

Economic Effects of Health Care Reform on Virginia

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PREFACE

This study by the Center for Economic and Policy Studies in the Weldon Cooper Center for Public Service at the University of Virginia was commissioned by the Virginia Hospital and Healthcare Association. It estimates the impact of the 2010 health care reform law, (the Patient Protection and Affordable Care Act/Health Care and Education Reconciliation Act) on Virginia's economy. Although health care reform was enacted with the purpose of improving health insurance coverage for U.S. residents and making it more affordable, the law also involves large changes in tax policy, government outlays and private expenditures that can be expected to have significant direct and indirect economic effects. These effects include levels of economic activity as measured by employment, gross domestic product and the types of occupational opportunities available. The study uses an industry-standard regional economic impact tool, Regional Economic Models, Inc. Policy Insight Plus (REMI PI+), to investigate these issues. Input data for the model are largely derived from public secondary sources.

The author would like to thank various individuals for assistance in completing this study. Chris Bailey, Senior Vice President of the Virginia Hospital and Healthcare Association (VHHA), coordinated a series of conference calls and meetings to discuss issues pertinent to developing

the impact estimates and provided important data elements for the study. Jim Regimbal of Fiscal Analytics, Ltd. suggested our center use REMI PI+ to perform the analysis and provided additional consultation throughout the project. Steve Ford, Director of the Policy and Research Division at the Virginia Department of Medical Assistance Services, shared useful information about how state Medicaid budget and enrollment estimates were developed. Dr. Steve Horan, President of Community Health Solutions, provided a valuable industry perspective on the health care reform issue and identified important research studies. Dr. Len Nichols, Director of the College of Health and Human Services Center for Health Policy Research and Ethics at George Mason University, offered a wide-ranging perspective on health care reform and recommended numerous readings and data sources. Many others participated in helpful discussions leading up to this report, including Katharine Webb, Senior Vice President at VHHA; Betty Long, Vice President at VHHA; and Patrick Finnerty, former Director of the Department of Medical Assistance Services. Tanya Wanchek, Research Associate at the Center for Economic and Policy Studies, provided helpful recommendations on an earlier draft of this study. Steve Kulp and Dave Borszich of the Weldon Cooper Center assisted with document presentation. Any errors or omissions are the responsibility of the author.

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EXECUTIVE SUMMARY

This study estimates the impact of the 2010 health care reform law (the Patient Protection and Affordable Care Act/Health Care and Education Reconciliation Act) on Virginia's economy. Health care reform is a complex and multifaceted law that was enacted with the joint goals of improving health insurance coverage for U.S. residents, decreasing the costs of health care, and improving overall health care delivery and quality. The law has been described as the most significant health care legislation since the passage of Medicare and Medicaid and is projected to expand health insurance coverage from an estimated 83 percent of U.S. legal residents in 2010 to 94 percent by 2019.

Although health care reform was enacted to improve health care accessibility, affordability, and quality for U.S. residents, the law also involves large changes in tax policy and government and private expenditures that can be expected to have significant direct and indirect economic effects. These effects include levels of economic activity as measured by employment, gross domestic product, income and the types of occupational opportunities available.

This study examines the effects of PPACA/HCERA in the commonwealth of Virginia for the period FY 2010-2019 for which federal budget estimates are available. PPACA/HCERA involves nearly \$1 trillion in new spending over that period. Net outlays and credits of \$465 billion relate to subsidies for purchasing private health insurance through health insurance exchanges, \$434 billion goes to Medicaid, \$37 billion to credits for employers, and \$30 billion for other reform-related health care spending such as research centers, pilot and demonstration projects, and workforce development. Health care reform funding derives from several major areas. The most significant category of funding is a cut of \$455 billion over a 10-year period in Medicare funding, including Medicare Advantage, Medicare Fee for Service programs, and Medicare and Medicaid Disproportionate Share Hospital (DSH) payments. The act also raises approximately \$453 billion in new revenues by increasing taxes and eliminating selected tax deductions and credits.

The Congressional Budget Office estimates that PPACA/HCERA will generate a budget surplus of \$143 billion for the 2010-2019 implementation time frame. However, the annual magnitude of this surplus varies over the period. Generally speaking, new revenues and spending cuts significantly outpace new spending before FY2015. Therefore, the act initially results in annual budgets that rack up surpluses in excess of \$50 billion in FY2013 and FY2014 before approaching balance in FY2016-FY2017. The fluctuating budgetary impacts of PPACA/HCERA over the 2010-2019 period affect the state-level economic effects of health care

reform. Because withdrawals of federal spending from the economy in the form of new taxes and reduced spending have a dampening effect on the economy, while new spending and tax cuts or credits have a stimulating effect of the economy, the economic effects synchronize with the pattern of annual budgetary surplus and deficit induced by the program.

The study uses an industry-standard regional economic impact tool, REMI PI+ (Regional Economic Models, Inc. Policy Insight Plus), to estimate the economic effects of health care reform. REMI PI+ is a respected, peer-reviewed model that has been used by federal, state, and local government agencies and private consultants in thousands of national and regional economic studies, including several studies of health care reform and health care issues around the United States. It is a dynamic, multi-sector regional economic simulation model used for economic forecasting and measuring the impact of public policy changes on economic activity, area demographics, and government fiscal conditions. The model used in this analysis includes 70 industry sectors and was customized for Virginia.

Input data for the model are largely derived from public secondary sources and were constructed by breaking the health care reform law into major budget components involving: (a) Medicaid, (b) Medicare, (c) the health insurance exchanges, (d) employers, (e) other health reform related expenditures, and (f) new tax revenues. Federal budget data from the Congressional Budget Office and Joint Committee on Taxation play a key role in the analysis, but supplemental state-level budget estimates are used to correct for disparities in the way the model assigns certain federal spending and cuts. Other imputations are made to estimate the direct effects of mandates and new insurance coverage on off-budget transactions for individuals and employers.

Results indicate that health care reform has significant positive employment effects for Virginia. Program spending has an initial positive employment impact followed by negative impacts in 2012-2014 succeeded by a rebound beginning in 2015. The employment impact trajectory closely follows Congressional Budget Office estimates of net budgetary stimulus. Relatively large budget surpluses in 2012-2014 represent a form of saving and a substantial leakage from the national economy that has a dampening effect on the overall economic impact results. However, once substantial program spending begins, health care reform results in sustained employment impacts that peak at 27,170 jobs in 2019.

Industry employment impacts are very concentrated in healthcare sectors with 25,098 jobs or 92 percent of the total job creation by 2019. State and local government and the administrative and waste services industry have positive impacts of 1,559 and 1,158 respectively. Other industries receiving small but positive employment impacts include finance and insurance (+499), accommodation and food services (+422), construction (+286), real estate (+266) and utilities (+11). The “other services” industry experiences a negative impact of 947 jobs while other losses are widely distributed among the remaining industries. Not surprisingly, the occupations most affected by health care reform are health care related. Employment impacts are highest for health diagnosing and treating practitioners (+5,452) followed by nursing, psychiatric, and home health aides (+4,285), health technologists and technicians (+3,281), and other healthcare support occupations (+1,763). Personal appearance workers experience the largest negative impact (-125) jobs, partly due to the health care reform federal tax on tanning salons.

Other economic measures follow the employment impact pattern. Gross domestic product (GDP) shows pronounced negative impacts during the budget surplus years turning positive when health insurance program spending accelerates. Health care reform has a positive impact of \$1.531 billion in 2019 and cumulative GDP impact of \$3.326 billion throughout the 2010-2019 period. Personal income and population impacts are positive in 2019 while disposable income is negative. The disposable personal income impact is negative because of the increase in personal taxes required to fund health care reform.

The economic impact of health care reform may extend beyond the measurable effects of public and private expenditures and taxes on the economy. Health care reform has the potential to slow the growth of health care costs, which are borne by individuals, businesses, and the public sector, and free up the expenditures for other productive investments. In addition, health care expansion to an underserved population represents an investment in human capital. It could improve labor productivity, increase the supply of

labor, or improve overall labor market efficiency by reducing the phenomenon of “job lock.” Lastly, health care reform could have negative effects on economic activity. It could impose costly administrative regulatory burdens on businesses and raise compensation costs for some workers.

To investigate the effects of health care costs on Virginia’s economy, two hypothetical health care cost scenarios are constructed. In one scenario, health care reform “bends the cost curve” and results in employer production cost reductions equivalent to a .75 percent per annum reduction in health insurance costs below baseline levels. It assumes that these cost savings begin in 2014 and continue through 2019. An alternative scenario models the effects of employer health care insurance costs escalating by .75 percent per annum over the same period. The savings or costs are assumed to accrue entirely to employers in the form of production cost reductions or increases rather than largely being rebated or passed on to workers in the form of increased or decreased wages.

Results indicate that if health care costs can be constrained and the benefits passed onto employers, the employment effects of health care reform nearly double. If health care costs instead accelerate, they would erode any advantage the state might have in comparative funding and the economic impacts would be nugatory. Results indicate that employer cost savings resulting from reduced per-annum worker health insurance costs for 2014-2019 results in additional employment of 22,270 in 2019 for a total employment impact of 49,930 when health care reform expenditures are added. This represents approximately one percent of total REMI PI+ forecasted Virginia employment of 4.968 million for 2019. The cost-bending scenario produces a GDP impact of \$3.714 billion in 2019 and cumulative GDP impact of \$10.722 billion. In contrast, escalating employer health insurance costs by .75 percent basically negates the positive impacts of health care reform spending. The employment impact trajectory in this case ends up at 4,858 in 2019. The cost escalation scenario results in negative impacts, reaching -\$609 million in 2019 and a cumulative value of -\$3.96 billion throughout the period.

INTRODUCTION

The Patient Protection and Affordable Care Act (PPACA) was signed into law by President Obama on March 23, 2010. On March 30th, a reconciliation bill, the Health Care and Education Reconciliation Act (HCERA), which modified the original bill, was signed into law. Collectively these two bills (PPACA/HCERA) represent what will be referred to in this document as the “health care reform” law. The law has been described as the most significant health reform legislation since the passage of Medicare and Medicaid and is projected to expand health insurance coverage from an estimated 83 percent of U.S. legal residents in 2010 to 94 percent by 2019 (Congressional Budget Office 2010). It accomplishes this task by increasing public health insurance expenditures for low-income residents, mandating that individuals obtain insurance coverage for their families and that large employers provide it to their employees, subsidizing private health insurance plans, imposing new regulations on the health care and insurance industries, and expanding spending on other public health programs, research, demonstration projects, and healthcare workforce development.

Although it has been more than six months since health care reform was signed into law, little is known about its likely macroeconomic and regional economic impacts. This study examines the effects of PPACA/HCERA in the commonwealth of Virginia for the period FY 2010-2019 for which federal budget estimates are available. The analysis relies on a model, REMI PI+ (Regional Economic Models,

Inc. Policy Insight Plus), calibrated for Virginia. REMI PI+ is a respected, peer-reviewed model that has been used by federal, state, and local government agencies and private consultants to study and quantify the economic impacts of budgetary decisions as well as the effects of specific kinds of health care policies. Federal budget data from the Congressional Budget Office (CBO) and Joint Committee on Taxation (JCT) play a key role in the analysis, but supplemental state-level budget estimates are used to correct for disparities in the way the model assigns certain federal spending and cuts. Other imputations are made to estimate the direct effects of mandates and new insurance coverage on off-budget transactions for individuals and employers. Economic impact results are reported in terms of employment by major industry, gross domestic product, personal income, disposable personal income, and population.

The study is divided into several sections. The first section examines the content of the health care reform law with particular attention paid to major categories of outlays and revenues described in CBO and JCT budget reports. The second section presents important features of the REMI PI+ model and the methodology for obtaining statewide economic impacts. The third section outlines data assembly for the model and mapping of specific categories of health care reform expenditures and tax revenues onto REMI PI+ policy variables. The fourth section introduces several modeling scenarios and presents the results.

SECTION 1 HEALTH CARE REFORM

PPACA/HCERA is a complex and multifaceted law that was enacted with the joint goals of improving health insurance coverage for U.S. residents, decreasing the costs of health care, and improving overall health care delivery and quality. Health care reform follows years of legislative efforts, both successful and unsuccessful, to expand health care accessibility and contain costs. Recent major legislative changes leading up to health care reform include the Health Insurance Portability and Accountability Act (HIPAA) in 1996 which placed new regulations on group health plans and created national standards for health care record-keeping, the State Children's Health Insurance Program (SCHIP) in 1997 which expanded coverage for low-income children, the Balanced Budget Act of 1997 which created the Medicare Advantage program and attempted to constrain Medicare program cost escalation, the Health Care Consolidation Act and Health Centers Initiative which consolidated and expanded funding for Federally Qualified Health Centers (FQHCs) that provide primary and preventive care to residents regardless of ability to pay, and the Medicare Prescription Drug and Improvement Act of 2003, which created a prescription drug plan for Medicare enrollees. What distinguishes health care reform from this earlier legislation, however, is both its size and scope.

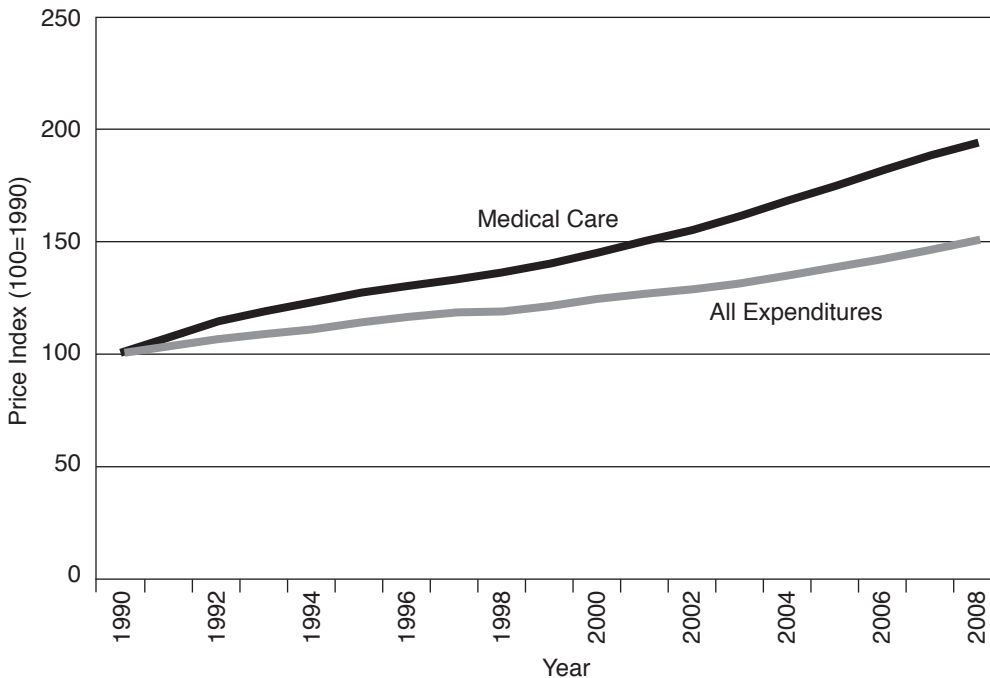
Two ongoing economic and social trends helped to propel comprehensive health care reform to the top of the national agenda. First, health care costs continued to increase at a rate

that outpaced the general rate of inflation and economy-wide productivity, making health care and health insurance increasingly unaffordable for employers providing company health plans and individuals purchasing insurance through non-group markets (see **Figure 1**). Second, public policy efforts to improve access to health care were being negated by health care cost increases that resulted in an increasing percentage of the population being uninsured (Chernew, Cutler, and Keenan 2005; Executive Office of the President Council of Economic Advisors 2009). **Figure 2** shows that the uninsured population in the United States increased an estimated three percent from 15.8% in 1999 to 18.8% in 2009. Over the same period, Virginia's uninsured rate increased from 13.7% to 14.7%. In contrast, Massachusetts, which enacted a comprehensive state health care reform law in 2007 that had features similar to PPACA/HCERA, saw its uninsured rate cut in half to 5.2%, making it by far the lowest in the nation.

PPACA/HCERA uses a multi-pronged strategy to expand health insurance coverage that contains both carrots and sticks. First, it expands the pool of individuals who would be covered by existing private insurance plans and provides bridge funding for high-risk insurance pools to subsidize some of the costs associated with such coverage. For example, it prohibits insurance plans from discriminating against applicants on the basis of pre-existing conditions, allows dependents up to age 26 to remain on their parents'

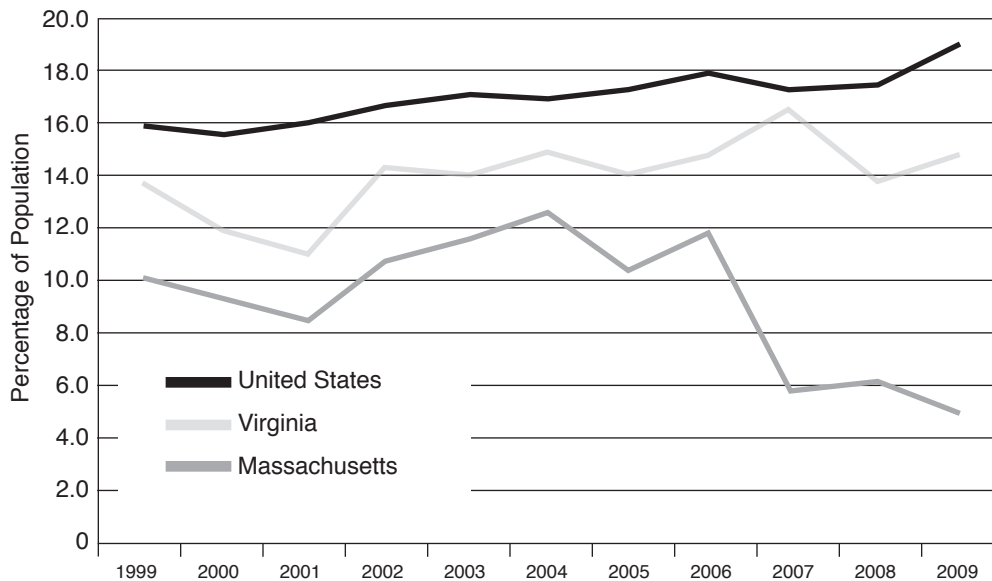
insurance plans, and prohibits caps on the amounts of annual and lifetime coverage. Second, it revises eligibility standards for Medicaid, a program for low-income residents, extending coverage to families and individuals who make up to 133% of the Federal Poverty Level (FPL). States are provided very favorable federal cost-share percentages that are well in excess of Federal Medical Assistance Percentages (FMAP) available for current Medicaid recipients. Third, it partially funds and mandates states to establish health care exchanges (American Health Benefit Exchanges and Small Business Health Options Program Exchanges) where individuals and businesses can shop for qualifying

Figure 1. Personal Consumption Expenditure Price Indices, All Expenditures and Health Care, 1990-2008



Source: REMI based on Bureau of Labor Statistics

Figure 2. Uninsurance Rates, United States, Virginia, and Massachusetts, 1999-2009



Source: U.S. Census Bureau (2010)

health care plans in a simpler, more transparent and competitive market. Individuals/families with income between 133% and 400% of FPL will become eligible for health insurance subsidies and credits on a sliding scale to offset the private costs of obtaining insurance. Fourth, it provides tax credits for small employers (no more than 25 employees) to offer health insurance to their employees. Fifth, it requires individuals to obtain qualifying health insurance and employers with more than 50 employees to provide employer-based insurance, with penalties imposed for non-compliance. Lastly, since a significant number of the uninsured are eligible under existing programs, the law funds outreach and marketing efforts to make the public aware of existing and expanded health insurance options.

Although receiving far less attention, PPACA/HCERA also has provisions that attempt to constrain health care costs or in popular parlance “bend the cost curve.” These provisions come in several forms. First, the act makes substantial cuts in the rate of planned spending on Medicare, mostly in lowered prices paid to health plans and hospitals. An extensive array of delivery and payment reform pilots, which was not scored by CBO as producing large savings, is nevertheless the cornerstone of an incentive re-alignment strategy that could spread to the whole system over the next decade, and if it does, will provide more savings than CBO predicted. Second, the act imposes new regulations on the health insurance industry. For instance, health insurers are required to report a “Medical Loss Ratio,” which measures the amount of premiums spent on administrative expenses. Penalties are imposed on large group plans where these expenses exceed 85% of premiums for large group plans and 80% for individual and small group plans. Third, health care reform attempts to increase the competitiveness of the health

insurance market through the establishment of health insurance exchanges and leverage additional public bargaining power in Medicaid and Medicare procurement arrangements such as prescription medicines. Fourth, reform increases taxes on high premium health care plans, increasing the probability that employers will scale down more costly plans. Fifth, the law spurs the deployment of new technology such as electronic medical record keeping in the health care sector to improve health care coordination and decrease administrative expenses. Fifth, the act funds new comparative effectiveness

research to inform future treatment recommendations and seeds a number of demonstration and pilot projects involving promising patient care management models such as bundled payment systems and pay-for-performance programs. Sixth, it contains funding for efforts to improve federal management and monitoring of public health care programs and to root out waste. Lastly, the act places new emphasis on prevention and wellness to avoid the escalation of costs due to chronic and acute conditions that could be averted by earlier routine screening and lifestyle modification.

PPACA/HCERA involves nearly \$1 trillion in new spending over a ten-year period (see **Table 1**). Net outlays and credits of \$465 billion relate to subsidies for purchasing private

Table 1. Summary of Major Health Care Reform Expenditures and Revenues, 2010-2019, Billions of Dollars

Item	Amount
Medicaid	434
Health Care Exchanges Subsidies	358
Credits—individuals	107
Credits—employers	37
Other Spending	30
Medicare Cuts and Other	-455
New Tax Revenues	-453
CLASS Revenues	-70
Penalties	-65
Associated Effects of Coverage Provisions on Revenues	-46
Education Spending Reductions	-19
Net Change in Deficit	-143

Source: Congressional Budget Office (2010)

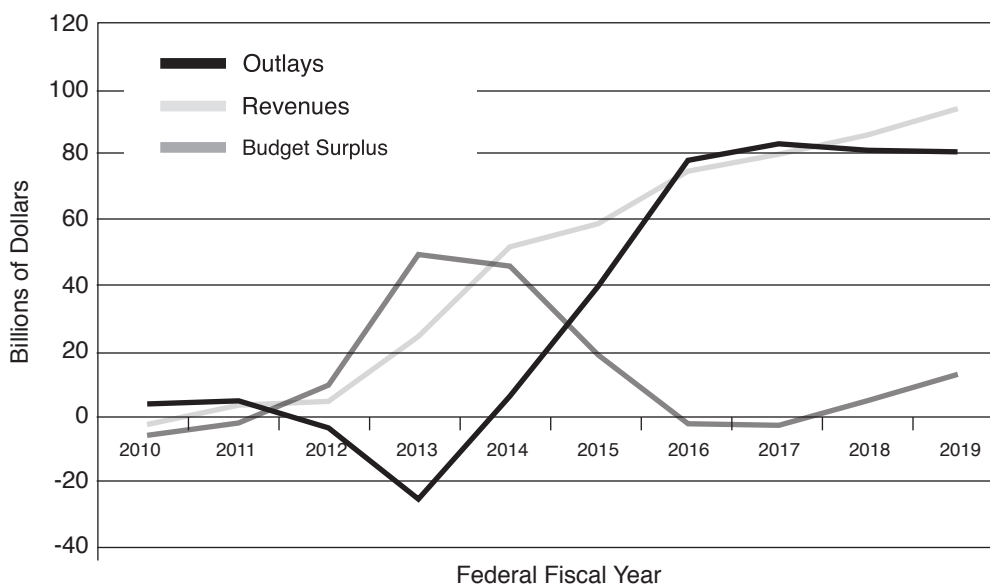
Table 2. Summary of New Tax Revenues by Source, 2010-2019, Billions of Dollars

Item	Amount
High Premium Insurance Excise Tax	32.0
Deductions for Medical Expenses	5.2
Tax on Distributions on HSAs	1.3
Limit on Flexible Spending Accounts	13.0
Form 1099 Reporting \$600+	17.2
Fee on Branded Prescription Pharmaceuticals	27.0
Excise Tax on Medical Device Manufacturers	20.0
Annual Fee on Health Insurance Providers	60.1
Modify Itemized Deduction Medicare Part D	4.4
Deductions for Medical Expenses--Threshold	15.3
500k Deduction Limitation--Health Insurance Companies	0.7
Unearned Income and High Income Earner Tax Increase	210.3
Fee/tax on Insurers with Large Medical Cost Ratio	0.2
Tanning Excise Tax	2.5
Therapeutic Discovery Project Credit	-0.8
Adoption Tax Credit	-1.3
Black Liquor Cellulosic Biofuel Credit	23.5
Economic Substance Doctrine	4.6
Other Revenue Provisions	18.2
Total Revenue	453.4

Source: Congressional Budget Office (2010) and Joint Committee on Taxation (2010)

health insurance through health insurance exchanges, \$434 billion goes to Medicaid, \$37 billion to credits for employers, and \$30 billion for other reform-related health care spending such as research centers, pilot and demonstration projects, and workforce development. Health care reform funding derives from several major areas. The most significant category of funding is a cut of \$455 billion over a 10-year period in Medicare funding, including Medicare Advantage, Medicare Fee for Service programs, and Medicare and Medicaid Disproportionate Share Hospital (DSH) payments. The act also raises approximately \$453 billion in new revenues by increasing taxes and eliminating selected tax deductions and credits. **Table 2** summarizes the major categories of revenues. The largest of these items are \$210 billion from a tax increase on the unearned income for high income individuals (generally individuals and households making \$200,000 or more), \$60.2 billion from an annual fee on health insurance providers, and \$30.2 billion from a tax on high premium “Cadillac” insurance plans. In addition to these tax revenues, the CBO estimates that \$65 billion will be raised from employer and individual penalties, and a new federally sponsored assisted living program called Community Living Assistance Services and Supports (CLASS) will generate an initial surplus of \$70 billion. The remainder of revenues will come from revenue changes associated with shifts in types of coverage (e.g., increases in payroll taxes as a result of more taxable income) and educational provisions of the reconciliation act that reorganize the delivery of the federal student loan program.

Figure 3. Health Care Reform Budget Outlays, Revenues, and Surpluses, FY2010-FY2019



Source: Congressional Budget Office (2010)

The Congressional Budget Office estimates that PPACA/HCERA will generate a budget surplus of \$143 billion for the 2010-2019 implementation time frame (see **Figure 3**).¹ Generally speaking, new revenues and spending cuts significantly outpace new spending before FY2015. Medicare cuts coupled with tax increases kick in before the onset of the major spending increases that result from Medicaid program expansion and the establishment of state insurance exchanges. Therefore, the act initially results in annual budgets that rack up surpluses in excess of \$50 billion in FY2013 and FY2014 before approaching

¹ The Lewin Group (2010) estimates that the deficit will be reduced by \$85.9 over the 2010-2019 period. Former CBO Director, Douglas Holtz-Eakin (2010) argues that health care reform will cause large deficits once discretionary spending and other accounting adjustments are made.

balance in FY2016-FY2017. Net program outlays peak in FY2017 while revenue increases are projected to increase at a steady rate throughout the period, resulting in the resumption of small budget surpluses in FY2018-FY2019.

The fluctuating budgetary impacts of PPACA/HCERA over the 2010-2019 period have implications for the national and state-level economic effects likely to result from health

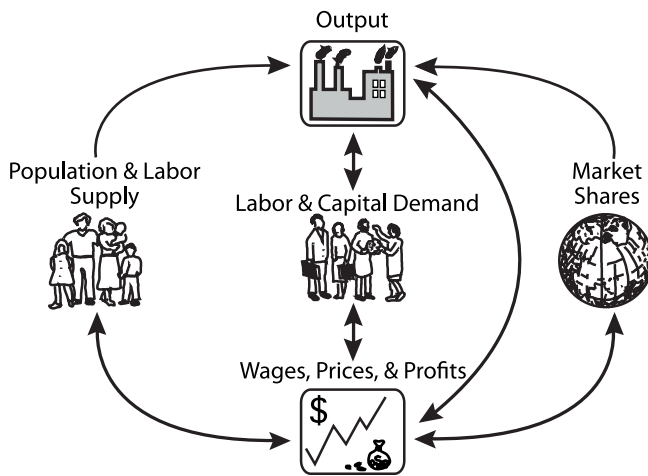
care reform. Because withdrawals of federal spending from the economy in the form of new taxes and reduced spending have a dampening effect on the economy, while new spending and tax cuts or credits have a stimulating effect of the economy, one should expect the economic effects to synchronize with the pattern of annual budgetary surplus and deficit induced by the program.

SECTION 2 METHODOLOGY

The REMI PI+ model is a dynamic, multi-sector regional economic simulation model used for economic forecasting and measuring the impact of public policy changes on economic activity, area demographics, and government fiscal conditions. REMI PI+ is a conjoined model that utilizes different economic modeling approaches, including input-output analysis, econometric forecasting, and computable general equilibrium (Treyz, Rickman, and Shao 1991). The model used in this analysis includes 70 industry sectors and was customized for Virginia. REMI PI+ and earlier versions of the software have been used in thousands of national and regional economic studies, including several studies of health care reform and health care issues around the United States.²

The model contains five major modules or blocks (see **Figure 4**), which interact simultaneously. The Output Block determines expenditures for final demand, including consumption, investment, government and imports as well as demand for intermediate inputs. Final demand responds to changes in other model blocks. This module contains a key engine in the model, an input-output model based

Figure 4. Modular Structure of the REMI PI+ Model



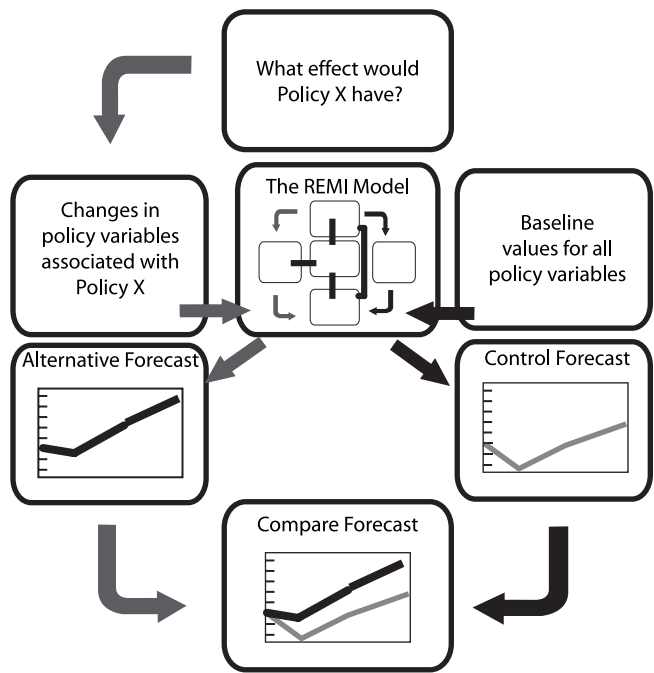
on the Bureau of Economic Analysis (BEA) benchmark transactions table that measures flows of goods and services among industries. The Labor and Capital Demand Block determines employment, capital and fuel demand as well as labor productivity. The Population and Labor Force Block determines the population characteristics of the region, including age, race and sex composition. Labor force participation adjusts in response to changes in wages and employment opportunities. A key driver of population changes is migration, which is influenced by relative wage levels as well as amenities. The Wage, Price and Costs Block determines factor and product price. The Market Shares Block helps to

² See, for example, Chow and Phillips (2009) and Holahan et al. (2005).

measure exports from and imports to the region. Changes in market share are driven by production costs, demand characteristics, distance to markets and output.

The basic procedure used to obtain Virginia health care reform economic impacts is illustrated in **Figure 5** and briefly summarized here. A control forecast for the Virginia economy was generated using a REMI national baseline forecast.³ The national forecast was then recalibrated by revising the macroeconomic data likely to be affected by health care reform. Health care reform spending and tax changes estimated by the Congressional Budget Office are entered into the model. In addition, imputations of state government and private spending changes at the national level are made as explained in the next section. The revised national forecast is then used as an input into a regional simulation. This “alternative forecast” for Virginia is then measured against the “control forecast” based on baseline data for the nation and Virginia to examine how health care reform affects the Virginia economy. In a further refinement to the Virginia “alternative” forecast, supplemental state-level budget information is used to correct for disparities in the way the REMI PI+ model assigns national spending and spending cuts to Virginia.

Figure 5. REMI Model Simulation Flow Diagram



³ This baseline forecast is a University of Michigan/RSQE national forecast which reflects a slow recovery in labor markets and economic activity beginning in 2010.

SECTION 3 DATA AND IMPLEMENTATION

To model the economic impacts of health care reform, the law was broken into major budget components involving: (a) Medicaid, (b) Medicare, (c) the health insurance exchanges, (d) employers, (e) other health reform related expenditures, and (f) new tax revenues. Data sources used to generate input data for each of these categories are summarized in **Table 3**. A general discussion is provided in this section of how these sources are used to prepare model input data. However, additional details regarding how estimates were derived and assigned to specific REMI PI+ policy variables are provided in the appendix to this study.

The primary mechanism available in REMI PI+ for introducing the expenditure effects of health care reform was through consumption expenditure categories. Therefore, new health reform spending was multiplied by a national health expenditure vector that reflects the spending pattern likely to result from the component of spending. For example, Medicare cuts were apportioned to consumer expenditure categories by using national expenditure data from the Centers for Medicare and Medicaid Services for Medicare. In addition to direct spending by the federal government, the legislation induces additional spending on health care by states, individuals, and employers. For examples, states must match increased federal Medicaid spending, and individuals must provide funds for the unsubsidized portion of health insurance purchased through the exchanges. The state match was modeled as being funded by personal taxes. The additional private spending was estimated and modeled as being reassigned from existing spending on consumer goods and services to spending on goods and services reflective of private insurance expenditure patterns. Federal tax revenues

collected were assigned to several different tax categories, depending on the revenue source. The largest category of revenue was assigned to the REMI PI+ “personal income taxes” policy variable.

Virginia is affected somewhat differently by health care reform than how the REMI PI+ model automatically assigns the national consumption expenditures to the state. National health care consumption expenditures are scaled down by REMI PI+ using consumption expenditure equations that are based on state and national differences in: (a) disposable incomes, (b) demographics, (c) consumer expenditure patterns, and (d) relative prices (REMI, Inc. 2009; Treyz and Petraglia 2001). These differences require some adjustments to the model because Virginia’s Medicaid expenditures are expected to be somewhat greater than assigned, and the Medicare cuts are anticipated to be substantially less than the amounts assigned. Medicaid consumption expenditures adjustments are modeled based on budget estimates provided by the Virginia Department of Medical Assistance Services while Medicare adjustment cuts are obtained from the Virginia Hospital and Healthcare Association based on their reduction impact estimates. No adjustments are made for Virginia national revenue contributions. For instance, the model assigns a larger burden of personal income taxes to Virginia than the rest of the nation. This finding is consistent with other studies such as Dubay (2006), and no alternative state-specific revenue forecasts are available.

The economic impact of health care reform may extend beyond the measurable effects of public and private expenditures and taxes on the economy. Health care reform has the

Table 3. Summary of Data Sources Used

Area	Source
Medicaid	Congressional Budget Office Virginia Department of Medical Assistance Services Kaiser Foundation/Urban Institute Centers for Medicare and Medicaid Services
Medicare	Congressional Budget Office Virginia Hospital and Healthcare Association Centers for Medicare and Medicaid Services
Individual Insurance Exchanges	Congressional Budget Office Centers for Medicare and Medicaid Services
Employer Coverage	Congressional Budget Office Agency for Healthcare Research and Quality Centers for Medicare and Medicaid Services
Other Health Care Expenditures	Congressional Budget Office Centers for Medicare and Medicaid Services
New Tax Revenues	Congressional Budget Office Joint Committee on Taxation

potential to slow the growth of health care costs, which are borne by individuals, businesses, and the public sector, and free up the expenditures for other productive investments. In addition, health care expansion to an underserved population represents an investment in human capital. Expanded health insurance could improve labor productivity⁴, increase the supply of labor⁵, or improve overall labor market efficiency by reducing the phenomenon of “job lock.” Lastly, health care reform could have negative effects on economic activity. It could impose costly administrative regulatory burdens⁶ on businesses and raise compensation costs for some workers.⁷ Only the potential effects of health care cost changes are explored here.

There are conflicting estimates of possible health care cost savings from PPACA/HCERA. For instance, Cutler, Davis, and Stremikis (2010) cite the possibility of as much as “1.5 percentage-point reduction in cost increases annually from significant health reform” while another paper by Cutler and Sood (2010) describes a likely “.75 percentage point reduction.” The President’s Council of Economic Advisors (2009, p. 22) places 1.5 percent “near the upper bound of what is feasible” while .5 percent is “almost certainly achievable.” Other estimates place the potential savings lower or

even negative.⁸ For illustrative purposes only, health care reform is modeled as producing a .75 percent annual health care cost savings above baseline levels in one scenario and a .75 percent annual health care cost increase in another.⁹ Moreover, for ease of modeling in REMI, the savings or costs are assumed to accrue entirely to employers in the form of production cost reductions or increases rather than largely being rebated or passed on to workers in the form of increased or decreased wages.¹⁰

4 Improved access to health insurance may improve worker health status. For example, one study places the effect of insurance on a computed health score to be in the range of 2-11 percent (Dor, Sudano, and Baker 2006). Improved health status may in turn play a significant role in raising worker productivity through decreased absenteeism and presenteeism and reducing associated costs for short-term disability, workers’ compensation, and employee turnover (Boles, Pelletier, and Lynch 2004; Goetzel et al. 2004).

5 The evidence is mixed on this point (Currie and Madrian 1999). Expanded accessibility to health care may increase the labor supply by reducing mortality rates of the working age population or by increasing labor force participation rates of the working age population as a result of improved health. On the other hand, there are potential offsetting effects. The availability of a new benefit could lead some workers to leave the labor force.

6 Health care reform may impose additional administrative costs on state and local governments and private businesses as a result of having to comply with new taxes and regulations. For instance, Subsection (b) of Section 4205 of the act (“Nutrition Labeling of Standard Menu Items at Chain Restaurants”) requires restaurants, retail food establishments, and vendors to disclose nutritional information on their menus and menu boards. Businesses will also need to improve accounting and recordkeeping to comply with new requirements related to Form 1099 reporting (Vaughan 2010). The CBO (2010) estimates that the costs as defined by the Unfunded Mandates Reform Act (UMRA) would equal approximately \$221 million per year in FY 2010 and each year thereafter, adjusted for inflation for the first five years.

7 For some employers, insurance mandates may have labor market effects not unlike the imposition of higher national minimum wages. For firms employing workers already at or near the minimum wage, the wage floors will not allow them to shift the increasing costs of insurance to their workers as they would for higher earning workers. The Lewin Group (2010) estimates that between 157,3000 and 366,200 low-wage workers will lose employment as a result of the mandates. This kind of “boundary” effect is not formally modeled within REMI PI+.

8 Recent information from the CMS actuary (Sisko et al. 2010) indicates little change in overall health care costs as a result of reform. Skeptics argue that health care reform will increase health care costs because of increasing reliance on third-party payment systems, tax and regulatory provisions of PPACA/HCERA, short-run health care supply inelasticity, and other factors (Foderman and Book 2010).

9 To estimate the production cost savings, it is assumed that health insurance costs make up 8% of compensation costs and that labor compensation constitutes two-thirds of the costs of production. A compounded annual cost savings of .75 percent is applied to a base of .05333 (=0.08 X 0.6667) and entered into REMI PI+ as a percentage reduction in the policy variable “Production Costs, All Industries, All Private Non-Farm Sectors.”

10 Although it is assumed in modeling employer-provided health insurance expenditures elsewhere in this paper that workers bear the costs of employer-provided health insurance, some evidence suggests that there may be cost sharing (Sood, Ghosh, and Escarce 2009).

SECTION 4 RESULTS

Four different scenarios were constructed for simulation purposes. The first scenario (termed “REMI Default”) examines the full economic impact of health care reform using all of the revenue and expenditure provisions identified by the Congressional Budget Office and REMI PI+ default assignments of health care expenditures to Virginia. The second scenario (termed “VA Adjusted”) makes adjustments for Virginia’s comparatively favorable funding position by increasing Medicaid allotments and decreasing Medicare costs from model assignment baselines using supplemental information from DMAS and VHHA. The third scenario (termed “Cost Bend”) models the effects of health care reform being implemented (i.e., VA Adjusted) and resulting in additional employer production cost reductions equivalent to a .75 percent per annum reduction in health insurance costs below baseline levels. It assumes that these cost savings begin in 2014 and continue through 2019. An alternative scenario (termed “Cost Grow”) models the effects of employer health care insurance costs escalating by .75 percent per annum over the same period.

Figure 6 shows the impacts of the four scenarios on total employment. All four indicate an initial positive impact followed by negative impacts in 2012-2014 succeeded by a rebound beginning in 2015. The employment impact trajectory closely follows CBO estimates of net budgetary stimulus reported earlier and exhibited in Figure 2 earlier. Relatively large budget surpluses in 2012-2014 represent a form of saving and a substantial leakage from the national economy that has a dampening effect on the overall economic impact results. In contrast to the default REMI expenditure assignment scenario (which shows peak

employment impact of 9,276 in 2016 which ebbs to 2,623 in 2019), correcting for Virginia’s comparatively favorable Medicaid spending and Medicare cost contribution status indicates a sustained employment impact which peaks at 27,170 in 2019. Adding the employer cost savings resulting from reduced per-annum worker health insurance costs for 2014-2019 results in additional employment of 22,270 in 2019 for a total impact of 49,930. This amount represents approximately one percent of total REMI PI+ forecasted Virginia employment of 4.968 million for 2019. In contrast, escalating employer health insurance costs by .75 percent basically negates the growth effects of any comparative funding advantages for Virginia. The employment trajectory in this case ends up at 4,858 in 2019.

Gross domestic product (GDP) is reported in **Figure 7**. GDP is a common measure of economic activity that reflects the value of goods and services produced in the economy for final demand. Impact results largely mirror the employment patterns with pronounced negative impacts during the budget surplus years turning positive when health insurance program spending accelerates. The REMI default scenario shows a slightly negative (-\$84 million) impact by 2019 and cumulative GDP impacts of -\$1.945 billion over the period 2010-2019. The adjusted scenario indicates a positive impact of \$1.531 billion in 2019 and cumulative GDP impact of \$3.326 billion. The cost-bending scenario produces a GDP impact of \$3.714 billion in 2019 and cumulative GDP impact of \$10.722 billion. With the exception of the initial two start-up years, the cost escalation scenario results in negative impacts, reaching -\$609 million in 2019 and a cumulative value of -\$3.960 billion throughout the period.

Figure 6. Four Scenarios, Employment Impacts by Year, 2010-2019

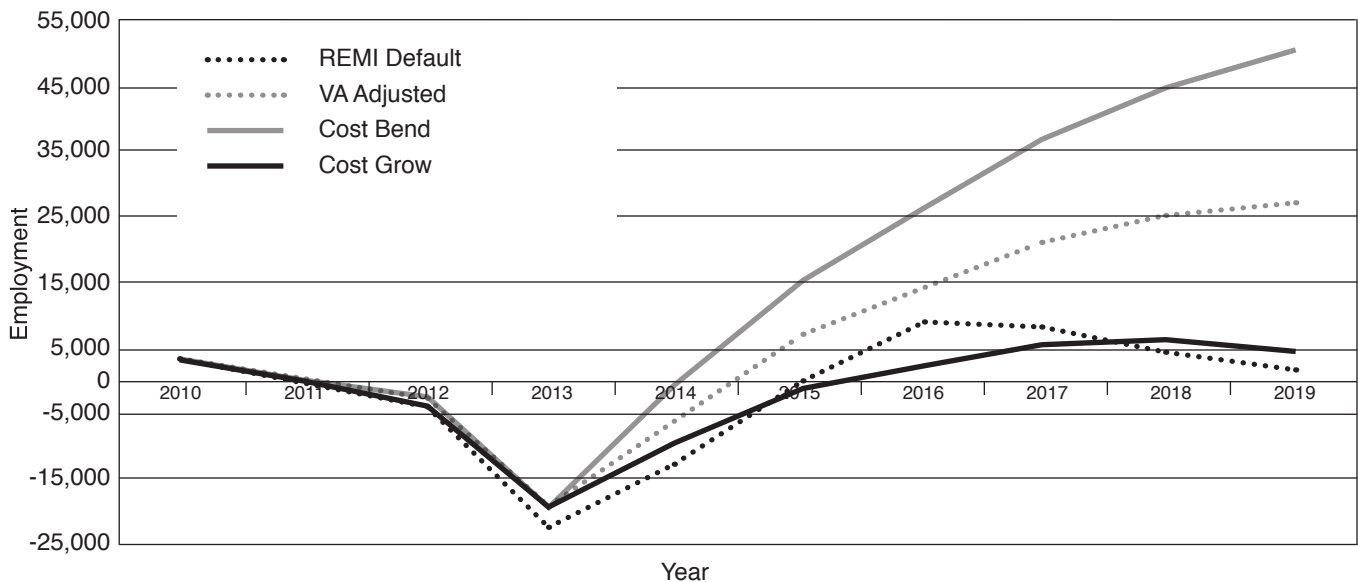
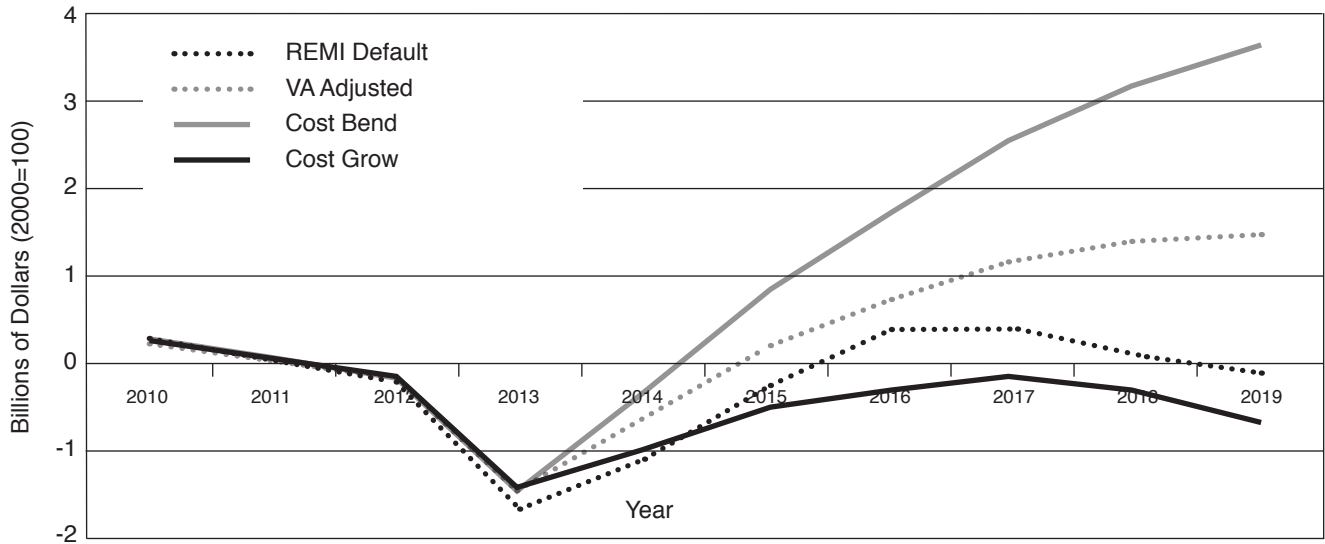


Figure 7. Four Scenarios, Gross Domestic Product Impacts by Year, 2010-2019



In sum, the results show that the default scenario provides little overall stimulus. However, adjusting for Virginia’s comparatively favorable funding status results in significant positive effects. Moreover, if health care costs can be constrained and the benefits passed onto employers, the employment effects of health care reform nearly double. If health care costs instead accelerate, they would erode any advantage the state might have in comparative funding, and the economic impacts would be nugatory.

Table 4 provides detailed results of the adjusted scenario for several different indicators, including personal income, disposable income, per capita income, and population. Personal income and population impacts are positive in 2019 while disposable income and per capita income are negatively impacted. The disposable personal income impact is negative because of the increase in personal taxes required to fund health care reform. Per capita personal income experiences

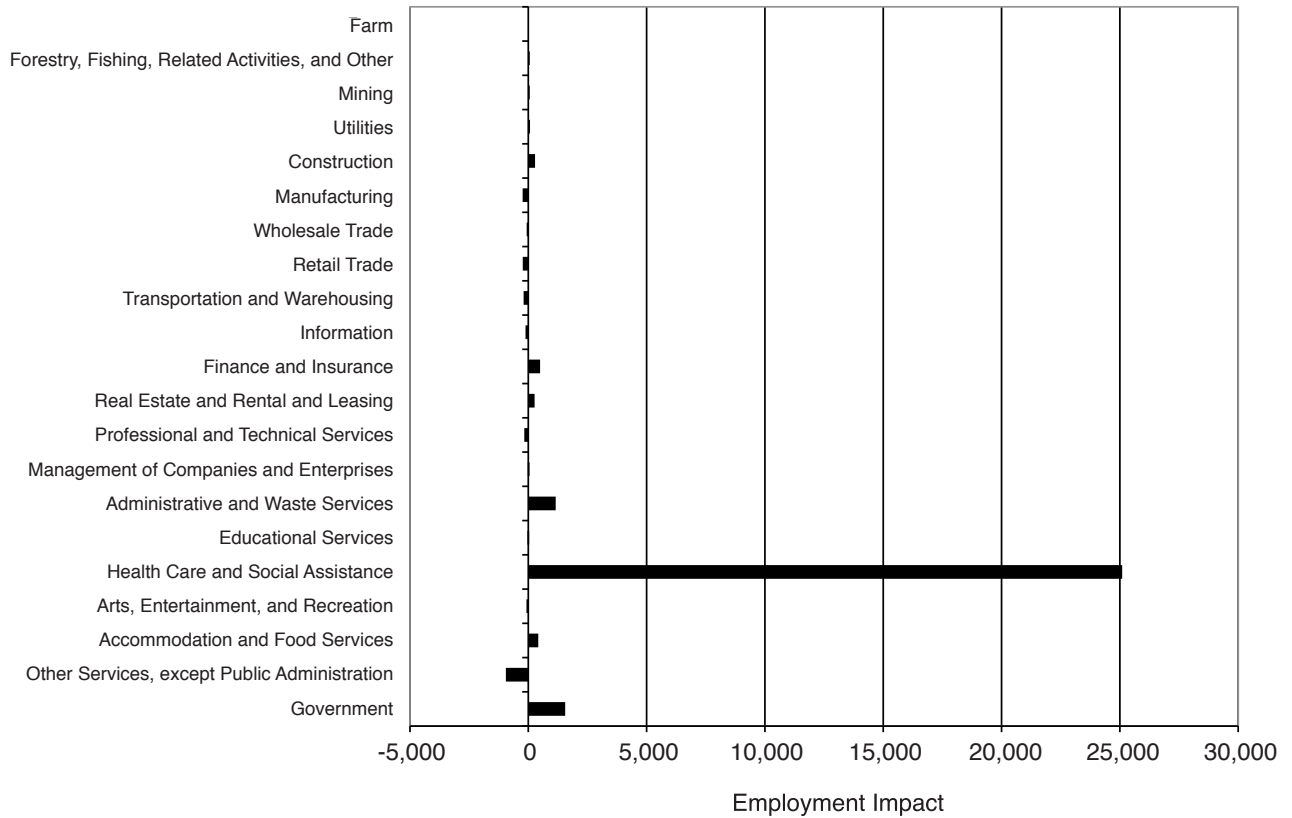
negative impacts during the surplus years before turning slightly positive. The impact atrophies and turns negative once again in 2019 because of the influx of economic migrants from elsewhere due to the stimulating effect of PPACA/HCERA.

Industry employment impacts are very concentrated in healthcare sector with 25,098 jobs or 92 percent of the total job creation by 2019 (see **Figure 8**). Government and the administrative and waste services industry have positive impacts of 1,559 and 1,158 respectively. Other industries receiving small but positive employment impacts include finance and insurance (+499), accommodation and food services (+422), construction (+286), real estate and rental and leasing (+266), and utilities (+11). The “other services” industry experiences a negative impact of 947 jobs while other losses are widely distributed among the remaining industries. Not surprisingly, the occupations most affected

Table 4. Summary Results

Year	Employment	GDP (Billions of 2000 Dollars)	Personal Income (Billions of 2000 Dollars)	Disposable Personal Income (Billions of 2000 Dollars)	Per Capita Personal Income (2000 Dollars)	Population
2010	3,793	0.289	0.177	0.143	23	-85
2011	61	0.060	-0.159	-0.118	-2	-42
2012	-2,165	-0.123	-0.385	-0.339	-5	447
2013	-18,176	-1.465	-1.191	-1.528	-156	1,667
2014	-4,702	-0.621	-0.709	-1.509	-102	2,978
2015	7,238	0.211	-0.255	-1.290	-47	3,164
2016	14,210	0.772	0.093	-1.450	2	1,904
2017	21,169	1.228	0.367	-1.392	35	1,771
2018	25,430	1.444	0.217	-1.424	11	3,057
2019	27,170	1.531	0.147	-1.486	-7	4,951

Figure 8. Employment Impacts by Industry, 2019



by health care reform are health care related (see **Table 5**). Employment impacts are highest for health diagnosing and treating practitioners (+5,452) followed by nursing, psychiatric, and home health aides (+4,285), health technologists and technicians (+3,281), and other healthcare support occupations (+1,763). Personal appearance workers experience the largest negative impact (-125), partly due to the health care reform federal tax on tanning salons.

Table 5. Top Occupational Gains and Losses, 2019

Gains		Losses	
Health diagnosing and treating practitioners	5,452	Personal appearance workers	-124
Nursing, psychiatric, and home health aides	4,285	Retail sales workers	-93
Health technologists and technicians	3,281	Woodworkers	-29
Other healthcare support occupations	1,763	Metal workers and plastic workers	-23
Secretaries and administrative assistants	1,250	Other transportation workers	-19
Information and record clerks	1,196	Animal care and service workers	-17
Other personal care and service workers	971	Entertainers and performers, sports and related occupations	-15
Other office and administrative support workers	910	Funeral service workers	-14
Counselors, Social workers	820	Sales representatives, wholesale and manufacturing	-10
Financial clerks	670	Assemblers and fabricators	-8

APPENDIX

In order to generate a revised national forecast for the period 2010-2019 reflecting the effects of health care reform, budgetary estimates from the CBO play a key role. They are used to obtain estimates of federal expenditures and tax revenues. Only net outlays and revenues are reported in the CBO report by category. Thus, they form the basis for model expenditure mapping onto REMI PI+ policy variables. Since the REMI PI+ model is built on calendar year data, and health care reform estimates are available only for federal

fiscal years 2010-2019, federal fiscal years were assumed to be concurrent with calendar years. Other non-budgetary transactions (e.g., the unsubsidized portion of spending of private individuals on health insurance) are estimated as well. Each of the subsections below provides a description of the data and methods used to generate REMI PI+ input data. **Table A** provides a mapping of specific spending and tax items onto REMI PI+ model block and policy variables.

Table A. Mapping of Health Care Reform Expenditures and Revenues onto REMI PI+ Policy Variables

Budget Area	Action	Model→Block→Category→Detail→Change
Medicaid	Medicaid Health Insurance Spending	Output and Demand→Consumption Spending for Ophthalmic and Orthopedic Products; Drug Preparations and Sundries; Physicians; Dentists; Other Professional Medical Services; Non-profit Hospitals; Proprietary Hospitals; Government Hospitals; Nursing Homes; and Health Insurance→Increase or Decrease
	Consumer Spending Savings from Health Insurance	Output and Demand→Consumption Reallocation→All Consumption Categories→Increase or Decrease
	State Cost Share	Output and Demand→Personal Taxes→Total→Increase
Medicare	Medicare Health Insurance Spending	Output and Demand→Consumption Spending for Ophthalmic and Orthopedic Products; Drug Preparations and Sundries; Physicians; Dentists; Other Professional Medical Services; Non-profit Hospitals; Proprietary Hospitals; Government Hospitals; Nursing Homes; and Health Insurance→Decrease
Insurance Exchanges	Health Insurance Spending	Output and Demand→Consumption Spending for Ophthalmic and Orthopedic Products; Drug Preparations and Sundries; Physicians; Dentists; Other Professional Medical Services; Non-profit Hospitals; Proprietary Hospitals; Government Hospitals; Nursing Homes; and Health Insurance→Increase
	Costs of Establishing the Exchanges	Output and Demand→Government Spending→Federal Civilian→Increase
	Consumer Spending Reduction from Individual Mandates	Output and Demand→Consumption Reallocation→All Consumption Categories→Decrease
	Penalty Payments	Output and Demand→Personal Taxes→Total→Increase
Employers	Employer Health Insurance Plan Spending	Output and Demand→Consumption Spending for Ophthalmic and Orthopedic Products; Drug Preparations and Sundries; Physicians; Dentists; Other Professional Medical Services; Non-profit Hospitals; Proprietary Hospitals; Government Hospitals; Nursing Homes; and Health Insurance→Decrease or Increase
	Consumer Spending Reduction from Employer Mandates	Output and Demand→Consumption Reallocation→All Consumption Categories→Decrease or Increase
Other Spending	Other Health Care Reform Spending	Output and Demand→Consumption Spending for Ophthalmic and Orthopedic Products; Drug Preparations and Sundries; Physicians; Dentists; Other Professional Medical Services; Non-profit Hospitals; Proprietary Hospitals; Government Hospitals; Nursing Homes; and Health Insurance→Decrease or Increase
	Education Related Spending	Output and Demand→Consumption Spending for Financial Services Furnished Without Payment→Decrease or Increase

Table A. Mapping of Health Care Reform Expenditures and Revenues onto REMI PI+ Policy Variables (continued)

Budget Area	Action	Model→Block→Category→Detail→Change
Federal Tax Revenues	CLASS Revenues	Output and Demand→Employee and Self-Employed Contributions for Government Social Insurance→Increase
	Cadillac Insurance Excise Tax; Modify Itemized Deduction Medicare Part D; 500k Deduction Limitation--Health Insurance Companies; Economic Substance Doctrine	Compensation, Price and Costs→Production Cost→All Naics →Increase
	Fee on Branded Prescription Pharmaceutical Manufacturers; Therapeutic Discovery Project Credit	Compensation, Price and Costs→Production Cost→Chemical Manufacturing→Increase
	Excise Tax on Medical Device Manufacturers	Compensation, Price and Costs→Production Cost→Miscellaneous Manufacturing→Increase
	Annual Fee On Health Insurance Providers; Fee/Tax On Insurers With Large Medical Cost Ratio	Compensation, Price and Costs→Production Cost→Insurance Carriers and Related Activities→Increase
	Tanning Excise Tax	Compensation, Price and Costs→Production Cost→Personal and Laundry Services Increase
	Black Liquor Cellulosic Biofuel Credit	Compensation, Price and Costs→Production Cost→Paper Manufacturing→Increase
	Deductions For Medical Expenses; Tax On Distributions On HSAs; Limit On Flexible Spending Accounts; Form 1099 Reporting \$600+; Deductions For Medical Expense—Threshold; Unearned Income And High Income Earner Tax Increase; Other Provisions Not Included Above	Output and Demand→Personal Taxes→Increase

Medicaid

Medicaid is a public health insurance program for low-income individuals begun in 1965. It is jointly funded by the federal government and states and administered by the states. Federal guidelines provide some flexibility for states to determine eligibility for coverage beyond core requirements, and these criteria differ among states. Federal Medical Assistance Percentages (FMAP), which vary by state based on per capita income, are applied to determine individual state cost shares. Under PPACA/HCERA, Medicaid will be expanded to cover all individuals up to 133 percent of the poverty level. The law establishes a favorable federal cost share for newly eligible individuals that starts at 100 percent of costs in 2014 and decreases to 90 percent of costs in 2019.

The Congressional Budget Office provides an estimate of the federal cost share for the 2010-2019 period of \$434 billion. State cost share estimates vary widely based on assumptions made about likely enrollment rates of new and formerly eligible individuals who will enroll because of simplified

enrollment procedures and outreach. This cost share was estimated for all U.S. states by averaging the low and high range of federal cost-share estimates (94 percent) available from a report on Medicaid coverage and spending (Holahan and Headen 2010). This percentage equates to a cumulative state share estimate of \$28 billion for the country over the period.

The direct effects of Medicaid expansion are modeled in three parts. First, new spending on Medicaid/SCHIP will increase consumer expenditures on health care (\$462 billion). These expenditure increases were assigned to consumer expenditure categories using an industry breakdown of Medicaid expenditures available from National Health Expenditures Accounts data provided by the Centers for Medicare and Medicaid Services (2010a).¹¹ State cost shares for Medicaid

¹¹ In addition, hospital expenditures were broken out into REMI categories of nonprofit, for-profit, and government hospitals using weights based on the distribution of REMI consumer expenditures for hospitals in the United States.

are assumed to be covered by an increase in personal income taxes. In addition, previously uninsured individuals who enroll in Medicaid are estimated to have savings in health care costs that were previously funded out-of-pocket. These savings can be spent on other goods and services. These savings (\$551 per individual) were estimated based on the results of a study of medical spending that examined out-of-pocket spending on health care by the full-year uninsured (Hadley and Holahan 2003). This saving is reassigned to spending on general consumption.

Medicare

A significant portion of the funding for PPACA/HCERA is obtained from Medicare savings. Reductions are made in both Medicare Fee for Services (FFS) and Medicare Advantage (MA) plans. The direct effects of Medicare reductions are modeled by decreasing national consumer expenditures on health care by \$455 billion over the 2010-2019 period. These expenditure decreases were assigned to consumer expenditure categories using an industry breakdown of Medicare expenditures available from the National Health Expenditures Accounts data.

Insurance Exchanges

By establishing health care insurance exchanges, offering insurance subsidies, and imposing individual mandates and penalties, health care reform will spur more residents to purchase health insurance. In order to model the economic impact of these changes, it is necessary to first estimate the total unsubsidized insurance costs of individuals who obtain new coverage through the health insurance exchanges. The CBO (2009) provides an estimate of the cost of an average exchange policy, which is slightly better than a “silver plan” for 2016. The estimate for an individual (\$5,800 in FY 2016) is used as the average cost of a policy.¹² This estimate is price adjusted for the analysis period (2010-2019) using the CMS (2010b) implicit medical price deflator and forecast deflators.

In order to estimate the total new national spending stimulated by new enrollees in the health insurance exchanges,¹³ CBO (2010) estimates of previously uninsured enrollment in the newly established exchanges are used. New spending on medical care for the uninsured associated with the exchanges is estimated by multiplying the average premium costs by estimates of the number of newly insured for the nation. Insurees will bear a portion of the cost of the insurance premium. Therefore, some part of the new spending represents spending that is reallocated from existing consumer spending rather than totally new spending. Federal

subsidies and credits for the newly insured are backed out of the total spending estimates to obtain the reallocated spending. To simplify matters, insuree costs for co-payments and deductibles are not included. These amounts will be roughly offset by out-of-pocket expenses incurred for medical expenses when they were uninsured.¹⁴

The individual exchange direct expenditure effects are modeled in four parts. First, the costs of establishing the exchanges (\$6 billion) are modeled as an increase in federal government spending. Second, total health insurance expenditures associated with the establishment of the exchanges for the newly insured are modeled as increased consumption expenditures on health care estimated at \$509 billion for the period 2010-2019. These expenditure increases were assigned to consumption expenditure categories using an industry breakdown of private health insurance expenditures available from National Health Expenditures Accounts data. Third, assessed penalties resulting from non-compliance with the insurance mandate are modeled as an increase in personal taxes of \$64 billion (this total includes both employer and individual penalties because they were not separated in CBO estimates). Fourth, the displaced private consumption spending of the previously uninsured is estimated at \$51 billion. This spending is represented as a loss in consumption expenditure that is subtracted from all consumption categories.

Employer

Health care reform includes subsidies for small businesses to adopt employer-based plans as well as penalties for larger businesses that elect to forego providing coverage to their employees. Businesses with fewer than 25 workers will be eligible to receive short-term credits for offering insurance coverage. Employers with 50 or more employees will pay penalties for at least some workers not covered by employer-based insurance.

The CBO estimates an initial net gain above baseline levels in the number of individuals who obtain employer-provided insurance when the small business insurance subsidies are introduced, but this turns negative in later years as Medicaid coverage is expanded and the insurance exchanges are initiated. Employer plan enrollment will initially expand to 4 million over baseline levels in FY 2014 and then decline

¹⁴ Based on a Hadley and Holahan (2003) analysis of MEP (Medical Expenditure Data) for 2001, medical care payments per capita for the uninsured are approximately 64 percent of medical care payments for full-year insured individuals. Approximately 34.7 percent of these expenses are paid out-of-pocket. Since the average individual market exchange insuree will subscribe to an average plan slightly above silver-rated with an actuarial value of 72 percent, insurees will be responsible for the remaining 28 percent in the form of co-payments and deductibles. The out-of-pocket amounts will be considered to go toward other private out-of-pocket costs associated with being insured rather than being rebated to newly insured consumers to spend elsewhere as was done with the newly insured in Medicaid.

¹² This will slightly overestimate the policy cost because many participants will enroll in family plans with have lower cost per beneficiary.

¹³ Enrollees who switched from previous non-group coverage to individual exchanges are not counted.

to 3 million below baseline levels. The average cost for an individual employer-based policy estimated by the Agency for Healthcare Research and Quality (\$4,386 in 2008) is used as an estimate of the cost of employer insurance per individual (Crimmel 2009). The 2008 figures are adjusted for price level changes using the CMS implicit medical price deflator and forecast deflators.

Changes in employer-based coverage induced by health care reform are modeled in three parts. Congressional Budget Office estimates do not separate employer penalty payments from individual penalty payments. Therefore, employer penalty payments for non-coverage are included in the insurance exchanges above. Increased employer plan insurance spending is modeled as increased expenditure on health care related services with an expenditure pattern typical of individuals with private insurance. Increased employer spending net of employer tax credits is treated as coming from workers' personal income, and the residual either displaces or induces private consumption expenditures.

Other Health Care Reform Act Expenditures

Two types of expenditures are included in this category. The higher education provisions of PPACA/HCERA concern federal student loan finance delivery and funding for federal Pell grants and other education grant programs. They show a net reduction of \$19 billion in spending over FY 2010-2019 as a result of shifting federal student lending away from financial institutions and toward a program administered by the Department of Education. This net decrease in spending is represented as decreased consumer spending for "financial services furnished without payment." The remaining health care spending was very heterogeneous and diffuse with only sketchy information provided in the CBO report. Therefore, it was difficult to assign to particular policy variables. As a result, this spending (\$30 billion over 10 years) is modeled as increased consumer expenditures on health insurance. These expenditure increases were assigned to consumption expenditure categories using an industry breakdown for all types (public and private) of health insurance expenditures available from National Health Expenditures Accounts data.

New Tax Revenues

The Act includes over \$400 billion in new tax revenues derived from a variety of sources including new taxes and fees (e.g., excise tax on high premium "Cadillac" insurance plans, tanning tax, fees on manufacturers of medical equipment and prescription drugs, fees on insurers, Medicare tax on unearned income for high earners) as well as elimination of existing credits, deductions and exclusions (e.g., flexible spending limitation to \$2,500, health spending deduction raised).

New taxes and fees were represented in REMI PI+ as either personal taxes, taxes on businesses (which affect business

production costs), or employee and self-employed contributions for government social insurance. Whenever specific industries are targeted for business taxes, the tax was assigned to that industry. A few examples are illustrative. The elimination of the black liquor cellulosic biofuel credit was assigned as a business tax for the paper and pulp manufacturing industry. The tanning tax was modeled as a business tax for the personal and laundry services industry.

Additional Adjustments for Virginia

State budget impact estimates for Medicaid and Medicare were obtained from the Virginia Department of Medical Assistance Services (DMAS) and the Virginia Hospital and Healthcare Association (VHHA). The former provides both low and high budget estimates of state Medicaid costs based on alternative enrollment assumptions. The low-end estimate for the period 2014-2019 (based on interpolations of state fiscal year expenditures to federal fiscal years) translates into \$13.3 billion in total Medicaid expenditures by state and federal governments. The high-end estimate is \$21 billion. An average of the two (\$17.2 billion) was used to reflect likely direct Medicaid expenditures. Relying on REMI PI+ assignments, Medicaid health care expenditures would amount to only \$11.1 billion. Therefore, the difference (\$6.1 billion) was added back into the regional control simulation. Because, this greater-than-model-generated-benchmark expenditure on Medicaid would require a greater-than-benchmark state share as well, an adjustment is also made by increasing state personal taxes to fund the match. However, Disproportionate Share Hospital (DSH) savings of \$21 million estimated by VHHA were assigned to help cover the match.

VHHA also provided estimates of the statewide impact of Medicare cuts based on the Medicare Advantage formula,¹⁵ impacts on hospitals, and offsetting payment improvements that relate to a low-cost county adjustment affecting FY11 and FY12.¹⁶ These estimates indicate that Virginia will experience \$4.3 billion in cuts compared to \$11.7 billion assigned by REMI PI+. This disparity is due chiefly to much lower relative enrollment in Medicare Advantage (14.6 percent compared to 24.9 percent nationally),¹⁷ which takes a much more sizeable hit than Medicare Fee for Service. Virginia also has lower Medicare costs per beneficiary, which is a key input used in the new funding formulas with high-cost regions bearing a greater brunt of cuts. Therefore, the difference (\$7.4 billion) was once again added back into the regional control simulation.

15 Frakt (2010) provides a description of the method used to produce the state estimates.

16 Estimates were not provided for Medicare impacts on home health agencies, skilled nursing facilities, hospices, and other Medicare providers. However, these cuts are thought to be minimal in comparison with the other items estimated.

17 Based on data from the Centers for Medicare and Medicaid Services (2010c).

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