WORKING PAPER / 2016.14

Analysing Performance-Based Financing through the Lenses of the Principal-Agent Theory

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This paper has been vetted by **Nathalie Holvoet**, coordinator of the
Research Line **Conditional Finance for Development**.

Comments on this Working Paper are invited.
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WORKING PAPER / 2016.14

ISSN 2294-8643

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December 2016

Acknowledgement

In loving memory of Prof. Dr. Bruno Dujardin, who was an inspiration for both of the other authors.

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Abstract

We approach Performance-Based Financing (PBF) through the lenses of the Principal-Agent theory to critically analyse PBF and elucidate the principal elements, main challenges and possible pitfalls. We discern a framework comprised of eight dimensions: context and other stakeholders, main principals (government, donors, purchasing agency), verification officers, agents (health providers), the PBF contract, benefitting principals (patients), positive and negative effects, and costs and benefits. Moreover, PBF is seen as a package of choices over six elements: governance arrangements, matrix of indicators, monitoring and evaluation arrangements, financial incentive arrangements, dispute settlement mechanism, and ancillary components. We advise the use of 'theory-based evaluations' (TBE) to advance our knowledge on PBF. The proposed framework acts as a good starting point for TBE, given its comprehensiveness and reference to an established theory.

1. Introduction

In the past decade, performance-based financing (PBF) in the health sector has gained momentum in developing countries. When narrowly defined, PBF is a financing mechanism that consists of a remuneration scheme wherein health providers (individual staff or facilities) receive financial incentives when certain predefined targets or outputs are achieved after verifying for appropriate quality. A more broader definition of PBF recognizes that it consists of several reforms (e.g. more autonomy, focus on planning, increased monitoring, participation of the community). One of its main objectives is to raise the motivation and consequently the performance of health workers, but also to guide the health care sector to specific results. The latter can be seen as the strategic purchasing objective.

Along with PBF's increasing presence in the field with over 30 countries implementing it as policy or pilot project (World Bank 2015); it has been subject to a growing number of studies and a fierce debate. However, the jury is still out on the relevance, effectiveness and impact of PBF in the health sector in developing countries (Eldridge & Palmer 2009; Ireland et al. 2011; Miller & Babiarz 2013; Renmans et al. 2016; Witter et al. 2012). The lack of a clear and thorough analytical framework and robust scientific research are the most important causes of disagreement (Liu & Mills 2007c; Witter et al. 2013). A first attempt to draw a comprehensive analytical framework is found in an article by Bertone and Meessen (2013). However, as reckoned by the authors, this framework is mainly focused on internal processes, therefore leaving out important aspects such as patients' interests and context-related influences, and not apprehending key issues related to information, monitoring and evaluation. Witter et al. (2013) came up with a more elaborate framework that is centred on the different implementation phases of PBF. It acknowledges that PBF programs must be evaluated on the ground of a program theory; however the framework itself lacks a theoretical underpinning. Moreover, we believe that it undervalues the roles played by actors involved.

That is why we feel there is still room to develop a more comprehensive and robust analytical framework to structure future research on PBF. We therefore propose an analytical framework that intends to assess 'What works, when, where and why?' (Ssengooba et al. 2012) and thus 'open the complex black box' of PBF schemes (Witter et al. 2013). It is based on a theory enabling to connect to empirical research, which is known as the principal-agent (P-A) theory. As we shall see below, this theory can be considered one of the underlying rationales of PBF since it pursues the same objective, namely getting the interests of the agents – in our case, health providers (who are likely to be willing to be paid higher while putting in less effort) – in line with those of their principal – in our case, Ministry of health (which is likely to be willing to pay them less for increased efforts). In the rest of this paper, we integrate several of the lessons from the P-A literature into our framework aimed at analysing PBF. It will become clear that the P-A theory is a good basis but lacks nuance and we need to incorporate lessons drawn from other currents in science, e.g. behavioural economics or social constructivism. The P-A theory is used as a guide and stepping stone to a more nuanced, fitting and empirically-based program theory of PBF.

2. Methods

2.1. The Principal-Agent theory

The P-A theory or agency theory belongs to the institutional economic current and analyses situations where an actor (called the principal) delegates a task and authority to another actor (called the agent) who receives a compensation for doing that task (Jensen & Meckling 1976). For example, a gold seller (principal) may recruit a gold digger (agent) to dig for him. The principal will then compensate the gold digger (agent) according to a certain remuneration scheme. The P-A theory tries to predict what is the most effective 'contract' (comprising a mix of remuneration scheme and sanction) to achieve optimum output or outcome, considering a number of constraints.

The P-A theory is grounded on two basic assumptions. Firstly, the interests of the principal and the agent diverge and are independent. For example, the gold digger will avoid too much effort, while wanting to earn as much as possible (i.e. effort causes disutility while leisure and money entail utility). Concomitantly, the gold seller wants to get as much gold as possible, and pay the gold digger as little as possible (the agent's effort causes utility while the agent's remuneration causes disutility). An implicit assumption here is that both are rational entities who are opportunistic and only motivated by financial, materialistic self-interest (model of *homo economicus*) (Cuevas-Rodríguez et al. 2012). Secondly, there is an information asymmetry between the principal and the agent. This entails that the agent is generally more knowledgeable about the situation and his own efforts and capacities, whereas the efforts put in by the agent are not always visible to the principal (Arrow 1986; Ostrom et al. 2002). For example, a gold digger might be able to mine five kilograms each week, yet he might communicate to the principal that the ground is very solid and that he can only mine three kilograms. Consequently, he may dig the three kilograms during the first three days and rest during the other two. Or he can keep on digging and try to sell the two extra kilograms.

These two assumptions lead to a major problem that is commonly analysed by the P-A theory, and called moral hazard (Laffont & Martimort 2002). It refers to a situation wherein the agent does not bear the negative consequences of his actions. For example, the gold digger who uses parts of his time to rest or to work for himself while being paid by the gold seller. These actions performed by the agent against the interests of the principal are called 'shirking', a tendency that is aggravated when assuming the model of homo economicus. Agency theory tries to predict how moral hazard can be mitigated by offering agents a remuneration scheme and associated contract that brings the agent's interests in line with the principal's interests. In many instances, the P-A theory recommends linking pay with some measure of performance, which enables aligning the agent's objective function with the principal's (increasing outputs or outcomes). It is this linking of payments to the achievement of certain targets and the aligning of the different interests, that makes the P-A theory such an interesting basis for an analysis of PBF.

A number of general lessons arise from the literature which will be discussed in the next chapter. Among other things: the importance of the observability of the targets, the existence of sources of motivations other than financial, and the finding that high-powered incentives are not the solution in all settings, especially where multi-tasking, multiple principles and difficult to measure outcomes are prevalent as is often the case in the public sector (see Paul & Robinson 2007 for a survey of the literature on these matters).

2.2. Performance-Based Financing and P-A theory in the health sector

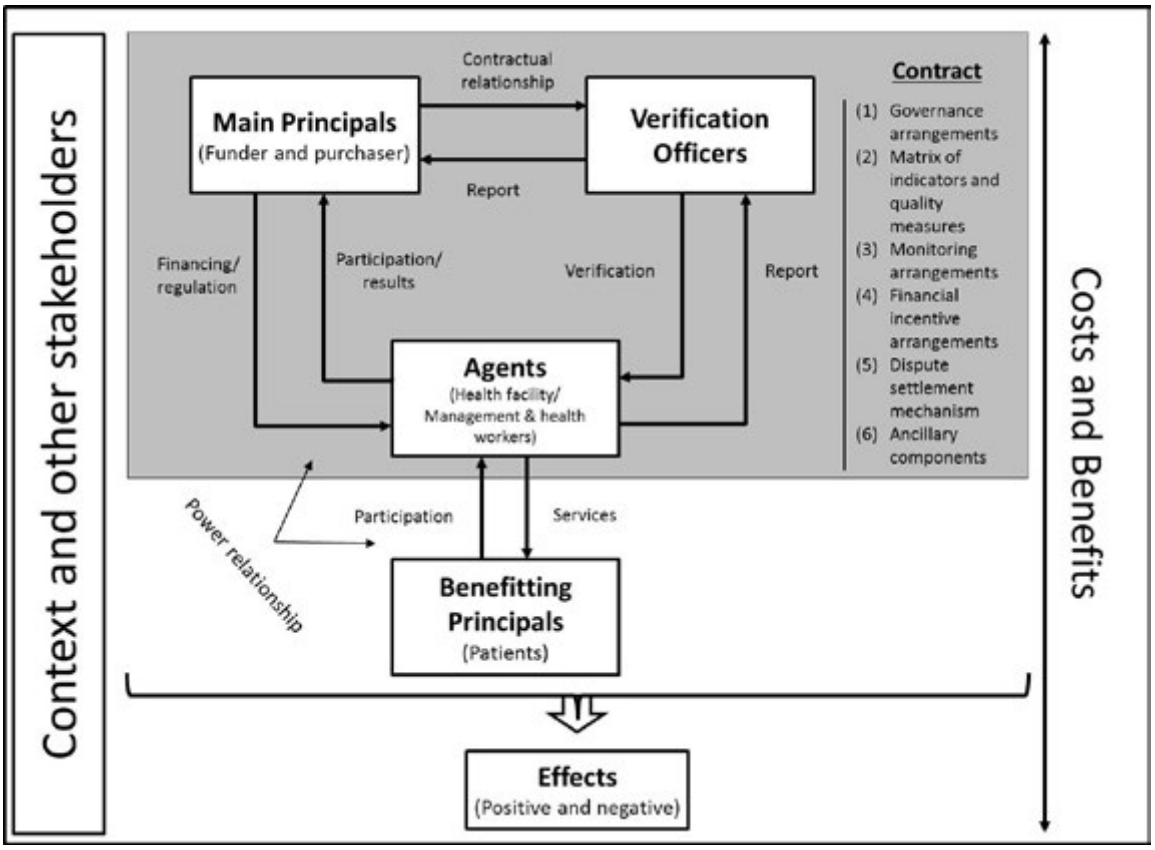
In this paper, we scrutinize the P-A relationships at stake in the health sector in developing countries where the donor or government (or the purchasing agency) can be viewed as a principal who delegates tasks aimed at improving health outcomes to a health facility or its health workers, who are thus viewed as agents. However, this is not the only P-A relationship in a PBF setting: as we will see, many different actors are involved in PBF (verifying officers, patients, other stakeholders) which are interlinked in a network of P-A relationships. An information asymmetry occurs from the fact that it is difficult for the principals to observe whether health providers offer good quality services, while health providers' interests might diverge from those of the principal. PBF was initiated in order to mitigate these problems. However, lessons from the P-A theory actually call for much care in applying performance related payments to the public sector and especially the health sector: indeed, some of its specificities may actually modify the optimal 'contract' compared to a simple model (usually assumed to be the productive, private sector) (Paul & Robinson 2007).

Importantly, as any P-A contract, each PBF scheme is different. We can identify six main elements of its package which are subject to choice: (1) governance arrangements, (2) a matrix of indicators and quality measures, (3) monitoring arrangements, (4) financial incentives and their time schedule, (5) a dispute settlement mechanism and (6) ancillary components (e.g. training or workshops). Variations on each aspect of the package may lead to an infinite number of PBF models which can be adapted to local contexts. Note also that different PBF schemes may impact to varying degrees on the different sources of motivation of health workers: the financial one of course, but also social (through peer pressure, social recognition), moral (through external accountability) and intrinsic (through increased participation for instance) motivations (Paul & Robinson 2007).

3. A Principal-Agent Theory-Based Analytical Framework for PBF

The framework we present in this paper is centred on the main actors of a PBF scheme (financiers, ministry and purchasers, health providers, verification officers, patients). It further incorporates important dimensions like the context and other stakeholders, the contract, the positive and negative effects, and the costs and benefits (cf. Figure 1). Our framework thus deepens some dimensions touched upon by Witter et al. (2013) to take the advantage of the P-A theory and include a number of lessons from this current of literature. This can help researchers and evaluators in identifying important aspects of PBF mechanisms – that otherwise risk to stay in the 'black box' of PBF.

Figure 1: An analytical framework for PBF



Below we discuss some of the main assumptions, flaws, and aspects pointed out by the P-A theory that need to be critically assessed and that can guide evaluations of PBF.

3.1. Context and other Stakeholders

As acknowledged by Witter et al. (2013) a first dimension to be analysed when assessing a PBF scheme is the local context. As the P-A school of thought is dominated by American scholars and empirical evidence from the USA; the standard P-A theory is little adapted to the context of developing countries which is characterized by specific features and constraints, among which differing levels of motivation sources and information constraints (Paul 2006). Similarly, despite the recent increase in studies in developing countries, the literature and debate on performance-based financing is strongly influenced by the findings of research in the United Kingdom and the USA. In general, the social, cultural, institutional, economical and epidemiological embedding of relationships and personal characteristics are often neglected in research on P-A relationships and PBF alike (Cuevas-Rodríguez et al. 2012; Lubatkin et al. 2007; Wiseman et al. 2012). This in spite of the fact that they influence the utility functions (interests) of principals and agents, the degree of opportunism (risk of moral hazard), the perception of rewards and payment schemes, and the preferred leadership styles (Cuevas-Rodríguez et al. 2012; Lubatkin et al. 2007; Wendt et al. 2009).

The local, national and international institutional context (including political and administrative norms, other policies being pursued by the actors – notably the Millennium Development Goals (MDGs) – power relations, the organization of the health sector and the health facilities, etc.) have a direct influence on the PBF and its implementation. Another aspect is the paying capacity of the purchaser. Uncertainty about the payment of the rewards or un-

timely payment may influence the effectiveness of financial incentives. Importantly, one should also include an analysis of the epidemiologic context since some diseases or health outcomes are more suitable to PBF-schemes than others (cf. measurability and attributability) (Eichler et al. 2009) and the best incentive mix will probably depend on the priority problems to be tackled (e.g. increasing coverage or improving quality of care) (Paul & Robinson 2007).

Furthermore, a number of actors have been insufficiently considered by the P-A theory and many PBF frameworks, while they are very influential in the health sector. These are the stakeholders defined as 'any individual or group that has an interest ... or is affected' (Cuevas-Rodríguez et al. 2012, p. 533) and are among others pharmaceutical companies, religious organizations, local and foreign NGOs, other health facilities, international institutions and organizations, etc. These may restrict the activities of the health workers and/or provide incentives that compete with or interact with the incentives of the PBF scheme. They may as well influence the utility function of the patients and the actions of the third payer organizations, and therefore the conception of the PBF scheme.

3.2. Main Principals (Donors, government, purchasing agency)

The actors in a PBF scheme, which are central to our framework, are essential in the attainment of results. Earlier we have argued that in PBF schemes, the donors or government (or purchasing agency) act as principals of the P-A contract – whereas since patients do not explicitly enter into a contract, we deal with them separately. These 'main principals' play a particularly important role at the 'policy development' and the 'implementation phase' of Witter et al.'s framework. They often also have an important operational role, sometimes paying out the rewards and giving guidance to the PBF scheme in general.

While theoretical P-A models are usually simplified, in reality there are often multiple principals, especially in the public and health sector which is characterized by a 'relation network' (Liu & Mills 2007a) if we consider other P-A relationships like hospital managers/health workers, patients/hospital managers, health funds/hospital managers, etc. This observation is 'often critical to understand agency relations' (Kiser 1999, p. 151). Additionally, the health sector in developing countries is characterized by a high presence of international donors with their proper objectives who may be very influential. The result of a lack of harmonization between them may be that none of the principals' objectives are reached, because agency theory predicts that 'having multiple principals weakens the overall incentives for the agent to deliver to any one principal' (Easterly 2005) .

Hidden objectives and values (i.e. the political economy) that lay behind the implementation of a PBF scheme by a donor or government may equally have an important influence on the effectiveness of the PBF scheme and the choices made (Bertone & Meessen 2013; Mooney 2012). Likewise, the pressure to disburse all committed funds may lead to an exaggerated reported success, an uncritical continuation of the PBF or a payment despite a negative evaluation (the Samaritan's dilemma) (Buchanan 1975).

3.3. Agents (Health providers)

Those in charge of improving health outcomes in the field, namely health providers (individual staff and facilities), are the agents in the PBF's P-A relationship. Besides delivering health services and reporting on their output, they may also participate in the design of the PBF scheme. These are critical actors as the success of PBF depends on their receptiveness towards it and their behaviour. Taking them into account during an evaluation is thus crucial.

Firstly, evaluators should look into the way positive/negative attitudes may influence the work environment and performance or even lead to obstruction (Frey 1993). The same goes for the knowledge of the managers and the health workers on the arrangements (objectives, targets, etc.) of the PBF scheme, since a lack of it may impact its effectiveness (Ssengooba et al. 2012).

A second issue is the expertise and capacities of the health workers to give quality services. This determines the outcome of the PBF but also the needed elements to be implemented next to the incentives (trainings, formative supervision, etc.). PBF gives more autonomy to the facilities and is thus based on the assumption that the local managers are better placed to come up with effective strategies. Therefore, the creativity and competence of the health managers to guide the facility towards better performance and to implement effective, innovative and locally adapted strategies is equally essential.

Thirdly, traditional P-A theory perceives agents as *homo economicus* and warns against a number of possible perverse behavioural responses ('rent seeking behaviour') to high-powered incentive schemes such as PBF. These are:

- 'gaming': agents take 'actions that increase pay-outs from the incentive contract without improving actual performance' (Baker 1992);
- 'cherry-picking': only patients that make it easier to reach the target are being treated or work in rural and poorer health centres is being refused;
- 'task trade-off': the payment scheme 'direct[s] the allocation of the agents' attention *among* their various duties'(*original emphasis*) (Holmström & Milgrom 1991) and among the different aspects of their duties (e.g. between quality and quantity) (Holmström & Milgrom 1991; Langebrunner & Liu 2005);
- 'the blatant manipulation of information': Campbell's law states that 'the more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures' (Campbell 1976);
- 'free riding': this occurs when a team member is trying to take advantage of a team effort without contributing to it (e.g. in the case of targets at the level of the health facility) (Laffont & Martimort 2002; Ostrom et al. 2002), which may lead to reduced motivation among other health workers. On the other hand, Cuevas-Rodríguez et al. (2012) posit an alternative view: the best performing team members have an interest in encouraging their peers and monitoring the latter's performance, and thus improving everyone's performance.

The effect of these 'rent seeking behaviours' may not be undervalued and asks for specific research designs that incorporate qualitative research methods like observation, focus groups and interviews. However, the assumption of *homo economicus* is probably the most criticized of the P-A theory (e.g. Sen 2004). Research suggests that non-materialistic motivations (social, intrinsic and moral) may be more important than materialistic motivations (Minkler 2004) (for a short overview see Liu & Mills 2007c; Paul & Robinson 2007); thus that the tendency to perverse behaviour may be less blatant.

This may even be more so in the health sector where health workers often, yet not always, 'are driven by an intrinsic motivation' (World Bank 2003, p. 5) and have professional ethics which may limit rent-seeking behaviors. Moreover, it is probable that 'the professional includes part at least of the patient's/client's interests in her own objectives' (Evans 1984, p. 79), hence their utility functions are not completely divergent.

Yet, according to some authors, the emphasis on materialistic and extrinsic motivation may crowd-out this intrinsic motivation and in turn enhance 'rent seeking behaviour' (Deci et al. 1999; Dickinson & Villeval 2008; Frey & Oberholzer-Gee 1997). However, intrinsic motivation can equally get crowded *in* by financial incentives or by other aspects of the PBF reform (Frey & Jegen 2001; Lohmann et al. 2016; Pierce et al. 2012). Long-term research is needed on the (intrinsic and extrinsic) motivation of health workers, both the self-reported and observed. Especially, since most of the research and theorization on this topic is done in the context of high income countries.

A final and important aspect at the level of the health providers is the impact of the power relationships within the facilities (between the management and the health workers) on the implementation and ,vice versa, the effect of the PBF on this.

3.4. Verification officers

Given the importance of monitoring in P-A relationships and PBF schemes, the impact of this should be thoroughly investigated. The verification officers have the task to control the information received from agents and bring them together to report to the main principals. This is either a newly created agency or a contracted independent firm; but it is also sometimes added to the tasks of the supervisors or another pre-existing entity. The relationship between the main principals and the verification officers is often constituted by a PBF contract; hence it can also be seen as a P-A relationship, bringing along the same possible problems and opportunities discussed in the section on 'agents'.

An extra aspect to investigate is the possibility of 'collusion' between agents and verification officer. This happens when the two can communicate with each other and entails 'a collective manipulation of the verification officers' and the agent's individual reports' (Faure-Grimaud et al. 2003). It is more likely when the two actors know each other and the covered area per verification officer is small. This should not be confused with conflict of interest, which may happen when the payment of the verifying officer is positively correlated with the performance of who (s)he controls. Both relate to the issue of independence and should be thoroughly investigated.

The person doing the verification may also be an important determinant of success. When a verification officer combines this role with a supervisory task, the latter may be affected by the former blurring their open and supporting relationship and jeopardising the training aspect of his/her task.

A final essential issue is the influence of the position in the institutional structure and the level of knowledge, authority and access of the verification officer on its ability to perform his/her work. Is the verification officer knowledgeable enough to understand the records, to distinguish good from bad practices? Is s/he able to look into all the necessary books, to have access to every space at any time? Does s/he have the authority to question, change or reject collected data when manipulations are observed?

3.5. Benefitting Principals (Patients)

Evaluating a PBF program also requires analysing its impact on patients as they are the final beneficiaries of every health care program. Therefore, unlike others, our framework incorporates the patients as important actors. We acknowledge that health workers are not only the agents of the third-payer, but that they act as 'double agents' having patients as principals as well (Blomqvist 1991). However, the role of patients as principals should be nuanced, given the

lack of knowledge, the related difficulty to evaluate actions, and the fact that patients usually do not enter into an explicit contract with their healthcare provider. Moreover, in developing countries, patients often do not have the luxury to 'choose with their feet' which has been seen as the 'patients' last resource to constrain physicians to behave as 'better' agents' (Rochaix 1989, p. 54). Therefore, we call them 'benefitting principals'.

Firstly, the needs and wishes (utility functions) of the patients need to be thoroughly investigated and not to be assumed, because improved health is not the only possible argument in the utility function of the patient. Ryan (1994) and Liu and Mills (2007b) highlight the importance of non-medical arguments. For example, getting information, getting a certificate, having someone that listens. The only common argument among patients seems to be satisfaction (Liu & Mills 2007b). When doing an impact evaluation it thus may be relevant to look at the satisfaction of the patients.

Secondly, an important part of PBF schemes is the involvement of the community. They involve the patients, the community or their representatives in the evaluation or even the management of the services (e.g. Cameroon). Thus, the power relations between patients, government (or donors) and health providers may be differently affected by different PBF schemes, resulting in different outcomes. Moreover, the effectiveness of these participation mechanisms also depends on the socio-economic representativeness of the delegates and their ability to influence policies and hold health workers accountable.

Thirdly, the presence of two principals with different levels of power creates a risk of 'misdirected or upward accountability', which means that health workers stop being responsive to the needs of patients and instead are only accountable to the objectives of the 'main principals', i.e. the incentivised services. For example, taking a TB test to reach a certain target, to the detriment of the interest of the patient.

3.6. Main Elements of the PBF Contract

As already stated, a PBF scheme implies choices concerning six elements. The P-A theory states that these choices are essential, influence the opportunities for shirking (Eichler et al. 2009) and determine the (un)successful outcome. Therefore, research should focus on the impact of the different components and their interactions. The framework of Witter et al. (2013) touches upon this issue, however it does not fully appreciate the multi-dimensional character of a PBF scheme as is presented here.

Furthermore, it is important to distinguish between the implementation in theory and the *de facto* implementation as they may differ, which may explain unexpected effects.

3.6.1. Governance Arrangements

A first aspect to be assessed is the level of participation of the agents and stakeholders and of the interaction between the different actors (power relations) during the set-up and the implementation of the contract, including management freedom over the use of resources, decision power of the community (benefitting principals) and how local stakeholders accommodate theoretical PBF models (see Paul et al. 2014). Moreover, health workers have a certain degree of discretionary power to influence the implementation process and problems at the micro level of implementation may explain failure of PBF schemes (Lehmann & Gilson 2013; Lipsky 1979; Ssengooba et al. 2012).

An important part of PBF is the increased autonomy for the health facilities. It is assumed that they have better information than the principal, hence more autonomy should

increase creativity and improve the strategies to reach the predefined targets/outputs (Fritsche et al. 2014). The level and breadth of the autonomy and the capacity of the supervisors (possibly the District Health Management Team) to guide facilities to actually use it may be an important factor of success/failure.

Another essential aspect of PBF is the separation of the different functions (verification officer, purchaser, and provider) in order to secure independence and objectivity. As we have seen, collusion and conflict of interest can be detrimental for the effectiveness of a PBF. Additionally, the specific governance arrangements produce specific power configurations that can strongly affect the implementation and the outcome of the PBF

3.6.2. Matrix of Indicators and Quality Measures

Second, the choice of objectives – quantitative indicators, quality measures and targets – remunerated by the PBF scheme is critical as it will guide health workers' behaviour. The literature points to several requirements PBF indicators should respect, referred to as 'SMART': Specific, Measurable, Attainable, Realistic and Time bound (Doran 1981). Others add that the indicators should be consistent with other objectives and targets, accepted by the health workers, challenging enough, oriented towards teamwork, easily attributed to the health workers' behaviour, observable and validated to measure what they are meant to measure (Liu & Mills 2007c; Stiglitz 1987). Any violation of these rules may lead to failure or underachievement. This is not to say that PBFs should adopt similar indicators; indicators will be different depending on the context and the objectives put forward by the main principals. Moreover, according to the P-A theory, too many targets and consequently indicators may lead to a blurring of the focus and have a negative influence on the effectiveness of the scheme. Too few targets, however, may make it difficult to comprehensively measure performance.

Assessing the participation of the agents in the choice of indicators may also shed light on success or failure. Agents often have specific local information that is only available to the principal at a cost, especially when the principal is a foreign donor (cf. information asymmetry), this specific information can make a difference between effective and unreachable, unacceptable and/or useless indicators. Therefore it is useful to analyse the priority setting phase since priorities may be forced onto the agents (and the governments) as shown by Sjöstedt (2013).

3.6.3. Monitoring Arrangements

The information asymmetry can be tackled by monitoring systems – which is however done at a cost (Alchian & Demsetz 1972). Different kinds of monitoring are part of a PBF scheme (verification of reported indicators, assessment of quality measures, supervisions, and contact tracing by private or community-based organizations). Moreover, within each kind of monitoring system, there is a plethora of possibilities on how to organize it (different verification officers, new or integrated information systems, different periodicity, systematically or samples). Evaluations should scrutinize the impact and effectiveness of the used monitoring arrangements and evaluate the rationale for choosing one and not another method.

3.6.4. Financial Incentive Arrangements

Understandably, rewards should be clearly stated in the contract and communicated to health workers to have a maximum effect. Because financial incentives are central to the initial program theory of PBF (P-A theory), it is important that evaluation focuses on the way they are distributed among recipients (see for example Paul et al. (2014) who show that per-

ceived unfairness in premium distribution among health workers is a critical issue jeopardizing PBF schemes in Benin) and the kind, height and timing of incentives.

3.6.5. Dispute Settlement Mechanism

Since targets are sometimes difficult to observe, it is also useful to look into the way the scheme handles situations when there is disagreement e.g. on the reports, attainment of targets or the exact provisions of the contract. This can be a completely new mechanism or can be aligned to already existing mechanisms, but adapting it to the local context will likely increase its credibility.

3.6.6. Ancillary Components

It is important to note that, as highlighted by Holmström and Milgrom (1994), incentive instruments should not be evaluated 'in isolation, but as part of a coherent incentive scheme' (p. 990). In a PBF reform, such an incentive or reform package may comprise the earlier mentioned governance and monitoring arrangements but also trainings, workshops, planning and management tools, increased supervision. These elements of the package may be crucial for the success of PBF (for instance, Paul et al. (2014) found that health workers welcome additional supervision, while the effect of financial premiums is blurred); they may help increase human capacity, (intrinsic) motivation and/or the knowledge on the PBF itself and health care in general. They may complement financial incentives by acting on non-materialistic sources of motivation or interact with the incentives strengthening or weakening some of the discussed negative and positive effects.

3.7. Effects (Positive and Negative)

The seventh aspect to investigate are the effects of the PBF scheme, including those unexpected and those needing a longer time to materialize (e.g. crowding-out effect). Performance should be clearly defined and conceptualized before initiating any impact research. In doing so, it is advised to go further than dully copying the indicators that appear in the Health Management Information System or the matrix of indicators (see for example Bawo et al. 2015). We also suggest explicitly analysing – whenever possible – the role played by the different elements of the reform package. This does not mean disentangling the impact of each of the elements; PBF is a reform *package* and should be treated as such.

The general objective of PBF is the improvement of the health situation of a certain population or region. Research at such a general level may encounter the problem of attribution; however, using the right methodology and being clear on what is being studied can help to a great extent to circumvent this problem. An important starting point is the design of the PBF scheme, e.g. the link between the targets and the impact on the health situation. Related to the health outcomes is the impact on the quality of care and services, because increased quantity is not automatically associated with increased quality. At the same time, it should be acknowledged that quality is a multifaceted concept and that it may not be possible to grasp every single element of it.

As with other programs, it is needed to evaluate the financial sustainability of PBF. Indeed, many PBF schemes are initially (co-)financed by donors over a limited period of time, and it is not sure that the recipient government will have sufficient resources to fund it after donors have left.

Moreover, one also has to consider whether PBF is sustainable for health workers.

The increased workload may have an influence on the motivation and self-esteem of the workers in the long run (Kalk et al. 2010). Health workers may be pushed to a level that exceeds their possibilities, leading to a failure to obtain the targets and decreased motivation among them. However, improved infrastructure and an increased feeling of recognition may in turn improve the work-environment and self-esteem of the health workers.

The possible impact on geographical inequality between health facilities is another important aspect to examine. It may be that better equipped health centres have an easier task to achieve targets, which may lead to an aggravation of an already problematic inequality between urban and rural facilities. This can also reinforce the 'inverse care law' since the more poor are usually serviced by the least-performing facilities. The effect of the inclusion of specific targets/indicators related to such inequities deserves a thorough examination..

Finally, what is often neglected is the impact of PBF on the aforementioned contexts and existing institutions: the trust between different actors, the work ethics, the organization of the health sector, the health management information system, etc. Indeed, although Meessen et al. (2011) claim that PBF makes health workers more responsible in completing health information forms, it may also lead to the prettification of the data (cf. Campbell's law) making it useless as an information tool (see Lim et al. 2008). On the other hand, it may also be that the increased (formative) supervision increases the quality of both the health actions and the reporting (Suh et al. 2007). The bigger question is whether PBF is solely an incentive program with accompanying measures or a larger health care system reform capable to facilitate the introduction of wide (paradigmatic) reforms (Meessen et al. 2011).

3.8. Costs and Benefits

Although it is important to investigate the effects of PBF, this does not suffice to make a sound judgment on the use of PBF as a policy (instrument). Reporting on its effectiveness should be accompanied by research on its efficiency. A thorough cost-benefit analysis (CBA) may be an important tool to compare the efficiency of a PBF with other performance improvement strategies that aim to achieve the same results (Ireland et al. 2011; Jensen & Meckling 1976; Mills 2014; Paul & Robinson 2007). Such an analysis of the costs and benefits should take account of the cost attributed to monitoring, performance premiums, and the transaction costs due to increased administrative burdens and possible other economic costs (Borghi et al. 2015; Ireland et al. 2011). While at the same time accounting for the benefits that come from the incentives and from the other aspects of the reform package. Importantly, these other reforms may have become possible because of its embeddedness in a PBF programme.

However, it should also be noted that not all costs or benefits are easily quantified or translated into financial gains or losses (e.g. increased or decreased trust levels, teamwork, perception of fairness, equity, improved transparency, improved accountability, community participation, etc.). Therefore it is essential that any CBA is accompanied by a more qualitative assessment. We believe that the P-A theory-based analytical framework presented in this paper can be one of the frameworks to guide such an analysis and qualitative assessment by pointing out possible hidden costs and perverse effects of PBF.

4. Future Research

In order to advance in the construction of an evidence-based program theory of PBF, future research needs to disentangle the mechanisms initiated by the different elements of the 'PBF reform package'. This is not the same as disentangling the elements of the reform package by creating different treatment groups. Elements influence each other (especially the incentives and the introduced results focus) positively and negatively, the disentangling of the elements overlooks this interaction. Instead, these interactions are some of the most important aspects to research. To do so, researchers and evaluators should resort to theory-driven evaluations to identify the different mechanisms that are initiated when PBF schemes are implemented (Van Belle et al. 2010; White 2009). We argue that our theory-based framework is a valuable starting point for such an approach, given its linkage with an already existing theory and its comprehensiveness regarding the issues at stake.

TBE also emphasizes the importance of controlling whether the program got implemented as was foreseen in the program implementation theory which outlines the actions to be taken. If not, the findings of the research cannot be attributed to what was in the initial program implementation theory, but only to what occurred in the field (Paul et al. 2014; Ssengooba et al. 2012).

5. Conclusion

In this paper, we propose a comprehensive analytical framework based on the assumptions and predictions raised by the principal-agent theory and the known shortcomings and pitfalls of this theory. The framework is aimed at doing research on and evaluating PBF. This framework comprises four actors and four other essential dimensions, hence eight dimensions: the principals (government, donor…), agents (health providers), verification officers, benefitting principals (patients), context and other stakeholders, the PBF contract and its constituting elements, positive and negative effects, and costs and benefits. All these dimensions need to be at the centre of evaluations on PBF, including the issues we pointed out.

We also state that every PBF scheme is a package and may differ over six elements comprising its 'contract': (1) governance arrangements, (2) matrix of indicators and quality measures, (3) monitoring arrangements, (4) financial incentives and time schedule, (5) dispute settlement mechanisms and (6) ancillary components. Therefore, if one wants to make progress in creating a sound program theory, one need to be clear on what one is investigating and what elements cause the observed effects. We propose to use theory-based evaluation (TBE) as the main tool to evaluate and do research on PBF in order to reveal the mechanisms at play after the initiation of a PBF program and bring us closer to a program theory of PBF. This approach should counter the present domination of 'black box' studies that only report on outcomes and give little information on the mechanisms and their interaction with the context. We believe that our framework is a good starting point for evaluations within the tradition of TBE, because of its comprehensiveness and its clear link with theory. This way we hope to open the box of PBF schemes to find out what works, when, where and why.

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