

Economix

<http://economix.u-paris10.fr/>

Document de Travail

Working Paper

2009-15

Disentangling extrinsic and intrinsic motivations: the case of French GPs dealing with prevention

Philippe Batifoulier, Maryse Gadreau, Yves Arrighi,
Yann Videau et Bruno Ventelou



UMR 7166 CNRS

Université Université de Paris Ouest Nanterre La Défense
(bâtiments K et G)
200, Avenue de la République
92001 NANTERRE CEDEX

Tél et Fax : 33.(0)1.40.97.59.07
Email : secretariat-economix@u-paris10.fr



Université Paris X Nanterre

Disentangling extrinsic and intrinsic motivations: the case of French GPs dealing with prevention

BATIFOULIER Philippe, EconomiX, Université Paris X-Nanterre.

GADREAU Maryse, LEG, Université de Bourgogne.

ARRIGHI Yves, ENSAI & ORS PACA

VIDEAU Yann, INSERM ORS PACA

VENTELOU Bruno, CNRS INSERM ORS PACA

Abstract

The economic literature attaches great importance to the analysis of “professional motivations”, in particular examining the possible crowding-out effects between extrinsic and intrinsic motivations. This article applies these questions to the healthcare professions with a view to providing a fair scaling of the implementation of pay-for-performance policies by public decision-makers. We assemble a panel of 528 independent general practitioners in the “Provence-Alpes-Côte d’Azur” region in France and provide an inter-personal statistical decomposition between extrinsic and intrinsic motivations with regard to preventive actions. The proportion of intrinsic motivations is relatively greater among physicians paid with fixed fees. The significant effect of age describes a U shape which can be interpreted as being the result of a “life cycle of medical motivations”. Finally, econometric estimations demonstrate a correlation between a small proportion of intrinsic motivation and a feeling of injustice with regard to the reforms. The cross-sectional nature of the data does not allow us to draw any conclusions concerning the direction of the causality. But the above correlation would seem to support the theory that the implementation of a policy based on monetary incentives towards performance is perceived as being offensive and may be accompanied by a reduction in intrinsic motivations in medical practice.

Keywords

General practitioners, Motivations, Prevention, Payment for performance, Intrinsic and extrinsic incentives, France

Résumé

La littérature économique fait désormais une large place à l’analyse des « motivations professionnelles », examinant notamment les possibles effets d’éviction entre motivations extrinsèques et intrinsèques. Le présent article propose de transposer ces questions dans le champ des professions de santé, avec l’enjeu d’un juste dimensionnement du recours aux politiques de paiement à la performance par le décideur public. Nous mobilisons un panel de 528 médecins généralistes libéraux de la région « Provence Alpes Côte d’Azur » en France et proposons une décomposition statistique interindividuelle entre motivations extrinsèques et intrinsèques dans le domaine des actions de prévention. La part des motivations intrinsèques est relativement plus importante chez les médecins pratiquant les tarifs conventionnés. L’effet significatif de l’âge suit une courbe en U qu’on peut interpréter comme le résultat d’un « cycle de vie des motivations médicales » ou comme celui d’un effet génération. Enfin, l’estimation économétrique établit une corrélation entre une faible part de motivation

intrinsèque et le sentiment d'injustice concernant les réformes. La nature transversale des données ne permet pas de conclure quant au sens de la causalité, mais la relation mise en évidence semble bien alimenter la thèse selon laquelle la mise en place d'une politique basée sur les incitations monétaires à la performance est jugée comme désobligeante et peut s'accompagner d'une érosion des motivations intrinsèques dans le travail médical.

Acknowledgements

We would like to thank Carine Franc for her highly constructive comments. Thanks also to Jean-Baptiste Combes for his work on the “prevention score” which we use here.

This work enjoyed the financial support of MIRE (governance of the national health insurance) and the Ministry of Research (ANR – ACI standards)

Introduction

The emphasis placed on asymmetric information, which a physician can use to his advantage, has for the most part masked the existence of different levels of intent. One means of taking the diversity of possible attitudes at work into consideration is to divide the concept of “professional motivation” into intrinsic motivations (IMs) and extrinsic motivations (EMs), following the reasoning outlined in the field of social and cognitive psychology (Déci, 1971). Intrinsic motivations relate to activities that are practised with a view to obtaining direct intrinsic satisfaction which is derived without expecting compensation or attempting to avoid any feeling of guiltⁱ. Extrinsic motivations relate to activities which are practised with a view to obtaining gratification exogenous to the activity itself, for example payment.

This framework allows us to question the efficiency of monetary incentive policies. Monetary compensation constitutes a sub-group of EMs which can weaken the motivations under the control of individuals, i.e. the IMs. Both types of motivation may suffer from crowding out by the other, as demonstrated in Titmuss’ famous example (1970) concerning blood donationⁱⁱ. This author points out that a commercial policy in a sphere where social norms play a major role may not only stimulate selfish behaviour but also have irreparable long-term consequences, where “the price of a price” is the disappearance of an efficient norm of social approval (Janssen and Mendys-Kamphorst, 2004).

This crowding-out effect, which calls into question the efficiency of “effort for the money” policies, has been widely supported in the field of economics following the works of Frey (1997) or Kreps (1997). Bénabou and Tirole (2003) attempted to reconcile the economic (individuals respond to incentives) and psycho-sociological perspectives (the incentives may prove counterproductive) by identifying the conditions in which an agent (an employee, a child) uses the policy of the principal (an employer, a teacher or a parent) to learn how he appears to him (the “looking-glass-self”). An incentive has hidden costs by revealing to the agent a piece of information concerning the trust granted by the principal (Falk and Kosfeld, 2006; Sliwka, 2007). It modifies the perception of the interaction on the part of the agent who can use the principal’s policy as a signalling device.

Nevertheless, by definition, a financial incentive does not only demonstrate negative effects and not all compensation is counterproductive. For example, the theory identifies a crowding-in effect when EMs are considered by the agent as a reward for effort. Some authors believe that the relationship between IMs and EMs is not linear and shows a discontinuity in the relationship between monetary incentives and performance (Gneezy and Rustichini, 2000;

James, 2005): in the same individual, it is possible to observe a better performance in the absence of monetary incentives than when minimum incentives are introduced, while his performance may increase with the level of incentives when these become more attractive.

Empirical works have attempted to isolate these different effects and the results obtained are somewhat contradictory: the effect of compensation on IMs depends on the type of compensation and the type of indicator adopted to measure the IMs – for example autonomy or the declared interest for the task – (Cameron et al., 2001). Moreover, despite numerous experimental studies on this subject (e.g., Frey and Oberholzer-Gee, 1997; Deci et al. 1999; Gneezy and Rustichini, 2000; Frey and Jegen, 2001; Fehr and Falk, 2002), it is still difficult to empirically identify a crowding-out effect outside the laboratory (using surveys) as a result of the difficulty in isolating and measuring motivations “in the field”. In the field of medicine, the few studies carried out reveal that certain types of incentive may result in a crowding-out effect through the deterioration of work conditions as perceived by the GP, while other types of incentive may cause a crowding-in effect by improving physicians’ competences by means of a “personal development policy” (Gené-Badia et al, 2007) or by creating the conditions necessary for greater autonomy and promoting “professional values” (McDonald et al, 2007).

These studies were carried out in the context of optimising physician payment schemes which are more personalised and performance-related. By means of financial compensation, the “Quality and Outcomes Framework” (QOF) programme in England or the “Pay for Performance” (P4P) programme in the United States aim to encourage physicians to show concern for the quality of primary healthcare. They primarily refer to the field of prevention wherein a series of measurable indicators are more likely to be achieved. Nevertheless, the conditions under which quality incentives in healthcare are effective have not been fully identified (Grady et al., 1997; Hillman et al., 1998, 1999; Town et al., 2005; Frolich et al. 2007), thereby justifying the fact that not all countries are committed to this process with the same level of intensity (Chaix-Couturier et al., 2000). In France, the legislator very recentlyⁱⁱⁱ manifested his interest in this type of approach, encouraging the evaluation of the legal conditions necessary for its implementation (Bras and Duhamel, 2008). However, implementing pay-for-performance requires knowledge of professional motivations in order to forestall any potential crowding-out effect. A necessary requirement is thus to overcome the lack of measurement afflicting the concept of IM in the specific context of the medical professions.

With this in mind and based on a survey of professional general practitioners, this article aims to better understand the motivations of French General Practitioners (GPs) to practise preventive procedures. The study highlights the importance of IMs and investigates the hypothesis of a possible crowding-out effect on IMs by EMs. To this end, it presents empirical evidence based on a model of the share of IMs in relation to EMs and on an econometric estimation using the GPs' self-reported reactions to the policy decisions about "the rational use of medicines", introduced by the French authorities in the last ten years and relying on the concept of "medicalized control of health expenditures" (implementation of a National Objective of Health Insurance Expenditure - *ONDAM* – and attempt to introduce regulatory practice guidelines known as *références médicales opposables* – *RMOs* – which planned fines and rewards depending on whether the target of health expenditures growth is observed).

1. A decomposition of intrinsic / extrinsic motivations in the analysis of preventive procedures

Performing preventive procedures may be based on two motivations.

- It may result from financial incentives offered by the public authorities. In this case, the physician is assumed to consider prevention and public health objectives in terms of "cost/benefit analysis" where the opportunity cost of medical time is evaluated as a monetary equivalent (under fee-for-service, it is medical time which conditions income). Such an approach is likely to correlate with an increasing number of procedures, overbilling and few free procedures. This is typically a case of EM.
- Preventive actions may result from a deliberate and disinterested behaviour on the part of the physician. Consequently, prevention is more frequently associated with motivations such as a concern for public health, the feeling of effectiveness in the process of health education etc. – a group of intrinsic factors which are nevertheless still to be identified more precisely.

To evaluate these two levels of motivation, we use a telephone survey carried out in 2006 on a panel of 600 self-employed GPs practising in the PACA region^{iv} and devoted to public health, prevention and health education. Preventive procedures performed by GPs were the subject of a specific study aimed at quantifying these practices which are of great benefit but not

necessarily implemented by all GPs with the same level of intensity. A synthetic prevention score was computed in order to rank physicians with regard to the frequency with which they perform 16 different preventive procedures according to the following scale: very often, often, sometimes and never (see appendix and Aulagnier et al., 2007). As these items are allocated values ranging from 1 (never) to 4 (very often), the score obtained by adding the answers for each action can, theoretically, vary from 16 to 64. The GPs were then divided into two categories according to their “prevention score”, [16-50] and [50-64], accounting for 75% and 25% of the respondents respectively^v. Initially, we use a simple logistic regression to model the probability that a physician will obtain a score which falls into the interval [50-64].

1.1 Regression model and categorising variables

The regressors are selected from the set of variables provided by the questionnaire by means of an automatic step-by-step procedure. The table below provides information concerning the independent variables of the logistic model and their level of significance.

Table 1: The determinants of prevention.

Type-III tests		
Variable	DDL	Pr > F
work time in excess of 45 hours/week	1	0.0002
participation in evaluating professional practices	1	0.0006
participation in training on behavioural and cognitive psychotherapies	1	0.0010
use of referentials and clinical practice guidelines as a source of information	1	0.0011
share in household income > 70%	1	0.0015
thinking that GPs should pay greater attention to public health activities	1	0.0033
performs free procedures	3	0.0059
gender	1	0.0186
resistance from patients as an obstacle to performing preventive activities	1	0.0203
lack of training as an obstacle to performing preventive activities	1	0.0232
favourable to the reform of regular doctors	1	0.0278
need more personnel to undertake public health activities	1	0.0352
use of medical journal with paid subscription as a source of information	1	0.0388
absence of payment as an obstacle to performing preventive activities	1	0.0567
reported consultation length is longer than 15 minutes	1	0.0741

*Source:
Panel, 6th wave
ORS PACA
Population:
524 physicians*

The results of the regression model highlight a number of independent variables acting as

determinants of preventive procedures in general medical practice. The method involves classifying these variables into three categories: IM, EM and control variables, in order to estimate the relative importance of IMs and EMs in the effective behaviour of physicians.

The control variables correspond to certain determinants of preventive practice which are “independent” of the physician’s motivations, for example physician gender will primarily reflect the composition of his/her practice (women GPs treat more women patients) and determine the high frequency of certain preventive procedures (gynaecological screening) without any real relation to motivations.

Among the independent variables adopted in this model, five are identified as “markers” of physicians’ IMs to perform certain preventive procedures: “thinking that GPs should pay greater attention to the public health dimension”, “participation in training on behavioural and cognitive therapies”, “not considering certain obstacles to prevention as a barrier to physician involvement in preventive care activities” (three variables for three types of obstacles: resistance by patients, lack of training on prevention, lack of payment). GPs answering these questions positively are assumed to be intrinsically motivated by public health and prevention activities.

We identify three extrinsic incentive variables (captured here by their negative slope, making them “disincentives”): “need more personnel to undertake public health activities”, “rarely performing free procedures”, “reported consultation length is under 15 minutes”. These three variables summarise the idea that prevention “takes time” without having any effect other than improving the quality of healthcare provided to patients (answering yes to these questions suggests that healthcare quality is not pursued for itself). They are therefore, for the most part, EMs (negative given the sense of the question). The last two variables are a very direct evaluation of the “opportunity value” that each physician allocates to the time spent on medical activities. We believe that including them in a regression explaining the probability of being more or less active in terms of prevention reflects the relevance of the “waste of time/money” obstacle which exists in self-employed practice with regard to time-consuming activities such as prevention.

1.2 Calculating the relative weight of each type of motivation

After categorizing the variables into three distinct vectors as described above, the logistic model can be expressed as follows:

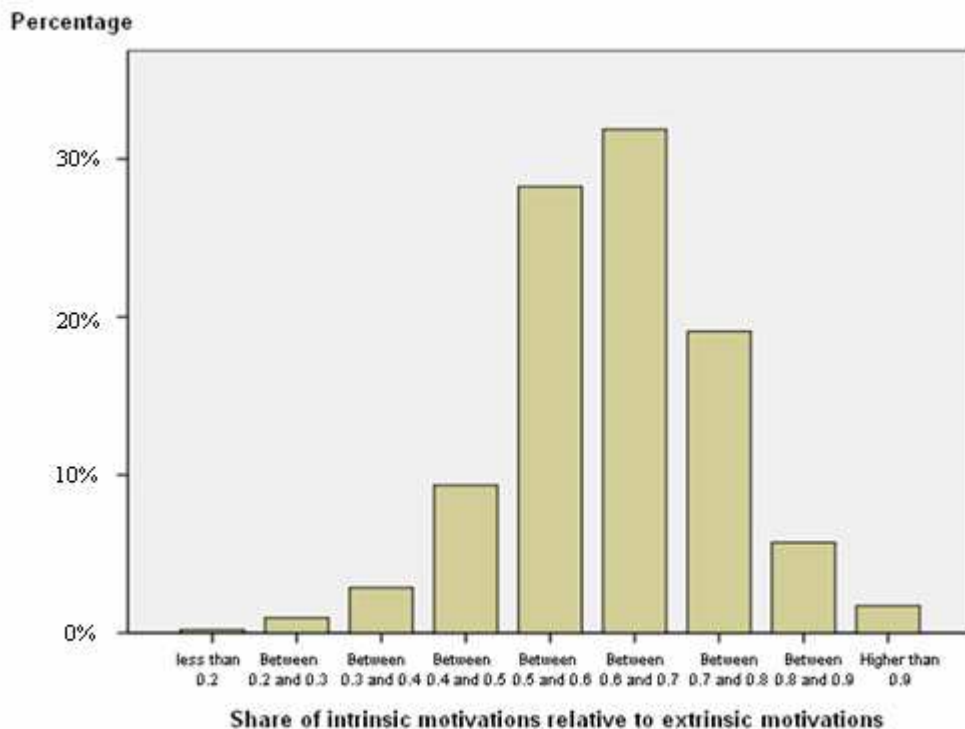
$$\text{Ln}\left(\frac{P}{1-P}\right) = X \cdot \beta + M^{\text{int}} \cdot \gamma^{\text{int}} + M^{\text{ext}} \cdot \gamma^{\text{ext}} + \mu$$

where X is the group of control variables, M^{int} the group of IM variables (five column vectors), M^{ext} the group of EM variables (three column vectors) and P the GPs' estimated propensity to provide a high level of prevention practices. Once the model has been estimated and the value of the regression vectors β , γ^{int} , γ^{ext} has been determined, we can calculate the following quantity for each GP:

$$partint = \frac{M_i^{\text{int}} \gamma^{\text{int}}}{M_i^{\text{int}} \gamma^{\text{int}} + M_i^{\text{ext}} \gamma^{\text{ext}}}, \text{ with } partint \in [0,1]$$

M^{int} and M^{ext} differ from one GP to other depending on the presence or absence of the 8 (5+3) basic motivations underlying their construction. For each physician i , the quantity “*partint*” measures the part accounted for by IMs in the probability that the GP belongs to the category of physicians who are highly active in the field of prevention. This is an individual measurement of the contribution of IMs to the propensity P_i of each physician to perform certain preventive procedures (relative to the total represented by the IMs and EMs together). We can provide descriptive statistics of this quantity and demonstrate that the share of IMs is non-negligible^{vi}.

Fig. 1: Histogram of the “*partint*” distribution



Source:
Panel, 6th wave
ORS PACA.

2. Modelling the share of intrinsic motivations in relation to extrinsic motivations

We note that the proportion accounted for by IMs in relation to physician's total motivations varies considerably from one individual to another. Beyond the mere measurement of this interpersonal heterogeneity, it is interesting to identify with which variables (or with which determinants) a dominant set of IMs is associated for a given level of prevention. A second regression model is now presented to determine the explanatory variables of the proportion of IMs. Among the explanatory variables identified, the "feeling of injustice" is of particular interest to us.

2.1 Identifying a model of intrinsic motivation

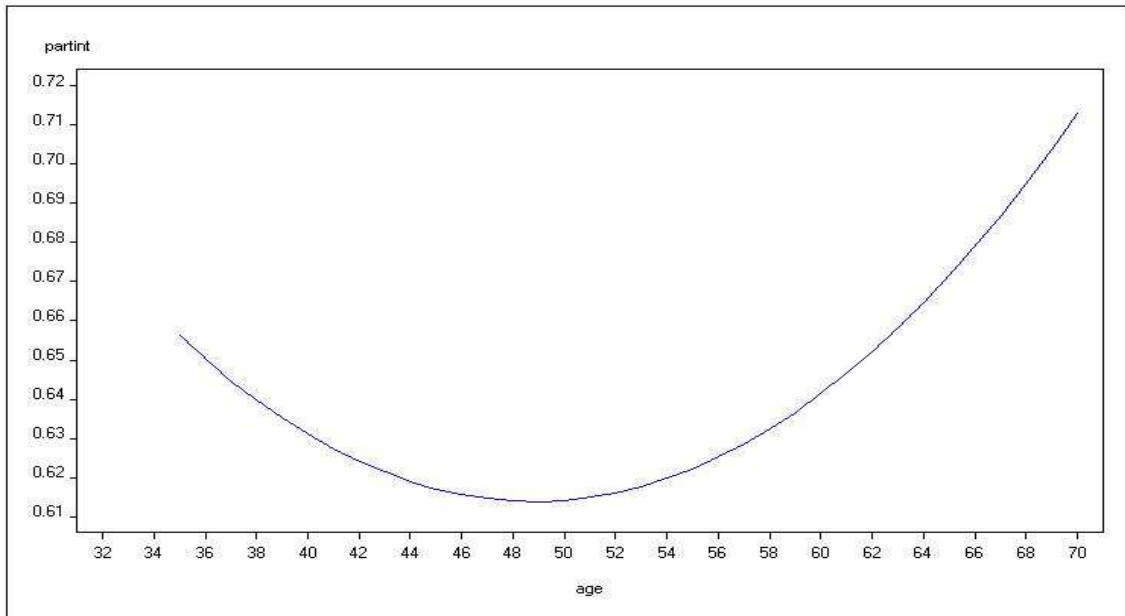
We consider the share of intrinsic motivations in physician's total motivations, ranging from 0 to 1, as a variable of interest. The series is truncated, both to the left and right, thereby justifying the use of a TOBIT model. We obtain the following results (backward selection, p threshold = 0.10):

Table 2: Results of the model

Dependant variable	Comparison	Coefficients	Standard Error	P-value
Constant		1.19470	0.32485	0.0002
Age		-0.02483	0.01256	0.0480
Age-squared		0.00025	0.00012	0.0378
Practice sector	1 vs 2	0.02878	0.01549	0.0633
Build-up area	> vs < 200k. Inhab.	0.02094	0.01186	0.0774
Feeling of injustice	Yes vs No	-0.02506	0.01144	0.0285

Working in sector 1, where physicians are paid by a fixed-fee per consultation, is positively correlated with IM (and thus adhesion to sector 2, where free pricing prevailed, is negatively linked to IMs). This result could reflect a self-selection effect. Nevertheless, the estimation is not significant at 5% ($p=0.063$), thereby limiting its scope. The same is true for the geographic situation and the location of the medical practice in a large urban centre, which would appear to have a positive effect on IMs. We have chosen to comment on the two destructive effects (significant at 5%) of IMs: age and the feeling of injustice.

Fig.2. “Partint” variable according to age

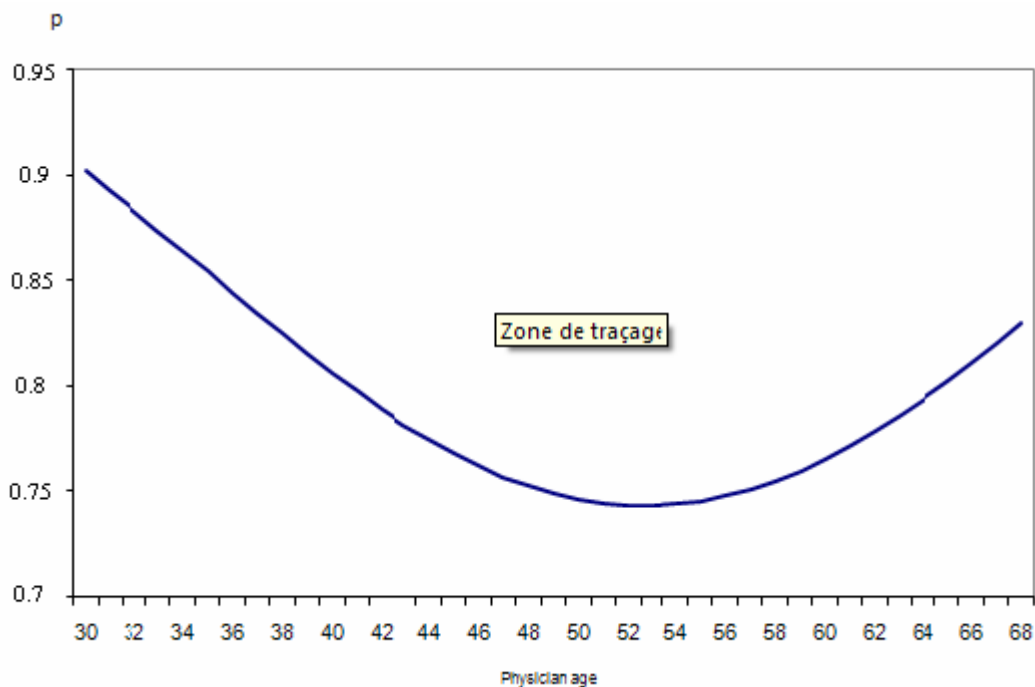


Source:
Panel, 6th wave
ORS PACA.

Let us first examine the effect of age. During their period of activity, it is at the age of about 49 that the share of IMs in physicians’ total motivations is the weakest. The graph representing the age effect is convex: we observe a fall in the share of intrinsic considerations in favour of extrinsic ones (all other things being equal) between the ages of 35 (lower limit) and 49, thereafter followed by a reversal of the trend.

These results may indicate a “life cycle of medical motivations” with an initially perverse effect of the increasing volume of physician’s activity on IMs (the phase when financial constraints are most significant). Then, after 50 years old, age and a relaxing of the financial constraints encourage physicians to adopt an attitude more favourable to expressing their IMs. We can assume that this graph, presenting cross sectional data, may also reflect a generational effect. It would reveal that older physicians are driven more by IMs whereas younger ones find themselves in an environment which promotes the expression of EMs. The data do not enable us to separate these different assumptions. It is nevertheless interesting to compare this graph with that obtained when analysing the question concerning “physician professional satisfaction” (profile obtained as a cross section for an identical panel of 1,901 doctors, but extended to 5 regions).

Fig.3. Probability of positive professional satisfaction (reported data) according to age



Source:
Observation panel
ORS PACA.
Population:
1,901 physicians

We note an age profile of professional satisfaction relatively similar to that established for “*partint*”. This would tend to support the methodology adopted here: when physicians are asked directly about their level of professional satisfaction, it would appear that the same findings as those identified through our own method hold, i.e. a life cycle of IMs in the choice of preventive practices.

2.2 The role of the feeling of injustice

To date, the study has allowed us to demonstrate and analyse the importance of IMs in physicians’ attitudes towards prevention but not to confirm the crowding-out hypothesis. At best, we can state that the extent of the IMs identified in these statistics pleads for caution when implementing any economic policy oriented towards financial compensation. The only information available to us here is an opinion, a reaction to the so-called public policies of “rational use of medicines”. Indeed, during the survey, we asked the following question; “do you find the implementation of actions promoting rational use of medicines, which aimed at limiting the increase in healthcare spending, *unfair with regard to yourself?*”.

We might think that the “feeling of injustice” expressed may be perceived as a bias which is inherent to declaratory data and can therefore be considered as unreliable. However, an increasing number of works, mirroring certain results provided in the field of comprehensive sociology, tend to give credence to the claims of those involved (Boltanski and Thévenot, 2006; Dubet, 2006). These surveys show that when individuals are questioned, they succeed in justifying the unfair nature of a situation. By doing so, they create their own construction of a “theory of justice” by behaving to a certain extent like *philosophers*, even if their theory of justice is spontaneous or profane. We therefore view justice criteria as a normative reference governing models of action. We believe that such a normative reference can be identified when physicians express their discomfort concerning policies promoting rational use of medicines introduced by the public authorities in France in recent years.

These are perceived as control devices threatening the autonomy of physicians. This loss of freedom can be combined with the belief in an “offensive” treatment of the profession by the public authorities who would have to buy a high-quality practice by means of compensation. The incentive can, then, have a perverse effect when it is interpreted as proof of the distrust demonstrated by society towards the medical profession, judged incapable of performing its missions without obtaining additional payments (Bras and Duhamel, 2008). This criticism leads to the activation of new types of motivation, some of which may supplant the others. The feeling of injustice with regard to the reforms could exercise a negative effect on IMs, by revealing physicians’ perception of an exaggerated appeal to EMs.

In our study, it appears that the coefficient associated with the “feeling of injustice” is negative and significant ($p = 0.02$): a physician feeling that he has been unfairly treated by the public authorities is less intrinsically motivated than a physician who does not share this feeling. The Tobit model therefore shows that, all other things being equal, the expression of a “feeling of injustice” is associated with a reduction in IMs involved in a preventive procedure. In the absence of time data, this statistic does not enable us to identify the direction of the causality: a low level of IMs may increase the feeling of injustice just as the feeling of injustice may – as in the theory – destroy the IMs. In the current context, we can only reveal the correlation between injustice and IMs.

Conclusion

One of the advantages of the notion of IMs (Déci, 1971) is to underline that individuals are likely to emphasize different facets of their identity: individuals have a reflexive capacity.

Under the effect of new economic policy measures, it is possible that individuals change the balance of their motivations. For instance, actions encouraging the rational use of medicines belong to economic incentive mechanisms and can lead physicians to change their attitude by adopting an economic way of reasoning (they turn pure “homo-oeconomicus”). Consequently, the extrinsic part of their motivation is over-stimulated, possibly at the expense of intrinsic considerations when the actions are regarded as “unfair” by physicians.

We are, of course, a long way from being able to identify these different dimensions of the crowding-out effect in the statistical study carried out. In our opinion, this study constitutes an initial contribution to a quantitative evaluation of the phenomenon: i) intrinsic motivations account for a large part of preventive actions undertaken by GPs ; ii) the feeling of injustice would indeed appear to be linked to a pejoration of IMs in medical prevention procedures, thereby giving form to the IM-EM theory.

Appendix:

List of questions used to construct the prevention score:

How frequently do you perform the following preventive procedures?

- Suggest a breast cancer screening mammography for patients between the ages of 50 and 75, every two years
- Suggest a programme for breaking nicotine addiction for patients who smoke
- Identify weight problems in children
- Record the Body Mass Index of patients and position it with regard to the thresholds
- Suggest the use of a nutrition booklet for obese patients
- Inform young patients about contraception
- Suggest a Hemocult test to all patients between the ages of 50 and 75, every two years
- Inform patients about the risks of self-medication
- Identify any side-effects resulting from multiple prescriptions among elderly people
- Suggest an annual preventive consultation
- In your practice, do you use predefined questionnaires to help identify risk factors or screen for a pathology, such as tests or scales?
- Do you ask your patients if they smoke?
- How often do you ask your patients this question?
- Do you ask patients who smoke if they intend to give up smoking?
- How often do you ask your smoker patients this question?
- When dealing with nicotine, do you evaluate the level of addiction of patients who smoke?

For all these questions (except questions 4 and 6), the answer scale was as follows: very often (4), often (3), sometimes (2), never (1), do not know (0), did not answer (0). For questions 4 and 6, the answer scale was as follows: every consultation (4), often (3), no fixed frequency (2), when dealing with a health issue linked to nicotine (1), do not know (0), did not answer (0). The score was obtained by adding the answers to these 16 questions. Cronbach's alpha for the 16 questions totalled 0.744, thereby enabling us to confirm the reliability of the prevention score.

References

- Aulagnier, M., Videau, Y., Combes, J.B., Sebbah, R., Paraponaris, A., Verger, P., Ventelou, B., (2007). Pratiques des médecins généralistes en matière de prévention : les enseignements d'un panel de médecins généralistes en Provence Alpes Côte d'Azur. *Pratiques et Organisation des Soins*, 38, 4, 259-268.
- Benabou, R., & Tirole, J. (2003). Intrinsic and extrinsic motivation. *Review of Economic Studies*, 70, 489-520.
- Boltanski, L., Thévenot, L. (2006). *On Justification: Economies of Worth*. Princeton : Princeton University Press.
- Bras, P.L., & Duhamel, G. (2008). *Rémunérer les médecins selon leurs performances : les enseignements des expériences étrangères*. Paris : IGAS.
- Cameron, J., Banko, K.M., Pierce, W.D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *The Behavior Analyst*, 24, 1-44.
- Chaix-Couturier, C., Durand-Zaleski, I., Jolly, D., Durieux, P. (2000). Effect of financial incentives on medical practice: results from a systematic review of the literature and methodological issues. *International Journal for Quality in Health Care*, 12, 133-142.
- Deci, E.L. (1971). Effect of externally mediated rewards on intrinsic motivation, *Journal of Personality and Social Psychology*, 18, 105-115.
- Deci, E.L., Koestner, R., Ryan, R.M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125, 627-668.
- Dubet, F. (2006). *Injustices : L'expérience des inégalités au travail*. Paris : Seuil.
- Falk, A., & Kosfeld, M. (2006). The Hidden Costs of Control. *American Economic Review*, 96, 1611–1630.
- Fehr, E. & Falk, A. (2002). Psychological Foundations of Incentives. *European Economic Review*, 46, 687-724.
- Frey, B.S. (1997). *Not just for the money: an economic theory of personal motivation*. Cheltenham, U.K.: Edward Elgar.
- Frey, B.S., & Jegen, R. (2001). Motivation Crowding Theory. *Journal of Economic Surveys*, 15, 589-611.
- Frey, B.S., & Oberholzer-Gee, F. (1997). The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-out, *American Economic Review*, 87, 746–755.
- Frølich, A., Talavera, J., Broadhead, P., Dudley, R. (2007). A behavioral model of clinician responses to incentives to improve quality. *Health Policy*, 80, 179-193.

Gené-Badia., J., Escaramis-Babiano, G., Sans-Corrales, M., Sampietro-Colom, L., Aguado-Menguy, F., Cabezas-Pena, C., de Puelles, P.G. (2007). Impact of economic incentives on quality of professional life and on end-user satisfaction in primary care. *Health Policy*, 80, 2-10.

Gneezy, U., Rustichini, A. (2000). Pay enough or don't pay at all, *Quarterly Journal of Economics*, 115, 791-810.

Grady, K.E., Lemkau, J.P., Lee, N.R., Caddell, C. (1997). Enhancing mammography referral in primary care, *Preventive Medicine*, 26, 791-800.

Hillman, A.L., Ripley, K., Goldfarb, N., Nuamah, I., Weiner, J., Lusk, E. (1998). Physician financial incentives and feedback: failure to increase cancer screening in Medicaid managed care. *American Journal of Public Health*, 88, 1699-1701.

Hillman, A.L., Ripley, K., Goldfarb, N., Weiner, J., Nuamah, I., Lusk, E. (1999). The use of physician financial incentives and feedback to improve pediatric preventive care in Medicaid managed care. *Pediatrics*, 104, 931-935.

James, H. (2005). Why did you do that? An economic examination of the effect of extrinsic compensation on intrinsic motivation and performance. *Journal of Economic Psychology*. 26, 549-566.

Janssen, M.C.W., Mendys-Kamphorst, E. (2004). The price of a price: on the crowding out and in of social norms, *Journal of Economic Behavior and Organization*, 55, 377-395.

Kreps, D.M. (1997). Intrinsic motivation and extrinsic incentives. *American Economic Review, Papers and Proceedings*. 87, 359-364.

McDonald, R, Harrison, S., Checklang, K., Campbell, S., Roland, M. (2007). Impact of financial incentives on clinical autonomy and internal motivation in primary care : ethnographic study, *British Medical Journal*. 334, 1357-1359.

Sliwka, D. (2007). Trust as a Signal of a Social Norm and the Hidden Costs of Incentive Schemes. *American Economic Review*. 97, 999-1012.

Titmuss, R.M. (1970), *The gift relationship: from human blood to social policy*. London: George Allen & Unwin.

Town, R., Kane, R., Johnson, P., Butler, M. (2005). Economic incentives and physicians' delivery of preventive care. A systematic review, *American Journal of Preventive Medicine*. 28, 234-240.

Notes

ⁱ « *One is said to be intrinsically motivated to perform an activity when he receives no apparent rewards except the activity itself* » (Déci, 1971, p.105).

ⁱⁱ According to Titmuss, blood donation in Britain in the context of a “socialist policy” is more efficient than the commercialisation of blood in the United States.

ⁱⁱⁱ In the social security financing law of 2008, which authorises local health insurance organisations to conclude individual contracts (involving financial compensation) with physicians or health centres. This provision stipulates the measures taken in 2000. See Bras and Duhamel (2008)

^{iv} The panel of GPs in the PACA region was defined in March 2002 with a view to analysing their medical practices. It was obtained by random sampling stratified according to sex, age and the size of the urban unit where the GP practised. To date, six surveys have been completed. The last wave, entitled “Preventive actions and public health”, comprised a sample of 528 GPs representative of the GPs in the PACA region. The questionnaire they filled-in was using the KABP method (knowledge, attitudes, beliefs, practices) and focussed on three main sections: (i) perceived roles, attitudes and opinions in terms of preventive procedures; (ii) the obstacles encountered; and (iii) the needs to be satisfied to improve preventive practices.

^v GPs with a high prevention score (second category) are those who perform all 16 actions “often” or even “very often” ($14 \times 3 + 2 \times 4 = 50$), although other distributions are possible.

^{vi} Nevertheless, although it is possible to compare GPs to one another, the high average (62.4% of IMs) is difficult to interpret as it is sensitive to the number of IM and EM variables available for the decomposition.