State-level Variations in Healthcare financing in the United States

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Abstract: Healthcare spending (total) in the United States (US) is the highest in the world. As state governments are a vital driver of healthcare implementation and as healthcare policy responses in containing healthcare expenses vary among states based on the underlying state-level factors, it is critical to examine state-level variations in healthcare funding. The aim of the study was to evaluate the state-level variations in healthcare financing and the factors that affect financing of healthcare. This research used publicly available data from 2001 to 2009. Fixed effect analysis showed that state-level variations in public financing of health care (Medicare and Medicaid) are associated with demographic composition (proportion of the female population, percentage of individuals over age 65, percentage of Hispanic population), economic factors (unemployment rate, per capita gross domestic product (GDP) of the state, per capita state tax revenue, FMAP rate), political climate (percentage of individuals enrolled in Medicare or Medicaid, rate of enrollment in HMO), healthcare supply factors (active physicians per 100,000 population, number of hospitals and beds) and healthcare needs (obesity rate). Additionally, variations in state-level private insurance financing was proportional to the economic factors (rate of federal funding, per capita state GDP), a supply side factor (active physicians per 100,000 population), political climate (percentage of individuals enrolled in Medicare or Medicaid) and healthcare needs (obesity rate). Lastly, state-level variations in out of pocket expenditures were associated with economic factors (per capita state tax revenue, per capita state GDP), demographic factors (percentage of African-Americans, percentage of female population, percentage of elderly population (aged 65 and above), percentage of Hispanic individuals, proportion of the population below age 17), a supply side factor (active physicians per 100,000 population), political characteristics (percentage of individuals enrolled in Medicare or Medicaid) and healthcare needs (obesity rate). Therefore' findings of the study specified the need for convergence of the two sectors: communities and health. Promoting health with synergistic efforts from the economic, social and health sectors of the economy at the state-level can lead to improved health outcomes and lower healthcare expenditures and financing.

Keywords: healthcare financing, panel, state level, public, out-of-pocket, private

JEL Classification: I100, I130, H710, I180, C180, C120

1. Introduction

In the U.S., the rising cost of healthcare has been a long-standing issue. Healthcare expenditures have reached $2.9 trillion in 2013 (CMS, 2013) from $666.2 billion in 1990 (CMS, 1990). According to Chernew (2015), during most of the post–World War II period, inflation-adjusted healthcare costs have been rising at a much faster rate than the GDP growth rate. It is projected that healthcare spending may account for as high as 38% of GDP by 2075 (Chernew, 2015). There is growing pressure on both the federal and state governments in the U.S. to contain healthcare spending. Many reasons have been cited for rising healthcare spending. These include: rising prevalence of disease in the population, changing clinical thresholds for diagnosing and treating disease, and innovations (new technology) in treatment (Chernew, 2015).

Whatever be the reasons behind the escalating healthcare costs, the rising costs of healthcare are not unique to the federal government of the U.S. States are also facing escalating health expenditures in the same way. For example, in 2012, 31.5% of state and local government budgets were spent on healthcare which is an 8% increase over the previous year and twice the national rate of increase (CMS, 2014). State and local government healthcare expenditures has increased by 262% from 1987-2013 with Medicaid increasing by 386% (Tracking Key Health Indicators. 2014). Rapidly rising health care costs are driving up the fiscal sector's long-term difficulties (Government Accountability Office (GAO), 2008). Healthcare spending is the single greatest threat to state and local government long-term fiscal health. In 2013, state and local government health costs was 3.8% of GDP of the country and it will increase to 7.2% in 2060 (GAO, 2013).

For example, in 2009, California spent the maximum amount on health spending ($2,30,089.80) and Wyoming spent the least ($3,832.65) (CMS, 2013). Per capita healthcare expenditures similarly varied widely among the states. Utah spent the least ($5,030.94) with median spending being that for Louisiana ($6,795.26) and the District of Columbia ($10,348.85) spent the maximum. The magnitude of healthcare expenditures at the state-level is influenced by a variety of factors. These may include the demographic profiles (OECD, 2006; Wang, 2009) of the residents, economic environment (Firat and Kein, 2013; Wang, 2009), political climate, supply of healthcare (Martin et al., 2002; Murthy and Ukpolo, 1994; Wang, 2009) and other factors.

Containing costs has become a priority for all state governments. To understand, the policy response of state governments in containing healthcare expenditures, it is critical to examine the sources of funding for healthcare at the state level. Therefore, the primary objective of this paper is to describe the various sources of funding for healthcare at the state-level and examine the association between demographic profiles of the residents, economic environment, political climate, healthcare infrastructure and healthcare needs and the healthcare funding by sources.

1.1 Types of Healthcare financing at the State level

State's finances healthcare to their residents through Medicaid, Medicare, subsidized premium to public employees, Children's Health Insurance Programs (CHIP), private health market and out-of-pocket spending by families. Medicare is the public insurance program created under the Social Security Act in July 1965 to provide coverage and funding for healthcare needs of the people at and above age 65, younger people with disabilities, end stage renal disease and

amyotrophic lateral sclerosis (CMS website). Medicaid is also the public insurance program that has been created for people of all ages who cannot pay for their healthcare expenses. It reallocates funds toward poor, low-income and sick populations. Out-of-pocket expenditure as defined by WHO (2014) is the:

> …direct outlay by households, including gratuities and in-kind payments, to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups.

Private health insurance comprises of the insurance coverage's provided by the nongovernmental organizations, such as private companies.

1.2 State level variations of Healthcare funding

Medicaid funding varies widely among the states. "Eight states account for over 50% of the Medicaid program's spending (California, New York, Texas, Florida, Illinois, Pennsylvania, Ohio, and Massachusetts). California and New York together spend 24.8% of the nation's Medicaid dollars. The 30 smallest Medicaid programs combined spend only 21% of Medicaid program dollars (Meara, 2012). Similar variations are also evident for Medicare funding (Rettenmaier and Saving, 2009). California (10.7%), Florida (8.3%), New York (7.2%), Texas (7.1%), Pennsylvania (5%), Ohio (4.1%), Illinois (4.1%) and Michigan (3.7%) are the states with largest amount of Medicare spending of the total US spending on Medicare in 2009 (CMS, 2009)."

In 2009, the lowest state level private health insurance coverage rate was for New Mexico (24%), while the highest for the District of Columbia (49.1%). Michigan (10.2%) had the out-of-pocket expenses with Louisiana, having the largest (17.2%) (Medical Expenditure Panel Survey (CMS, 2009).

1.3 Determinants of private, public and personal healthcare funding

Table 1 provides the definition of the variables and the expected sign for the coefficients that explains the variation in public, private and out of pocket healthcare expenditures. These determinants has been subdivided as-

1.3.1 Economic profile

The economic climate of the state influences the sources of funding. The factors contributing to economic variations are-

1) Gross Domestic Product (GDP) - One of the important factors that influence healthcare funding at the state-level is the state's GDP. Change in the GDP of a state can change the private, public, and personal healthcare funding. For example, when the state economy flourishes, the state government has more money to spend on all sectors of the economy, including healthcare. Thus, an increase in GDP will be associated with an increase in public health funding (Rettenmaier and Saving, 2009). An increase in GDP may also reflect improved economic

characteristics of the individual. Therefore, an increase in GDP will also be associated with an increase in private insurance market. An increase in GDP may also reflect increased income of the residents of the state and therefore, an increase in GDP may be associated with increased affordability of medical services resulting in higher out-of-pocket healthcare spending as well.

*2) Unemployment rate and poverty rate-*The unemployment rate, a proxy for economic climate of the state can change the level of public health spending. As unemployment rate increases, the healthcare spending by the state will also increase. Individuals without jobs may not have insurance coverage and may need to rely on Medicaid or public assistance for healthcare coverage (Rettenmaier and Saving, 2009). Similarly with increase in poverty rate, public health insurance increases as these people have to rely on public health funding to access healthcare services as they don't have any alternative method of payment. Thus, as unemployment and poverty rate increases, the proportion of public funding may also increase (Mays and Smith, 2011). Increasing unemployment rates may cause an upward pressure on out-of-pocket spending (Nair, 2006), if the unemployed do not qualify for Medicaid coverage.

3) Uninsurance rate- The rise in the number of uninsured people drives up the out-of-pocket expenses because now to access health services, these people have to pay on their own. They don't have any additional support of private of public sources. Therefore, a rising rate of uninsured increases the healthcare fundings (Nair, 2006).

4) State tax revenue- The government funds the increasing costs in the healthcare sector though taxes or by borrowing (Emanuel and Fuchs, 2008). CMS (2008) report states that "the financial burden of health care costs resides with businesses, households, and governments that pay insurance premiums, out-of-pocket costs, or finance health care through dedicated taxes or general revenues." Thus, state tax revenue has positive association with public and out of pocket financing.

5) Federal funding- Percentage of federal funding to the state general fund (Benjamin, 1986) is an important driving factor for public health insurance financing to the states over the years. The more the central government provides funds to the states, the lesser is the burden on the state's economy. This compensation amount also determines how much interference the states want from the federal government and how much independence they want in their health reform decisions (Bachrach and Boozang, 2011).

6) Federal Medicaid Assistance Percentage (FMAP) - A higher rate of Federal Medicaid Assistance Percentage (FMAP) may be associated with lower levels of healthcare funding by the state (public). For example, in 2012, FMAP rates were as high 74.17% in Mississippi and as low as 50% in Wyoming (Federal Register, 2014). As reported by Meara (2012), "Federal government finances the majority of Medicaid spending with states covering the remainder at rates that vary from 24% in the poorest states to 50% in states with higher incomes."

1.3.2 Demographic profile

Demographic profiles of the state may also influence the nature of healthcare spending.

7) Aged population- As the proportion of elderly increases, healthcare funding by the state may also increase. This may be because elderly individuals need expensive and long-term healthcare (Benjamin, 1986; Calmus, 2013). Elderly individuals are also more likely to use long-term medical care and home health care facilities (Calmus, 2013; McCall, 2001). Elderly over age 65 are typically covered through Medicare (Fischer, 1980). However, elderly individuals are also more likely to be poor (Wu and Baer, 2010) and therefore, dually eligible for Medicaid. Indeed, many residents spend-down so that they become eligible for Medicaid and can gain access to nursing home care (Kassner, 2000). All these factors may interact with each other and lead to higher healthcare funding by the state (Benjamin, 1986; Lukens, 2014; Hanratty et al. 2012).

*8) Race -*The African-American population has different lifestyle, cultural differences and socio-economic disadvantages (Bose, 2015; Nair, 2006). They also constitute the low or middle income group of population and suffer from various chronic diseases and poor health conditions (14.6%, CDC (2013)). They also constitute the group with a very high un-insurance rate (21%, Kaiser State Health Facts, 2011). Hence, a greater part of this population might be depending on personal spending on healthcare needs.

9) Ethnicity- Concentrating on the ethnic disparity, it has been observed that 25% of Medicaid enrollees are Hispanics (Kaiser Medicaid Facts, May 2011). Medicare also covers a small percentage (5%) of the Hispanic population in the U.S. 32% of the Hispanic individuals are uninsured. Therefore, a major proportion of Hispanic population who has insurance is covered by Medicaid or Medicare. As a result, with increasing population of Hispanics in the U.S. (U.S. Census Bureau, 2012), the public healthcare funding might increase.

*10) Gender-*The female population needs more medical care in form of prescription drugs, checkups, doctor visits, and they have a higher percentage of insurance coverage in the form of Medicaid (58% in 2011, Kaiser State Health Facts) and Medicare, (56% in 2013, Kaiser State Health Facts) as in comparison to the male population. Hence, an increase in the rate of the female population will drive the public health insurance market upwards (Nair, 2006).

1.3.3 Political Climate

The political climate of the state also influences the spending by the state.

*11) Party in control of state legislatures-*Budget and other policy decisions are made by the major governing party. States with democrats as the governing majority may be more likely to be in favor of investing state funds on healthcare and expand access to health insurance compared to states with republicans as the governing majority (Lukens, 2014; Rosenthal, 2004; Fischer, 1980).

*12) Enrollment rate –*As highlighted by Meara (2012), 50% of the 59 million Medicaid enrollees lives in eight states (California, New York, Texas, Florida, Illinois, Pennsylvania, Ohio, and Massachusetts). Out of this, 25% of the enrollment is from California and New York. The enrollment rates vary widely because of the diverging criteria's of the states to be eligible for

Medicaid coverage. Rate of Medicare enrollment also witnessed similar variation. In 2009, West Virginia has the largest enrollment of 20.71% and Utah had the smallest of 9.84%. Lukens (2014) also reported that total enrollment positively influenced public healthcare funding.

*13) Health Maintenance Organizations (HMO)-*Yet another factor that may influence healthcare spending by states are the penetration of health maintenance organizations (HMO). There is evidence of association between HMO penetration rate and healthcare financing (Baker, 2000). HMO enrollees are more likely to use preventive care (Greene et al., 2001) and less likely to use expensive services such as inpatient care (Tu et al., 2000). As stated by Wickizer and Feldstein (1995), competitive strategies of managed care and their entry in the market reduce the health insurance premium growth rate and also prevent the private insurance market to expand. All this may result in reduction of the overall healthcare funding (Greene et al., 2001).

1.3.4 Healthcare needs

Another important factor associated with healthcare funding is healthcare needs of states' residents.

14) Obesity rate- This is of specific importance with respect to the US as obesity rates and thereby obesity-attributable healthcare expenditures vary across states (Trogdon et al., 2012). As reported by them, 50% of the obesity-attributable expenditures in 2003 ($75 billion) was funded by Medicare and Medicaid. While Wyoming had the lowest spending of $87 million ($38 million from public healthcare funding), California had the highest spending of $7.7 billion ($1.7 billion from public healthcare funding). This demonstrates that there may be a positive association of healthcare needs with healthcare funding.

1.3.5 Healthcare supply variables

The supply-side variables, such as the proportion of active physicians and the total number of hospitals and hospital beds, vary widely across the states (Zuckerman et al., 2014) and influence health insurance markets (Benjamin, 1986).

*15) Active physicians-*The greater the number of physicians treating Medicare and Medicaid patients, the higher the amount of money the state and federal governments have to reimburse for their service fees. Further it also increases the private health insurance funding and personal funding. Hence, with increase in physicians, healthcare funding increases in general (Benjamin, 1986; Lukens, 2014).

*16) Hospitals and hospital beds-*Higher number of hospital beds and number of hospitals in a state may have ambiguous effect on healthcare funding. Increase in number of beds might lead to an increase in total healthcare funding (Benjamin, 1986). Kiselev (2010) reported that hospitals are suffering financial debt due to low reimbursements from Medicare and Medicaid coverage and also due to greater amount of uninsured population. The number of privately owned hospitals has been increasing and the number of publicly owned hospitals is decreasing thereby causing a downward impact on public healthcare funding (Horwitz, 2005).

1.4 Unique contribution

No study so far has examined factors associated with all three types of healthcare financing at the state-level. As mentioned earlier, it is critical to understand the sources of healthcare funding and its determinants at the state-level. Therefore, this study describes the sources of funding (public (Medicare and Medicaid) and private (private insurance and out-of-pocket expenses)) and the demographic profiles, economic environment, political climate, and supply-side factors associated with healthcare funding sources between the period of 2001 and 2009.

Employing a state fixed-effect model helps in controlling the fixed differences among the states that are unobservable state-level factors which potentially leads to inefficient estimates (Lukens, 2014). In addition to the fixed-effects method, this paper presents the pooled ordinary least squares (OLS) analysis because a pooled model incorporates both between-state and within-state variation (Lukens, 2014) and a first-difference model as a robustness check to the afore-mentioned methods of analysis.

2. Model

A panel data regression model has been considered for the state-level data analysis for this study for all of the three models. This is because the panel regression analysis "is a method of studying a particular subject within multiple sites, periodically observed over a defined time frame (page 1) (Yaffee, 2003)." It is a combination of time series with cross-sections that enhances the quality and quantity of data in ways that will not be possible to achieve using only one of these two dimensions (Yaffee, 2003). Therefore, as stated by Yaffee (2003), "Panel data analysis endows regression analysis with both spatial and temporal dimension (page 1)." Hence, in order to control for the unobserved heterogeneity, panel regression analysis approach is considered to be the most appropriate method for this multiple year's dataset. It also removes bias from the estimation techniques that might have been the problem faced by the previous studies.

The basic framework of the panel data regression model used for this study is of the form:

$$Y_{it} = X_{it}'\beta + Z_i'\alpha + u_{it} \tag{1}$$

Where Y is the dependent variable, u=error term, t=time period and i=state. X_{it} has K regressors without the inclusion of the constant term. The heterogeneity or individual effect is $Z_i'\alpha$, where Z_i contains a constant term and group specific variables, which may or may not be observed. If Z_i is observed for all individuals, then the model is reduced to an Ordinary Least Square Model. The two types of panel data models considered for the analysis are-fixed effects model and random effects model. STATA 12 is used to perform the data analysis.

2.1 Fixed effect model

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \tag{2}$$

Where α_i is the coefficient for each entity, Y_{it} is the dependent variable, t = time, X_{it} represents one independent variable, β_1 is the coefficient for X_{it} and u_{it} is the error term

2.2 Random effect model

$$Y_{it} = \beta_1 X_{it} + \alpha + u_{it} + \varepsilon_{it} \tag{3}$$

Where u_{it} is the between entity error term and ε_{it} is within entity error term.

2.3 Robustness check

The first difference method has been employed to check the robustness of the panel regression model and the pooled OLS model used for the study. The first-difference method eliminates measurement error and inconsistency created by unobserved effects (omitted variables) from the model (McManus, 2011) by regressing changes of healthcare fundings on the changes in explanatory variables (Lukens, 2014). This model is also referred to as the first-difference fixed effects model. For instance, considering the general form of the model as:

$$Y_{it} = X_{it}'\beta + c_i + u_{it} \tag{4}$$

Therefore the first-difference transformation can be written as:

$$Y_{it} - Y_{it-1} = (X_{it}' - X_{it-1}')\beta + c_i - c_i + u_{it} - u_{it-1} \tag{5}$$

Or, $\Delta Y_{it} = \Delta X_{it}'\beta + \Delta u_{it}$ with no intercept term (McManus, 2011).

2.4 Statistical Analysis

2.4.1 Breusch Pagan Lagrange Multiplier

To determine which model is appropriate for the state-level data analysis, the Breusch and Pagan Lagrange multiplier [1980] (LM) test is performed.

$$LM = \frac{(\sum_{i=1}^{N} T_i)^2}{2(\sum_{i=1}^{N} T_i(T_i-1))} \left[\frac{\sum_{i=1}^{N}(\sum_{t=1}^{T_i} e_{it})^2}{\sum_{i=1}^{N}(\sum_{t=1}^{T_i} e_{it})^2} - 1 \right]^2 \tag{6}$$

Where e_{it} is the residual term of the OLS model. This follows χ^2 distribution. It considers the null hypothesis, H_0 = the best fit model is Ordinary Least Square Model (OLS) against the alternative H_1 = the fixed effect or random effect model is the more appropriate model. If the LM test value is significant and it rejects the null hypothesis, then it is confirmed that the OLS model is not applicable for this analysis. This is followed by the Hausman specification test (1978) to see which of the random effect or the fixed effect model is the preferred one.

2.4.2 Hausman Specification Test

$$H = (\beta_1 - \beta_0)'(Var(\beta_0) - Var(\beta_1))''(\beta_1 - \beta_0) \tag{7}$$

The Hausman test examines the null hypothesis H_0 = coefficients estimated by the random effects estimator which is consistent and efficient (β_1) are same as the ones estimated by the consistent fixed effects estimator (β_0) (Princeton University Library, Data and Statistical

Services). The alternative hypothesis H_1 = coefficients estimated by the efficient random effects estimator (β_1) are different from the ones estimated by the consistent and efficient fixed effects estimator (β_0). If the test value is insignificant, then random effect model needs to be used for the study. However, if the value falls in the critical region and it is significant, then the state fixed effect model is the appropriate one.

3. Types and Sources of Data

The data that has been used for the study is collected from various sources. The first data source is the *U.S. Bureau of Economic Analysis.* This source provides data on consumer expenditure variables that represent state-level statistics. Data on personal consumption expenditure for health from this source has been used to calculate the state-level out-of-pocket expenditures on health services. This out-of-pocket spending value is the average amount of money spent by the consumers of a state on health care services from their own income (apart from spending on health insurances).The second data source that has been used is the *Centers for Medicare and Medicaid Services(CMS)*. Data on total personal health care spending, public funding (Medicare and Medicaid), and private health insurance funding has been obtained across the states for the years 2001 to 2009 (Health Expenditures by State of Residence) from this resource.

The third data source used is the *U.S. Census Bureau.* This contains data of the independent variables for state-level analysis namely—the gross domestic product of each state, the percentage of population above age 65, percentage of population below age 17, number of active physicians per 100,000 civilian population, poverty rate, unemployment rate, percentage of uninsured people, region, HMO, party in control of the U.S. state legislatures, state tax revenue, percentage of Medicare enrollment, percentage of Medicaid enrollment and percentage distribution of population by gender, ethnicity and race (Population Estimates, U.S. Census Bureau).

The fourth source is the *State Health Facts* which is the data source provided by the Henry Kaiser Family Foundation. Data on the hospital bed per 1,000 population and the total number of community hospitals are obtained from this data source. The fifth data source is the *State Expenditure Report*. It provides data on the percentage of federal funding to each state over time period considered for the study. The sixth data source is *Center for Disease Control and Prevention (CDC)*. Data for obesity rate has been obtained from this source. The last data source used is the *U.S. Department of Health And Human Services* to acquire the Federal Medicaid Assistance Program rate.

The classification of variables used for this state-level analysis is provided in Table 1. Eighteen independent variables are in the per capita or percentage form for this analysis. An interaction term of hospital beds and the total number of hospitals has been considered for the analysis as they are highly correlated (0.77). The dependent variables for the three models are—Per capita value of public healthcare funding, private health insurance financing and out-of-pocket expenses.

4. Results and Discussion

4.1 Descriptive Statistics

The descriptive statistics for the dependent and independent variables used for the analysis has been summarized in Table 2. The statistical values indicate that the independent variables vary widely across the states and over the years. In terms of percentages, while out-of-pocket expenses varied from 11.1% (Utah) to 20.57% (West Virginia), public funding varied from 24.3% (Utah) to 50.1% (New York) and private health insurance varied from 22.6% (New Mexico) to 50.8% (District of Columbia). Federal funds reach a maximum of 49.1% (Louisiana) with Massachusetts being the lowest of all. Mississippi has the lowest HMO rate (0.1%) and the highest is for the District of Columbia (64.1%). Mississippi has the highest FMAP rate with the lowest rate for California. The unemployment rate is the lowest in Connecticut (2.3%) and the highest is in Michigan (13.3%). Poverty rate falls to 5.3% for New Hampshire and reaches to 21.9% for Mississippi. The African-American population diverges from 0.37% to 60.26% for Maine to District of Columbia. The highest population of Hispanics was in New Mexico (45.56%) and the lowest in West Virginia (0.67%). Massachusetts has the lowest uninsured rate of 4.4% and reaches maximum for Texas (26.1%).

4.2.1 Model I: Public Sources of funding (Medicare and Medicaid)

With the LM test results in Table 3 (χ bar^2 value=657.48, 1% level of significance) suggesting that the suitable model for this study is a panel regression model, the Hausman specification test (χ^2=99.58, 1% significance level) in Table 4 states that the fixed-effect panel model is preferred to the Random effect model. The R^2 value for the state fixed-effect model is 0.93, which reports that 93% of variations in state-level public health insurance funding are explained by this model in Table 5. Therefore, it is a very good fit model to elucidate the changes in public funding across the states over time. Factors such as the unemployment rate, the proportion of the female population, active physicians per 100,000 population, percentage of people over age 65, per capita GDP of the state, the percentage of Hispanic population, total enrollment rate (Medicare and Medicaid), per capita tax revenue and obesity rate demonstrates positive effects on public health care financing. Alternatively, FMAP rate, interaction term of hospitals and beds and percentage of HMO rate negatively impact public healthcare financing.

The aged population mostly uses public sources of funding to pay for their medical care. Thus with an increase in percentage of elderly people, the state and central government has to invest more money to cover a much larger population under Medicare, to pay for their treatments and medical bills, causing the public source of health care funding to increase. It can also be seen that with the rise in the unemployment rate, public healthcare funding experiences a positive increase. The rise in the number of people with no jobs leads the state government to invest more money on unemployment insurances and these people are also entitled to Medicare and Medicaid if their income level falls below the stipulated federal poverty level (criteria to be fulfilled to be enrolled as Medicaid beneficiary).

Concentrating on the racial disparity, it has been observed that 27% of Hispanic individuals are covered by Medicaid (Kaiser Medicaid Facts, May 2011) and 5% is covered by Medicare. Therefore, with increase in the percentage of Hispanic population with insurance, public financing of healthcare increase. Evidently, female population needs more medical care in

forms of prescription drugs, checkups, doctor visits, and they have a higher percentage of insurance coverage in the form of Medicaid (58% in 2011, Kaiser State Health Facts) and Medicare, (56% in 2013, Kaiser State Health Facts) as in comparison to the male population. Hence, an increase in the rate of the female population will drive the public health insurance market upwards.

It can be seen that an increase in supply side variable such as the number of physicians boost public health care financing. With rise in the number of active physicians, the state and local government has to pay more for their fee for services thereby increasing the total funding. Per capita state GDP also has a positive impact on the public healthcare funding. Rise in total GDP demonstrates that the state economy is doing well hence the state can invest more funding on health insurance coverage for the children, poor, needy and elderly population. Hence, the total public healthcare funding rises. Rise in enrollment rate for Medicare and Medicaid beneficiaries means that state government is investing more funds in public health insurance financing. Increase in per capita state tax revenue implies that state government can finance more state health costs. Thus, with rise in state tax revenue, public healthcare financing increases.

With increasing obesity rate, the obesity rate, the obesity-attributable medical expenditures increases. As a result it increases the Medicaid and Medicare funding along with it as seen before that 50% of this expenditures are funded by public healthcare financing. With rise in the enrollment rate in HMO, the population has fewer requirements of inpatient and outpatient services and suffers less from chronic diseases. This lowers down the total public health care financing. Increase in FMAP rate is negatively associated with public healthcare funding. The higher the amount of assistance that federal government provides to a state, the lower is the amount of funding that the state has to invest.

With rising number of hospitals and beds, total public healthcare funding decreases. With time, number of privately owned hospitals is increasing and state owned hospitals are decreasing. The reimbursement rate for Medicare and Medicaid patients are lower for hospitals. This might be causing a decreasing trend in total public healthcare funding. Thus all of the above mentioned significant factors add up to impact the public health funding of a state positively.

4.2.2 Model II: Private Health Insurance Funding

It is apparent from Table 3 that the Breusch Pagan LM test value (χ bar^2 =207.43) is significant at the 1% level. This rejects the null hypothesis (H_0 = OLS is the preferred model, against H_1= Random or fixed effect model is the preferred model) stating that a panel regression analysis (a fixed effect model or a random effect model) is the suitable one. Thus, in implementing the Hausman specification test results (Table 4), which rejects the null hypothesis, too (χ^2 = 60.09, significant at 1% level), it is inferred that fixed effect model is the most appropriate fit to estimate the factors influencing state-level private health insurance funding. The R^2 value for the state fixed effect model in Table 6 highlights that the model and its independent variables have been able to capture 84% of the fluctuations in private health insurance funding.

The set of factors that positively influences private health insurance fund are per capita state GDP, active physicians per 100,000 populations, enrollment rate and obesity rate. Apart from these factors, rate of federal funding to the state general funding has negative impacts on private health insurance. The largest positive significant effect on the deviations of private health insurance financing is revealed by the GDP of the state. The rise in the GDP means economy of the state is doing well. It means the average income of the people will increase and they will be able to afford more private health insurance coverage for their health services from the profit and non-profit organization selling those insurances. The results highlight that an increase in the proportion of active physicians in a state increases the total private health insurance funding of the state. Increase in the obesity rate not only increases public healthcare funding but it also increases private health insurance funding. Rise in the rate of federal funding to the state general fund compensates a larger share of the medical spending. Hence this has a negative impact on the private health insurance market.

4.2.3 Model III: Out-of-pocket Expenditures

The χ bar^2 value of the LM (Breusch Pagan) test (581.29) in Table 3 is significant at 1% level. Thus this test rejecting the ordinary least square estimation process signifies that either fixed effect or random effect model is the best fit model. Performing Hausman specification test, the χ^2 value = 64.06 of the test result in Table 4 being significant at 1% level rejects the null hypothesis H_0 =Random effect model (the individual specific effects are not correlated with the regressors) and indicates that the alternative hypothesis H_0 = fixed-effect model (the individual specific effects are correlated with the regressors) is the appropriate one. Table 7 provides the coefficients of explanatory variables, their standard errors, and t statistics for out-of-pocket spending resulting from the state fixed-effect panel analysis, pooled OLS model analysis, and first-difference model analysis.

The R^2 value from the state fixed effect model affirms that approximately 92% of variation in the state-level out-of-pocket expenses has been explained by the explanatory variables thus confirming the model to be a very good fit. Per capita state tax revenue, proportion of the population that is African-American and female population, active physicians, proportion of the population above age 65, per capita state GDP, enrollment rate and obesity rate has positive and significant influences (at 1% level) on out-of-pocket spending. Additionally, the percentage of population below age 17 and percentage of Hispanic population has negative impact on personal health care funding.

The elderly suffer from more health problems than does the rest of the population. Medicare provides the aged with finance needed to pay for their medical bills, but this doesn't cover all costs incurred for their treatments, such as the long-term health care facilities (only certain services are covered by Medicare for a limited time period), prescription drugs, etc. Additionally, the federal government doesn't compensate the entire fees of physicians who are treating Medicare patients. The federal government is also reducing the reimbursement rates for the services provided by physicians to Medicare patients, thereby placing this group of the population at a greater risk of getting turned down from being treated or getting efficient health care services.

Therefore, they need additional resources to pay for their extra medical needs. The premiums needed to be paid to buy private health insurance, as additional funding is much higher for the elderly since they are more susceptible to becoming sick and have greater medical care needs. Furthermore, the medical benefits that the employers of firms offer after the retirement of their employees are declining (Golberstein et al., 2013; Lukens, 2014). As a result, the elderly population has to depend on their own incomes to pay for the charges that are not financed by public sources. Therefore, with the rise in the elderly population of a state, the out-of-pocket expenditures of the state increase.

The African-American population has cultural differences and socio-economic disadvantages (Bose, 2015). They also constitute the low or middle income group of population and suffer from various chronic diseases and poor health conditions (14.6%, CDC (2013). They also constitute the group with a very high un-insurance rate (21%, Kaiser State Health Facts, 2011). Hence, a greater part of this population uses their own income to pay for the health care services that they access, driving the total state out-of-pocket spending upwards. The rise in per capita state GDP and the per capita state tax revenue indicates that the average income of people is higher, helping them to spend more on medical facilities as needed. Hence, there is a rise in all the three types of financing of the health care services. Out-of-pocket expenses being one of them experience the same increase.

The increase in supply side variables such as the number of active physicians has witnessed a higher number of hospitalizations and office visits, thereby creating additional health expenses for the people of the state. It can be seen that the proportion of the population below age 17 has a negative impact on the out-of-pocket expenditures. This group of population on average being very healthy does not need health services as others do. This leads to a decrease in the total out-of-pocket expenses of the state. Hispanics comprises of the highest percentage of uninsured people (30.7% in 2010, DeNavas-Walt et al., 2011). This group of population usually doesn't access health care facilities to a large extent. This will decrease the total out of pocket expenses.

First-difference analysis as a check of robustness for the state fixed effects model results is presented along with each of the models in Table 5, 6 and 7. These "additional specification controls for the unobserved differences between states (Page 27) (Lukens, 2014)" and the robustness check "provides considerable confidence to the estimates (Page 27)" (Lukens, 2014). Coefficients of all the variables that are significant in state fixed effect analysis for public insurance funding are also significant in first difference analysis except for per capita state tax (insignificant) and FMAP rate (opposite sign). Results varied among state fixed effect and first difference analysis for private insurance funding. While, percentage of federal funding and enrollment rate (Medicare and Medicaid) are insignificant, percentage of Hispanic population is significant for first difference analysis. Finally, findings of out of pocket expenses varied widely. In addition to the significant variables of state fixed effect analysis of out of pocket expenses; uninsured rate, percentage of federal funding, FMAP rate, HMO rate and proportion of active physicians are significant and percentage of aged, female, state tax revenue, enrollment and obesity rate are insignificant for first difference analysis. Hence, this paper has successfully established the determinants that have been causing variations in the all the three sources of healthcare funding among the states.

5. Conclusion and Policy Implications

5.1 Summary

The present analysis determines that economic profile, demographic factors, social and political variables, healthcare needs, supply side and other factors explain variations in all three sources of financing—public (Medicare and Medicaid), private health insurance and out-of-pocket expenses at state-level health care from 2001 to 2009. Employing models of state fixed effect, pooled ordinary least square and first-difference analysis (for a robustness check), it can be seen that these variables impact the types of funding extensively. It can be seen that public funding (Medicare and Medicaid) within a state is positively influenced by the unemployment rate, the proportion of the female population, active physicians per 100,000 population, percentage of people over age 65, per capita GDP of the state, the percentage of Hispanic population, percentage of individuals enrolled in Medicare or Medicaid, per capita tax revenue, and obesity rate. Alternatively, FMAP rate, interaction term of hospitals and beds and percentage of HMO enrollment negatively impact public healthcare financing.

While private insurance financing is inversely proportional to the federal fund rate, it is directly (positively) proportional to active physician, per capita state GDP, percentage of individuals enrolled in Medicare or Medicaid and obesity rate. Lastly, out of pocket expenditures are positively impacted by the African-Americans, females, per capita tax revenue, active physician, proportion of elderly population (aged 65 and above), per capita state GDP, percentage of individuals enrolled in Medicare or Medicaid and obesity rate. It is also negatively influenced by percentage of Hispanic population and proportion of the population below age 17.

5.2 Policy Implications

Cost of healthcare is a perennial policy concern. Policy responses to contain healthcare have been fragmented and have focused on some aspects. The majority of public healthcare funding by state governments comes from Medicare and Medicaid. Currently, healthcare funding by public sources (i.e. Medicare and Medicaid) make up 44% of healthcare spending (CMS, 2012) and is expected to increase to 50% by 2021(WHO, National Health Account database, World Bank). Therefore, Medicare/Medicaid reforms to contain costs will help in reducing the reliance on healthcare funding by public sources for all the states.

This study's findings highlighted the role of factors beyond healthcare sector. Unfortunately, all healthcare policy reforms have exclusively focused on healthcare sector. Policy efforts are needed to strengthen non-health sector as well. For example, findings from this study suggest that the economic profile of the states such as unemployment rates, GDP, state tax revenues play a significant role in healthcare funding by public sources. As the economic stability is one of the key components to reduce the reliance on healthcare funding from public sources. Indeed, the US economic climate shapes the health coverage and costs, and financial access to care and health outcomes (Impact of the Economy on Health Care, 2009).

Social determinants of health also need to become one of the most essential parts of our healthcare conversation. Changes in social norms by denormalization/stigmatization (eliminate

or change health behaviors which were considered acceptable or desirable to reduce or eradicate resistance towards health policies), change of attitude and isolation of morality instead of discrimination or social isolation, increasing networks should be the goal to enact health policy successfully. Effectiveness of any health policy depends on the population's rate of utilization and access which depends on the demographic profile of the population. "Increasing health insurance coverage as a reform is not sufficient to systemic barriers to access like health care workforce shortages in low-income communities, or the higher prevalence of chronic diseases in some populations (WHO)." To promote a social determinant approach towards healthcare policy, policy efforts need to be coordinated among different sectors of the economy, different population groups and organizations (WHO, 2015).

Patient Protection and Affordable Care Act (ACA) included some reforms to reduce overall healthcare spending and financing while maintaining reasonable healthcare quality. These reforms include cost-savings through Accountable Care Organizations (ACOs), restrictions on the amount of money spent on administrative costs and marketing bundle payments, moving from FFS to payment based on outcomes etc. "Under bundled payments, doctors, hospitals and other health providers share a fixed payment that covers the average cost of a "bundle" of services (Hernandez, 2014). The "health care organizations will have more autonomy on funds and deliver care (Hernandez, 2014). Further under this payment system, healthcare providers will be forced to treat a minimum number of patients (because of threshold administrative costs) thereby increasing more treatments and access of healthcare for the people.

"ACO is a network of doctors and hospitals that shares financial and medical responsibility for providing coordinated care to patients thereby limiting unnecessary spending. It takes care of the healthcare requirements of the elderly (as it needs to manage of a minimum of 5,000 Medicare beneficiaries)" (Gold, 2014). Therefore this organizations will focus on reducing hospital costs by decreasing hospital stays, emergency visits, expensive tests etc. and it has been projected that ACO will save Medicare spending by $940 million in 4 years (Gold, 2014).

In this study, states with higher obesity rates had higher share of healthcare spending across all sources. Annual medical care costs of obesity in the U.S. were about $190.2 billion in 2012 or 21% of the total medical costs (Cawley and Meyerhoefer, 2012). Obesity "put individuals at risk for the leading causes of death in the US including: heart disease, certain cancers, and stroke, as well high cholesterol, type 2 diabetes, sleep apnea, and other negative physical and mental health outcomes (CDC)." Obesity prevention requires approaches that "ensure a sustainable, adequate, and nutritious food supply; a habitat that lends itself to easy uptake of healthier food; participation in physical activity; and a family, educational, and work environment that positively reinforces healthy living. Very little of this action sits within the capabilities or responsibilities of the health sector (WHO)".

As acknowledged earlier, most states have reduced their public healthcare budget in 2011-2012. However, the federal government has initiated programs in 28 state health departments via CDC (bureaucratic federal agency) to prevent and control obesity and other chronic diseases (American Obesity). Preventing obesity and its related chronic diseases should be a major focus of healthcare cost-containment efforts. Obesity Prevention efforts can save billions of dollars over 75 years. Therefore increasing funding for obesity-prevention programs will be important to achieve results in improving health and reducing healthcare costs and financing for the future.

Another way of addressing this issue is changing the choice structure of people (people are forced to make healthy choices) to make the prevention programs and health policies more effective to control costs.

This study's findings suggest that investment in prevention of diseases and obesity may reduce healthcare spending by all sources (i.e. government, private, and individuals). Currently, most of the healthcare spending is devoted to treating chronically ill patients and very little is spent on health promotion and prevention. According to Thorpe (2005), an overwhelming percentage (90%) of spending is for sicker patients, spending $1,000 per year or more. The ACA "breaks new ground" by investing in prevention of diseases (Advisory Committee on Immunization Practices (vaccinations, preventive care and screening), U.S. Preventive Services Task Force (screening for cancer, HIV and depression, alcohol-misuse counseling, effective treatment, follow-up and immunizations)) and promoting health and wellness in the population (Howard and Sebelius, 2010). Such prevention investments need to be amplified to reduce healthcare spending on sickness.

Endnotes

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Table 1: Definition of Variables

Dependent Variables	Definition			
Per capita Public Health insurance funding (a)	Per capita value of Public Funding (Medicare and Medicaid)			
Per capita Private health insurance funding (b)	Per capita value of Private Health Insurance Funding			
Per capita Out of Pocket Expenses (c)	Per capita value of Out of Pocket Expenditure			
Independent Variables		**Expected sign of coefficients**		
Economic Profile		(a)	(b)	(c)
Uninsured rate	Percentage of people without any insurance	+	-	+
Per capita GDP	Per capita value of state Gross Domestic Product	+	+	+
Unemployment rate	Proportion of unemployed population	+	-	+
Federal funding rate	Percentage of federal fund to states	-	-	-
FMAP rate	Percentage of Federal Medicaid Assistance Program	-	-	-
Per capita State tax revenue	Per capita value of State tax revenue	+	-	+
Poverty rate	Percentage of population below the poverty line	+	-	+
Demographic Profile				
Proppopbelow17	Proportion of the population below age 17	-	-	-
Proppopabove65	Proportion of the population above age 65	+	+	+
African-American	Percentage of African-American population	+	+	+
Female	Percentage of female population	+	+	+
Hispanic	Percentage of Hispanic Population	+	+	-
Political Profile				
Party in Control of State Legislature	Republican=0 and Democrat=1	+	-	-
Percentage enrolled in Medicare and Medicaid	Total percentage of enrolled in Medicare and Medicaid	+	+	+
HMO	Percentage enrolled in Health Maintenance Organizations	-	-	-
Healthcare needs				
Obesity rate	Percentage of population suffering from obesity	+	+	+
Supply factors				
Hospital	The total number of community hospitals	-	+	-
Hospbed	Total number of hospital beds per 1000 population	+	-	+
Actphys	The total number of active physicians per 100,000 population	+	+	+
Region dummy	Regions (as named in CMS coded in numeric dummy format for analysis purpose Northeast=0, Midwest=1, West=2, South=3)	-	-	-

Table 2: Summary Statistics (Public, Private Health Insurance and Out Of Pocket Expenses) 2001-2009 for 48 states and D.C.

Variable	Unit	Observations	Mean	Standard Deviation	Minimum	Maximum
Region dummy	Unit	441	2.612	1.028	1.000	4.000
Per capita Out of Pocket expenses	$	441	9110.194	2512.844	3662.561	17845.520
Per capita Private health insurance	$	441	20592.140	5132.524	10570.620	50843.020
Per capita Public healthcare funding	$	441	20589.770	5773.549	7994.667	41817.430
Demographic profile						
Proportion of population above age 65	%	441	12.790	1.527	8.500	17.600
Proportion of population below17	%	441	24.490	2.108	18.930	43.757
Percentage of African-American population	%	441	11.658	11.561	0.373	60.268
Percentage of Female population	%	441	49.222	0.721	47.044	51.014
Percentage of Hispanic population	%	441	9.224	9.523	0.732	45.567
Economic profile						
Uninsured rate	%	441	13.738	3.875	4.400	26.100
Per capita GDP (Gross Domestic Product)	$	441	42346.540	16599.940	23668.720	165330.200
Unemployment rate	%	441	5.339	1.664	2.700	13.300
Federal fund%	%	441	28.054	7.807	3.943	49.170
Per capita tax revenue	$	441	2619.215	2974.148	1282.240	26687.540
Poverty rate	%	441	12.236	3.196	5.400	23.100
Percentage of enrollment in HMO	%	441	19.465	11.895	0.100	64.100
Political profile						
Control of State legislature	Unit	441	1.508	0.501	1.000	2.000
Enroll rate	%	441	32.291	6.155	18.653	56.381
FMAP rate	%	441	63.156	8.836	50.000	84.240
Healthcare outcomes						
Obesity rate	%	441	24.306	3.581	14.900	35.400
Health supply factors						
Active physician per 100,000 population	Unit	441	262.011	94.498	154.000	817.134
Hospital bed per 1000 population	Unit	441	0.294	0.215	0.012	1.087
Total number of Hospitals	Unit	441	99.825	79.715	5.000	428.000

Table 3: Breusch and Pagan Lagrangian Multiplier Test Results

Breusch and Pagan Lagrangian multiplier test for random effects	Public Insurance	Private Insurance	Out of Pocket Expenditure
$\bar{\chi}^2$	657.48***	207.43***	581.29***
P value	0.000	0.000	0.000

***, **,* represent 1%, 5% and 10 level of significance

Table 4: Hausman Test Results

Hausman Specification Test	Public Insurance	Private Insurance	Out of Pocket Expenditure
$\chi^2 (17)$	99.58***	60.09***	64.06***
P	0.000	0.000	0.000

***, **,* represent 1%, 5% and 10 level of significance

Table 5: State Fixed Effect Model, Pooled OLS Model and First Difference Model Results (Public Insurance)

	State fixed effect model			Pooled OLS model			First difference model		
	Coefficient	S.E	T value	Coefficient	S.E	T value	Coefficient	S.E	T value
Per capita Public Healthcare Funding									
Proportion of population above age 65 years	2291.227***	266.922	8.580	778.073***	99.137	7.850	1585.339***	296.147	5.350
Proportion of population below age 17 years	-27.566	55.252	-0.500	12.678	76.629	0.170	13.905	10.519	1.320
Percentage of Hispanic population	306.515**	133.882	2.290	-13.959	18.994	-0.730	1425.227***	375.306	3.800
Percentage of African-American population	59.037	226.969	0.260	-18.143	20.477	-0.890	60.338	364.023	0.170
Percentage of Female population	8605.453***	1163.734	7.390	435.873	377.567	1.150	5810.266***	1037.140	5.600
Unemployment rate	188.366**	73.252	2.570	252.960***	68.452	3.700	119.046**	60.346	1.970
Uninsured rate	8.067	41.382	0.190	160.853***	53.030	3.030	-23.793	18.952	-1.260
Per capita GDP	0.070**	0.035	2.010	0.164***	0.022	7.560	0.234***	0.055	4.230
Poverty rate	21.504	46.975	0.460	176.480***	61.298	2.880	14.259	22.129	0.640
Federal fund%	-0.418	16.802	-0.020	-35.180**	15.864	-2.220	18.052	15.442	1.170
Per capita tax revenue	0.691**	0.278	2.490	-0.829***	0.128	-6.460	0.143	0.414	0.340
Control of State legislature	-287.102	211.186	-1.360	-907.640***	248.544	-3.650	-50.286	112.544	-0.450
HMO rate	-33.235**	13.089	-2.540	-13.563	12.453	-1.090	-19.778**	7.355	-2.690
Percentage enrolled in Medicare and Medicaid	183.880***	29.105	6.320	273.943***	24.585	11.140	55.295***	19.026	2.910
FMAP rate	-0.079*	0.025	-2.020	7.577	23.907	0.320	40.965**	15.823	2.590
Obesity rate	496.669***	49.619	10.010	773.910***	41.795	18.520	110.902***	27.763	3.990
Active physician per 100,000 population	27.125***	6.218	4.360	34.020***	3.036	11.210	8.053**	4.870	3.650
(Total Hospitals*Hospital bed) per 1000 people	-5825.754*	3271.185	-1.780	-513.159	639.577	-0.800	25.318	371.338	0.070
Region dummy									
Mid-west				-5279.688***	397.013	-13.300			
South				-6571.919***	457.473	-14.370			
West				-5202.200***	534.237	-9.740			
Constant	-463610.400***	57145.050	-8.110	-50807.700**	19700.080	-2.580			
F value	293.4***			186.39***			52.38***		
R square	0.9339			0.8985			0.776		
N observation	441			441			392		

***, **,* represent 1%, 5% and 10 level of significance

Table 6: State Fixed Effect Model, Pooled OLS Model and First Difference Model Results (Private Insurance)

Per capita Private health insurance funding	State fixed effect model			Pooled OLS model			First difference model		
	Coefficient	S.E	T value	Coefficient	S.E	T value	Coefficient	S.E	T value
Proportion of population above age 65	237.374	333.389	0.710	-69.076	92.237	-0.750	-79.228	782.286	-0.100
Proportion of population below age 17	-100.975	69.011	-1.460	-99.273	71.295	-1.390	-37.196	60.720	-0.610
Percentage of Hispanic population	254.108	167.221	1.520	-46.633***	17.672	-2.640	1564.747***	348.694	4.490
Percentage of African-American population	186.037	283.488	0.660	-59.185***	19.051	-3.110	-87.221	304.347	-0.290
Percentage of Female population	1736.658	1453.524	1.190	665.338**	351.286	1.890	939.874	1657.060	0.570
Poverty rate	-1.103	58.672	-0.020	-151.555***	57.031	-2.660	21.256	46.929	0.450
Uninsured rate	63.926	51.687	1.240	32.603	49.339	0.660	26.496	40.618	0.650
Per capita GDP	0.269***	0.044	6.120	0.219***	0.020	10.870	0.219***	0.045	4.930
Unemployment rate	97.328	91.493	1.060	399.280****	63.687	6.270	85.694	104.305	0.820
Federal fund%	-37.368*	20.985	-1.780	-19.455	14.760	-1.320	-9.119	20.950	-0.440
Per capita tax revenue	-0.200	0.347	-0.570	-0.061	0.119	-0.510	0.297	0.380	0.780
Control of State legislature	15.825	263.774	0.060	-891.457***	231.244	-3.860	-470.752	392.765	-1.200
HMO rate	-17.675	16.349	-1.080	16.870	11.586	1.460	-6.830	16.429	-0.420
Percentage enrolled in Medicare and Medicaid	92.358**	36.353	2.540	-13.038	22.874	-0.570	2.314	46.807	0.050
FMAP rate	-0.708	34.331	-0.020	-41.634*	22.243	-1.870	-4.424	49.042	-0.090
Obesity rate	264.278***	61.976	4.260	560.366***	38.885	14.410	66.679	52.252	1.280
Active physician per 100,000 population	37.273***	7.767	4.800	14.233***	2.824	5.040	11.697**	5.604	3.100
(Total Hospitals *Hospital bed) per 1000 people	-367.936	4085.766	-0.090	-3685.807***	595.059	-6.190	-428.280	599.283	-0.710
Region dummy									
Mid-west				-600.040	369.379	-1.620			
South				-3045.433***	425.630	-7.160			
West				-3000.033***	497.051	-6.040			
Constant	-99853.020	71375.130	-1.400	-27341.120	18328.840	-1.490			
F value	112.02***			168.42***			47.63***		
R square	0.844			0.888			0.366		
N observation	441			441			392		

***, **,* represent 1%, 5% and 10 level of significance

Table 7: State Fixed Effect Model, Pooled OLS Model and First Difference Model Results (Out of Pocket Expenditure)

Per capita Out of Pocket Expenses	State fixed effect model			Pooled OLS model			First difference model		
	Coefficient	S.E	T value	Coefficient	S.E	T value	Coefficient	S.E	T value
Proportion of population above age 65	555.880***	131.405	4.230	316.443***	45.179	7.000	20.903	10.017	2.090
Proportion of population below age 17	-58.073**	27.201	-2.130	-85.564**	34.921	-2.450	0.134**	0.033	4.000
Percentage of Hispanic population	-197.390***	65.910	-2.990	-24.488***	8.656	-2.830	26.978***	7.648	3.530
Percentage of African-American population	484.977***	111.736	4.340	-50.277***	9.332	-5.390	20.179*	10.663	1.890
Percentage of Female population	3278.414***	572.904	5.720	881.130***	172.064	5.120	5.655	3.556	1.590
Poverty rate	28.168	23.125	1.220	73.793***	27.934	2.640	-273.642	217.189	-1.260
Uninsured rate	23.165	20.372	1.140	-13.793	24.167	-0.570	472.206***	190.382	2.480
Per capita GDP	0.097***	0.017	5.590	0.099***	0.010	9.990	-7.692*	4.161	-1.850
Per capita tax revenue	-0.180	0.137	-1.310	-0.492***	0.058	-8.410	8.882	7.360	1.210
Federal fund%	-8.630	8.271	-1.040	-34.156***	7.230	-4.720	2319.312***	547.296	4.240
Unemployment rate	195.562***	36.062	5.420	97.189***	31.195	3.120	164.861	251.013	0.660
Control of State legislature	-82.277	103.966	-0.790	-406.459***	113.266	-3.590	8.882	7.360	1.210
HMO rate	-5.092	6.444	-0.790	-14.764**	5.675	-2.600	16.048*	8.713	1.840
Percentage enrolled in Medicare and Medicaid	77.183***	14.329	5.390	85.105***	11.204	7.600	-0.265	0.202	-1.310
FMAP rate	8.964	13.532	0.660	42.712***	10.895	3.920	59.399***	11.488	5.170
Obesity rate	216.664***	24.428	8.870	336.478***	19.047	17.670	164.861	251.013	0.660
Active physician per 100,000 population	24.535***	3.061	8.010	18.566***	1.383	13.420	422.101***	138.157	3.060
(Total Hospitals *Hospital bed) per 1000 people	-1451.493	1610.397	-0.900	-584.965***	291.467	-2.010	-14.586	15.387	-0.950
Region dummy									
Mid-west				-618.211	180.926	-3.420			
South				-1493.817	208.479	-7.170			
West				-2212.698	243.461	-9.090			
Constant	-180970.400***	28132.380	-6.430	-54812.910	8977.673	-6.110			
F value	248.11***			168.25***			121.05***		
R square	0.9227			0.888			0.792		
N observation	441			441			392		

***, **,* represent 1%, 5% and10% level of significance