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An Analysis of The Early Treatment for HIV Act

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Prepared for Treatment Access Expansion Project (TAEP)

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Introduction

The advent of highly active antiretroviral therapy (HAART) has significantly decreased the morbidity and mortality among HIV-infected individuals.[1] A key indicator, the number of AIDS-related deaths, fell from 61 percent of total cases diagnosed for 1991 to 36 percent in 2001.[2] Moreover, the development of AIDS from HIV infection is decelerating. Clearly, these new drugs are providing better quality of life and health for individuals with HIV/AIDS. The future of the AIDS epidemic will be significantly affected by access to HAART. Access is also closely related to health insurance coverage for HAART treatment.

Medicaid is the largest single payer of direct medical services for persons living with AIDS (PLWA) in the United States. Medicaid covers 55 percent of PLWA and up to 90 percent of all children living with AIDS. However, most adults with HIV disease who qualify for Medicaid do so because they are disabled, have low income, and have limited assets. By the time they qualify for Medicaid, they usually have advanced AIDS. At that point, the costs of treatment and medical care have increased significantly and are costs to the Medicaid system.

The HIV Waiver model was designed to assess the benefits and costs associated with early intervention in the HIV/AIDS disease progression by providing comprehensive care and treatment through Medicaid to low-income individuals before they become disabled from advanced AIDS. The previous PwC work addressed one pathway to Medicaid coverage.[3] This is the existing Medicaid waiver authority under which the Secretary of Health and Human Services may grant waiver authority to interventions such as early-HIV treatment programs as long as the demonstration is deemed to be budget neutral. To date, "budget neutrality" has been defined as costing no more than current law during the first five years of the waiver. Moreover, only Medicaid costs are taken into account in this determination, so savings from lower cash benefits and savings in other health programs are not factored into the "budget neutrality" calculations.

Another pathway for early-HIV coverage under Medicaid would be federal legislation that would allow states to expand eligibility to include low-income individuals who are HIV positive but not yet disabled. This approach does not require any proof of budget neutrality but any change in federal law would have to overcome the usual budgetary and legislative hurdles in Congress. Legislation (S. 847, The Early Treatment for HIV Act of

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1 Pallela, FJ et al. (1998) Declining Morbidity and Mortality Among Patients with Advanced Human Immunodeficiency Virus Infection. *NEJM*. 338(13): 853-860.

2 Centers for Disease Control and Prevention (CDC). (2002) U.S. HIV and AIDS cases reported through December 2001. *HIV/AIDS Surveillance Report*. Year-end Edition 13(2).

3 PricewaterhouseCoopers. (2001) The HIV Waiver Model. *Georgia Medicaid 1115 Waiver*.

2003) was introduced in April 2003 in the 108th Congress that would give states the option of providing Medicaid coverage for certain low-income HIV-infected individuals

The Treatment Access Expansion Project (TAEP) requested PricewaterhouseCoopers (PwC) to provide a federal budget estimate of the Early Treatment for HIV Act (ETHA) legislation that includes an enhanced Medicaid match rate. Currently, the federal portion of the federal medical assistance percentage (FMAP) is on average 57 percent and states' are responsible for 43 percent of most Medicaid costs. An enhanced FMAP would raise the federal share of costs to an average of about 70 percent. Currently, the State Children's Health Insurance Program and the Breast and Cervical Cancer Prevention and Treatment Act of 2000 utilize the enhanced FMAP for their services.

General Methodology

The federal ETHA model utilizes the disease progression from the Georgia waiver estimates, which was based on a US Conference on AIDS paper presented by John Hornberger of Roche Pharmaceuticals. It forms the core of the federal costs model. We have modified the model to incorporate the impact on various federal programs that were not considered in the GA waiver application.[4]

Specifically, the model has been expanded to estimate spending in the major federal programs—Supplemental Security Insurance (SSI) payments, Social Security Disability Insurance (SSDI) payments, Medicare medical costs, federal income tax revenues, and federal payroll tax collections. The average payment for SSI and SSDI are based on the March 2001 Current Population Survey (CPS) released jointly by the Bureau of Labor Statistics and Bureau of the Census.

The following describes the inputs to the model and the sources of data and assumptions made for these parameters.

Population

We estimate that about 30,000 individuals would enroll in Medicaid early-HIV treatment program if all states participated. This number is based on estimates of populations currently ineligible for Medicaid and are poor. This estimate is consistent with Kahn and

[4] The PwC federal budget estimate utilizes the HIV Waiver Model, on which PwC based its analysis of the Georgia (GA) Medicaid demonstration waiver. The Centers for Medicare and Medicaid Services (CMS), Office of the Actuary reviewed the analysis, as well as the underlying PwC model. Our analysis withstood the review, and we were not asked to make any changes to our methodology or assumptions.

the Congressional Budget Office (CBO) estimates.[5, 6] We assume that the total number of eligible individuals increases by 6 percent annually before accounting for improvements in life expectancy. (In other words, each year, the number of newly enrolled Medicaid recipients is large enough to cover deaths as well as expand the program by 6 percent.)

HAART Status

We assume, under the baseline (current-law Medicaid), that only 10 percent of Medicaid recipients would receive early HAART treatment, 30 percent would receive late HAART, and 60 percent would not receive HAART at all. Under ETHA, we assume that 60 percent would receive early HAART, 30 percent would receive late HAART, and 10 percent would not receive HAART at all.[7] We did not change the key assumption from the GA Waiver about how early treatment coverage would affect the use of HAART.

CD4 Counts

The following table shows the CD4 level distribution that we assume for those participating under ETHA. The distribution is recalibrated from the Medicaid population in the HIV Cost and Services Utilization Study (HCSUS).[8]

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5 Kahn, JG et al. (2001) Health and Budgetary Effect of Increasing Access to Antiretroviral Medications for HIV by Expanding Medicaid. *AJPH*. 91(9): 1464-1473.

6 Congressional Budget Office (CBO). (2003) Personal communication with CBO analyst, Alexis Ahlstrom.

7 Early HAART describes those who are receiving HAART at the appropriate CD4 or viral load level as determined by federal guidelines. Currently, federal guidelines (CDC, February 2002) state that, in general, treatment should be offered to asymptomatic individuals with CD4 levels of less than 350 per cubic millimeter of blood or RNA levels of greater than 55,000 copies per millimeter of blood plasma.

8 Bozzette, SA et al. (1998) The Care of HIV-Infected Adults in the United States. *NEJM*. 339(26): 1897-1904.

Table 1.
CD4 Level Distribution of Medicaid Population

CD4 Level (in mm^3)	Percent
Greater than 500	10%
351-500	16%
201-350	21%
50-200	36%
Less than 50	17%
Total	*100%*

PricewaterhouseCoopers' calculations of HCSUS data.

Disease Progression

The progression of HIV disease is based on CD4 levels and HAART status recalibrated from HCSUS. It is based on the probability of an individual remaining at the same CD4 level, moving to a higher or lower CD4 level, or dying within the year. The progression differs for those under each HAART category and under baseline (current-law Medicaid) and ETHA. Those under early HAART have a lower death rate and slower progression to lower CD4 levels. The individuals receiving late HAART have higher death rates and faster progression and no HAART have the highest death rates and most rapid progression to low CD4 levels and AIDS.

Medicaid Costs

Medicaid costs are recalibrated from Maryland Medicaid costs from Gebo.[9] The costs follow a similar pattern as the disease progression. As the CD4 level decreases, cost of medical care and prescription drugs increase. Those who are not receiving any HAART treatment have higher medical costs on average than those who are receiving late HAART. Those who are receiving early HAART have the lowest medical costs, but the highest average per drug costs. While those with late and no HAART have lower and the lowest average drug costs, respectively (Table 2).

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[9] Gebo, KA et al. (1999) Costs of HIV Medical Care in the Era of Highly Active Antiretroviral Therapy. *JAIDS*. 13: 963-969.

Table 2.
Annual Medicaid Costs of Medical Care and Drug Treatment
By CD4 Level and HAART Status

CD4 Level (in mm^3)	Medical Care (W/o drugs) Cost	Drug Cost
	No HAART	
Greater than 500	$8,800	$3,100
351-500	$13,100	$6,400
201-350	$17,500	$9,500
50-200	$26,300	$12,300
Less than 50	$34,400	$14,100
	Late HAART	
Greater than 500	$8,800	$8,500
351-500	$13,000	$10,700
201-350	$14,700	$11,800
50-200	$17,200	$13,100
Less than 50	$28,300	$15,700
	Early HAART	
Greater than 500	$3,600	$8,900
351-500	$6,400	$12,200
201-350	$10,700	$13,800
50-200	$14,700	$14,900
Less than 50	$19,000	$16,200

PricewaterhouseCoopers' calculations of Maryland Medicaid data.

Results

The results of ETHA include a higher percentage of lives saved due to a slower disease progression than under baseline Medicaid. In addition, there are monetary savings to other federal programs.

Lives Saved

Being on ETHA saves lives because HIV-infected individuals are getting care earlier and they are living longer. The probability of death is lower than compared with under baseline Medicaid. The death rates are about halved for those under ETHA. For the ten-year estimate, the percentage of those who die is 12 percent under baseline Medicaid compared with only 6 percent of total participants if ETHA was passed.

Slower Disease Progression

The percentage of those individuals in the lowest CD4 level would decline if ETHA were enacted. The difference is slightly apparent in five years and more prominent in ten years. For the five-year total, about 21 percent of people under baseline Medicare are at a CD4 level of 50 or less compared with 17 percent under ETHA. In addition, more people are moving to the higher CD4 levels compared with those under baseline Medicaid. For the total ten-year period, under ETHA, there are about 77,000 individuals at the CD4 level greater than 500 compared with 42,000 in baseline Medicaid.

Other Federal Program Offsets

ETHA would lead to savings in various federal programs. Specifically, there would be savings in Medicaid, SSI, SSDI, and Medicare spending. In addition ETHA results in higher tax revenues for the federal government. (Higher CD4 levels and fewer deaths imply higher incomes and higher tax collections.)

Medicaid Savings

We updated the levels of spending to account for the most current information. The Medicaid savings are calculated using the standard Medicaid match rate for baseline and the enhanced match rate for ETHA. Medicaid currently utilizes the federal medical assistance percentage (FMAP). Under the new ETHA legislation, Medicaid costs will be calculated using the enhanced FMAP that is currently being used for SCHIP and the Breast and Cervical Cancer Prevention and Treatment program under Medicaid.

SSI Savings

Low-income individuals who are disabled are not only eligible for Medicaid benefits, they are also eligible for cash assistance under the SSI program. To the extent that early-HIV treatment delays the progression of HIV to AIDS, entry to SSI would also be delayed. Analysis of the medical costs data suggests that disease progression is slowed by about 4 ½ years for those who move from no HAART to early HAART treatment. Based on this difference, we estimate that, on average, entry into SSI changes from 15 percent each year to only 10 percent under ETHA.

The average SSI payment reported in the CPS was about $5,000 in 2000. The maximum annual payment for an individual under SSI was about $6,300 in 2001 according to SSA. In our budget calculations, we assume an SSI payment of about $8,100 in 2003.

Social Security Disability Insurance Savings

As with SSI, Social Security Disability Insurance payments would be reduced by early-HIV coverage, especially early HAART treatment, due to fewer individuals becoming disabled. The two programs, in fact, are closely linked with SSI intended as a supplement for the disabled whose SSDI payments are very low.

To estimate the level of SSDI payments that are typical of disabled beneficiaries, we compute the average SSDI and SSI payments for SSI beneficiaries. The average SSDI payment in 2000 was roughly $5,700. Our calculations are based on an assumed payment of about $6,900 in 2003.

To calculate savings, we follow the same methodology as the SSI savings estimate. However, we assume that the rate that individuals become eligible for is only about 24 percent of the population receiving SSI payments.

Medicare Savings

Medicare spending would decrease due to fewer Medicaid recipients entering the disabled population because of early-HIV coverage, especially early HAART treatment. Individuals with HIV would become eligible for Medicare roughly two years after becoming disabled and eligible for SSDI benefits. Savings to Medicare for medical treatments (but not drugs) would be roughly the same as the savings for Medicaid but the federal share is 100 percent rather than 57 percent on average. Moreover, Medicare is somewhat more generous so that utilization for services other than prescription drugs would probably be higher. Finally, an adjustment is made to the Medicaid offset to reflect the fact that Medicare is the first payer for Medicare beneficiaries.

Our best data from the CPS shows that only 6 percent of Medicaid beneficiaries (age 25-44) are also eligible for Medicare. This is partly because some Medicaid recipients, due to work history, are not eligible for Social Security benefits and others become eligible for Medicare only after a lag of two years. In the model, we assume that 24 percent of individuals who become eligible for SSI are also eligible for SSDI and that those 24 percent are eligible for Medicare after another two years passes.

Federal Tax Savings

Federal tax collections would be increased by early-HIV coverage since individuals would be returning to work early or stay at work longer under ETHA than under current law. Tax collections come from two sources—individual income taxes and payroll taxes for Social Security and Medicare. Individual income taxes are progressive and the marginal tax rate for many low-income people is zero. Federal payroll taxes, however, are about 15 percent, on average, for the lowest income workers.

Based on median income eligibility levels, we assume that federal income and payroll tax collections would average about $1,800 at the time that early-HIV coverage begins. Over time, federal tax revenues fall to about $800 at the time of normal Medicaid coverage (under current law). The decline, which is due to failing health, is slowed down for those who receive earlier HAART under ETHA. The extra tax collection would amount to about $1,000 per year for each added year of good health. This is the one area where

longer life works in the same direction as better health. Both tend to increase federal tax collections.

Budget Estimate

PwC has completed a preliminary examination of the federal budgetary costs of The Early Treatment for HIV Act, which allows states to provide early coverage for HIV treatment. We have also included the impact of states having the option to cover this eligibility. In addition, we have incorporated recession effects into the estimate.

Impact of Optional Eligibility of States

ETHA allows states to include HIV-infection as an eligibility requirement. However, this proposed legislation does not mandate all states to cover low-income HIV-infected individuals. Since this is an optional eligibility, not all states will participate under ETHA. Some states, such as Massachusetts and Maine, have Medicaid 1115 Waivers approved by CMS to cover HIV-infected individuals under their current Medicaid program, and are, therefore, already providing early treatment for HIV. In addition, many states are suffering from the soft economy and are running substantial deficits. Participating in ETHA may not be an option for these states where Medicaid program benefits are being reduced to balance state budgets. For that reason, we estimate that few states would participate until the economy improves.

The following table shows our assumptions of states participating over a ten-year period.

Table 3.
State Participation in ETHA, 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Percentage of States Participating*	5%	10%	20%	30%	40%	50%	50%	50%	50%	50%

PricewaterhouseCoopers' assumptions, May 27, 2003.
* Weighted by potential spending on early-HIV coverage.

Ten Year Budget Estimate

We estimate the five-year costs, FY2004-FY2008, at $359 million and the ten-year costs, FY 2003-FY2012, at $2,453.6 million (as shown in Table 4 below).

These net federal costs are the result of offsetting $2,528 million in gross federal Medicaid spending over the ten years with about $504 million in Medicaid savings.

Taking federal programs into account has a mixed impact. SSI payments increase by an estimated $7.3 million and SSDI payments increase by about $4.4 million. Medicare costs, however, are reduced by $36.7 million in Medicare payments. Finally, we estimate that federal revenues from individual income and payroll tax collections are increased by $49.8 million.

The counter-intuitive results with respect to savings from SSI and SSDI are due mostly to the longer life expectancies under ETHA. Although Medicaid and other federal programs save on specific individuals who are healthier and who work for longer periods before becoming ill, these savings are reduced by additional costs for other individuals who live longer but are disabled and receiving federal support under ETHA in years when they would have no longer been alive under current law. These significant benefits in longevity are accounted for only insofar as they lead to increased spending in future years.

Table 4.
Federal Budgetary Estimate of
The Early Treatment for HIV Act of 2001, S. 987/H.R. 2063
(in $ millions, FY 2004-FY2013)

	2004	2005	2006	2007	2008	2004-2008	2004-2013
Gross Medicaid Costs	$18.1	$37.6	$63.3	$109.5	$179.7	$408.3	$3,032.1
Offsets							
Medicaid	$0.0	($2.1)	($6.0)	($11.7)	($21.3)	($41.1)	($503.7)
SSI	$0.0	($0.1)	($0.1)	($0.2)	($0.2)	($0.6)	$7.3
SSDI	$0.0	($0.0)	($0.1)	($0.1)	($0.1)	($0.3)	$4.4
Medicare	$0.0	$0.0	$0.0	($1.0)	($1.9)	($2.9)	($36.7)
Taxes	$0.0	($0.2)	($0.6)	($1.3)	($2.2)	($4.4)	($49.8)
Net Budgetary Impact	**$18.1**	**$35.2**	**$56.4**	**$95.3**	**$154.0**	**$359.0**	**$2,453.6**

PricewaterhouseCoopers, May 27, 2003.

Comparison with CBO's Earlier Estimate

The Congressional Budget Office estimated the federal budgetary costs of ETHA (H.R. 1591, 106th Congress) in 2000. If CBO's estimate is extrapolated to future years, their estimate would be about $2 billion for FY 2004-2008 and about $6.6 billion for FY 2004-2013.

The main difference between PwC and CBO's estimates are:

1. Impact of recession – We have also included the impact on state participation rates of the recession and the increasing state budget deficits.
2. Medicaid eligibility – We have also accounted for the likelihood that most individuals who come into ETHA would have been eligible for Medicaid within a few years.
3. Other federal programs – We have estimated the offsets from a variety of other federal programs that have not been considered in CBO's estimates.

Sensitivity Analysis

Some of our estimates of savings (offsets) from early HIV coverage may seem conservative given the strong impact of early intervention on the progression of HIV. As noted above, there are large savings for many individuals but these savings are hidden by costs associated with late entrants to the programs,[10] differential death rates, the enhanced match rate, and participants in the program who would have received early HAART in the absence of ETHA.

We have tested the impact of these features of the model by following the first year's cohort of people with no HAART for ten years, equalizing the death rate between baseline and early-HIV coverage groups, and assuming that 100 percent of the population shift from no HAART to early HAART treatment. Also, we assumed that 5 percent of the states (weighted by potential spending on early-HIV coverage) would participate. Finally, we have assumed the same federal match rates for both ETHA and the current Medicaid program. This approach estimates savings and benefits not recognized under traditional budget rules.

As shown in Table 5 below, after adjusting for each of the factors, the net ten-year budgetary impact is a savings of $31.7 million. Each of the factors is discussed in detail in the sections that follow Table 5.

[10] The savings to these late entrants are outside of the ten-year timeframe.

Table 5.
Costs of Each Component of Sensitivity Analysis
(in $ millions, FY 2004-FY2013)

Component	Ten-Year Cost
Estimate without Adjustments	$2,453.6
Adjustments:	
Cohort Only	($2,161.6)
Death Rates	($192.8)
Enhanced Match Rate	($71.2)
HAART Treatment	($59.7)
Net Cost after Adjustment	($31.7)

PricewaterhouseCoopers, May 27, 2003.

Cohort Only

The budget estimate that is shown in Table 4 includes individuals who enter the program after the first year and for whom savings are not realized fully in the ten-year budget window. By looking at one group of individuals entering the program and following them for the entire ten-year period, the program saves about $2,161.6 million (see Table 5) in costs to the Medicaid program.[11] A cohort study eliminates those individuals for whom savings are not realized within the 10-year budget window.

Death Rates

As noted earlier, longer lives of individuals who receive early HIV treatment under ETHA increase life expectancy and therefore the federal budgetary costs of ETHA. As shown in Table 5 above, equalizing the death rates under baseline Medicaid and ETHA, the ten-year savings to the program would be about $192.8 million.

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[11] The program is limited to one cohort only therefore, 60 percent fewer individuals are included in the budget estimate. This effect alone reduces the net costs by a factor of $1,472.6 million. Savings grow by another $689 million because all the savings are captured for those individuals who are in the included cohort. The "Estimate without Adjustments" line would consequently be $981 million ($2,453.6 - $1,472.6). This results in Medicaid savings offsetting 70% ($689 million /$981 million) of the costs of providing earlier access to care under ETHA.

Enhanced Match Rate

Some of the savings under ETHA are cancelled out by the higher federal match rate under ETHA. Thus, a larger proportion of savings are realized by states, not the federal government, compared to their share of costs under ETHA. When we estimate the impact of the enhanced match rate, the savings to the program is about $71.2 million.

HAART Treatment

Many people continue with the same treatment as before because these individuals are receiving treatment though other venues, which the majority of cases are through federally funded programs. For these people, there are no offsets from early intervention under traditional budget rules as costs of providing care under ETHA is considered but savings from other federally funded programs are not. Specifically, in our estimate, the major change is that only about 50 percent of the population moves to early treatment, which removes about 50 percent of the potential savings compared to if the entire population switched to early treatment. When we account for this "cost shifting," which only changes who pays for services, but not improve access to HAART,[12] the savings to the program is about $59.7 million.

Detailed Statistics on Sensitivity Analysis

The detail behind the sensitivity experiment on the first cohort is shown in Table 6. Under this set of assumptions, Medicaid saves $31.7 million over the ten-year period. Gross Medicaid costs in this sensitivity test are estimated to be $245.5 million over the ten years. (The costs are substantially lower than in Table 4 because only the first cohort is included in the model.) The estimated offsets shown in Table 6, however, are proportionately much larger than those in Table 4. Medicaid offsets of $210.8 million reduce the gross Medicaid costs by about 85 percent. Medicare offsets of $51.4 million reduce costs by about 21 percent. The higher offsets are a combination of more individuals switching from no HAART to early HAART and no additional costs from longer life spans. Surprisingly, taxes are not changed substantially under the assumptions in this sensitivity test. Apparently, the increases in federal taxes are related more to longer life expectancy than to better health and less disability.

The assumptions behind this test are not consistent with traditional budget "scoring" rules. Rather, they illustrate why traditional scoring rules lead to net federal budgetary costs rather than recognizing all savings to early intervention.[13] For example, cohorts

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12 HAART access does not change, however, under ETHA, entrants will have access to a broad range of services and treatment beyond the AIDS Drug Assistance Program (ADAP) and other federal programs. The AIDS Drugs Assistance Program (ADAP) is a federally program that provides access to HIV medications only, such as HAART.

13 Savings include benefits of improved health, improved quality of life, and longer life expectancy.

that enter early-HIV coverage toward the end of the ten-year budget window would only add to net costs. Likewise, better treatments would prolong life and those effects increase net costs. And, finally, some individuals are currently receiving HAART largely through other sources and only costs can be included for those individuals under traditional budgetary scoring rules.

The sensitivity analysis illustrates the aspects of budgetary accounting that result in net positive costs under ETHA. First, benefits to individuals from longer, healthier lives are not included in the offset. Second, longer lives lead to higher federal costs for many individuals because they are receiving benefits from federal programs years after they would have died under current law. Third, enhanced benefits to encourage states to adopt ETHA are offset by savings at the lower match rates under current law. Finally, the budget rules do not account for savings outside of a ten-year window. A large proportion of benefits to individuals who enter after the first year are realized outside that window.

Table 6.
Sensitivity Analysis, for One Cohort Only
(in $ millions, FY 2004-FY2013)

	2004	2005	2006	2007	2008	2004-2008	2004-2013
Gross Medicaid Costs	$13.9	$22.4	$22.8	$23.4	$24.3	$106.8	$245.5
Offsets							
Medicaid	$0.0	($2.7)	($7.3)	($12.3)	($17.7)	($40.1)	($210.8)
SSI	$0.0	($0.1)	($0.3)	($0.6)	($0.8)	($1.9)	($7.6)
SSDI	$0.0	($0.1)	($0.2)	($0.3)	($0.5)	($1.1)	($4.6)
Medicare	$0.0	$0.0	$0.0	($2.7)	($5.1)	($7.8)	($51.4)
Taxes	$0.0	$0.0	($0.1)	($0.2)	($0.3)	($0.7)	($2.8)
Net Budgetary Impact	**$13.9**	**$19.4**	**$14.8**	**$7.3**	**($0.2)**	**$55.2**	**($31.7)**

PricewaterhouseCoopers, May 27, 2003.