ELSEVIER

Journal of Health Economics 16 (1997) 249–255

JOURNAL OF HEALTH ECONOMICS

The friction cost method: A comment

Magnus Johannesson *, Göran Karlsson

Department of Economics, Stockholm School of Economics, Box 6501, S-113 83 Stockholm, Sweden

Received 1 June 1995; revised 1 February 1996

Abstract

The friction cost method has been proposed as an alternative to the human-capital approach of estimating indirect costs. We argue that the fricton cost method is based on implausible assumptions not supported by neoclassical economic theory. Furthermore consistently applying the friction cost method would mean that the method should also be applied in the estimation of direct costs, which would mean that the costs of health care programmes are substantially decreased. It is concluded that the friction cost method does not seem to be a useful alternative to the human-capital approach in the estimation of indirect costs.

JEL classification: I1; J3

Keywords: Indirect costs; Economic evaluation; Human-capital

1. Introduction

In a recent article, Koopmanschap et al. (1995) argued that indirect costs in economic evaluations of health care programmes should be measured according to the friction cost method rather than the traditional human-capital approach (Weisbrod, 1961, Cooper and Rice, 1976). In studies based on the human-capital approach, indirect costs have traditionally been estimated as the lost gross income during the time of absence from work (Weisbrod, 1961, Cooper and Rice, 1976).

According to the friction cost method, indirect costs for long-term absence, disability and mortality mainly only occur during the time it takes to replace a

* Corresponding author. Tel: +46 8 7369443; fax: +46 8 302115; e-mail: HEMJ@HHS.SE.

PII S0167-6296(97)00006-4

worker, i.e. the friction period. For short-term absence, Koopmanschap et al. (1995) argue that the real indirect costs are lower than the estimates based on the human-capital approach due to diminishing returns to labour, internal labour reserves within firms, and the fact that sick employees can sometimes make up for lost work when they return to work after a period of absence.

Using the friction cost method to estimate indirect costs essentially means that the price of labour (i.e. the opportunity cost of labour) is set close to zero after the friction period and is reduced during the friction period. In this comment, we critically examine the friction cost method. It is argued that the friction cost method is based on implausible assumptions not supported by neoclassical economic theory. Furthermore, consistently applying the friction cost method would mean that the price of labour should also be set close to zero in the estimation of direct costs (e.g. health care costs), which would substantially reduce the cost of health care programmes. It is concluded that the friction cost method does not seem to be a useful alternative to the human-capital approach in the estimation of indirect costs.

2. Problems with the friction cost method

In this section, we critically examine the friction cost method. We start by analysing the use of the method to estimate the indirect costs of short-term absence. This is followed by an analysis of the friction cost method to estimate the indirect costs of long-term absence, disability and mortality. Finally, we consider the implications of using the friction cost method for the estimation of direct costs.

2.1. Short-term absence

Koopmanschap et al. (1995) argue that the indirect costs due to short-term absence fall short of the estimations of indirect costs of the human-capital approach for a number of reasons. These stated reasons are diminishing returns to labour, internal labour reserves within firms, and the fact that sick employees can sometimes make up for lost work when they return to work after a period of absence. These arguments are critically examined below. It should be noted that Koopmanschap et al. (1995), in their base-case estimations, estimate the indirect costs during the friction period to be 80% of the average value of production. So for their base-case empirical estimations of indirect costs of short-term absence of equal or less time than the friction period, the difference compared with the human capital approach is not that great.

Even if there are diminishing returns to labour within a firm, this does not mean that the human-capital approach would overestimate the indirect costs. A firm can be expected to hire labour until the marginal cost of labour equals the marginal value of the products produced by the worker. If a worker is absent this would

represent a marginal loss of labour, whose value for the firm equals the gross income of the worker. [1] The human-capital approach would thus correctly estimate the indirect costs according to neoclassical economic theory.

Internal labour reserves within firms does not seem to be a fully convincing argument that the human-capital method overestimates indirect costs either. Also for these workers it is the case that the firm would not hire them unless the value of their production would exceed or be equal to the gross income of the workers. An increase in the short-term absence would then mean that the firm either loses the production during the absence or has to hire additional workers that are withdrawn from other sectors in the economy. If the firm does not hire any additional workers and the production of the firm is unaffected by an increase in the short-term absence, this would mean that the firm is not maximizing profits as is usually assumed in economics (Varian, 1992). This is so since they could have produced the same output with less labour. It may be possible that some firms have surplus labour during a recession if discharging and employing workers are associated with transaction costs, but for this to be generally the case seems unconvincing to us. It should be noted that Koopmanschap et al. (1995), in their base-case estimations of indirect costs of short-term absence, did not assume a reduction in indirect costs due to internal labour reserves. This was only done in the sensitivity analysis.

The final argument by Koopmanschap et al. (1995) that sick employees make up for lost work when they return to work after a period of absence could possibly be used as an argument that the human-capital approach overestimates indirect costs. The extent of the overestimation would, however, be less than the overestimation suggested by Koopmanschap et al. (1995). If an employee makes up for lost work when he or she returns to work this means that they reduce their leisure time and the opportunity cost of this leisure time would be the appropriate estimate of the indirect costs. It is possible that the opportunity cost of leisure time falls short of the gross income, due to, for instance, taxes on labour. In such a case the human-capital approach would overestimate indirect costs, but not by the full amount of the gross income as suggested by Koopmanschap et al. (1995). It is doubtful if this possible overestimation is a big problem in human-capital estimations, however, since in many occupations absence from work would not lead to the worker's having to increase the number of hours worked later. It may also be possible that employees can make up for lost work without a reduction in leisure by increasing effort, but in such a case this increased effort is also likely to be associated with a cost for the individual. It should be noted that if the indirect

[1] The gross income is here defined as the total cost the firm pays for a worker (i.e. including income tax, payroll taxes and any insurance payments). If a tax is applied to the final goods produced by the firm (e.g. a value added tax), this tax should also be added to the wage cost of the firm to get the correct value of the lost production in consumer prices.

costs are defined strictly as the change in the value of the market production, the opportunity cost of the changes in leisure would not enter into the estimations. From a societal perspective, however, also the changes in leisure time represent changes in costs and should be incorporated into the economic evaluation of a health care programme.

It is possible to use one more argument, not used by Koopmanschap et al. (1995), that the human-capital approach overestimates indirect costs. Absence from work means that the leisure time of the individual increases and it could be argued that the value of this increased leisure time should be subtracted from the value of the lost production to arrive at the correct indirect costs. However, this aspect is complicated to analyse since the individual with increased leisure time is in a state of poor health. In an economic evaluation this change in the amount of leisure time may also already be incorporated in the valuation of the health change.

We think that the arguments put forward by Koopmanschap et al. (1995) that the human-capital approach overestimates the indirect costs of short-term absence are unconvincing and do not motivate the use of the type of arbitrary estimations of indirect costs for short-term absence as carried out by Koopmanschap et al. (1995).

Our argument against the friction cost model relies on traditional neoclassical economic theory (Varian, 1992). The friction cost method may, however, question the result in neoclassical theory that the (marginal) value of an employee equals the labour cost. Even if this result does not hold, it is not obvious that the labour cost overestimates the indirect costs as claimed by Koopmanschap et al. (1995). An underestimation seems equally likely. This could be the case if there were, for instance, difficulties in replacing key personnel when they are absent from work, e.g. the absence of an airline pilot that leads to flight cancellations.

2.2. *Long-term absence, disability and mortality*

For long-term absence, Koopmanschap et al. (1995) argue that indirect costs mainly occur only during the time it takes to replace a worker, i.e. the friction period. This is the essence of the proposed friction cost method. During the friction period the indirect costs are estimated in the same way as for short-term absence. The rationale for using the friction cost method given by the authors is that after the friction period a worker will be replaced by a previously unemployed person and therefore the indirect costs are confined to the friction period (Koopmanschap et al., 1995). The only indirect costs that Koopmanschap et al. (1995) estimate after the friction period is that they attempt to estimate the "medium-term macro-economic consequences" of absence and disability on production by using a simulation model for the Dutch economy. It is rather unclear in the paper how these estimations are carried out, and they lead to indirect costs that are much smaller than the estimations based on the human-capital approach.

Before discussing the reasonableness of the underlying assumptions of the friction cost method, we think that it is important to make a distinction between indirect costs of mortality and morbidity. The production loss or gain due to increased or decreased mortality can be given no meaningful interpretation in an economic evaluation (Johannesson, 1994).

Koopmanschap et al. (1995) seem to argue that the indirect costs of mortality should be included in an economic evaluation. It is argued that it should be included not as the value of life per se, but as an additional cost item in an economic evaluation. The rationale for this is unclear. The part of the production change due to mortality that falls on the individuals that receive a health care programme will be included in their valuation of the programme. It would thus mean double counting to include it again. What matters for other individuals in society would be the external costs imposed by them of the change in mortality, but this cannot be estimated as the change in production (Johannesson, 1994). To include the indirect costs of mortality in an economic evaluation as argued by Koopmanschap et al. (1995) thus has no foundation in economic theory.

Using the friction cost method to estimate the indirect costs of long-term absence and disability essentially means that the price (i.e. opportunity cost) of labour is set close to zero after the friction period. This assumption is not supported by either neoclassical economic theory or empirical observations. The friction cost method is based on a number of unsupported assumptions.

First, it has to be assumed that all vacancies due to long-term absence and disability are filled by previously unemployed persons, or that if these vacancies are filled by employed persons this leads to replacement by an unemployed person at the end of this chain. This does not seem very likely, since at least some vacancies would be filled by workers withdrawn from other employment without an unemployed person eventually being employed. It furthermore has to be assumed that these previously unemployed persons would not have obtained a job elsewhere during the time of the long-term absence or disability, or that if they would have obtained a job elsewhere somebody else would have become unemployed instead. To apply the friction cost method consistently a cost should also be measured for all the friction periods created by a vacancy due to long-term absence and disability, i.e. if the vacancy is filled by an employed person that is replaced by an unemployed person this would lead to two friction periods rather than one. This is not done by Koopmanschap et al. (1995), and in practice it would seem to be very difficult to follow the chain of vacancies and estimate the number of friction periods created by a vacancy due to long-term absence and disability.

The friction cost method assumes that sickness and absence from work will reduce the overall unemployment rate in the economy. This might be true in certain phases of the business cycle, but we know of no empirical evidence which shows that sickness causing absence from work actually reduces the unemployment rate in the long run.

It also has to be assumed that the opportunity cost of leisure time of unem-

ployed persons is zero in the friction cost method, which would mean that they should be willing to accept a job at a zero wage rate or at the same wage rate as the amount they receive in unemployment benefits. In our opinion this also seems to be an implausible assumption.

If the friction cost method were valid it would mean that problems of unemployment could be solved at no cost to society by simply reducing the number of hours worked for employed people, since the vacancies could simply be filled by unemployed persons at no cost and without any loss in total production. We think that few economists consider that to be a very plausible scenario. Koopmanschap et al. (1995) acknowledge that it may be difficult to replace workers in some segments of the labour market even with substantial unemployment. They deal with this by segmenting the labour market according to education level, so that the friction period and thus the indirect costs can differ in different segments of the labour market. It is still assumed, however, that after the friction period a vacancy leads to an unemployed person being employed. The segmenting of the labour market therefore does not escape the essential problem of the friction cost method, i.e. the implausible assumption that indirect costs are close to zero after the friction period.

Overall, we think that employing the friction cost method to estimate the indirect costs of long-term absence and disability will severly underestimate these costs and that it does not provide a useful alternative to the human-capital approach.

2.3. Implications for the estimation of direct costs

If the friction cost method is used to estimate indirect costs it should also, to be consistent, be used in the estimation of direct costs (e.g. health care costs). The main part of the health care costs consists of the cost of labour. This is true also for health care items such as drugs and medical equipment, since labour is used to produce these goods. If it is the case that the opportunity cost of additional labour is close to zero, as argued in the friction cost method, the part of the health care costs that are labour costs should be set close to zero in an economic evaluation of a marginal health care programme based on the friction cost method. The cost of health care programmes would then be substantially reduced, as the labour cost is a major part of the value added. In Sweden in 1993, for instance, the labour cost accounted for 66% of the value added in the whole economy and 94% of the value added in the public sector in which health care mainly is produced (Statistics Sweden, 1995). In our opinion, this shows the unreasonableness of using the friction cost method in economic evaluations of health care programmes. As for the estimation of indirect costs of long-term absence and disability, we do not find it plausible that every job opportunity created due to the implementation of health care programmes will reduce unemployment.

3. Concluding remarks

This comment considered the use of the friction cost method to measure the indirect costs in economic evaluations of health care programmes. It is concluded that the friction cost method is based on implausible assumptions not supported by neoclassical economic theory. The friction cost method essentially means that the price of labour is set close to zero. This means that, to be consistent, the part of the health care costs that are labour costs should also be assigned a value close to zero in economic evaluations of health care programmes. In our view, the friction cost method cannot be recommended as an alternative to estimations of indirect costs based on the human-capital approach.

Acknowledgements

We thank two anonymous referees for helpful comments. This work was financially supported by the National Corporation of Swedish Pharmacies.

References

Cooper, B.S., Rice, D.P., 1976. The economic cost of illness revisited. Social Security Bulletin 39, 21–36.

Johannesson, M., 1994. The concept of cost in the economic evaluation of health care: A theoretical inquiry. International Journal of Technology Assessment in Health Care 10, 675–682.

Koopmanschap, M.A., Rutten, F.F.H., van Ineveld, B.M., van Roijen, L., 1995. The friction cost method for measuring indirect costs of disease. Journal of Health Economics 14, 171–189.

Statistics Sweden, 1995. National Accounts 1980–1993, Appendix 1. Statistics Sweden, Stockholm.

Varian, M.R., 1992. Microeconomic Analysis, 3rd edition. W.W. Norton, New York.

Weisbrod, B., 1961. Economics of Public Health. University of Pennsylvania Press, Philadelphia.