A Primer on the Efficent Valuation of Fringe Benefits

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ABSTRACT

In absence of an income tax, few goods or services would be purchased by employees from their employers. However, nontaxability of a fringe benefit causes inefficiency by leading employees to demand the good as a fringe benefit even when they value it at less than its marginal cost. This study determines bounds on the valuation of a fringe benefit by employees and on the amount of cash compensation that would be forgone to receive the benefit.

When the marginal cost to an employer of providing a good to employees is less than the market price of that good, there may be efficiency reasons for valuing the good for tax purposes at less than market price. However, complete examination of all efficiency conditions requires a discarding of the simple notion that valuing a fringe benefit at marginal cost is efficient. If valuation is ever to be provided at less than market price, considerations of both efficiency and administration require that the discount from market price valuation should be allowed only for a reasonable or verifiable difference between the marginal cost of providing the good on the open market and the cost of providing it to employees.

A PRIMER ON THE EFFICIENT VALUATION OF FRINGE BENEFITS

I. INTRODUCTION

In recent years the value of fringe benefits has been a steadily increasing portion of the compensation of employees. (Hartzmark and Steuerle, 1980; Chamber of Commerce). One of the major reasons for the increased demand for fringe benefits is that many of these fringe benefits are not subject to taxation (Sunley, 1977), either because of specific statutory exemptions, regulations and rulings, or because of Congressional intervention to prevent regulatory change (Parnell, 1980). Several U.S. Congresses and Administrations have groped with the question of whether certain fringe benefits should be included in income subject to taxation (Lubick, 1978; Chapoton, 1981).

Of special concern have been fringe benefits which are products or services of an employer's business (Ferguson, 1981) or which are indirectly related to the employee's job. Even if a number of these benefits were subject to taxation, a major question remains to be resolved: What is the appropriate measure of compensation to impute to employees as taxable income? Is it zero (as in much of current practice), the marginal cost to the employer, the price that the employee would pay for the benefit (however that would be

determined), or the market price of the benefit? 1/ For instance, should employees of transportation companies be taxed on free trips when they take seats that would otherwise be unoccupied under existing pricing mechanisms? How much income should executives be attributed because of free use of automobiles or discounts on purchases of automobiles?

Improper valuation of fringe benefits can distort labor and consumer markets (Kosters and Steuerle, 1981), lead to sizeable welfare losses in the economy (Browning, 1979), and affect the distribution of compensation across workers (Smeeding, 1981). Although the choice of the appropriate measure of compensation is dependent upon various considerations, including equity and administrative simplicity (Nolan, 1977), this note is concerned principally with efficiency considerations.

II. THE VALUATION OF FRINGE BENEFITS IN ABSENCE OF TAXATION

In absence of all taxes, it is possible to place limits on the value of a fringe benefit to an employee. First, an employee will never value a fringe benefit more than the market price of that benefit. This does not mean that the

1/ U.S. Treasury regulations state that "if services are paid for other than in money, the fair market value of the property or services taken in payment must be included in income (section 1.61-2(d)(1)).

employee would be unwilling to buy the item of concern if the market price were higher. However, he would not be willing to substitute the fringe benefit for cash compensation if the loss of cash compensation was greater than the market price. Thus, suppose an individual is willing to pay $10 for a widget, but the market price of widgets is $8. The value of the widget received as in-kind compensation, then, is never greater than $8, the value of wage compensation that would allow him to purchase the widget. 2/

From the employer's standpoint, a major concern is the marginal cost of providing the benefit. As long as the employee places a value on the benefit greater than the marginal cost, there is an incentive for the employer and employee to bargain so that the fringe benefit can be received as compensation. Of course, it is worthwhile for the employer to bargain with any person, employee or otherwise, to provide or sell an object if that person will pay the employer more than his cost. However, if the employee (or other individual) values the object at less than the marginal cost to the employer, then no bargain would be struck. In the case of an employee, the employer can provide greater benefits at lower cost simply by providing cash compensation.

2/ The difference between $10 and $8 in this case represents consumer surplus.

In general, then, we have

$$\text{Marginal Cost to Employer} \leq \text{Value of Fringe Benefit to Employee} \leq \text{Market Price} \quad (1)$$

In normal circumstances, equation (1) would be written not as an inequality, but as an equality. Employees would demand the fringe benefit up to the point that their valuation of an extra benefit equaled the extra cost to the employer. The employer, in turn, would provide or produce the benefit for either his employees or the market up to the point that his cost equaled the market price, i.e., until he could make no more profit. Since marginal cost would equal market price, the employee normally would prefer cash compensation to the fringe benefit; after all, for the same cost to the employer, he could buy the fringe benefit on the open market or not buy it, as he desired. Thus, an employee would usually avoid a contract in which payment of a fringe benefit was specified, for there could be no advantage in foreclosing options on how to spend his compensation. We conclude that in a nontax world there would need to be exceptional circumstances for employees and an employer to bargain for payment of a fringe benefit in lieu of cash compensation; in particular, a necessary, but not sufficient, condition is that there must be a lower marginal cost to the employer than to other producers for providing the fringe benefit to the employee. We will return to this point later.

III. THE VALUATION OF NONTAXABLE FRINGE BENEFITS IN THE PRESENCE OF INCOME TAXATION.

The addition of income taxes complicates the issue considerably. When cash compensation is subject to income taxation, but a fringe benefit is excluded from the tax base, then distortions are created as employees demand more of the fringe benefit than is efficient.

An excessive amount of a fringe benefit is demanded because of the tax savings that it generates. One can derive the amount of cash compensation that an employee would require to forgo receiving a fringe benefit by adding the tax savings to the after-tax price that the employee would be willing to pay for that benefit. If "t" is the employee's marginal tax rate, then

$$\begin{matrix}\text{Equivalent} \\ \text{Cash} \\ \text{Compensation}\end{matrix} = \begin{matrix}\text{Value of} \\ \text{Fringe Benefit} \\ \text{to Employee}\end{matrix} + \text{Tax Savings} = \frac{\begin{matrix}\text{Value} \\ \text{to Employee}\end{matrix}}{(1-t)} \qquad (2)$$

Working from equation (2), the value of the tax savings can be calculated as the cash price that the employee is willing to pay for the fringe benefit times his marginal tax rate divided by one minus his marginal tax rate, i.e.

$$\text{Tax Savings} = \text{Value to Employee} \times (t/1-t) \qquad (3)$$

One way of viewing equations (2) and (3) is that the government effectively intervenes to offer a potential tax savings when an employee consumes goods and services furnished directly by an employer. This tax savings may or may not be shared with the employer through lower total compensation costs. Suppose that an employee is willing to work for $100 a week. Also assume that the cost of the fringe benefit to the employer, the market value of the fringe benefit, and the valuation placed on the fringe benefit by the employee are all the same. If the government steps in with a potential $10 in tax savings, the employee may now be willing to work for $90 in total employer compensation a week. On the other hand, if the employer was willing to pay $100 in total cost of compensation, he may still be willing to pay that amount; the employee then reaps the full value of the tax savings. In effect, a bargaining area is created, and the total cost of compensation paid by the employer to the employee, excluding tax savings, varies between the $90 and $100; including tax savings, it varies between $100 and $110.

In general, the employer will not substitute a fringe benefit for cash consumption unless the wage reduction is at least equal to his marginal cost. The employee in turn will not give up more in wage reduction than the full cash value, including tax savings, of the fringe benefit:

$$\text{Marginal Cost} \leq \text{Wage Reduction} \leq \text{Value of Fringe Benefit to Employee} + \text{Tax Savings} \quad (4)$$

Because the tax savings may be shared with the employer through lower compensation costs, the employer may be willing to provide the fringe benefit even when the employee values the benefit at less than marginal cost. For instance, suppose a fringe benefit has a marginal cost and a market price of $20, but that an employee in a 50 percent tax bracket values the benefit at only $14. Then the value of benefit to the employee, plus the tax savings, equals $28. As long as the employee is willing to "pay" $20 or more of that $28 to the employer in the form of reduced wages, then the employer will be willing to provide the fringe benefit "free" (without direct charge) to the employee.

Inefficiency almost inevitably results from nontaxability of a good or service provided as a fringe benefit because employees generally demand the good or service even when they value it (exclusive of tax savings) at less than its marginal cost of production. The difference between employee value and employer cost represents the

amount of wasted resources of land, labor and capital which are prevented from being used for more productive (or more highly valued) purposes. In fact, it would be normal for the employee to demand the benefit up to the point that his equivalent cash compensation equals employer cost, so that, at the margin, the tax savings actually represent the amount of wasted resources. 3/

Usually, we know neither the exact value of the fringe benefit nor the value of the tax savings to the employee. However, we do know that the value of the fringe benefit to the employee, excluding tax savings, must still be less than or equal to market price:

$$\text{Value of Fringe to Employee} \leq \text{Market Price} \tag{5}$$

Therefore, combining equations (2), (3), (4) and (5), we can derive certain observable limitations on the value of a nontaxable fringe benefit, both excluding and including the tax savings:

$$\text{Marginal Cost To Employer} - \text{Market Price} \times \frac{t}{1-t} \leq \text{Value to Employee} \leq \text{Market Price} \tag{6}$$

$$\text{Marginal Cost To Employer} \leq \text{Equivalent Cash Compensation} \leq \text{Market Price}/(1 - t) \tag{7}$$

3/ Equation (4) becomes an equality: marginal cost = equivalent cash compensation = value of fringe benefit to employee plus tax savings, or tax savings = marginal cost less value of fringe benefit to employee.

IV. EFFICIENT VALUATION OF FRINGE BENEFITS FOR TAX PURPOSES

Because of the inefficiencies that can result when fringe benefits are not subject to taxation, it is often proposed that fringe benefits be treated as income subject to tax to the employee receiving those benefits. We know that taxation is efficient if the fringe benefit is counted in taxable income at its value to the employee. However, when the marginal cost to the employer does not equal market price, the equations derived so far only give us broad bounds on how to determine that value. The question then remains of how to assess the value of the fringe benefit; not all assessment values will bring about an efficient allocation of resources.

In order to answer this question, it is necessary to examine more closely the conditions that should hold if the method of tax assessment is efficient. We will label these conditions as bargaining efficiency (i.e., exchange efficiency within the employer-employee world), productive efficiency and distributive efficiency. These conditions are simple extensions of the three conditions of welfare economics (Samuelson, 1970, pp. 230-249).

Bargaining Efficiency. Bargaining efficiency requires that the employee and employer should bargain to substitute fringe benefits for cash if and only if equation (1) holds

true. This is an efficiency condition that existed naturally in the nontax world. If the employer cannot provide the fringe benefit at a cost less than market price, then the employee should not demand payment in-kind rather than cash. Even if marginal cost is less than market price, the employee still should not demand an additional fringe benefit unless his valuation of the extra benefit is greater than the cost of producing that benefit.

In some articles (e.g. Clotfelter, 1979), it is noted that efficiency would result if the tax assessed value equaled the value of the fringe benefit to the individual. In effect, there would be no tax savings to the employee from demanding the fringe benefit; he would pay in after-tax dollars exactly what the fringe benefit was worth to him, but no more.

While, theoretically, assessment at employee value would result in bargaining efficiency, tax authorities are unable to determine valuations and preferences of employees except as they are revealed in open markets where prices are explicit. In the market for fringe benefits, prices often are implicit and concealed in the process of wage negotiation. Moreover, employees may place different values on different amounts of a fringe benefit, and it is the marginal valuation that tax authorities would need to determine. Equation (5) could be used to place some bounds on valuation which could be observed empirically, but these bounds are fairly wide.

In absence of information on preferences, any tax assessed value above marginal cost has a probability that it could also be above the marginal value of the fringe benefit to the employee. Consequently, since receipt of an in-kind benefit could increase taxable income by more than the value of the benefit to the employee, a rule requiring assessment above marginal cost has a probability of preventing a bargain from being struck even though both the employer and employee could profit from the exchange. On the other hand, if the tax authorities were to assess the fringe benefit at marginal cost, then the employee would continue to demand the fringe benefit as long as both his own valuation is greater than the marginal cost, and the employer's marginal cost was less than the market price. To the extent that the employee's own valuation is greater than the tax-assessed value, he may receive a windfall in tax reduction, but he still has an incentive to demand the fringe benefit only as long as his valuation is above cost. Thus, tax assessment at marginal cost achieves bargaining efficiency in the employer-employee world.

This logic, although perhaps less formally presented, has been used as a basis for arguing that marginal cost assessment should be the general rule for taxing fringe benefits. Nonetheless, the analysis is incomplete. To evaluate more fully the efficiency question, it is necessary to determine what assessment values will achieve productive and distributive efficiency, as well as bargaining efficiency.

Productive Efficiency. Productive efficiency requires that a good be produced by the lowest cost producer. If there is more than one producer, then in equilibrium each will produce the good at the same marginal cost, which will also be the lowest cost possible. An employer should provide a fringe benefit to his employees only if his cost of production or provision is the lowest possible.

Normally, there would be no debate over whether marginal cost valuation or market price valuation of the fringe benefit is correct. The marginal cost (including a reasonable rate of return on capital) to the lowest cost producer generally equals the market price. Else more profit could be made by producing more of the good; marginal cost would rise with greater production of the good until that cost equaled market price. Therefore, if the employer is among the lowest cost producers, normally his cost for the good would be equal to the market price. In fact, if an employer can provide a good on the open market at the same cost that he can provide it to his employees, and that cost is less than market price, then he actually reveals productive inefficiency if he provides the good only to his employees.

In summary, productive efficiency normally requires that the employer, as producer or buyer of the fringe benefit, be able to provide the fringe benefit at the lowest cost, and

that he provide that good on the open market to all consumers. Tax assessment at market price would be efficient because the producer, to be efficient, would provide the good up to the point that price equaled marginal cost.

An exception to market price assessment, therefore, needs to be considered only if the employer's cost function for providing the benefit to employees is both less than any other producer's cost function and less than his own cost function for providing the benefit to other consumers. In that case, there may be justification for assessing the fringe benefit at a price different from the normal market price because, in effect, the employee market would comprise a different relevant market. The market price for employees in their market would reflect production under a differenct cost function than production for other consumers. To determine the extent to which tax-assessed value should differ from market price when there are different cost functions for different consumers, however, we must examine the third condition for an efficient allocation of resources.

Distributional Efficiency. In the case in which there is one cost function for providing a good, distributional efficiency requires that the good be purchased by the persons willing to pay the most for the good. In these circumstances, valuation of the good at market price provides the correct clearing mechanism for distributing the good to those

persons with the greatest demand for the good. Valuation at less than market price for a given employee may result in his purchase of the good even when there are other consumers who value the good more highly.

However, as in the case of productive efficiency, an exception must be made when a producer can actually provide a good at a lower cost for a given group of consumers than for another group. In that case, market price in the different markets should reflect marginal cost in the different markets. In such a world, distributional efficiency requires not that the good be sold to the consumer willing to pay the highest price, but rather to that consumer for whom "value added", or the difference between price and cost, is the greatest.

With most goods sold on the open market, this distributional efficiency results from the profit-maximizing behavior of producers. If one group of consumers can be supplied in a separate market at a lower than average cost, that group will tend to receive the good at a price which reflects this lower cost. Competition will direct supply to any market in which the difference between price and cost is greatest.

In the presence of an income tax, distributional efficiency is maintained if tax considerations do not lead a

consumer to purchase a good even though his valuation of that good (relative to cost) is less than some other consumer's valuation. In the case of fringe benefits, this implies that the tax-assessed value of the benefit must equal market price in the relevant market. If the employees' market is open, e.g., if the benefit is purchased from a supplier other than the employer, the relevant market price may be easy to identify. For instance, if a type of insurance policy would cost an individual $X, but, because of economies of scale, a firm can purchase a group policy for a per capita cost of $Y, then the efficient tax assessment is clearly $Y.

For some fringe benefits, however, there is no open market on which the exchange between employers and employees (or an identical exchange) takes place at an observable price. Nonetheless, there may be an alternative means of ascertaining or approximating what this "market price" for employees would have been. The market price for employees should differ from market price for other consumers only by the <u>difference in marginal costs</u> of providing the good to the different groups. Thus, suppose a fringe benefit could be offered to a set of employees at a cost, c_e, and, under the most profitable circumstance, could be sold on the open market at a price, p_m, but at a cost, c_m. Then an efficient tax valuation would equal:

$$p_m - (c_m - c_e), \text{ provided } c_e \leq c_m. \qquad (8)$$

This is basically a benefit-cost rule designed to maximize sales where the difference between price and marginal cost is greatest.

Generally, as we have noted, competition would lead marginal cost to rise to the point that it equaled market price in each relevent market. In this case, $p_m = c_m$, and equation (8) would imply tax assessment at marginal cost in the employee market. Again, it should be clear that marginal cost in this sense includes some normal return to capital (including both bondholders and equity owners).

Regardless of whether competition lowers the market price to marginal cost, distributional efficiency still demands that the good be sold to those persons for whom value-added is highest, i.e. that the employer maximize profits. Let us rewrite equation (8) as

$$c_e + (p_m - c_m), \text{ provided } c_e \leq c_m. \qquad (8')$$

Since $(p_m - c_m)$ is a measure of additional value added if the good is sold on the market rather than to the employee, equation (8') can be seen to demand that <u>the tax base of an employee receiving a fringe benefit should include not only the marginal costs of the employer, but also the employer's opportunity cost of not selling the good in another market</u>.

This opportunity cost must be the maximum profit lost by not disposing of the good in any other way. It is not always sufficient to examine existing markets to determine the potential profit that is forgone. For instance, if a transportation company furnishes transit or if a retail outlet sells a perishable good on the open market for price p_m, and p_m is too high to clear the supply of the good or service, then the marginal cost plus the opportunity cost of giving the excess supply to employees may appear to be close to zero. Yet the opportunity cost cannot be designated as zero unless other markets for disposing of the excess supply have been properly searched. In this case, an opportunity cost of zero makes sense only if no one other than an employee would be willing to pay anything to relieve the producer of the excess supply.

Another example may be given by the cartel or monopolist wishing to maintain a price well above marginal cost. To begin with, monopoly or cartel pricing is a sign of productive inefficiency. Assume that a monopolist's cost function for providing the good as a fringe benefit to employees and to consumers on the open market is exactly the same. To allow a tax assessment at marginal cost for the fringe benefit may promote productive efficiency, but it also supports the distributional inefficency caused by the monopolist's decision to limit the number of persons who can buy at marginal cost.

V. ADMINISTRATIVE ASPECTS OF EFFICIENCY RULES

Although this paper is concerned with efficiency considerations, we cannot help but comment on the administrative aspects of the different rules which are promulgated on efficiency, but not administrative, grounds. For purposes of taxing a fringe benefit, valuation at market price has always been recognized to provide the simplest administrative method, while the naive rule that pricing should be at marginal cost, even if it were correct, would involve enormous complexity and dispute over how to measure that cost. Adding opportunity cost to marginal cost--the correct solution from an efficiency standpoint--would add only further complexity if one had to measure opportunity cost as well as marginal cost.

Fortunately, adding opportunity cost to marginal cost (equation 8') is equivalent to subtracting from market price the difference between marginal costs of providing the good to two different groups of customers (equation 8). In this form, the correct efficiency rule comes closer to an administrable rule than any proposed efficiency rule other than strict market pricing. Data on market prices are generally available, and most marginal costs of producing a good are common to all markets and therefore do not have to

be calculated in determining any difference in marginal costs between providing a good to employees and providing it to others. In equation terms, one needs only to acquire data on p_m and on $(c_m - c_e)$, but not on either c_m or c_e by themselves.

As as example, suppose a retail merchant was to provide his merchandise free to his employees. He might reasonably assert that he did not have to pay for advertising costs to his employees; however, other costs such as operating the store, paying overhead, and accounting for transactions would be the same (even if zero for some excess inventory) regardless of the buyer. For this merchant, therefore, the reasonable discount from market price could be approximated simply by looking at his costs of advertising and ignoring all other costs. In practice, a de minimis rule could be provided to cover this type of situation.

Other cases may be somewhat more difficult, but safe harbor rules could be used to approximate the actual situation. Even in such difficult and highly debated case as free rides to employees of transportation companies, it is probably less the marginal cost differences that cause a problem than the measurement of the relevant market price. For instance, airline stewards might be able to fly free, but only under a type of pass which would be equivalent to a standby-standby ticket. It is the failure of the airline to sell such an equivalent product on the open market that makes

it difficult to determine the market value of the employee pass, but the marginal cost of providing such a pass is likely not to vary much between employees and other users. A reasonable and efficient solution in this case might be to allow a standard percentage discount (as determined under a de minimis or safe harbor rule) from the price of the lowest price discount ticket available.

While this discussion is not meant to suggest that there is still not a substantial amount of difficulty, any rule must have some standard by which to judge its adequacy. If it is deemed appropriate to provide valuation of certain types of fringe benefits at other than market price, then the standard of efficiency seems to be appropriate. If de minimis rules and safe harbor rules are then established on the basis of reasonable differences in marginal costs, the amount of arbitrariness can at least be kept to a minimum.

VI. SUMMARY

In the absence of an income tax, a good provided as a fringe benefit would be valued by an employee at less than or equal to the market price of the good but at greater than or equal to the marginal cost to the employer of providing the benefit. For most goods, market price would equal marginal cost. The employee would then avoid payment in-kind since, for the same employee cost, cash compensation would always be valued as much or more than a fringe benefit.

When cash compensation is taxed, however, nontaxability of a fringe benefit may cause inefficiency by leading employees to demand a benefit even when they value it at less than marginal cost. They may also share the tax savings from special treatment of the fringe benefit with their employer. If the fringe benefit is not treated as income subject to tax, one can still ascertain bounds on the value of the fringe benefit by the employee; however, these bounds are fairly wide.

Efficient tax assessment for fringe benefits is dependent upon three conditions: bargaining efficiency, productive efficiency and distributive efficiency. Bargaining efficiency between employer and employee requires that any tax valuation placed on the fringe benefit should fall somewhere between marginal cost and the value placed by the employee on the fringe benefit. In absence of full information on valuations by employees, marginal cost valuation would safely avoid interfering in an employer-employee bargain where both could profit from the exchange.

Productive efficiency requires that the employer should provide a fringe benefit only if he is the lowest cost producer of that benefit. Moreover, if he is lowest cost producer, he should provide the good to any customer for whom

valuation is greater than marginal cost, and he should provide the good up to the point that marginal cost equals market price. If the employer faces different cost functions for different consumers (including his employees), then the market prices in the separable consumer markets should reflect differences in those costs.

Distributive efficiency requires that goods be distributed to consumers who are willing to pay the highest price relative to cost. If producers face the same cost curve for all consumers, distributive efficiency is achieved by having all consumers, including employees, face the same price curve. Thus, for most goods, tax assessment at market price is sufficient and necessary to achieve distributive efficiency.

If employers are the lowest cost providers of a good to their employees, however, and the cost of providing the good to employees is less than the cost of providing the good to other consumers, then efficient tax assessment would require valuation for employees at the market price that would be relevant in the employee market. The assessed value of the fringe benefit should equal market price in the nonemployee market less the difference between cost of providing the good to the nonemployee market and the cost of providing it to employees. Another interpretation of this efficiency rule is

that the tax assessed value for fringe benefits should equal marginal cost plus opportunity cost, where opportunity cost is a measure of the maximum profit obtainable from selling the good to consumers other than employees.

Complete examination of all efficiency conditions therefore requires a discarding of the simple notion that valuing a fringe benefit at marginal cost is efficient. If valuation is ever to be provided at less than market price, considerations of both efficiency and administration require that the discount should be allowed only for a provable or reasonable or verifiable <u>difference</u> between the marginal cost of providing the good on the open market and the cost of providing it to employees.

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