclear whether standardised coefficients are reported</p>	No serious limitations	C
10. Young, 2015	Before-after study (three-year pre-intervention and three-year post-intervention data, with comparison of national performance data) n = 171	Physicians enrolled in the pay-for-performance program Rochester (New York) Individual Practice Association	<p>1. The adoption of a pay-for-performance programme by professional organisations results in higher levels of performance among the participating professionals</p> <p>2. The impact of pay-for-performance programmes on the performance of professionals is moderated by professionals' attitudes regarding the incentive programme's effect on their work autonomy. The greater the belief that the incentive system undermines professional autonomy, the weaker will be the impact of the programme on performance</p> <p>3. The impact of pay-for-performance programmes on the performance of professionals is moderated by professionals' attitudes regarding the importance of the assigned performance goals in relation to their professional values and objectives. The greater the belief that the performance goals are important, the greater will be the impact of the programme on performance</p> <p>Note: involved bonus payments of up to \$15,000</p>	<p>unclear (2: d = .49?) (3: d = .40?)</p>	No serious limitations	B

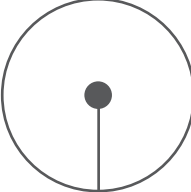
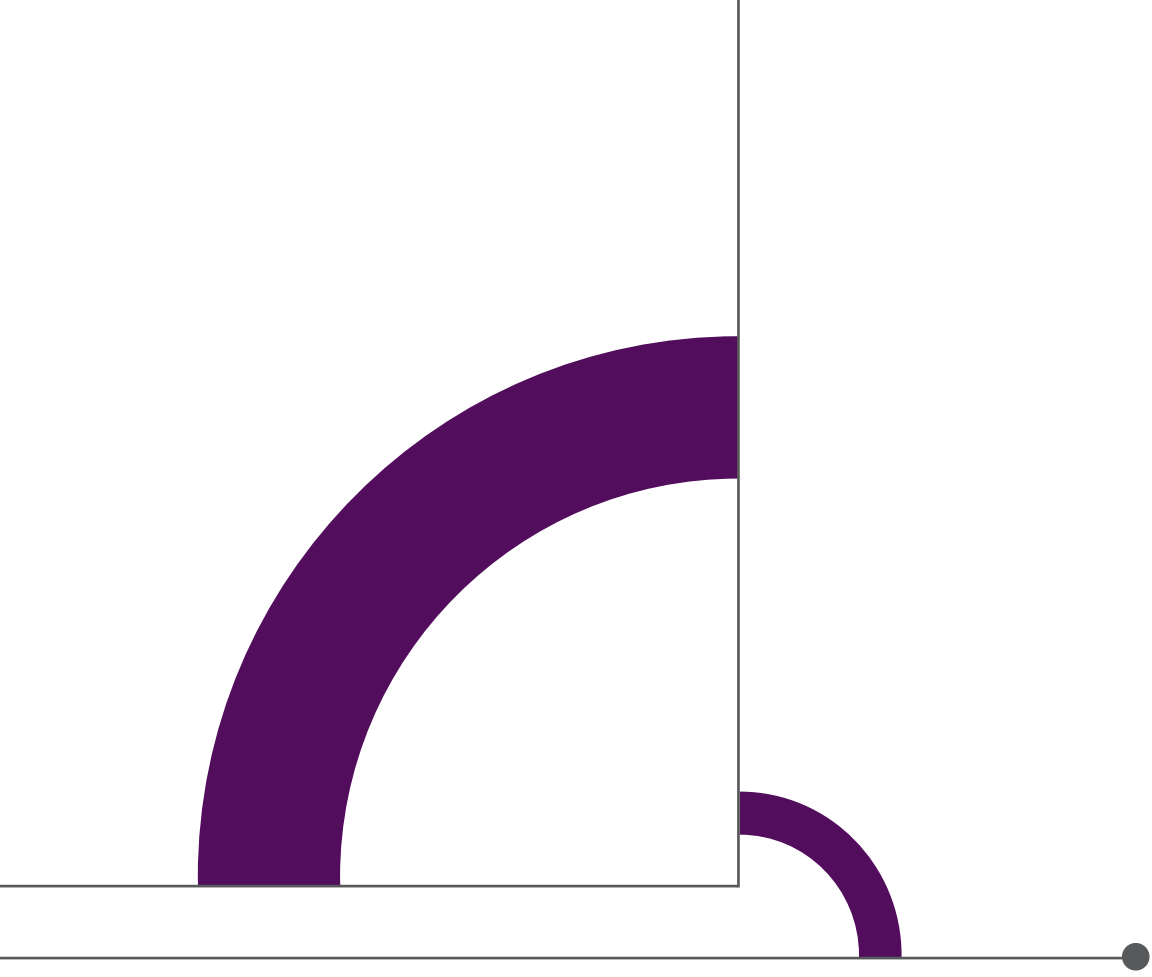
### Overview of excluded studies

1. Blasi, 2016	Cross-sectional study
2. Bucklin, 2001	Traditional literature review
3. Cameron, 1994	Concerns non-monetary rewards (tangible rewards not further specified)
4. Cameron, 1996	Not a meta-analysis (comment on comment by Lepper et al and Ryan and Deci)
5. Chang, 2006	Cross-sectional study, outcome is organisational commitment
6. Chung, 2014	Cross-sectional study
7. Chung, 2017	Concerns front-line sales agents of an Indian company responsible for selling multiple product lines, including water/air purifiers, vacuum cleaners, security systems, etc – focuses on the difference between regular bonus and punitive bonus schemes, and conditional vs unconditional bonuses. In

	addition, the sales agents participating in the experiment were most likely more extrinsically (rather than intrinsically) motivated
8. Deci, 1999	Does not specify what 'tangible rewards' are. Examples provided suggest that monetary tangible awards are often very low in value (for example, \$1)
9. Deci, 2001	Not a meta-analysis (comment on Cameron et al)
10. Della Vigna, 2018	Online experiment with participants recruited through M-Turk. Very artificial and non-realistic setting/tasks
11. Eisenberger, 1996	Traditional literature review
12. Eisenberger, 1999	Not a meta-analysis (critique on Deci et al)
13. Eisenberger, 1999-II	Findings are covered (supported/rejected) by recent meta-analyses
14. Gerhardt, 2015	Traditional literature review
15. Jackson, 2012	Concerns leader reward behaviour
16. Lepper, 1996	Not a meta-analysis (comment on Cameron et al)
17. Lepper, 1999	Not a meta-analysis (comment on Deci et al)
18. Liu, 2016	Focuses on whether employee stock incentives are beneficial to firm financial performance, and to what extent unrecognised expenses of employee stock incentives may influence firm profitability and market reaction
19. Luthans, 1999	Traditional literature review
20. Moradi, 2015	Research design unclear
21. Olafsen, 2015	Cross-sectional study
22. Park, 2012	Cross-sectional study
23. Park, 2016	Cross-sectional study
24. Perry, 2006	Traditional literature review, studies discussed are rather old and often concern experiments with students
25. Pierce, 2002	Summary of Cameron 2001
26. Podsakow, 2006	Concerns a meta-analysis of studies on the relationships between leader reward and punishment behaviours and employee attitudes, perceptions, and behaviours (not financial incentives)
27. Ryan, 1996	Not a meta-analysis (comment on Cameron et al)
28. Shaw, 2015	Traditional (but excellent) literature review

29. Wegge, 2010	Traditional literature review, includes only Jenkins 1998
30. Weibel, 2010	Concerns meta-analysis of studies on the effect of pay-for-performance schemes on the performance of public organisations
31. Wiersema, 1992	Focuses on the advantages and disadvantages of different operationalisations of the intrinsic motivation construct
32. Wooley, 2018	Online experiment with participants recruited through M-Turk and lab experiment. Very artificial and non-realistic setting/tasks

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