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REVISING THE FUNDAMENTALS: INSIGHTS OF NEUROECONOMICS FOR ECONOMIC FOUNDATIONS OF PERFORMANCE-RELATED PAY IN PUBLIC MANAGEMENT

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ABSTRACT. ***This paper concentrates on recent findings in the upcoming field of neuroeconomics where researchers use new neuroscientific methods to analyze economic behaviour. It focuses on the question what public management research can learn from neuroeconomics to improve performance-related pay systems. Among those findings covered are intertemporal choices, fairness concerns and altruistic punishment. The results concerning social behaviour are contrasting the neoclassical theory-based recommendations of public choice theory as competition among bureaucracies and performance-related salary. This paper proposes to integrate these findings in the public management theory and to revise established performance-related pay schemes and contracts. Furthermore, it discusses possible problems which could arise with this new approach.***

KEYWORDS: performance-related pay, monetary incentives, new public management, neuroeconomics.

JEL classification: D87, M52.

Introduction

Besides other influences, some major theoretical fundaments of the New Public Management (NPM) movement can be found in the schools of institutional economics and public choice theory. Based on the idea that rational and self-maximizing bureaucrats behave in their own interest rather than in that of their political leaders (rent-seeking), incentive structures, such as performance-related pay (PRP) have been designed to bring both sides together. Over the years, scholars tried to customize these economic ideas to the needs of the public sector. However, only little research in public management deals with the question whether these economic fundamentals are still up-to date in the economic scientific community. This paper concentrates on recent findings in the upcoming field of *neuroeconomics* where researchers use new neuroscientific methods to analyze economic behavior. It focuses on the question what public management research can learn from neuroeconomics to improve performance-related pay systems and contracts.

Especially those results concerning intertemporal choices and social behaviour of fairness and altruism are contrasting neoclassical theory-based recommendations of public choice theory which advocate competition among bureaucracies and performance related pay.

In other words, the question is whether the opening of the black box brain through neuroscience will indeed lead to results that have the potential to enlarge the theoretical foundation of another science as the Harvard evolutionary biologist Edward O. Wilson once claimed by stating that "it is in biology and psychology that economists and social scientists will find the premises needed to fashion more predictive models, just as it was in physics and chemistry that researchers found the premises that upgraded biology." (Wilson, 1998)

The article is organized as follows: After giving a short introduction in traditional theoretical approaches (*Section 1*) and neuroscientific basics (*Section 2*), I will bring up current neuroeconomic research (*Section 3*), discuss its potential implications for PRP (*Section 4*) and conclude with some evaluating remarks.

1. Economics of Monetary Incentive Schemes and Administration

1.1 The challenge of coordination and control

The above mentioned problem of rent-seeking arises in situations of *asymmetric information* (Milgrom and Roberts, 1992). Suppose a Principal-Agent relationship where the principal wants the agent to do something. The relationship between both is characterized by asymmetric information of three types: the principal does not know all the agent's relevant attributes *(hidden characteristics),* the principal is not able to observe the agent's action completely *(hidden action)* and is not able to evaluate the observed agent's action correctly in all manners since the principal might not have the same information as the agent *(hidden information).* In other words, there is a principal who wants his agent to do something—but she has not the capabilities to overview what the agent is doing in detail: maybe the principal has too many agents to overview or the agent being an expert in his job has specific knowledge.

A problem arises if the agent takes advantage of the fact that the principal has fewer information at his disposal *(moral hazard).* That represents the basic economic downside of asymmetric information. Thus it is not only to cope with the challenge of coordinating an organization but also to bring the interests of the bureaucrats (agents) closer to the interests of the representative government (principal).

But this problem is by far not limited to the relationship between public administrations and their political leaders. The same problem arises within administrations.

Theses organizations are by themselves often characterized by specification. Hundreds or even thousands of processes within administrations have to be coordinated—often in more than one place. Of course, in an organization no one is capable of processing all this information and able to oversee each single process. Furthermore, people are working very specialized. So the challenge is to coordinate all these processes and employees (Milgrom and Roberts, 1992, p. 17).

Although organizations try to solve this by developing standard operating procedures and strategies, there is still a situation of asymmetric information between the worker and his superior.

Note that this problem may emerge in all situations structured similar to those mentioned above, e.g. supplying, contracting out and public-private-partnering. However, for the purpose of this article we will focus on the relationship between the public managers and lower level civil servants (*Figure 1*).

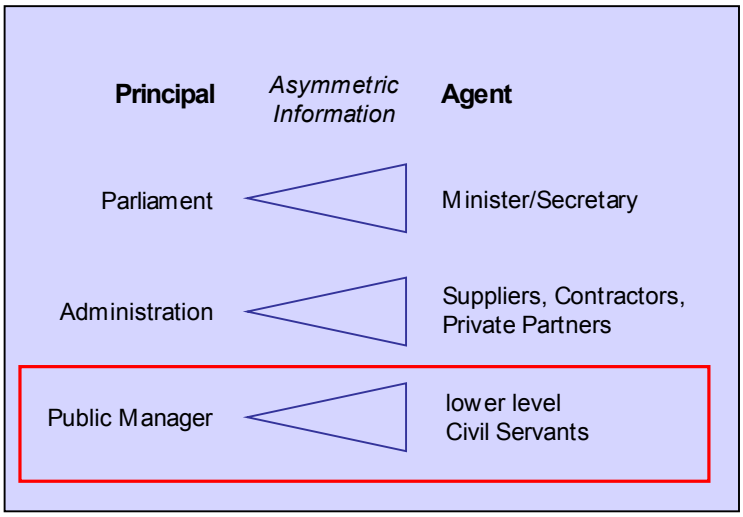


Figure 1. **Examples of asymmetric information in the public sector**

1.1 Theoretical streams

The idea of asymmetric information between a principal and her agent due to incomplete information is an economic paradigm. Following ideas initially published by Ronald Coase (1937) that contracts are imperfect later led on to (New) *Institutional Economics* (North, 1990), *Principal-Agent Theory (PAT)* (Jensen and Meckling, 1976) and *Industrial Economics* (Milgrom and Roberts, 1992) – to mention only a few.

In times of growing requests of public services contrasted by public budgets with limited growth options due to economic decline, those ideas have been adopted in public management in the seventieths of the last century (Aucoin, 1990). With *Public Choice Theory* and *Managerialism* two fundaments of *New Public Management* still have a lasting impact on the organization of current public administrations (Budäus and Grüning, 1998).

One of the most visible results of these schools of thoughts can be found in defining services, measuring results and establishing accountability of agents for their performance in combination with the implementation of adequate incentive structures. One common example are *incentive contracts* which honour the agent's effort with an extra amount if it exceeds a previously defined level.

Times of considerable socio-economic pressure have led governments to adopt explicit incentive structures in their administrations since the 1970s (OECD, 2005, p. 10; Proeller, 2006; Schedler, 2003).

Australia	Performance-related pay, not organized centrally.
Canada	Standardized performance-related pay system including lump sum bonuses of 10-25 % for top performer. Compensation for top level managers is benchmarked against the private sector for comparable positions.
Chile	Standardized performance-related pay system consisting of a 5 % range progression and lump sum bonuses of 10-25 %.
Czechia	Performance-related pay with a share up to 20 % of base salary (currently in implementation).
Denmark	Performance-related pay (target: share of 20 % of base salary), not organized centrally.
Finland	Performance-related pay with an average share of 15 % of base salary.
France	Pilot project with 20 % performance-related bonuses.
Germany	Introduction of bonuses and performance-related pay at the federal level and in some German states. Currently share of ±1 % / ±4 %. Target ±10 % / ±8 % of base salary (last figure for civil servants with tenure).
Hungary	Performance-related pay with a corridor of +30 % / -20 % of base salary.
Italy	Performance-related pay limited to senior level civil servants with a share between 5 % and 15 % of base salary.
Korea	Performance-related pay for top level employees with a share up to 7 % of base salary for top 20 % performers. Lump sum bonuses for mid and lower level employees with a bonus up to 100 % of base salary for top 20 % performers.
Netherlands	Performance-related pay.
New Zealand	Performance-related pay, not organized centrally.
Norway	Private sector oriented flexible pay.
Poland	Facultative awards up to 3 % of base salary.
Spain	Facultative bonuses, not organized centrally.
Sweden	Performance-related pay.
Switzerland	Performance-related pay consisting of merit increments and bonuses. Abolition of tenure.
United Kingdom	Strong monetary incentives (most extensive in Europe), not organized centrally.
USA	Performance-related pay, not organized centrally.

Source: adapted from Köllner, 2006; OECD, 2005; Reichard, 1992.

Figure 2. **Performance-related pay/ monetary incentives in the public sector (examples out of 17 countries)**

The critical assumption of those incentive-related schemes is that people behave according to the monetary incentives provided by the given scheme. This not only means stable preferences over time – expressed in a behaviour that future rewards of PRP are perceived rewarding already today. Furthermore that assumption includes self-maximizing actors who are mentally capable to notice an offered reward. Thus if a rewarding option is favourable in monetary terms, the actor will inevitably choose this option. But is this really a realistic assumption?

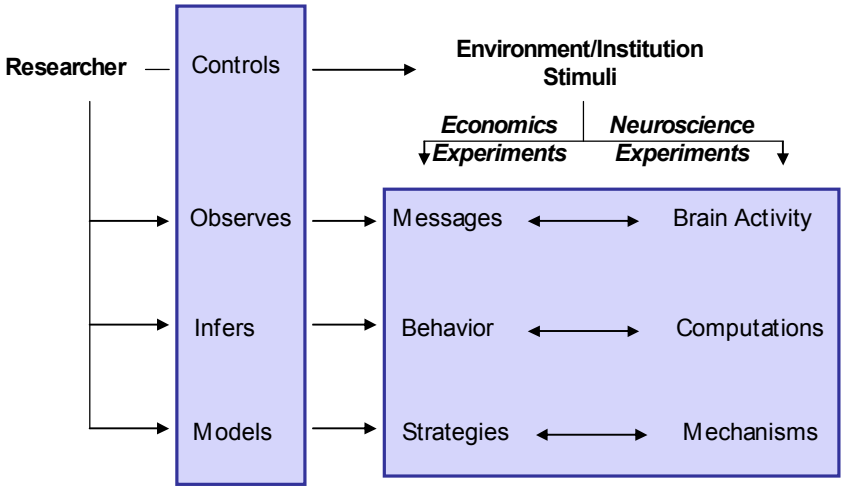
In management science researchers were in doubt. Not only Herzberg (1968) introduced the concept of *intrinsic* motivation as a complement to *extrinsic* motivation. In the following, combined motivational concepts emerged until Frey came up with the idea of a *crowding effect:* extrinsic incentives can crowd out intrinsic motivation (Frey, 1994).

Indeed, there are strong empirical clues that neither pure incentives nor a simple "extrinsic plus intrinsic" motivational concept is worth implementing (for an overview of emotional influenced motivational concepts of consumer behaviour in this journal see Grundey, 2006). In contradiction to established economic theory, "standard" incentive contracts are inferior in the laboratory (Fehr *et al*., 2001) as civil servants report on their decline of motivation and the increase of envy through incentives (Marsden and French, 1998). Also, researchers observe the crowding effect in the U.S. Federal Civil Service (Bertelli, 2006). Thus subjects seem not always to follow an extrinsic reward. What we need is a revision of the theoretical fundamentals of PRP which incorporates these findings. In the following, we will take a look at some recent findings in neuroeconomics in order to learn more about the decision-making process and to find out which of these findings might be a fruitful completion of the PRP schemes for the public sector.

To get a deeper understanding of the decision-making process, economic researchers basically have two options: (i) interviewing individuals about their preferences and (ii) observing their decisions. In the first example subjects are asked for the cardinal utility they see in a specific good or they are asked about the relative utility of a bundle of good at the ratio of another bundle („ordinal utility") (Jungermann *et al*., 2005, Chapter 3).

The second example is backed by the theory of revealed preferences. Hereafter, preferences are revealed by the actual behaviour ("what you want is what you do, not what you say"). Repeating this observation with varying prices, indifference curves can be derived which can be used to predict an individual's choices at a given prices.

However, the theory of revealed preferences does not reveal the emergence of theses preferences. The actual thinking, that is the individual decision-making in the brain, remained a black box. The enrichment of economic theory by the observation of actual behaviour enhances the prognostic validity of theoretic predictions but still cannot open the cover of the black box – since scientists are not able to observe the actual process in the working brain.



Source: Adapted from McCabe, 2006.

Figure 3. **Neuroeconomics as synthesis of research**

Neuroscience as an emerging and ambitious discipline now for the first time offers the possibility to monitor the process of decision making within a subject's brain. Instead of just observing effects of certain stimuli on the outcome, the brain's activities now can be made visible by imaging techniques. In combination with methods of experimental economics, the brain can be observed while making decisions. Or, to put it in words of neuroeconomic pioneers Colin F. Camerer, George Loewenstein und Drazen Prelec: Neuroscience is "asking

the brain, not the person" (Camerer *et al*., 2004, p. 573). By following this track, adherents hope to scale down the black box in the future.

Applied in economics – known as *neuroeconomics* – it is closely linked to experimental economics (*Figure 3*). A science, where economic researchers have long-time experiences in observing a subject's behaviour and modelling their strategies in strictly laboratorial settings. Not surprisingly, first neuroeconomic research was the repetition of well investigated phenomena of experimental economics like the ultimatum game (Sanfey *et al*., 2003).

Figure 3 compares experimental economic and neuroeconomic research paradigms. In both procedures the researcher controls the environment and stimulates the participant. Neuroeconomics are distinguished from experimental economics by the fact that the brain activity of participants can be observed as a reaction to the stimuli.

2. Neuroscientific Basics

Historic neuroscience had to solely rely on neuropathology. For hundreds of years researchers opened the cranium of the deceased and tried to find explanations about the way we think and behave by describing and analyzing the brain's patterns. The still in-use "Brodmann-Areas" are one example. Although more advanced three-dimensional scales have been established meanwhile—localization of specific interest is usually also numeralized by respective Brodmann Areas (52 in sum).

First anatomical results about the functionality of specific regions of the brain could be gathered by categorizing dysfunctions of humans with brain damages. Nevertheless the potential of dead material to explain actual human behaviour is rather limited. Progress was made with the discovery of (medical) imaging techniques which were able to show the working brain. Those can be divided in techniques (a) measuring changes in electric currents and (b) those measuring changes in metabolism.

(a) Techniques measuring changes in electric currents:

- Electroencephalography (EEG)
- Single Neuron measurement
- Magnetencephalography (MEG)

(b) Techniques measuring changes in metabolism:

- Positron emission tomography (PET)
- functional transcranial Doppler-Sonography (fTCD)
- functional magnetic resonance imaging (fMRI)

The methods for measuring the change of electric currents are usually not be applied for the neuroeconomic experiments discussed below due to small spatial resolution (i) as well as from ethical (ii) and practical (iii) considerations. Methods of *our* particular interest are Positron-Emissions-Tomography (PET) and functional Magnetic Resonance Imaging (fMRI) which are both used to measure changes in the brain's metabolism. Of course, even with these imaging techniques one can't visualize a specific thought. But by comparing the level of brain activity in two situations they allow to measure the significance of a stimulus. For example one can show that regions of the brain which lead to an emotional response are overwhelmingly activated and "outshine" other regions which process logical responses. The influence of emotions like anger, envy, trust, appreciation, gear and fear in decisions becomes visible and evident.

3. Findings of Neuroeconomics with Contribution to PRP

A complete consideration of all possible impacts of neuroeconomic research is well beyond the scope of this article (Camerer *et al.* (2005) and Kenning *et al.* (2005) give a recommendable review on this). As already mentioned at the beginning, in the following we will focus on potential impact of neuroeconomics on monetary incentive schemes. *Section 1* showed that the ideas behind PRP are especially questioned when emotions come into play and that actors behave not solely rationally self-maximizing. In the following, we will take a look at some neuroeconomic findings to understand what incentives induce in the brain and to learn what can be improved in PRP schemes.

Fields of our interest are (i) intertemporal decisions when choosing between immediate and delayed benefits, (ii) fairness concerns since empirical research shows that they cause failure of established incentive contracts and (iii) altruistic punishment which might be an interesting regulator in a group of agents.

Topic I: intertemporal choices

It is in the nature of performance-related pay that monetary rewards are some sort of delayed compensation for today's non-consumption (of leisure-time, rewards from shirking etc.).

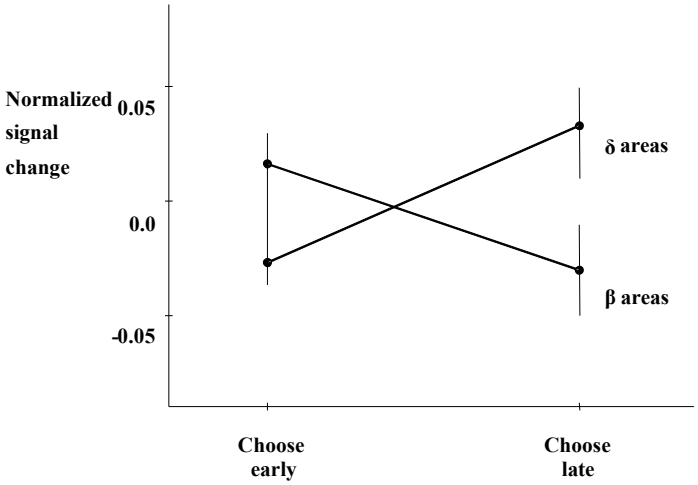
Studies show that subjects are often discounting future rewards and prefer today's consumption in favour of future rewards (McClure et al., 2004). This by itself is not irrational since all "the best-laid plans of mice and men often go awry" and future events are of higher risk than immediate consumption. However, Stuphorn (2005) reports on *hyperbolic discount* subjects often pursue, which discounts faster than a rational discount function proportional to the referred risk. Subjects prefer smaller sooner rewards instead of larger later ones. According to this hyperbolic discount, Stuphorn discusses enhanced activation in the forebrain of birds. Furthermore, Spinella *et al*. (2004) showed in a study with 235 randomly chosen people with *no* apparent behavioural disorders that only slight dysfunctions of the brain's frontal lobe system had measurable effects on their economic behaviour. Those participants with dysfunctions according to the Frontal Systems Behaviour Scale had lower incomes and preferred immediate rewards in favour of future larger rewards.

McClure *et al*. (2004) were able to show in a fMRI study the involved parts of the human brain. It seems that two systems – a β *system* associated with dopamine releases, which is activated by decisions involving immediately available rewards and a δ *system* associated with areas involved in cognitive processes – are disputing whether to accept or refuse an offered immediate monetary reward. McClure et al. even showed that the relative engagement of the two systems is closely correlated with actors' choices for one specific alternative.

These findings suggest that when installing incentive schemes we are dealing with two different groups. On the one hand a group consisting of people with a dominant δ system who are more likely to be stimulated by a monetary incentive and on the other hand a group consisting of people with a dominant β system who will prefer immediate compensation, such as leisure-time or shirking. Furthermore, rewards have to be of a significant size, since subjects discount them hyperbolically.

In the experiment of McClure *et al.* (2004) subjects had to choose between an immediate and a delayed monetary reward. They show that two different brain systems are involved. It seems that with midbrain areas (ventral striatum) as well as medial prefrontal cortex areas associated with immediate dopaminergic rewards on the one hand and parts of lateral prefrontal and right posterior parietal cortex on the other hand, two systems (β and δ) in the brain are disputing whether to accept or refuse an offered immediate monetary reward.

Furthermore, choices even tend to reflect the relative activity in both systems. When people choose the later, larger reward, activity tends to predominate in the cognitive δ system.



Source: adapted from Sanfey *et al*., 2006.

Figure 4. **Beta and delta systems competing in intertemporal choices**

Topic II: fairness concerns

However, people not only vary in their ability to be incited by future rewards—they also differ in their attitude towards fairness. Various theories of fairness concerns emerged in economics over the last years since empirical evidence has shown that about 40% of subjects share fairness concerns in incentive settings (Bolton and Ockenfels, 2000; Fehr *et al*., 2001).

Those fairness concerns of subjects in incentive settings are of major research interest in order to improve performance-related pay schemes since they determine the degree of agent's shirking. To study the effect of different fairness concerns within a population of principals and agents, Fehr et al. (2007) ran different types of employment contracts against each other. In the experiment an *incentive contract* was defined as a contract where an agent gets a binding explicit offer of an extra reward if his effort is above a defined level. Thus, the principal can sanction an agent's shirking by not paying off the reward. Nevertheless, the principal has to face that she is not able to monitor the agent completely.

With a *bonus contract*, on the other hand, the principal does not invest in monitoring and makes a non-binding promise to reward an agent's performance at her discretion. Although this seems to be a more risky contract from an agent's perspective, it outperformed all other contracts offered in the experiment. Fehr et al. show that a "classical" incentive contract, which has also become popular in the Public Sector as illustrated in Source: adapted from Köllner, 2006; OECD, 2005; Reichard, 1992.

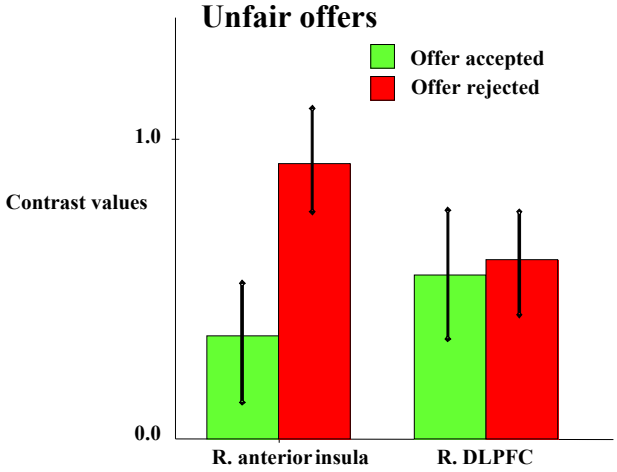
*Figure **2*** – is inferior[1] to a bonus contract: explicit incentive contracts which according to self interest theory for the first time outperform all other contracts do not lead to an optimum output in a moral hazard context. In contradiction to classical self-interest theory, the elimination of intrinsic motivation of the fair employees more than compensates the motivation of the selfish by an explicit incentive contract.

Interesting evidence comes from Ultimatum Games, originally developed in the late seventies of the last century by Güth *et al*. (1982). In an Ultimatum Game one player makes an offer to a second player at his discretion out of a certain budget. The second player has to

[1] As sum of total earnings in terms of costs in monitoring agents and earnings in terms of working-level chosen by self-regarding and other-regarding agents.

decide whether to reject or to accept the offer. Only in the latter case both players can keep the money, otherwise both get nothing. Whereas economic theory predicts that the second player should accept every offer greater than zero, unfair offers are rejected frequently across a wide variety of different cultures (Camerer and Fehr, 2006). Keeping the second player's behaviour in mind, the first player's offer is usually around 40% of his given budget, whereas the majority of second players accept this offer. Unfair offers are rejected in general (Bazerman, 2006).

Results are now questioned again in the light of neuroscience. In a fMRI study Sanfey, Rilling *et al*. (2003) studied the emotional evaluation of an incentive in the Ultimatum Game. They associated unfair offers with higher activation of specific areas within the brain, such as the anterior insula which is integrated in the emotional response system, especially with negative emotions. The activation of the right side dorsolateral prefrontal cortex (DLPFC) - responsible for cognitive processes, such as goal maintenance—represents the wish to make as much money as possible, even out of unfair offers. The activation of the anterior cingulate cortex (ACC) reflects the conflict between both areas. Sanfey, Rilling *et al*. now report on a similar effect as McCube *et al*. mentioned above: the relative activation of both regions of the brain is directly associated with subjects' choices.



Source: adapted from Sanfey *et al*., 2006.

Figure 5. **Emotional evaluation of unfair offers in the Ultimatum Game**

Figure 5 compares the relative brain activity of two areas when subjects accepted and rejected unfair offers in the ultimatum game. A rejected unfair offer is associated with a higher activation of the r. anterior insula, whereas the r. dorsolateral prefrontal cortex (DLPFC) represents the constant desire for money. Or, in other words: if the activity of the r. anterior insula was higher than the activity of the r. DLPFC, an offer was rejected.

It should also be noted that source matters. The rejection of unfair offers is closely connected to *human* unfair offers (Sanfey *et al*., 2003). Instead, unfair offers from a computer caused significant lower activities in the right and left anterior insula compared with human unfair offers—indicating that fairness concern seems to be a crucial part of social interaction. A fMRI study by Rilling, Gutmann *et al*. (2002) indeed identifies cooperative behaviour between human beings even with non-relatives as itself rewarding.

Topic III: altruistic punishment

Recall that a principal will never be able to observe the behaviour of all her agents completely. Smart principals therefore choose a bonus contract as described in the preliminary

paragraph and save monitoring efforts. Mohnen *et al*. show experimentally that principals can rely on another potential compensation for their non-control within a group of agents based on agents' inequity aversion (2007). When their contributions are observable, *peer pressure* within teams of agents reduces free-riding and enhances working efficiency. In a PET study, de Quervain *et al*. (2005) could show that agents even punish if it is costly for them. They call this phenomenon *altruistic punishment.* This is an effect where individuals punish norm violators also if they meet only once. Remember: from an economical perspective this is a strongly irrational behaviour. Yet, de Quervain *et al*. could show that this punishment is perceived highly rewarding for the punishing agent in terms of activation of his dorsal striatum. People seem to invest in punishment like in other things they spend money on – perceiving the punishment of norm violators as deeply rewarding as a good concert or a good meal.

For bonus contracts these findings might implicate that they work even better in groups of agents. In situations where agents are not closely monitored by their principals, but are in interaction with and under observation of other agents, peer pressure and altruistic punishment might be an effective regulator of free riding in terms of agents' shirking. Since the neuroeconomic investigation of corporative group behaviour of agents has so far been limited technically, this area might be a field of fruitful future research once those limits will have been solved.

4. Discussion of potential contribution to PRP

These findings challenge present PRP schemes in the public sector. From a neuroscientific point of view they question the existing model of cause and effect relationships of a monetary incentive and the resulting behaviour. Concerning PRP some aspects are of particular interest.

At first, we have to remark that *not all civil servants will behave according to monetary incentives.* Neuroeconomics can now help to understand this phenomenon by providing a *physical explanation* for at least some of them: it seems that people who are not responding to incentives in the predicted way may tend to have a different processing in their frontal lobes. Therefore, in-use motivational concepts proposing sociological explanations for a non-response to monetary incentives should be questioned. Some hints of a genetic dependency of neural processes underlying personality differences in behaviour are brought up by Cohen *et al*. (2005). They show that the individual configuration of a specific dopamine receptor gene is associated with the activation of the brain's reward system during a gambling task.

Second, people not only differ in terms of their neural processing of monetary incentives, but also in their attitudes towards fairness. The implementation of *bonus contracts* might fulfil the role of the golden medium in this respect for PRP schemes. Research into present PRP contracts in the public sector is ambiguous in terms of motivation, productivity morale and other effects (Marsden and French, 1998; Köllner, 2006; Bertelli, 2006). *Incorporating social behaviour,* bonus contracts seem to fit better to how people really are. A benefit is that principals do not have to rely on control to today's extent. Behn already warned against the risk of a roll back to "*command-and-control hierarchies*" inhabiting principal-agent models in the public sector (Behn, 1995).

Furthermore, the findings of Fehr *et al.* (2007) rely on large bonuses: roughly 40% of the agent's total compensation was paid in the form of a bonus. With irrational *hyperbolic discounting*, neuroeconomics now indeed suggest to offer large bonuses. Although that even in the public sector it is understood that rewards should be significant (Köllner, 2006), that

meant an enormous extension of today's performance-related shares of total income (see *Figure 2*).

This might provoke envy and resistance by the affected civil servants. And even on the basis of today's comparably small extent of performance-related pay opponents evoke the supposed overemphasis of the motivation-effect through this sort of compensation within the public sector (Reichard, 1998).

Another conflicting point might be that bonuses are in discretion of the principal. Bonus contracts might result in sharp income differences within a group of agents. Even if the principal tries to behave fairly and keeps her promises, bonus contracts might provoke *legal conflicts* especially in anti-discrimination and equalization law. Take for example the anti-discrimination legislation of the U.S. with the establishment of the "*Equal Employment Opportunity Commission*" or more recently the European Union's directives concerning the implementation of "the principle of equal treatment between persons irrespective of racial or ethnic" (2000/43/EC), the establishment of "a general framework for equal treatment in employment and occupation" (2000/78/EC) and "the implementation of the principle of equal treatment for men and women as regards access to employment, vocational training and promotion, and working conditions" (2002/73/EC). These legislations require a very careful handling of bonuses in order not to be associated with arbitrariness.

However, from an organizational perspective it seems to be interesting how the fortification of a principal's *leadership* bonus contract evokes: allocating substantial rewards on her discretion, a principal handling these contracts must be decisive and of sophisticated talent. So political leaders should be aware that introducing substantial bonus shares in times of budgets limited in growth might be worthwhile in the long run, but could cause extensive troubles they have to sit out in the short run.

Concluding remarks

> *"Economics could continue to chug along, paying no attention to cognitive neuroscience. but, to ignore a major new stream of relevant data is always a dangerous strategy scientifically."*
> (Camerer *et al*., 2004, p. 573)

This article proposes to integrate neuroeconomic findings in the public management context as scholars of law already started in their discipline (Chorvat *et al*., 2004). Although there are – at least so far – no specific neuroeconomic study groups on civil servants, there is no systematic reason that they are *stronger* pecuniary motivated than private sector employees. Instead, it has often been argued that employees in non-profit organizations are rather intrinsic motivated and other-regarding, such as recent research convinces for volunteering charity projects and blood donation (Houston, 2006). Hence, there is no evidence why neuroeconomic findings about incentive reactions of humans discussed in this paper should not be transferred into the theoretical discussion of public management. If the assumptions of purely rational acting and self-maximizing bureaucrats are not valid anymore, incentive structures in PRP schemes have to be revised.

The findings discussed in this article suggest that people are and will be diverse not only from their observable behaviour but also from their "hardware" in terms of their neuroscientific processing. Even normally behaving subjects may have slight dysfunctions of the frontal lobes evoking that those persons are not able to follow performance related (deferred) incentives. Furthermore, the integration of fairness concerns of a remarkable share of employees seems to be an imperative. Bonus contracts might be a possible origin to work with. However, the discussion showed that they too are not free from any problems in practical implementation.

Economic theory is by far not the only input to public management theory. Yet, it is an important one. Therefore, the public community should not ignore the development of economic sciences. In times when public sector is facing increasing demand on its output coming along with a smaller headcount, a motivated workforce becomes even more a critical success factor. In return, public management theory might be fruitfully enriched. Or to put it in the words of F. A. Hayek: "… an economist who is nothing but an economist cannot be a good economist".

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FUNDAMENTALIZMO PERŽIŪRA: NEUROEKONOMIKOS ĮŽVALGŲ TAIKYMAS EKONOMINIAM UŽMOKESČIO PAGAL VEIKLOS REZULTATYVUMĄ PAGRINDIMUI VIEŠAME ADMINISTRAVIME

Utz Helmuth

SANTRAUKA

Straipsnyje supažindinama su naujais neuroekonomikos mokslo rezultatais, aptariant tyrėjų siūlomus naujus neuro-mokslo metodus, taikomus ekonominio elgesio analizei atlikti. Straipsnio autorius kelia klausimą, kaip neuroekonomikos mokslo pasiekimai galėtų būti taikomi viešojo administravimo vadyboje, sprendžiant mokslinių tyrimų problemas, sietinas su užmokesčio pagal veiklos rezultatyvumą sistemomis. Gauti rezultatai apima tokias formas kaip laikini pasirinkimai, padorumo problemos ir altruistinė bausmė. Kitos išvados teigia, jog socialinis elgesys priešpastatomas neoklasikinei teorijai, atskleidžiant viešojo pasirinkimo teorijos taikymo poreikį nelygioje biurokratijos ir užmokesčio už veiklos rezultatyvumą konkurencinėje kovoje.

REIKŠMINIAI ŽODŽIAI: užmokestis pagal veiklos rezultatyvumą, piniginė motyvacija, naujoji viešoji vadyba, neuroekonomika.