Medicare provisions) and is immediately taken out; in this case $1,177 from hospital, $870 from other medical charges and nothing from drug charges. The plan provisions are then applied to the balance of $2,432, giving a plan reimbursement of $1,786 ((2,432 - 200) times 80%). This produces a post-65 reimbursement ratio of 0.3987 for this claim range. As with the pre-65 case the ratios for all ranges are then averaged using weights given by the distribution table to determine the gross post-65 BLI.

The gross BLIs are then adjusted to reflect participant contributions. Our example here might produce gross BLIs of 0.85 pre-65 and 0.32 post-65. The participant contribution of $10 per month translates into a reduction in the gross BLIs of 0.03 pre-65 and 0.04 post-65, giving final BLIs of 0.82 and 0.28 respectively.

NYASZ #157

Appendix C-1

Appendix C

Part I: Derivation of the Model

I. Households

All households are assumed to be identical and obtain utility from money and leisure as well as each of the m produced goods. Each household solves the following maximization problem

$$\text{(A1)} \quad U^* = \max_{\{C_i, M, N\}} \{C^{\gamma}(M/P)^{1-\gamma} - (\phi N^{\eta+1})^{1/\eta}\}$$

subject to the constraint that

$$\text{(A2)} \quad M + \Sigma_i P_i C_i = I$$

where

$$\text{(A3)} \quad C \equiv (\Sigma_i \alpha_i C_i^{(\theta-1)/\theta})^{\theta/(\theta-1)}$$

$$\text{(A4)} \quad P \equiv (\Sigma_i \alpha_i^{\theta} P_i^{1-\theta})^{1/(1-\theta)}$$

and C_i is the consumption of produced good i, P_i is the nominal price of produced good i, M is the amount of money held at the end of the period, N is the amount of labor supplied, I is the total nominal value of resources available to the household, C is the bundle of consumption goods defined by the aggregator function in (A3), and P is a price index defined in (A4). (Note that the price index P in (A4) is not the fixed-weight GNP price index. The solution of the model produces prices for each of the m goods which can then be combined to calculate the appropriate fixed-weight GNP price index.) The parameters of the utility function are γ, which equals the share of the household's nominal expenditure on produced goods rather than on money balances; θ, which is the elasticity of substitution between the consumption of any pair of goods; α_i, $i = 1,\ldots,m$, which indicate the weight of each good in the household's utility function; η, which is the elasticity of labor supply; and ϕ which characterizes the degree of disutility of labor.

The utility function in equation (A1) is additively separable between (C_i, M) and N. This separability allows us to solve the household's maximization problem in two stages. First, we will maximize utility with respect to C_i and M, and then we will choose the utility-maximizing level of labor supply N. Choosing C_i and M to maximize the utility function in (A1) subject to the constraint in (A2) yields the following first-order conditions:

$$\text{(A5)} \quad \alpha_i C_i^{-1/\theta} \gamma C^{\gamma-1+1/\theta} (M/P)^{1-\gamma} = \mu P_i$$

$$\text{(A6)} \quad (1-\gamma) C^{\gamma} (M/P)^{-\gamma}/P = \mu$$

where μ is the Lagrange multiplier on the constraint (A2).

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Appendix C-2

Combining the first-order conditions (A5) and (A6) yields

(A7) $\alpha_i C_i^{-1/\theta} \gamma C^{(1-\theta)/\theta} M = (1-\gamma) P_i$

Multiplying both sides of (A7) by C_i and then summing over all i yields

(A8) $\Sigma_i \; P_i C_i = (\gamma/(1-\gamma))\; M$

Substituting (A8) into (A2) yields

(A9) $M = (1-\gamma) I$

Substituting (A9) into (A7), summing over all i, and using the definition of the price index in (A4) yields

(A10) $PC = \gamma I$

Substituting (A9) into (A7) and then using (A10) yields the demand for good i

(A11) $C_i = \alpha_i^{\theta} (P_i/P)^{-\theta} \gamma I/P$

Substituting (A9) into (A11) yields

(A12) $C_i = \alpha_i^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma)) M/P$

Having solved for the optimal values of C_i and M, we now solve for the optimal value of labor supply N. First, substitute the optimal values of C_i (eq. A11) and M (eq. A9) into the utility function in (A1) to obtain

(A13) $U^* = \max_N \{\gamma^{\gamma}(1-\gamma)^{1-\gamma}(I/P) - (\phi N^{\eta+1})^{1/\eta}\}$

subject to $I = wN + rK^* + M + \pi$, where π is the (present value of) post-retirement health benefits to be received by the household.

The first-order condition for labor supply N is

(A14) $\gamma^{\gamma}(1-\gamma)^{1-\gamma}(w/P) = ((\eta+1)/\eta)(\phi N)^{1/\eta}$

which can be solved to obtain N*, the optimal amount of labor supplied

(A15) $N^* = \nu (w/P)^{\eta}$

where $\nu \equiv [\gamma^{\gamma}(1-\gamma)^{1-\gamma}\eta/(\eta+1)]^{\eta}\phi^{-1}$

Appendix C-3

II. Firms

Each of the m goods is produced by competitive firms with Cobb-Douglas production functions. The total production of good i, Y_i, is given by the production function

(A16) $Y_i = A_i N_i^{\rho_i} K_i^{1-\rho_i} \qquad i = 1,\ldots,m$

The firms are assumed to be competitive and thus take the nominal price of their output, P_i, the nominal rental price of capital, r, and the nominal price of labor, $D_i w$, as fixed. Note that the nominal price of labor consists of two parts: w reflects the nominal wage rate excluding the cost of post-retirement health benefits covered by FAS 106. The factor D_i reflects the impact on the cost per unit of labor of post-retirement health benefits covered by FAS 106. For firms that do not offer post-retirement health benefits, $D_i = 1$. For firms that offer such benefits, $D_i > 1$. Competitive firms choose N_i and K_i to maximize

(A17) $P_i A_i N_i^{\rho_i} K_i^{1-\rho_i} - wD_i N_i - rK_i \qquad i = 1,\ldots,m$

The first-order conditions for labor and capital are

(A18) $\rho_i P_i Y_i / N_i = wD_i \qquad i = 1,\ldots,m$

(A19) $(1-\rho_i) P_i Y_i / K_i = r \qquad i = 1,\ldots,m$

Given the nominal wage w and the FAS 106 factor D_i, (A18) determines the amount of labor demanded in sector i; given the rental price of capital, (A19) determines the amount of capital demanded in sector i.

III. Market Equilibrium

Equilibrium in the factor markets requires that the aggregate amount of labor demanded equal the supply of labor and the aggregate amount of capital demanded equal the supply of capital:

(A20) $\Sigma_i N_i = N^*$

(A21) $\Sigma_i K_i = K^*$

The amount of money demanded equals the amount initially held by consumers

(A22) $M = M^*$

The amount of good i produced must equal the amount of good i demanded, so that using (A12) we obtain

(A23) $Y_i = \alpha_i^{\theta} (P_i/P)^{-\theta} (\gamma/(1-\gamma)) M/P$

Appendix C-4

The nominal value of production must equal the nominal value of total factor payments, including the (present value of the) cost of post-retirement health benefits,

(A24) $\Sigma_i P_i Y_i = rK^* + w\Sigma_i D_i N_i$

The nominal value of total resources available to the household, I, equals the initial holding of money M^* plus capital income rK^*, wage income, $w\Sigma_i N_i$, and the present value of post retirement health benefits $\pi = w\Sigma_i (D_i - 1) N_i$ so that

(A25) $I = M^* + rK^* + w\Sigma_i D_i N_i$

The solution to the model consists of the equilibrium conditions (A20) - (A25), the production functions (A16), the labor demand equations (A18), the capital demand equations (A19), and the definition of the price index (A4).

Part II: Calibration of the model

The model is calibrated so that in the absence of FAS 106 it yields an allocation of labor across sectors that matches the actual allocation of labor across sectors. It is also calibrated such that in the absence of FAS 106, all nominal prices are equal to one.

Inputs to the calibration procedure:

η, the elasticity of labor supply

θ, the elasticity of substitution between the consumption of any two goods

γ, the share of nominal expenditure devoted to produced goods

N_o^*, the initial total amount of labor to be allocated across sectors

K^*, the fixed total amount of capital to be allocated across sectors

ρ_i, the share of labor in total cost in sector i

D_i, the FAS 106 cost factor in sector i (equal to 1 in the absence of FAS 106)

$s^N_i = N_i/N^*$, the fraction of labor employed in sector i

In the initial calibration, all nominal prices are set equal to one

(B1) $P_i = 1, \qquad i = 1,\ldots,m$

(B2) $P = 1$

The amount of labor initially used in each sector follows directly from the fraction of the labor force employed in sector i, s^N_i, and the total amount of labor employed, N_o^*

(B3) $N_i = s^N_i \, N_o^* \qquad i = 1,\ldots,m$

Define $s^Y_i = P_iY_i/\Sigma_iP_iY_i$ to be the share of sector i's output P_iY_i in total output $\Sigma_iP_iY_i$. Then using the labor demand equation (A18) and the fact that the total amount of labor employed is N_o^*, it can be shown that

(B4) $s^Y_i = (D_is^N_i/\rho_i)/\Sigma_i(D_is^N_i/\rho_i) \qquad i = 1,\ldots,m$

Using the capital demand equation (A19) and the fact that the total amount of capital used is K^*, it can be shown that

(B5) $K_i = [(1-\rho_i)s^Y_i/\Sigma_i(1-\rho_i)s^Y_i]\, K^* \qquad i = 1,\ldots,m$

Normalize $A_1 = 1$ so that the production function in the first sector is

(B6) $Y_1 = N_1^{\rho_1} K_1^{1-\rho_1}$

Using Y_1 from (B6), the nominal wage and the nominal rental price of capital can be determined from the first-order conditions (A18) and (A19) for sector 1 to obtain

(B7) $w = \rho_1 Y_1 P_1/(D_1 N_1)$

(B8) $r = (1-\rho_1) Y_1 P_1/K_1$

Now calculate ν in the labor supply curve (eq. A15) as

(B9) $\nu = N_o^* (P/w)^{\eta}$

To calibrate A_i, $i = 2,\ldots,m$, substitute the production function (A16) into the first-order condition for labor (A18) and set $P_i = 1$ (eq. B1) to obtain

(B10) $A_i = (D_i w/\rho_i)(N_i/K_i)^{1-\rho_i}$ $\qquad i = 2,\ldots,m$

Now set all prices equal to 1 in the equilibrium condition (A23), and use (A22) to obtain

(B11) $Y_i = \alpha_i^{\theta}(\gamma/(1-\gamma))M^*$

Summing (B11) over all i we obtain

(B12) $\Sigma_i Y_i = (\gamma/(1-\gamma))M^* \, \Sigma_i \alpha_i^{\theta}$

Now observe that with $P = P_i = 1$ for all i, equation (A4) implies that

(B13) $\Sigma_i \alpha_i^{\theta} = 1$

Substituting (B13) into (B12) and rearranging yields

(B14) $M^* = ((1-\gamma)/\gamma) \, \Sigma_i Y_i$

Finally, substituting (B14) into (B11) and recalling that when $P_i = P = 1$, $s^Y_i \equiv Y_i/\Sigma Y_i$, we obtain

(B15) $\alpha_i^{\theta} = s^Y_i \qquad i = 1,\ldots,m.$

Exhibit 24-e

Response to Paragraph 16

of FCC Order of Investigation and Suspension

CC Docket No. 92 - 101

May 26, 1992

Godwins

Paragraph 16 requests information that can be used in a serious impartial evaluation of a macroeconomic model and its results. Ideally, enough information should be provided so that the numerical results produced by a macroeconomic model can be reproduced, or at least checked, by an outside reader with a professional training in economics. In writing the macroeconomic portions of the Godwins report we tried to anticipate the need for reproducibility and included in the report enough information to reproduce the numerical results of the macroeconomic model (See Appendix C of the Godwins report). However, the explanation in Appendix C of the Godwins report is relatively brief, so we will use the opportunity presented by Paragraph 16 to elaborate on various aspects of the macroeconomic model and its calibration.

Before presenting a detailed point-by-point response to items raised in Paragraph 16, it might be helpful to discuss the type of macroeconomic model used in the Godwins report and to contrast this model with conventional large-scale short-run econometric forecasting models. The reason for contrasting the two types of models is that the requests in Paragraph 16 constitute an appropriate set of questions for scrutinizing the results of a conventional large-scale econometric forecasting model. However, some of the questions are not germane for scrutinizing the macroeconomic model used in the Godwins report.

The macroeconomic model used in the Godwins report is a classical general equilibrium model. As discussed in the Godwins report on pp. 26-27, the choice of a type of macroeconomic model for examining the effect on GNP-PI of the introduction of SFAS 106 was guided by a list of five desirable characteristics for a model:

(1) The model should be a multi-sector model allowing for some firms to offer post-retirement health benefits while other firms do not offer such benefits.

(2) The model should explain how production costs are related to the costs of labor and other inputs, and should allow for the possibility of substituting capital for labor as labor becomes more expensive.

(3) The model should provide a specification of the demand for goods related to the overall price level as well as to prices of goods in each sector.

(4) The model should be tractable so that numerical solutions can be computed and readily interpreted.

(5) The model should be internally consistent and based on sound economic foundations.

The classical general equilibrium model used in the Godwins report meets all five of these criteria. However, large-scale commercial econometric models do not meet all of these criteria. In particular, most large-scale commercial econometric models do not meet criteria (4)

and (5). These models typically contain several hundred, or even over a thousand, equations and variables to be forecast. In addition to the sheer difficulty of tracing the effects of so many variables, the forecasts produced by commercial forecasters generally are based also on other factors such as time-series analysis, current data analysis, and "judgment". The fact that the forecasts of these models are based significantly on judgment and current data analysis makes it very difficult for an impartial observer to reproduce the results of these models and obscures the ability to readily interpret the forecasts produced by these commercial forecasters. Commercial large-scale econometric models in general have also been criticized for failure to satisfy criterion (5) that they be internally consistent and based on sound economic foundations. In light of the five desirable characteristics listed above, it was decided that a classical general equilibrium model would be preferable to a large-scale commercial econometric model for the purpose of evaluating the effect on GNP-PI of the introduction of SFAS 106.

An additional consideration that led to the choice of the classical general equilibrium model is related to the timing of the responses to the introduction of SFAS 106. The classical general equilibrium model is intended to gauge the effects of changes after the economy has returned to equilibrium, which may take several calendar quarters or years. This model does not address the extremely difficult task of predicting the dynamic responses over the short-run. By contrast, large-scale econometric models deliver a series of quarterly forecasts of GNP and other macroeconomic variables. However, in our judgment, short-run dynamic behavior is extremely difficult to forecast. Although these models do produce short-run forecasts, we would be cautious in interpreting the timing implied by these short-run forecasts. We decided to sidestep this difficult problem by using the conservative approach of calculating the impact on the macroeconomy after the economy fully responds to SFAS 106. The sense in which this approach is conservative is that it probably will overstate the short-run impact on macroeconomic variables, and thus helps guard against understating the impact on GNP-PI.

Now we will present a detailed point-by-point response to the issues raised in paragraph 16. We will structure the responses according to the following list of requests in Paragraph 16:

(1) fully describe and document the macroeconomic model, including

(a) the method of estimation
(b) parameter estimates
(c) summary statistics

(2) provide the same information as in (1) for any alternate functional forms that were used

(3) provide the data used to estimate the model

(4) provide the data used in making forecasts from the model

(5) provide the results of any sensitivity analyses performed to determine the effect of using different assumptions.

Response to request (1): fully describe and document the macroeconomic model, including the method of estimation, parameter estimates, and summary statistics.

The macroeconomic model used in the Godwins report is described verbally on pp. 27-28 of the Godwins report, and a complete mathematical derivation and description of the model is presented in Part I of Appendix C, pp. 54-57. In order to apply this mathematical model to the United States, numerical values of the parameters need to be selected. In a conventional large-scale commercial econometric model, the numerical values of the parameters are typically estimated econometrically. For these models, it is important to ask about the method of estimation, the parameter estimates, and summary statistics describing the statistical properties of the parameter estimates and the model forecasts. However, the values of the parameters used in the classical general equilibrium model in the Godwins report were not econometrically estimated in the course of the preparation of the Godwins report. Instead, the numerical values of the model were calibrated so that in the baseline calculation without SFAS 106, the numerical results produced by the model matched U.S. macroeconomic data.

The calibration procedure is described in Part II of Appendix C, pp. 58-59, but here we will present a verbal description of the calibration. The utility function of households contains the following parameters:

α_1 and α_2, which measure the relative desirability to consumers of the goods produced in sectors 1 and 2: The larger is α_1 relative to α_2, the larger is the production of good 1 relative to good 2, and the larger is the share of the labor force employed in sector 1. The values of α_1 and α_2 are chosen so that in the initial equilibrium (before the introduction of SFAS 106) 68% of the labor force is employed in sector 1 (which does not offer SFAS 106 benefits) and 32% of the labor force is employed in sector 2 (which offers SFAS 106 benefits). These figures for the shares of employment in sector 1 and in sector 2 match U.S. data as indicated on page 7 of the Godwins report. (Of the 95.8 million private sector employees, 30.7 million are eligible to have a proportion of their charges in retirement met by their employer's medical plan. Thus, the share of the private sector labor force employed in sector 2 is 30.7 million/95.6 million = 32%.)

θ, which is the elasticity of substitution between the consumption of any two goods: The parameter θ equals the price of elasticity of the demand for goods. This parameter was not estimated nor was

it directly calibrated to data. As stated on page 29 of the Godwins report, a value of 1.5 was used for θ, recognizing that this value most likely overstates the true price elasticity of demand. Experimentation with the value of θ indicated that the impact of SFAS 106 on the GNP-PI increases when the price elasticity of demand increases. (See the table on page 41 of the sensitivity analysis in the Godwins report.) Thus, using a high value of θ would guard against understating the impact of SFAS 106 on the GNP-PI.

η, which is the elasticity of labor supply: The elasticity of labor supply has been estimated econometrically in dozens of studies. Rather than try to estimate this elasticity again for the Godwins study, we referred to surveys of econometric studies of labor supply. The first complete paragraph on page 30 of the Godwins report describes the results of these studies and explains the choice of the value of zero for the labor supply elasticity.

We can amplify the discussion on page 30 by pointing out that there is an important difference between the response of labor supply to a *temporary* change in the real wage and a *permanent* change in the real wage. Economists explain the difference by using the concepts of an income effect and a substitution effect. An increase in the real wage increases the reward for working and causes people to substitute some of their time away from leisure toward working. Thus, the substitution effect of an increase in the real wage is an increase in labor supply. In addition, an increase in the real wage makes workers wealthier and reduces the need to work (or equivalently makes workers able to afford more leisure and less labor). This effect, known as the income effect, means that workers will reduce their labor supply in response to an increase in the real wage. Thus, the income effect and the substitution effect work in opposite directions: the substitution effect increases labor supply and the income effect reduces labor supply when the real wage increases. For a temporary increase in the real wage, the worker does not become very much wealthier and the income effect is relatively small. The income effect is likely to be smaller than the substitution effect and thus workers would be likely to increase labor supply in response to a temporary increase in the real wage. In contrast, for a permanent increase in the real wage, the income effect is likely to be relatively large. If the income effect is larger than the substitution effect, then workers will reduce their labor supply in response to a permanent increase in the real wage, which is a negative labor supply elasticity.

The introduction of SFAS 106 is a permanent change and thus any effects on the real wage are to be regarded as permanent effects rather than temporary effects. Thus, in choosing a value of the labor supply elasticity, it is appropriate to use the elasticity describing the response to a permanent change in the real wage. The econometric estimates described on page 30 of the Godwins

report refer to permanent wage changes, and the use of income and substitution effects explains why these estimated elasticities are somewhat negative. The impact of SFAS 106 on the GNP-PI is larger for higher labor supply elasticities, and the labor supply elasticity was set to zero in the baseline calculation to guard against understating the impact on the GNP-PI.

γ, which is the share of nominal expenditure devoted to produced goods: Given the calibration of the other parameters of the model, the value of γ does not affect the calculated effects of SFAS 106 on GNP-PI or the wage rate. As explained in Part II of Appendix C of the Godwins report, the model is calibrated so that in the absence of SFAS 106, prices in all sectors and the GNP-PI are normalized to equal 1.0. With this normalization, the value of γ becomes completely irrelevant to the numerical results of the model.

ϕ, which measures the disutility of labor: With the specification of the utility function in equation (A1) in Appendix C of the Godwins report, the labor supply curve has a constant elasticity with respect to the real wage. With a constant elasticity with respect to the real wage, the labor supply curve depends on only two parameters: the elasticity of labor supply and a location parameter. The elasticity of labor supply has already been discussed. The location parameter was chosen to make labor supply equal to labor demand as indicated in equation (B9) in Part II of Appendix C in the Godwins report. Given the labor supply elasticity and the location parameter, the numerical value of the parameter ϕ is irrelevant.

The production function contains the following parameters:

ρ_1 and ρ_2, which are the shares of labor cost in value added in sectors 1 and 2 respectively: In the baseline calculations, each of these parameters is set equal to 0.64 which is the share of labor cost in value added for the U.S. economy as a whole.

A_1 and A_2, which are productivity parameters in sectors 1 and 2 respectively: These parameters affect the demand for labor in each sector. They are calibrated so that when labor supply equals labor demand, 68% of the labor force is employed in sector 1 and 32% of the labor force is employed in sector 2. The details of this calibration are contained in Part II of Appendix C, pp. 58-59.

Response to request (2): provide the same information as in (1) for any alternate functional forms that were used.

Experimentation with different functional forms and different parameter values involves a fundamental tension. On the one hand,

experimentation with different functional forms and different parameter values offers the benefit of learning how robust the results are to various changes in the model. On the other hand, experimentation may allow the researcher to go on a "fishing expedition", fishing for the functional forms and parameter values that deliver the most pleasing result. We tried to strike the appropriate balance by not experimenting with functional forms (except as described below) and by reporting the results of experimentation with parameter values in the sensitivity analysis.

The only change in the model that might be construed as a change in functional form occurred while the model was in a developmental stage before Godwins was engaged by USTA. In the developmental stage, the original (simpler) functional form for labor supply assumed that the labor supply elasticity must be zero. However, we modified the labor supply function to its current form to allow the labor supply elasticity to be either zero or nonzero. In a sense, this change was not really a change in functional form because the original labor supply function is a special case of the labor supply function used in the Godwins report. The baseline calculations use a value of zero for the labor supply elasticity, but we decided to allow for nonzero labor supply elasticities so that we could perform a sensitivity analysis on the labor supply elasticity. The results of the sensitivity analysis are reported in section IV of the Godwins report.

The functional form used for the production functions is the Cobb-Douglas production function. This functional form is perhaps the most widely used functional form for production functions.

The functional form of the utility function was chosen so that the elasticity of labor supply and the price elasticity of demand for each good are all constant. Various constant values of these elasticities were used in the sensitivity analysis. The functional form of the utility function was also chosen to incorporate the effects on demand of the aggregate price level as well as the individual sector prices.

Response to request (3): provide the data used to estimate the model.

As explained above, the model used in the Godwins report is not an econometric model. The choice of values for various parameters was described in response to request (1).

Response to request (4): provide the data used in making forecasts from the model.

Conventional large-scale commercial econometric models are frequently used to make short-run macroeconomic forecasts of a variety of macroeconomic variables. The forecasts are *conditional* forecasts which means that the forecasts depend on the assumed future values of various input variables to the model. For such models, it is important to examine the data used in making forecasts from the model as well as

summary statistics describing historical forecast accuracy (which is related to request (1c) above).

The macroeconomic model in the Godwins report is not a conventional short-run forecasting model. The only additional data that is used to calculate the macroeconomic effects of the introduction of SFAS 106 is the direct percentage increase in labor costs for firms in sector 2. In the baseline calculations a value of 3% is used for the direct percentage increase in labor costs for firms in sector 2. In the sensitivity analysis values of 2% and 5% are also used.

Summary statistics are often used to gauge the forecasting accuracy of conventional short-run econometric forecasting models, but such statistics are not appropriate in the case of the macroeconomic model used in the Godwins report. Short-run econometric forecasting models produce forecasts of a variety of economic variables and, after the fact, the accuracy or forecast error of each forecast can be evaluated. For instance, a model could be used in 1992 to forecast GNP-PI in 1993. Then after we learn what the actual value of GNP-PI turns out to be in 1993, we can calculate the forecast error as the difference between the forecasted value of GNP-PI and the actual value of GNP-PI. Then after several years, the accuracy of the forecasts can be gauged by appropriate summary statistics of the forecast errors.

The model in the Godwins report is not a forecasting model in the same sense as the large-scale commercial econometric models. The model is not designed to forecast the actual level of GNP-PI. Instead it is designed to estimate the *change* in the level of GNP-PI that results from the introduction of SFAS 106. That is, the model is designed to calculate the difference between the actual value of GNP-PI after the introduction of SFAS 106 and the value of GNP-PI that *would have prevailed* if SFAS 106 were not introduced. Even after the fact, when we observe the actual value of GNP-PI in the presence of SFAS 106, we will not be able to assess the accuracy of the model in the standard way. Remember that the model produces an estimate of how much different GNP-PI is as a result of the introduction of SFAS 106. To assess the accuracy of this estimate we would need to know the actual level of GNP-PI after the introduction of SFAS 106 and we would also need to know the value that GNP-PI would have had if SFAS 106 were not introduced. Even after the fact, we cannot observe or directly measure the level that GNP-PI would have taken in the absence of SFAS 106. Thus traditional measures of forecast accuracy cannot be used to assess the accuracy of the model in the Godwins report.

Three additional remarks are in order at this point. First, the model is specifically designed not to be a forecasting model but instead to focus on how much different GNP-PI is as a result of the introduction of SFAS 106. This focus is exactly the question at issue in the Godwins report.

Second, the fact that the model in the Godwins report cannot be evaluated by the traditional measures of forecast accuracy does not mean

that the model cannot be checked against reality. The parameters in the model were calibrated so that the values of labor share of total cost, and the share of employment covered by SFAS 106 produced by the model matched up with actual values of these numbers.

Third, our confidence in the model's numerical results is bolstered by the sensitivity analysis which indicates that our results are quite robust to changes in the values of the model's parameters.

Response to request (5): provide the results of any sensitivity analyses performed to determine the effect of using different assumptions.

As mentioned above, Section IV of the Godwins report, pp. 34-43, is devoted to the sensitivity analysis. In particular, pp. 37-39 specifically discuss the sensitivity analysis of the macroeconomic model. The numerical results of the sensitivity analysis are presented in the table on page 41.

UNITED STATES TELEPHONE ASSOCIATION

Analysis of Impact of SFAS 106 Costs on GNP-PI

Supplemental Report: Responses to Objections Raised Regarding Original Study

Godwins

July, 1992

INTRODUCTION

Earlier this year, Godwins submitted a report to the United States Telephone Association (USTA) analyzing the impact of SFAS 106 on the GNP-PI, and, in particular, the extent to which the GNP-PI will reflect the increase in costs experienced by the Price Cap LECs as a result of adopting the new accounting standard. This report was placed on the record with the FCC in Bell Atlantic's Tariff Transmittal filed on February 28, 1992 (Transmittal No. 497) and was also included in U.S.West's Tariff Transmittal filed on April 3, 1992 (Transmittal No. 246).

In their filings with the FCC, several organizations took exception to the findings of that report. In particular, AT&T, MCI and the Ad Hoc Telecommunications Users Committee raised several objections with regard to various aspects of the study. The USTA has asked Godwins to provide a detailed response to each of those objections.

The purpose of this Supplemental Report is to provide the USTA with those responses. We have organized our responses into three sections, corresponding to the three different types of objections raised.

While the objections raised were numerous, this material will demonstrate that none of the objections raised should cause the Commission to have any doubts regarding the soundness of the study, or the validity of the results.

Respectfully Submitted,

Peter J. Neuwirth, F.S.A., M.A.A.A.

Andrew B. Abel, Ph.D.

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SECTION I

RESPONSE TO OBJECTIONS REGARDING OVERALL STUDY

A. Definition of Double Count

There were two objections raised with respect to the manner in which we defined the potential sources of double counting and what sort of analysis would be required to eliminate any double counting in determining the portion of the LECs' SFAS 106 costs that should qualify for exogenous treatment.

AT&T Contention (Pages 6 and 7) - "The LEC's have failed to demonstrate that the Commission's third criteria is met. To the contrary, the LECs' requests for exogenous treatment appear to reflect certain OPEB costs that will be reflected in the GNP-PI ... The double count occurs because (i) the GNP-PI component of the PCI will increase as all firms with OPEB liabilities reflect those costs through higher prices, and (ii) the SFAS 106 accrual calculation includes the present value of future inflation. If the SFAS 106 accrual is afforded exogenous treatment, the amount of the accrual will be increased automatically in future periods due to growth in inflation expressed by the GNP-PI component of PCI.** Therefore, if inflation is included in both the exogenous cost component and GNP-PI, an LEC would be compensated twice. Although the LECs recognize this problem, no carrier has met its burden of showing that it has effectively removed this double count."

Response - AT&T's description of what it considers the source of potential double counting in the LECs' request for exogenous treatment for increased costs due to SFAS 106 demonstrates some confusion as to both the double count problem and the Godwins Report. Essentially AT&T suggests that double counting may arise from two separate sources:

(1) Increases in the PCI due to increases in the GNP-PI caused by "firms with OPEB liabilities reflect(ing) those costs through higher prices."

(2) Automatic increases in the exogenously treated portion of SFAS 106 accrual "due to growth in inflation expressed by the GNP-PI component of PCI."

The first source of potential double count, while a valid concern, is precisely the factor that the Godwins Report directly and thoroughly addresses. The first paragraph of page 1 of the Godwins Report explicitly states this as the primary objective of the study. As will be seen in the responses to specific criticisms of the Godwins Report, no respondent has raised any issue which, upon scrutiny, casts doubt on any of the basic findings of the study. Therefore, the Commission should accept the Report's conclusions that (a) this source of double count accounts for 0.7% of the increase in costs attributable to SFAS 106, (b) another 14.5% of the increase will be recovered through a reduction in the national wage rate, and (c) the remaining 84.8% of such increase in costs will remain unrecovered unless exogenous treatment is granted on this amount.

The second alleged source of double counting simply doesn't exist, and is the result of confusion over exactly what the LECs are requesting. While it is true that the SFAS 106 expense calculation includes the present value of future inflation, and that the expense calculated under SFAS 106 can be expected to increase each year at something close to the rate of inflation, SFAS 106 expense is not what the LECs are requesting exogenous treatment on. It is the increase in expense due to the SFAS 106 accounting change that should be afforded exogenous treatment. This is an absolutely critical distinction which is missed by AT&T. Retiree medical plans were sponsored by firms before and after SFAS 106 was issued. It is only the accounting for those plans that has changed, and it is the increase in costs associated with this change in accounting that must be evaluated.

MCI Contention - (Page 30)

"If one were to include SFAS 106 costs through exogenous treatment, the revenues resulting from the increase in the price cap index to account for these costs would also increase each year by the GNP-PI, as adjusted for the productivity factor. The problem is that SFAS 106 costs have already been adjusted for future inflation...Therefore, the impact of medical care cost inflation has already been counted. As such the amount offered by the LEC's has been inflated to reflect future medical costs. To include these costs again within the price cap formula through exogenous treatment, and treat them by the full amount of GNP-PI which has medical inflation embedded as well is tantamount to double counting the medical care inflation rate."

Response -

This contention is virtually identical to the second "source" of double counting outlined by AT&T on page 7 of its filing with the Commission. Rather than repeat our response to that contention, we would just point out that, like AT&T, MCI seems to have failed to grasp the point that the LECs are not asking for exogenous treatment on the SFAS 106 expense, rather they are asking for exogenous treatment on that portion of the increase in expense due to the mandated accounting change, which will not already be reflected in GNP-PI increases caused by that accounting change.

B. Avoidance of Double Count

Two respondents suggested "better" ways of determining the extent of the double count problem, and therefore "better" ways of determining the appropriate portion of SFAS 106 costs that should qualify for exogenous treatment.

AT&T Contention - (pp. 13 - 14)

"....The Commission should require the LEC's to use an alternative that is both a simpler and more reliable means for correcting the double count. AT&T suggests that the appropriate method for removing the double count between the SFAS 106 accrual and the GNP-PI term in the price cap formula is to remove the impact of expected changes in GNP-PI from the SFAS 106 accrual. This can be accomplished in a straightforward manner by requiring the LEC's to subtract the expected rate of change of GNP-PI from the health care inflation component in the SFAS 106 accrual. The Commission should specify the changes in GNP-PI over the SFAS 106 forecast period. Current estimates is (sic) that GNP-PI will increase approximately 4% over the long term."

Response -

That AT&T should suggest such an illogical and erroneous "solution" to the double count problem is indicative of a failure to understand the true source of any potential double counting. As discussed earlier, potential double counting is not related to the fact that SFAS 106 costs are calculated by discounting future medical inflation back to the present. As discussed on page 2 of this material, double counting will only arise to the extent that the increased costs companies will bear, as a result of the change in accounting method required by SFAS 106, will also cause an increase in GNP-PI.

The fact that the AT&T "solution" does not address the true source of potential double counting is illustrated in the following example, where the AT&T solution is shown to produce an identical exogenous adjustment in two factually different circumstances, where logic would dictate different exogenous adjustments be applied.

In the second footnote on page 13 of its filing, AT&T estimates that its "solution" of allowing exogenous treatment for SFAS 106 accruals, calculated using a medical trend rate 4% lower than the actual rate used by the LECs for their financial statements, might result in approximately 55% of a given LEC's actual SFAS 106 accrual being afforded exogenous treatment. Now let us consider two hypothetical scenarios:

(1) Every U.S. firm, LECs and non-LECs alike, have identical demographic makeups and provide identical retiree medical benefits. Thus, in this case, presumably every U.S. firm would experience the same increase in labor costs due to SFAS 106. In addition, under this scenario, it is assumed that all labor cost increases associated with SFAS 106 are completely reflected in the GNP-PI, as companies raise their prices to recover those costs.

(2) The LECs are the <u>only</u> firms subject to SFAS 106, and/or the additional costs due to the adoption of SFAS 106 costs are never reflected in the GNP-PI.

In the first scenario, it is obvious that the increased labor costs due to SFAS 106 experienced by the LECs would be fully and completely reflected in the GNP-PI (the Godwins Report, of course, demonstrates that this hypothetical situation does not exist), and thus no exogenous adjustment would be required. In fact, in this hypothetical scenario, providing any exogenous adjustment would result in a complete double count. Yet in this circumstance, the AT&T approach of allowing recovery of SFAS 106 costs, calculated using a lower trend rate (medical inflation minus 4%), would, as noted above, result in allowing exogenous treatment on 55% of SFAS 106 accruals.

Conversely, under the second scenario, the LECs should receive an exogenous adjustment equal to 100% of their increased costs due to SFAS 106, because the double count problem simply wouldn't exist. Yet in this circumstance as well, the AT&T approach would allow an exogenous adjustment for the same 55% of SFAS 106 accruals as before. This is clearly an illogical result.

One can therefore see that AT&T's suggested approach to the double count does not address the specific factors that affect the extent of double count, i.e.:

- Differences in plans between the LECs and non-LECs

- Differences between the LECs and non-LECs which will give rise to different SFAS 106 costs (e.g., demographic differences).

- Proportion of increased aggregate labor costs due to SFAS 106, that in fact is reflected in GNP-PI.

As noted, it is precisely these critical factors detailed above that are addressed completely and comprehensively in the Godwins Report.

MCI Contention - (Page 31)

"If the Commission does decide to afford these LECs exogenous treatment for SFAS 106 costs, this double counting must be eliminated. This can be accomplished either through the removal of medical care inflation from the GNP-PI or through the removal of medical care inflation from the SFAS 106 accruals."

Response -

While this "solution" differs slightly from AT&T's suggested "solution" (pages 13-14 of its filing) in that MCI focuses on the medical care inflation component of GNP-PI, conceptually it is very similar, and suffers from the same