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**WHO PAYS MORE: PUBLIC, PRIVATE,
BOTH OR NONE? THE EFFECTS OF HEALTH
INSURANCE SCHEMES AND HEALTH REFORMS
ON OUT-OF-POCKET AND CATASTROPHIC HEALTH
EXPENDITURES IN TURKEY**

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Working Paper No. 1058

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Abstract

This study explores the determinants and characteristics of the out-of-pocket to capacity to pay and catastrophic health expenditures in Turkey using a detailed micro-level survey, the Household Budget Survey during the period 2002-2011. The results show that those who have public health insurance are less likely to face out-of-pocket to capacity to pay and catastrophic health expenditures, than those with private or without health insurance. In addition, the study explores the expansion of the health reform of 2003, where in 2008 the Green Card (Yeşil Kart) holders are entitled, without fee, to the same services as those with public health insurance such as *Emekli Sandığı*, *BAĞ-KUR*, *SSK*. The analysis employs a differences-in-differences approach using a pseudo-panel based on propensity score matching. The results support that the difference of pocket health expenditures between the public health insurers and green card holders has been reduced. Furthermore, those who are located in rural areas are compared with those residing in urban areas, as the health reform in 2008 included expansion and improvement on the emergency services and infrastructure in rural areas.

JEL Classification: H5, I1

Keywords: Catastrophic Health Expenditures; Differences-in-Differences; Health Insurance Schemes; Health Reforms; Out-of-Pocket Expenditures; Propensity Score Matching; Pseudo-Panel; Turkey

ملخص

تستكشف هذه الدراسة محددات وخصائص قدرة الدفع على النفقات الصحية الكارثية في تركيا باستخدام مسح على المستوى الجزئي تفصيلاً، ومسح ميزانية الأسرة خلال الفترة 2002-2011. وأظهرت النتائج أن أولئك الذين لديهم تأمين صحي عام هم أقل عرضة لمواجهة الدفع الخاص على النفقات الصحية الكارثية، من تلك التي مع التأمين الصحي الخاص أو بدون. وبالإضافة إلى ذلك، أوضحت الدراسة أن التوسع في إصلاح قطاع الصحة من عام 2003، حيث في عام 2008 البطاقة الخضراء (يسيل كارت) يحق للأصحاب، وبدون المال، نفس الخدمات مثل تلك مع التأمين الصحي العام. التحليل يستخدم نهجاً الاختلافات في الخلافات باستخدام مسح على أساس مطابقة درجة الميل. تدعم النتائج إلى أن الاختلاف في النفقات الصحية بين شركات التأمين الصحي العامة وأصحاب البطاقة الخضراء قد انخفض. وعلاوة على ذلك، يتم مقارنة أولئك الذين يعيشون في المناطق الريفية مع أولئك الذين يقيمون في المناطق الحضرية، كما تضمن إصلاح النظام الصحي في عام 2008 توسيع وتحسين في خدمات الطوارئ والبنية التحتية في المناطق الريفية.

1. Introduction

Healthcare in many developing countries, including those in Middle East and North Africa (MENA) region, is mainly funded and financed through out-of-pocket expenditures (OOPEs) by households. OOPEs is a part of the private health expenditures which include in-kind payments and perks to suppliers of pharmaceutical products, therapeutic appliances and other health related goods and services and to health practitioners with purpose the enhancement of the individuals' health status. An important tool and policy for a country's health care system is to provide financial protection from extreme OOPEs in order to ensure equitable access to health care. In the absence of this policy, a household may be forced to spend huge amount on medical bills and treatment, as well as, significant use of time, to treat a family member. The reason that OOPEs are a concern for policy makers and society is that they have multiple consequences to the household, the ill members and to the society generally.

Firstly, the impact of OOPEs is the catastrophic health expenditure, where according to World Health Organization (WHO) is defined as the percentage of income which is spent for health expenses and it is set up at 40 per cent. In addition, the impact of OOPEs goes beyond the catastrophic health expenditures, where people do not use health services anymore, because they cannot afford the direct costs, such as costs for medicines and consultation and the indirect costs, such as transportation. Moreover, this has further impact on poverty and thus overall a negative impact on country's growth and development.

Therefore, a concern of the policy makers is to protect people of financial catastrophic health expenditures as a result of the health services usage. Even though WHO has set up the threshold of 40 per cent where health expenditures can be viewed as catastrophic, this threshold can be varied in each country depending on the situations and on the national health policies that they wish to apply. In our analysis, therefore, alternative thresholds are explored: 10%, 20% and 30% for robustness checks and sensitivity analysis.

Overall, this is the first study which employs and examines various topics on OOPEs over the capacity to pay and catastrophic health expenditures in Turkey, including the reforms of 2008 for Green Card (Yeşil Kart)¹ holders. The study examines also the relationship between OOPEs and catastrophic health expenditures with the health insurance coverage, access to health care and possible barriers as distance to health centers in Turkey. In addition, the analysis accounts for socio-economic characteristics of the individual and household, such as education, wealth, marital status and location of the household such as urban and rural areas.

In 2008, OOPEs were 17.4 per cent of the total expenditure on health care in Turkey (Turkish Statistical Institute, 2011). However, as a candidate country to European Union, the rate was higher than the other EU countries, including Germany with 13 per cent, France with 7.6 per cent and United Kingdom with 11.2 per cent at the same year (OECD, 2010). Nevertheless, the health care system in Turkey has been restructured and has undergone health reforms since 2003, promoting the use of technology, delivering a high quality of health care, which might have affected the OOPEs as well. Apparently, the ratio was 22 per cent in 2006 and was reduced at 15.4 per cent in 2012, while the respective percentage in 2012 was 12.9 per cent, 9 per cent and 7.5 per cent for Germany, United Kingdom and France respectively (OECD, 2014). To summarize, in this study;

- Determinants of OOPEs and catastrophic health expenditures in Turkey, including socio-economic characteristics, barriers to health care access, health insurance coverage and type (social versus private) among others will be analysed.

¹ Green Card is an insurance plan for the poor who were unable to pay for healthcare which is provided by government without and fee or contribution.

- The impact of the Turkish Health Reform regarding Green Card in 2008, on the OOPes and catastrophic health expenditures will be examined.

The structure of the paper is as follows: In section 2, a brief literature review of previous studies exploring OOPes and catastrophic health expenditures is discussed. Section 3 presents the methodology followed, while in section 4 the data are described. In section 5, the empirical results are reported, while section 6 discusses the concluding remarks.

2. Literature Review

This section discusses previous researches related to this study. Regarding the OOPes, medicines are the main sources of this spending (Van Doorslaer et al., 2007; Mugisha et al., 2007; Barros and Bertoldi, 2008; Garg and Karan, 2009) and represents between 25-65 per cent of the total OOPes in low-middle income countries (Wagner et al., 2007). Evidence from the literature shows that in Brazil and India, households spend 41 per cent and 65 per cent of their household income on medicines respectively (Barros and Bertoldi, 2008; Garg and Karan, 2009), while the share of OOPes on medicines in Burkina Faso and to Vietnam ranges between 80-88 per cent (Mugisha et al, 2007; Wagstaff, 2007). Moreover, the largest inequities were reported for income groups, where the poorest spend proportionally more on medicines than the richest households do (Wagner et al., 2007). Knaul et al. (2006) found that medicines are the most important component of the health expenditures regarding the low-income households accounting to almost 50 per cent of catastrophic health expenditure in the first quintile (the poorest households), while they amount less than 20 per cent for the richest households' quintile. Concluding, health systems that require lower OOPes for health care offer better protection to the poor against catastrophic health spending.

Regarding Turkey, Brown et al. (2012) examined the determinants of OOPes using a Probit binary model during the period 2002-2008. One of the most important findings of their research is that insurance coverage may protect households from the risk occurrence of catastrophic health expenditures. However, they did not analyze the determinants of OOPes and catastrophic health expenditures for people who are insured under different insurance schemes such as private, public or green card holders. Within this study, we do not only expand their analysis using the years 2002-2011, but we also take into consideration of different insurance schemes where the amount of out-pocket expenditures of people might be different according to insurance type that they are covered. As green card holders officially did not have the same benefits as enrollees in other public health insurance schemes (SSK, Emekli Sandığı, BAĞ-KUR) before 2008², it is more probably that they might spend more on OOPes and more likely to face catastrophic expenditures. In addition to their approach to solve the selection bias³ problem, where they follow Sartori (2003), our study employs the propensity score matching to account for selection bias as an alternative and more likely better approach for causal concerns.

Moreover we additionally analyzed the impact of 2008 health reform, which entitled the Green Card holders with the same benefits of other public insurance beneficiaries, on OOPes and catastrophic health expenditures in Turkey. Using Household Budget Survey in 2003-2006, Erus and Aktakke (2012) examined the impact of the Turkish health reforms in 2003 on OOPe resulting that their levels have been decreased and the impact varies on income level. Aran and Hentschel (2012) examined the impact of the Green Card non-contributory health insurance

² Prior to 2006, there were three public social security institutions in Turkey SSK (covering private sector employees), Emekli Sandığı (covering government employees) and Bağkur (for the self-employed). In 2006, the government merged the formal social security system under the umbrella of SGK (Social Security Institution). The members of the Green Card scheme have officially obtained the same benefits as beneficiaries in other health insurance schemes only in 2008 (Erus and Aktakke, 2012; OECD, 2008)

³ Selection bias problem may occur if poor households prefer do not use or do not seek health care because of affordability concerns.

program, which was expanded rapidly between 2003 and 2008 when the number of Green Card beneficiaries increased nearly four-fold, on the protection of healthcare utilization of Turkish people, defined by whether individuals reduced the preventive and curative care or not. The authors found significant effects where Green Card holders reduced both forms of care. However, our study contributes to those studies by examining the effects of the 2008 health reform for Green Card holders, where they are entitled with the same benefits of other public insurance holders, on OOPes by applying Differences-in-Differences (DID) analysis considering the periods before and after the 2008 health reform, as well as, the macroeconomics shocks of the economic crisis of 2008.

3. Conceptual Framework and Research Methodology

3.1 Research questions

As it has been discussed in the previous sections, OOPes can cause huge financial burden to households that may drive them in poverty. The aim of this project is to examine various topics. Firstly, it explores the determinants of OOPes and catastrophic health expenditures. Secondly, it investigates whether the health reforms took place in 2008 are efficient on reducing the level and share of medicines and OOPes overall.

3.2 Methodology and data

3.2.1 OOPes and catastrophic health expenditures

The calculation of the OOPes and catastrophic health expenditures involves the following steps (Xu, 2005). Initially, the poverty line (PL) and the household subsistence spending (SE) should be calculated. SE refers to the minimum requirement for a household to maintain the basic life standards in a society and PL is used in the analysis as SE. Various poverty indicators have been developed in the previous literature, but none of them is perfect, depending on the place and period of study. However, following the methodology by Xu (2005) the food as share of the total household expenditures for estimating SE is used. The PL in that case is defined as the food expenditure share to be within 45th and 55th percentile of the total sample. Then the equivalence household scale is taken which is:

$$eqsize_h = hhsiz_e_h^\beta \quad (1)$$

The parameter β has been estimated from previous studies based on 59 countries' household surveys data, and it is equal at 0.56 (Xu, 2005). The next step is to divide each household food expenditure ($foodex_h$) by the equivalent household size to get the equivalised food expenditures ($eqfood_h$):

$$eqfood_h = \frac{foodex_h}{eqsize_h} \quad (2)$$

Then the food expenditure shares of total household expenditure that are at the 45th and 55th percentile across the whole sample, are calculated and are defined as $foodex_{45}$ and $foodex_{55}$. The next step is to calculate the weighted average of food expenditure in the 45th to 55th percentile range. In order to get subsistence expenditure per capita and which is also the poverty line (PL) as:

$$PL = \frac{\sum w_h \cdot eqfood_h}{\sum w_h} \quad \text{for } foodex_{45} < foodex_h < foodex_{55} \quad (3)$$

Then the subsistence expenditure (SE) for each household is:

$$SE_h = PL \cdot eqsize_h \quad (4)$$

The household is regarded as poor when the total household expenditure is smaller than its subsistence spending (SE):

$$\begin{aligned} poor_h &= 1 \text{ if } exp_h < SE_h \\ poor_h &= 0 \text{ if } exp_h \geq SE_h \end{aligned} \quad (5)$$

The next steps involve the calculation for OOPes. Firstly, the household capacity to pay (CTP) is calculated which is defined as a household non-subsistence spending and it is:

$$\begin{aligned} CTP_h &= exp_h - SE_h \text{ if } SE_h \leq foodex_h \\ CTP_h &= exp_h - foodex_h \text{ if } SE_h > foodex_h \end{aligned} \quad (6)$$

Then the OOPes is the share over the CTP and it is:

$$OOPE_CTP = \frac{OOPE_h}{CTP_h} \quad (7)$$

Then the catastrophic health expenditures constructed as a dummy variable taking value 1 whether a household faces catastrophic expenditure at 40% threshold and 0 otherwise and it is defined as:

$$\begin{aligned} CataEx_h &= 1 \text{ if } OOPE_CTP \geq 0.4 \\ CataEx_h &= 0 \text{ if } OOPE_CTP < 0.4 \end{aligned} \quad (8)$$

3.2.2 Ordinary Least Squares and Ordered Logit Models

In the first section the determinants of the OOPe are examined using ordinary least squares (OLS) regression. The model is defined as:

$$OOPECTP_{i,h,j,t} = \beta_0 + \beta_1 \log(y)_{i,h,j,t} + \gamma'Z_{i,h,j,t} + A_j + \theta_t + A_jT + \varepsilon_{i,h,j,t} \quad (9)$$

OOPECTP denotes the out-of-pocket health expenditures over the capacity to pay for individual i in household h , area location j and in time t . The variable $\log(y)$ is the logarithm of the household income. However, the regression examines also wealth index or quintiles of wealth. Vector Z includes the rest of the explanatory variables, such as sex, age, education, marital status, household size, employment status, house tenure, whether a person is disable or not, whether an individual has health coverage and if yes what type (e.g. public or private) and others. In addition, toilet facilities are very important to disease control and health improvement, affecting health expenditures. Also barriers to health care access, such as the difficulties to access the health centers because of distance, are examined. Finally, lifestyle variables, such as Body Mass Index (BMI) and smoking are included in the analysis. A_j controls for area, θ_t controls for time-year of the survey, while A_jT is a wave area specific trend which controls for time-invariant unobserved characteristics in the area.

In the case of catastrophic health expenditures, a standard Probit and Logit model is initially estimated, where the dependent variable takes the value of 1 if the household's total OOPe exceeds the threshold level (i.e. if the household experienced catastrophic health expenditure) and 0 otherwise. The Probit or Logit model takes the following form (Greene, 2011):

$$CataEx_{i,h,j,t} = \beta_0 + \beta_1 \log(y)_{i,h,j,t} + \gamma'Z_{i,h,j,t} + A_j + \theta_t + A_jT + \varepsilon_{i,h,j,t} \quad (10)$$

In this case model (10) is defined as model (9) with the exception that the dependent variable now is binary and is defined as the catastrophic health expenditures (CataEx). Models (9) and (10) examine at the same time the effects of health reforms. Thus, in regressions considering

different thresholds for catastrophic health expenditures and time periods, as before and after, the health reforms will take place.

However, another issue is the possible selection bias coming from the self-selection on health expenditures or heterogeneity between individuals with health coverage or not. In order to address the selection bias of spending on OOPes, a Heckman two-stage procedure could be implemented. In that case the Heckman selection two-stage procedure is constituted by two equations; firstly, by the equation which describes the relationship between the outcome of interest y_i (i.e. the OOPes) and a vector of covariates X_i , and second, the selection equation, describing the relationship between a binary participation decision in a health insurance program D_i and another vector of covariates Z_i . The selection equation can include the health insurance type, the household type, health status and socio-economic characteristics such as education and employment status and location area such as rural or urban. However, since Heckman model may present biases (see Elwert and Winship for more details on Heckman model and endogenous selection bias) a propensity score matching (Rosenbaum and Rubin, 1983) is followed instead of the Heckman model. Based on the methodology discussed the effect of 2008 health reform on OOPes, OOPCTP and catastrophic health expenditures is examined.

In Turkey the Health Transformation Program (HTP) initially took place in 2003. One main characteristic of the HTP is that coverage of Green Card has been widened including low-income groups and the health care services and pharmaceutical expenses for the Green Card holders are covered by the state. In addition, the VAT of pharmaceutical products has been reduced resulting to a discount of pharmaceutical expenses and consequently reducing the burden for public and citizens. It is claimed that HTP was successful in expanding health insurance coverage for all population -especially the poor people- and in improving access to health services -especially in rural areas (Chakraborty, 2009). However, for the implementation of the reform it was a pre-requisite that the government of Turkey should prepare a universal health insurance law that will combine all the different health insurance schemes into one. This law took years and has been adopted by the Turkish Grand National Assembly in 2006. However, the implementation of this law started after 2007. In addition, with the implementation of HTP, the preventive health care and mother-child health care services have been strengthened, as well as, family medicine implementation took place. This is a program which has been spread out in the whole country and its purpose is the understanding of modern health, such as lifestyle, health diet and others. Furthermore, HTP tried to expand the coverage in both formal health sector insurance schemes (SSK, Emekli Sandığı and Bağkur) and the Green Card program. Finally, the Green Card Holders in 2008 enjoy the same benefits with the enrollees in other health insurance schemes. More specifically, the contribution to the formal health sector insurance schemes has been expanded from 59 per cent of the population to 69 per cent of the population in 2008, while the number of Green Card beneficiaries has been increased from 2.5 million in 2003 to 9.5 million on 2008. Contributing the existing literature which so far analyzed the effect of 2003 and 2006 reforms rather than the 2008 health reform, this study will analyze the impact of it on OOPes, OOPCTP and catastrophic health expenditures applying a differences-in-differences (DID) framework as:

$$OOPE_{i,h,j,t} = \beta_1 Treat + \beta_2 Post + \beta_3 Treat * Post + \gamma' Z_{i,h,j,t} + A_j + \theta_t + A_j T + \varepsilon_{i,h,j,t} \quad (11)$$

The regression is defined as in (9), where \mathbf{Z} includes also income and wealth, while $Treat$ is the treatment variable taking value 1 for those who are treated from the reform and 0 otherwise. Two possible treated groups can be examined. The first refers to poor people in rural areas taking value 1 and 0 for poor people located in urban areas. The reason why this can be considered it that with the HTP reform, emergency health care services have been implemented

also in villages and general practitioners, vaccinations, health care services at home have been increased. Second, as this reform mainly concerns the poor and disadvantaged people, the Green Card holders are examined, where value 1 indicates households with Green Card and 0 otherwise. *Post* is the period dummy, taking value 1 if the year is after 2007 and 0 before 2008. Finally, the interaction term *Treat*Post* is the DID estimator which is the main interest. If the DID estimator is negative and significant implies that the OOPEs have been reduced in the treatment group after the HTP implementation relatively to the untreated-control group. Moreover, the data allow us to examine the effects of the reform after the economic and financial crisis of 2008 and the macro shocks associated whose severity outcomes became obvious in 2009. Similarly, the catastrophic health expenditures can be examined, where in this case a binary logistic DID regression will be estimated.

Since the estimates may suffer from selection bias the estimates are based on a pseudo-panel analysis using propensity score matching and taking individual fixed effects on the matched sample. The reason of considering matching comes from the fact that those who are eligible for Green Card and consist the treated group may have significant different characteristics than the individuals and their households that have public health insurance. The most important difference is the income, since those who have a higher income, as well as, those who are employed are more able and therefore more likely to have public health insurance. Moreover, the two groups may differ in other characteristics, including age, education and employment status. More specifically, the more educated people they might be more able to find a better job which is associated with higher income. Similarly, those who are employed are more likely to be eligible for public health insurance, while the disabled or the unemployed may belong to the lower-income groups and poor social classes who are eligible for the Green Card program. A similar logic holds also for those who are located in urban and rural areas.

Matching has become a popular approach for the causal treatment effects estimation and it is widely applied for the evaluation of a variety of policies and has been used in very diverse fields of study, including labor, health and environmental policies. The first problem that arises in many situations, as well as, in this study is the effect of the health reform of 2008 on the treated group and to investigate the difference between this group and the control-that is without treatment. One very common approach is to obtain the mean outcome of the treated and control or to apply straightforward a DID analysis as in (11). However, this is not advisable and it is believed in this study that there is a selection bias problem, as it has been mentioned above, that some individuals have a higher probability of entering the public health insurance system and thus to have a lower amount of OOPEs. This study is one of the few studies so far that accounts for selection bias and applies a propensity score matching within a DID framework. The matching approach thus is one possible solution to the selection issue and through the statistical literature it shows a close link to the experimental context. The main idea is simple and is to find a group of non-treated individuals (public health insurance in this case) who share similar individual and household characteristics with the treated or the participant (the ones who are Green Card holders). If this being done efficiently then the differences in the outcome of interest of the selected groups can be attributed to the health reform.

3.2.3 Propensity score matching

Regarding the Matching of participants and non participants based on their estimated propensity scores will be $p(x) \equiv P(C=1|x)$. Rosenbaum und Rubin (1983) show that if the Conditional Independence Assumption (CIA) holds then:

$$E[y_0 | p(x), C = 1] = E[y_0 | p(x), C = 0] \quad (12)$$

Hence, matching of participants and non participants based on propensity scores is sufficient. The Mahalanobis algorithm is used.

However, the assumptions of the matching process are discussed. Conditional Independence Assumption: The first possible and most important identification strategy assumed in the propensity score matching is the CIA. This assumption implies that given a set of observable covariates which are not affected by the policy or the treatment, then the potential outcomes of interest are independent of the treatment assignment.

Conditional Independence Assumption: The first possible and most important identification strategy assumed in the propensity score matching is the CIA. This assumption implies that given a set of observable covariates X which are not affected by the policy or the treatment, then the potential outcomes of interest are independent of the treatment assignment. In other words, CIA implies that the selection is solely based on the observable characteristics and that all the variables that may influence the treated or policy assignment and the potential outcomes of interest are observed by the researcher. For the purpose of this study it is assumed that the CIA holds. The unconfoundedness is:

$$y_0, y_1 \perp\!\!\!\perp D \mid X, \forall X \quad (13)$$

Relation (13) implies that the the potential outcomes are independent from the treatment assignment or the treated group given a set of covariates X . Within the propensity score matching then (13) and unconfoundedness based on the propensity score can be written as:

$$y_0, y_1 \perp\!\!\!\perp D \mid P(X), \forall X \quad (14)$$

Nevertheless, there are issues and drawbacks using matching. The first is the issue of unobservable that are not included into the matching process and into the DID analysis. The second is the assumption that the covariates included into the matching process are enough to create comparable treated and control groups. However, the majority of the econometric models suffer from this issues. For example, there are unobservable characteristics in randomized trial experiments and the natural experiments, as is out case, where unobservables may affect the outcomes and the matching. Regarding the second issue, many models may not control for various variables, as well as, the regressions may suffer from plausible, over-control, confounding and selections biases.

Common Support: This is another requirement besides the independence, which rules out the phenomenon of the perfect predictability of the D given a set of covariates X

$$0 < P(D = 1 \mid X) < 1 \quad (15)$$

Another aspect of the matching process is the model choice, where it is common practice to employ discrete choice models when the treatment is a binary variable. Preference is given to Logit or Probit estimates, where the estimated probability of the participation or the policy treatment usually is almost identical.

Model choice: Another aspect of the matching process is the model choice, where it is common practice to employ discrete choice models when the treatment is a binary variable. Preference is given to Logit or Probit estimates, where the estimated probability of the participation or the policy treatment usually are identical.

Variable choice: Another important element of the matching process refers to the inclusion or exclusion of the covariates in the propensity score model, where according to the CIA it is required that the outcome variable of interest must be independent of the treatment conditional on the propensity score. Therefore, the implementation of matching requires that the set of the covariates X should credibly satisfy this condition. According to Heckman et al. (1997), omitting important variables can seriously increase bias in resulting estimates, and only variables that influence simultaneously the participation decision and the outcome variable should be included. The justification of the variables choice in our study comes from the fact

that these covariates are observed before and after the participation and they can influence both outcome and the participation into the policy program, which is the Green Card. Variables, such as age, education level, marital and job status and area are some of the variables used into the matching process that can influence both OOPEs and the participation into the program as the results provide evidence in the empirical results section.

4. Data

The data used in this study are the Turkish Household Budget Survey (HBS), available from Turkish Statistical Institute (TUII) during the period 2002 to 2011, which are a time-series of repeated cross sections. The survey includes three main groups of variables: variables relating to household assets (e.g. type of dwelling and ownership, ownership of durables and transportation vehicles), expenditure on consumption (e.g. food and health expenditure), and variables related to individuals (e.g. age, marital status, employment status and education among others).

In table 1 the summary statistics for the CataEx and health insurance type are presented, while in table 2 the correlation matrix among these variables is reported.

In table 1 the summary statistics for the catastrophic health expenditures (CataEx) for various households and the percentage of the insured individuals are presented. It becomes obvious that the average CataEx are very low during the period examined, especially for the 40% threshold. However, the percentage of CataEx and threshold 40% was only 0.8 in 2002 and 0.49 in 2011, while for threshold 30% the percentage of CataEx 2.47% in 2002 and 0.61% in 2011. The majority of the sample has public health insurance at 63.10%, while only 6.76% is privately insured. A high percentage of the population is green card holders at 13.24% and the 16.91% has no health insurance.

In table 2 the correlation among household income, various thresholds of catastrophic health expenditures, education and the type of health insurance are reported. As it was expected, a positive relationship among the CataEx at various thresholds, as well as, a negative association among the health insurance types is presented. Both public and private health insurance schemes are negatively associated with the probability of a catastrophic health expenditure, while the latter is positively associated for Green card holders and those with no health insurance. In addition, education is negatively associated with the probability of CataEx occurrence. Household income is positively related to both private and public health insurance schemes and negatively to Green Card holders and no-insured, as it was expected.

Following the previous literature (Van Doorslaer et al., 2007; Mugisha et al., 2007; Barros and Bertoldi, 2008; Erus and Aktakke, 2012; Brown et al., 2014) the regressions control for various individual and household characteristics, including gender, age, education level, household income, marital and job status, occupation industry code, rural versus urban area, years of working, years of leaving in the current residence, difficulties in access to transportation points and health centers and year. These controls are useful, since education, job status, years of work and household income may cause the decision and the type of health insurance.

5. Empirical Results

5.1 Health insurance types and determinants of OOPECTP and catastrophic health expenditures

In this section, the empirical results are presented and discussed. In table 3, some initial OLS estimates for the OOPECTP are reported. A first conclusion is that the OOPECTP do not depend on the gender, as well as, age presents a positive and significant relationship with OOPECTP in linear terms, but the quadratic terms are insignificant in all cases. Columns (1)-(4) use the same dependent variable, but additional controls or factors are considered. For instance in columns (2)-(4) the industry codes are included, while column (2) includes wealth,

while column (3) considers the accessibility level to health centers and transportation points and finally in column (4), the health status of the respondent is additionally included. The number of observations differ among the regressions, as there are fewer observations answering the accessibility level. At a first glance, it seems that in all estimates the OOPECTP level does not differ between health insurance types, with the exception those who have not health insurance and are more likely to spend more to OOPECTP. Marital status does not differ with the exception when the accessibility level is included in (2) and those who are married when the wealth and health status are considered. This may reflect the fact that married can have more obligations and more expenses, while controlling for respondents with health problems and the disabled probably increase the household health expenditures. Education level, household income, household size and wealth are negatively associated with OOPECTP. This is expected as those factors may be strongly related to each other as higher educated people have more skills and more opportunities in the labor market resulting to higher income and in long term in higher wealth level. Additional regressions also took place including the working experience and dwelling size but the results on health insurance type and concluding remarks remain the same. Household size has also a negative coefficient implying that it is plausible that large families support each other reducing in this way the OOPECTP. Nevertheless, the quality of family relationships, togetherness and the degree of support are important factors that could be included as proxies; but are not available in the dataset. Industry codes of the respondent's occupation have been included, where those who are employed in the sector of hotels and restaurants are more likely to spend less in OOPECTP than the reference category which is the agriculture sector. This is also confirmed by the estimated coefficient of the urban area which is negative. This may also indicate that people residing in urban areas have more labor market opportunities resulting to higher income and wealth levels, as well as, better quality of health centers and access to them and to transportation points as the regression results show in column (3). More specifically those who reported that they can very easily access to transportation points and health centers spend lower levels of OOPECTP. Therefore, transportation accessibility can also be an important factor since many people may reside in isolated and small areas, where the location of health centers is significantly further than their residence, as well as, some or many of them may not have available transportation mean, making for them more difficult and more expensive to access to the transportation points leading to OOPECTP increases.

For this reason, the health reform in 2008 is also explored. As it has been mentioned in the introduction, the Green Card holders have the opportunity of access to the same health services as those with public insurance, while also the road and service infrastructure in the rural areas has been improved in 2008.

The results overall are consistent with the study by Brown et al. (2014); however, our analysis is expanded examining all the health insurance types, including the accessibility to health centers and transportation, wealth, as well as, the DID approach will be applied in order to see the effectiveness of the health reform of 2008. However, these estimates are not based on propensity score matching; thus it is highly possible that there is selection bias and heterogeneity in the sample. For this reason, the following estimates are reported after the matching process. Various algorithms have been estimated and the results remain robust, but the results reported are based on the Mahalanobis metric algorithm.

In table 4, the Probit selection equation for various health insurance types are presented. More specifically, regarding columns (1)-(2), the dependent variable is a binary-dummy taking value 1 if the respondents have private health insurance and 0 if they have public. In column (2), the accessibility level to health centers and transportation points is included. Similarly in columns (3)-(4), the dependent variable takes 1 if the respondent has no health insurance and 0 whether they have either public or private. Finally, in columns (5)-(6), the dummy obtains value 1

whether the respondents are green card holders and 0 if they have no health insurance. The reason for implementing these dummies is the limitation of the propensity score since it allows for one treatment and one effect and it would be difficult to distinguish all the four health type insurance. Thus, in columns (1)-(2) the determinants of the private versus the public health insurance are explored in order to examine also their effects on OOPE and catastrophic health expenditures (CataEx). Similarly, the purpose of the estimates in columns (3)-(4) is to examine the determinants of those with insurance and those without, and what is the additional OOPEs paid. Finally, the green card holders versus the respondents with no health insurance are examined in order to see the potential benefits of this scheme to OOPEs and CataEx.

Gender is not significant regarding the choice between public and private, but women are less likely to have no insurance or are less likely to be Green Card holders according to columns (5)-(6). The former can be explained that women are more likely to have a public or private health insurance because they are usually covered by their husband or other family members, for instance young women are covered by their father's insurance. Nevertheless, this depends on various other factors, such as the household income. On the other hand, women are more likely to be uninsured than green card holders. This may be derived by the fact that some women belong to rich households that do not need health insurance or more possible are not employed or working in agriculture and rural areas where households are not insured.

Age, household income, wealth, education level, as well as, those who are married and located in urban areas, in all cases have a negative and significant coefficient. This implies that more educated, richer, wealthier and married people are more likely to choose public versus private or no-insurance, and less likely to be green card holders than uninsured. The latter can probably be explained for the reasons mentioned above, such as these households are rich and wealthy and they do not need health insurance, since they can spend on private medical doctors. Those who are not employed are more likely to choose public health insurance and green card, as in the latter case green card refers to poor people and the unemployed status probably reflect this situation.

Dwelling size presents the same sign with household income and education, but it is positive in columns (1)-(2) which positively associated with the probability that the respondent has a private health insurance. This may reflect the wealthy state of these households even when the regressions control for the wealth index show a negative coefficient. Regarding the accessibility level, columns (1)-(2) show that those who reported that the access to health centers is easy, are more likely to choose public health over the private health insurance and green card over the no-health insurance, indicating that accessibility is an important factor for the type of health insurance selection, which has been ignored in previous studies. On the other hand, the access to transportation points seems to be insignificant. Nevertheless, there is a strong heterogeneity among the samples examined as it was expected.

In table 5, the results show that those who have a private health insurance spend on average 14 Turkish Liras (TL) more than those with public health coverage, while those without health insurance coverage pay on average 6TL more than the respondents who have either public or private health insurance. In addition, the OOPECTP levels are higher for uninsured people. On the other hand, the green card holders spend less health expenditures than those with no health insurance by 12.5 TL and they have low OOPECTP levels. Moreover, the private health insurers are more likely to have CataEx at 20%, 30% and 40% thresholds than the respective respondents with public health insurance, while the difference at 10% threshold is insignificant. Similarly, those who are uninsured have the probability of facing CataEx at all thresholds, with the exception of 40% which is the level defined by the WHO. The same results hold for the Green Card holders, where they present a lower likelihood of facing CataEx at various thresholds examined, except from 40%.

Furthermore, table 6 reports some estimates of a regression that use dummies which take 1 for the health insurance of interest and 0 otherwise. In this case, it is clear that those who have public health insurance spend less health expenditures and have lower levels of OOPECTP. In addition, while there is no difference of the public health insurance with the other types of health insurance at the 10% of the catastrophic health expenditures, it becomes significant in the rest of the thresholds and there is a lower probability of catastrophic health expenditures occurrence. On the other hand, there is no difference between private insurance with the rest of the insurance types, as well as, no difference between green card holders and the remained types. Regarding the respondents with no health insurance pay on average 8.5 TL and they face higher levels of OOPECTP by 0.0054. Finally, in all the thresholds examined, the probability of catastrophic expenditures occurrence is significantly higher for those with no health insurance coverage and the probability is monotonically decreasing.

In table 7 the test of the propensity score matching considering various health insurance classes are reported. In the majority of the estimates the groups share similar characteristics. However, the marital status which is significantly difference among the groups examined, with the exception the groups of Green card holders versus those with no health insurance and the green card holders versus all the others. The wealth index is significantly different for the groups public versus other health insurance; private versus any other health insurance type; and the non-insurance group versus all the others. Finally, employment status is only significantly different between the groups of public and private health insurers. The propensity score matching results are based on the CIA as it has been discussed in the methodology section and it is based on the observables variables. However, it should be noticed that the matching process is not without drawbacks since the individuals-agents may choose the insurance type based on unobservable characteristics like trust, quality of family support, relations and togetherness and the individual and family medical history, which is not available in the dataset. Nevertheless, the estimates are not significantly differing with the unmatched sample, as the analysis is relied on a quasi-experimental approach, which is the health reform of 2008. Moreover, this approach along with the randomized trial experiments and the natural experiments present the common problems of not considering the unobservable characteristics, followed in the majority of previous research studies.

5.2 Differences-in-Differences (DID) on health reforms

In this section, the estimates of DID, which is employed to understand the effect of 2008 health reform, are presented. In the first case, the treatment group is the individuals who are green card holders, while the control group is those who have public health insurance. It should be noticed that those who are uninsured or have private health coverage are not included because the health reform in 2008 refers to changes that are applied to Green Card holders and specifically they are entitled after this period to the same services with those who have public health insurance coverage (OECD, 2008). Since this is not related to the uninsured, as well as, to those with private health insurance, the study is limited to these two groups-public health insurance and green card. A pseudo-panel based on propensity score matching is used. The DID estimates for this case are reported in table 8.

In table 8 and panel A, the DID estimates for the green card holders as treated and those who have public health insurance as control group for OOPECTP are reported, while the DID estimates for the same treated-control group for OOPEs are presented in panel B. In both cases, the results show that there is no difference between the treated and control group, while the OOPECTP and OOPEs have been reduced after 2007. Concluding in both cases, the OOPECTP and OOPEs levels between the treated and the control group have been reduced due to the health reform of 2008. In addition, in panels C and D the placebo tests for the DID, taking as the year of health reform 2007 instead of 2008 are reported, implying that the DID can be robust, since the DID coefficient is insignificant.

In panels E and F, the OOPECTP and OOPEs are reported where the treated group is those with public health insurance located in rural areas, while the control group is again those who have public health coverage but are located in urban areas. In this case, the DID is also significant and negative indicating that the OOPECTP have been reduced in the treatment group relatively to the control, always regarding the sample of the household budget survey used in this study, but there is no significant difference concerning the OOPEs. Furthermore, based on the placebo test and OOPEs, the results show that the DID is robust, while concerning the OOPECTP, the DID is positive and significant, indicating that before the reform, the difference of OOPECTP between urban and rural areas is increased, where they were higher in the latter area.

Finally, in figure 1, the parallel trend assumption is presented taking as treated the green card holders and control those with public health insurance. The figure 1 refers to the OOPEs, while figure 2 refers to the OOPECTP.

In figure 3 the histogram for the OOPEs is presented. It becomes obvious that the distribution is skewed, while the histogram for the logarithm of the OOPEs is presented in figure 4. Similarly, the same conclusion is derived by the figures 5-6 for the OOPEs over the capacity to pay, and for this reason the estimates in table 8 and DID are re-estimated considering the logarithm of the OOPEs over the capacity to pay. In table 9 the DID estimates for the OOPECTP and OOPEs and considering the green card holders as the treated group and those with public health insurance as the control group, are reported. Based on the DID coefficient in both cases the difference in the OOPECTP and OOPEs between the Green card holders and those with public health insurance has been reduced respectively by 21 and 26 per cent.

Similarly, in table 10, the DID estimates with Logit fixed effects and catastrophic health expenditures are reported. Regarding the thresholds 10 and 20 per cent, there is no difference between treated and control group, while the treated group at thresholds 30 and 40 per cent are more likely to face catastrophic health expenditures. In all cases the post period coefficients are negative and significant, indicating that CataEx have been reduced, while the DID coefficient is also negative and significant and monotonically decreasing, implying that the difference of CataEx probability occurrence between the treated and control group has been reduced.

6. Conclusions

This study examines various topics on OOPEs and catastrophic health expenditures in Turkey during the period 2002-2013 and aims to answer in various research questions. The first aim is to analyse which are the most important factors that determine people and their capability to choose the type of health insurance. Second, the effects of the health insurance type on OOPEs and their probability of the catastrophic health expenditures in various threshold levels are explored. The findings show that in all cases, public health insurance offers a protection to the individuals and households regarding the OOPEs and the health expenditure levels. In addition, those who are green card holders spend less on OOPEs comparatively with those who are uninsured, while the last group is more probable to spend more on health expenditures, to present higher levels of OOPEs and to be more likely that they face catastrophic health expenditures. Although there might be a chance that some households belonging to the uninsured group can be rich and wealthy, this possibility cannot be valid anymore after the propensity score matching, since it allows us to compare only the households who are poor. It is therefore concluded that green card scheme offers a protection over catastrophic health expenditures and OOPEs to the people who are green card holders while such a protection does not exist for the uninsured people. Overall, the catastrophic health expenditures in Turkey are really low and have been significantly reduced during the period examined.

Next the study explored the effect of the health reform in 2008, where green card holders are entitled to the same health services with those who have public health coverage, as well as, the infrastructure is improved and the emergency services are expanded in the rural areas (OECD, 2008). The findings show that the OOPes and OOPECTP between the treated group-the green card holders- and the control group –public health insurance- have been reduced, indicating that the policy of green card and its expansion in 2008 was a successful policy that has reduced the OOPes and catastrophic health expenditures in this sensitive group. The results also show that besides the socio-economic characteristics that have been examined in other studies, such as age, income and other factors, a very important factor is the accessibility level to health centres and transportation points. Since many people need a private transportation, in the case where the accessibility to public transportation is difficult or no convenient, as well as, the distance to health centres and their accessibility level, can increase the OOPes. Another importation factor that have also been explored in previous studies, is the disability, illness or different health problems of a person in the household, which is positively associated with the probability of seeking health care and increasing OOPes.

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Figure 1: Parallel Trend Assumption for OOPEs

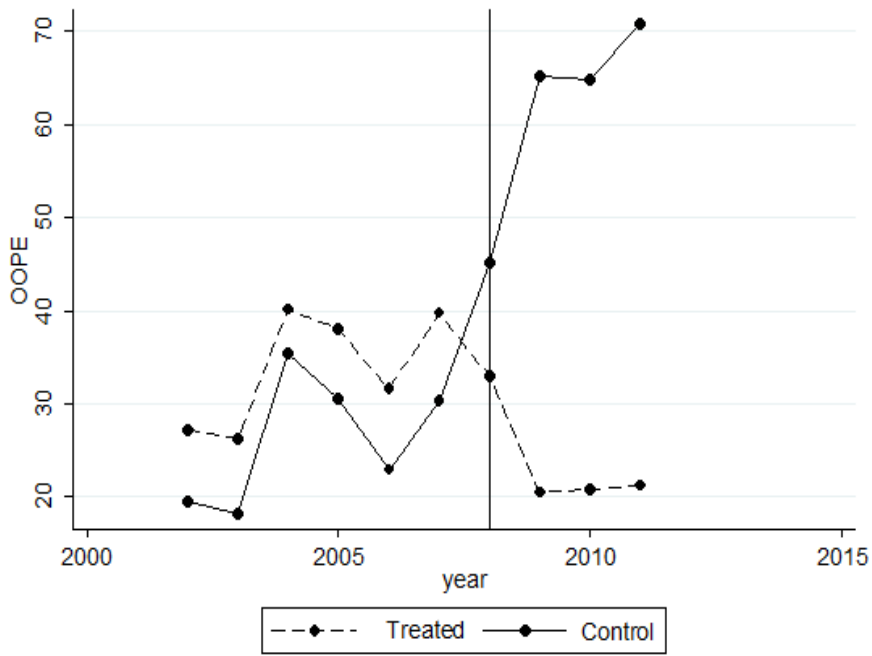


Figure 2: Parallel Trend Assumption for OOPECTP

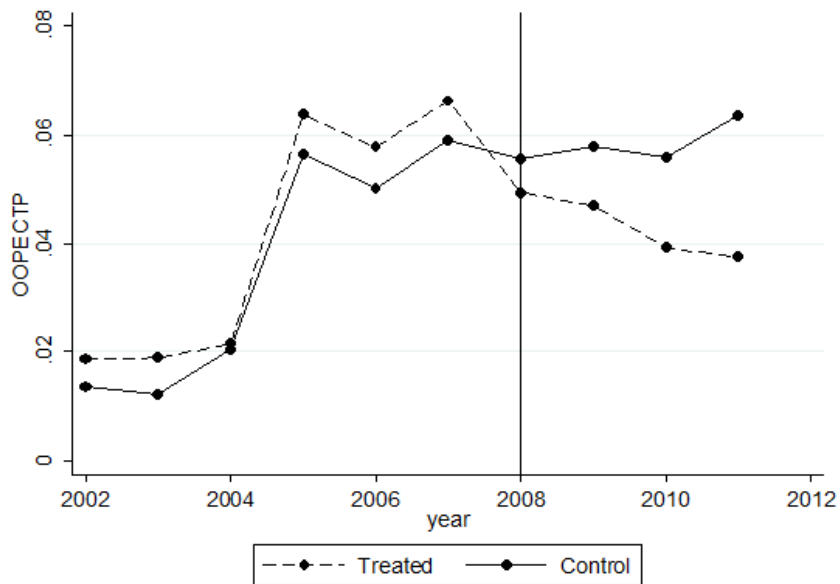


Figure 3: Histogram for OOPEs

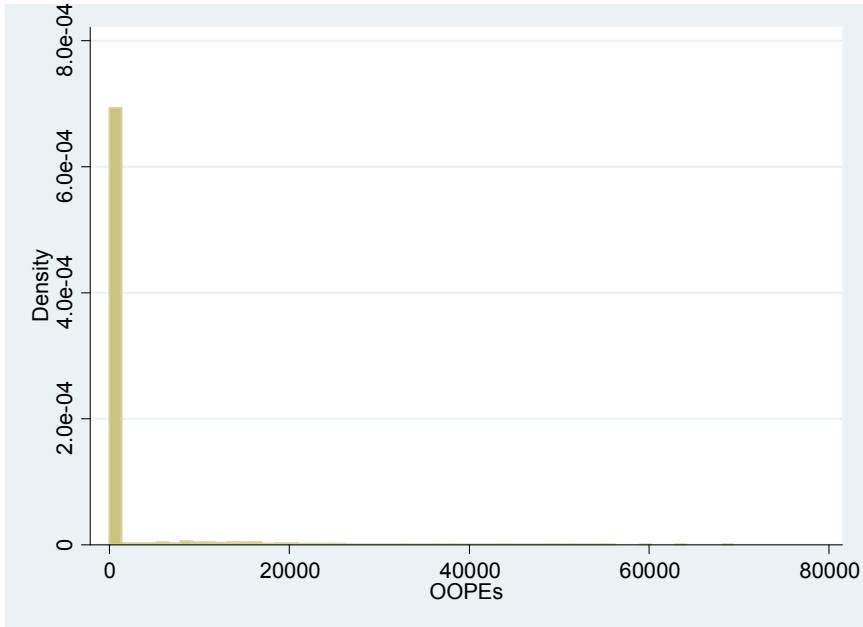


Figure 4: Histogram for Logarithm of OOPEs

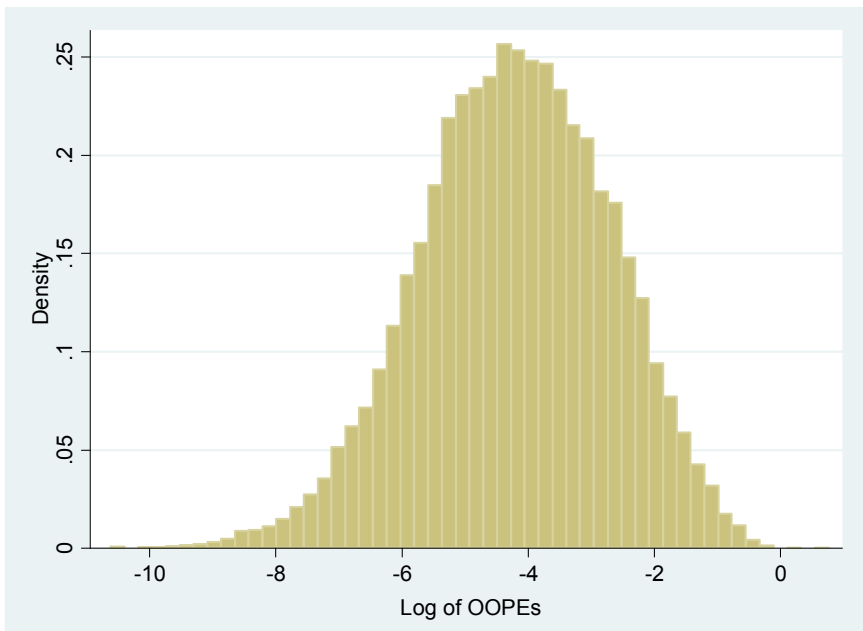


Figure 5: Histogram for OOPEs over the Capacity to Pay

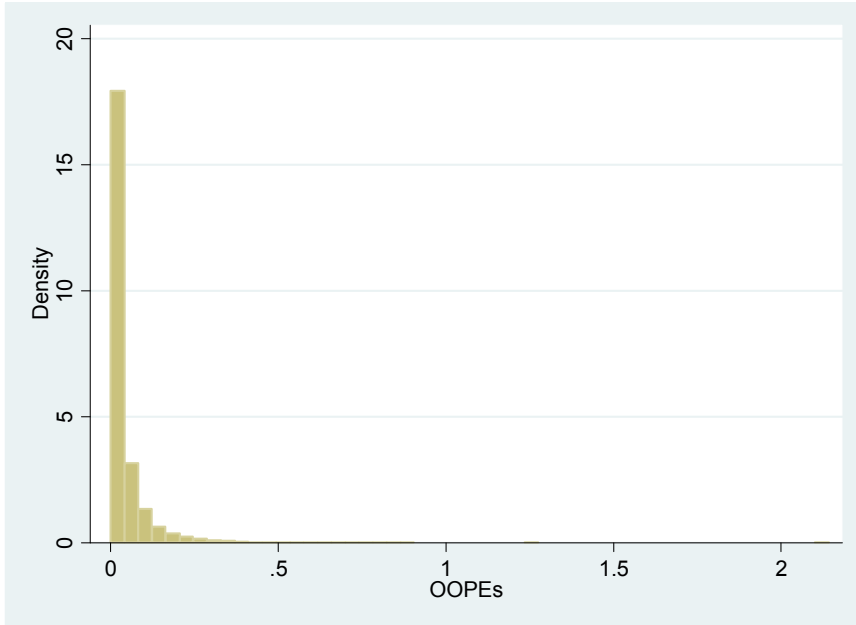


Figure 6 Histogram for the Logarithm of OOPEs over the Capacity to Pay

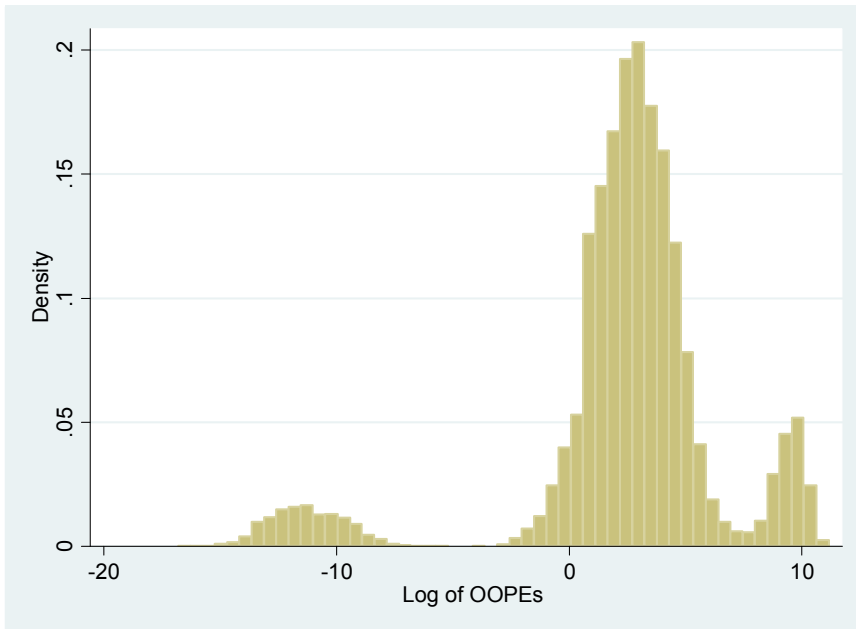


Table 1: Summary Statistics

	Above 10%	Below 10%		Above 20%	Below 20%
Catastrophic health expenditures	10.83	89.17	Catastrophic health expenditures	3.81	96.19
	Above 30%	Below 30%		Above 40%	Below 40%
Catastrophic health expenditures	1.57	98.43	Catastrophic health expenditures	0.65	99.35
	Public	Private	Green Card	No Health insurance	
Health Insurance	63.09	6.76	13.24	16.91	

Table 2: Correlation Matrix

	CataEx 10%	CataEx 20%	CataEx 30%	CataEx 40%	Household Income	Public Health Insurance	Private Health Insurance	Green Card Holders	No Health Insurance
CataEx 20%	0.5715*** (0.000)								
CataEx 30%	0.3627*** (0.000)	0.6346*** (0.000)							
CataEx 40%	0.2322*** (0.000)	0.4063*** (0.000)	0.6401*** (0.000)						
Household Income	0.0253*** (0.000)	0.0158*** (0.000)	0.0159*** (0.000)	0.0050** (0.0317)					
Public Health Insurance	-0.0770*** (0.000)	-0.0602*** (0.000)	-0.0417*** (0.000)	-0.0262*** (0.000)	0.0413*** (0.000)				
Private Health Insurance	-0.0158*** (0.000)	-0.0116*** (0.000)	-0.0122*** (0.000)	-0.0055** (0.0184)	0.0101*** (0.000)	-0.3522*** (0.000)			
Green Card Holders	0.0415*** (0.000)	0.0256*** (0.000)	0.0207*** (0.000)	0.0115*** (0.000)	-0.0988*** (0.000)	-0.5107*** (0.000)	-0.1052*** (0.000)		
No Health Insurance	0.0750*** (0.000)	0.0644*** (0.000)	0.0450*** (0.000)	0.0280*** (0.000)	-0.0415*** (0.000)	-0.5897*** (0.000)	-0.1215*** (0.000)	-0.1762*** (0.000)	
Education	-0.0588*** (0.000)	-0.0520*** (0.000)	-0.0367*** (0.000)	-0.0240*** (0.000)	0.0580*** (0.000)	0.2021*** (0.000)	0.0034** (0.0432)	-0.1999*** (0.0432)	-0.0848*** (0.0432)

Table 3: OLS Estimates for Out-of-Pocket Health Expenditures over the Capacity to Pay

VARIABLES	OLS (1)	OLS (2)	OLS (3)	OLS (4)
Gender (Female)	-0.0002 (0.0004)	0.0012 (0.0008)	-0.00001 (0.0006)	0.00001 (0.0006)
Age	0.0001* (0.0001)	-0.0000 (0.0002)	-0.0002 (0.0002)	0.0004** (0.0002)
Age Square	-0.00001 (0.00001)	0.00001 (0.00001)	0.00001 (0.00001)	0.00001 (0.00001)
Health Insurance (reference Public)				
Health Insurance -Private	0.0011 (0.0008)	-0.0026 (0.0026)	0.0004 (0.0011)	0.0011 (0.0012)
Health Insurance-Green Card	0.0060*** (0.0009)	-0.0001 (0.0013)	0.0041*** (0.0011)	0.0046*** (0.0011)
Health Insurance-No Health insurance	0.0069*** (0.0005)	0.0036*** (0.0013)	0.0060*** (0.0008)	0.0080*** (0.0009)
Logarithm of Household Income	-0.0036*** (0.0005)	-0.0040*** (0.0006)	-0.0028*** (0.0005)	-0.0037*** (0.0005)
Marital Status (Never Married)				
Marital Status-Married	0.0008 (0.0007)	0.0009 (0.0011)	0.0015* (0.0008)	0.0020** (0.0009)
Marital Status-Widowed	-0.0003 (0.0012)	0.0071* (0.0043)	0.0037 (0.0028)	0.0043 (0.0031)
Marital Status-Divorced	-0.0010 (0.0032)	0.0041 (0.0028)	0.0033 (0.0023)	0.0038 (0.0024)
Education Level (reference Illiterate)				
Education Level-Not completed school	-0.0025*** (0.0009)	0.0032 (0.0026)	-0.0012 (0.0019)	-0.0016 (0.0020)
Education Level-Primary School	-0.0058*** (0.0007)	-0.0041** (0.0020)	-0.0043*** (0.0015)	-0.0051*** (0.0016)
Education Level-Primary Education	-0.0071*** (0.0009)	-0.0022 (0.0024)	-0.0041** (0.0019)	-0.0051** (0.0020)
Education Level-Secondary School	-0.0074*** (0.0009)	-0.0042* (0.0022)	-0.0045*** (0.0017)	-0.0056*** (0.0018)
Education Level-High School	-0.0074*** (0.0008)	-0.0034 (0.0022)	-0.0048*** (0.0017)	-0.0059*** (0.0018)
Education Level-Senior School	-0.0077*** (0.0009)	-0.0025 (0.0022)	-0.0055*** (0.0017)	-0.0064*** (0.0018)
Education Level-College	-0.0070*** (0.0011)	-0.0031 (0.0024)	-0.0050*** (0.0018)	-0.0058*** (0.0020)
Education Level-University	-0.0042*** (0.0010)	0.0018 (0.0025)	-0.0023 (0.0019)	-0.0028 (0.0020)
Industry Codes (reference Agriculture, hunting, forestry)				
Industry Codes -Fishing		0.0016 (0.0017)	0.0029** (0.0012)	0.0031** (0.0013)
Industry Codes- Mining		-0.0010 (0.0017)	0.0018** (0.0007)	0.0022** (0.0010)
Industry Codes- Manufacturing		0.00004 (0.0017)	0.0011 (0.0013)	0.0012 (0.0014)
Industry Codes- Construction		-0.0008 (0.0015)	-0.0009 (0.0012)	-0.0010 (0.0013)
Industry Codes- Wholesale and retail business		0.0026 (0.0017)	0.0030** (0.0013)	0.0038*** (0.0014)
Industry Codes- Hotel and restaurants		-0.0027* (0.0015)	-0.0023* (0.0012)	-0.0026** (0.0013)
Industry Codes- Transportation		0.0005 (0.0016)	-0.0006 (0.0013)	-0.0005 (0.0014)
Industry Codes- Financial Services		-0.0015 (0.0016)	-0.0002 (0.0013)	-0.0002 (0.0014)

Table 3 (cont.): OLS Estimates for Out-of-Pocket Health Expenditures over the Capacity to Pay

VARIABLES	OLS (1)	OLS (2)	OLS (3)	OLS (4)
House tenure (reference owner)				
House tenure-Tenant	-0.0027*** (0.0004)	-0.0005 (0.0008)	-0.0013** (0.0005)	-0.0015** (0.0006)
House tenure-Lodging	-0.0041*** (0.0011)	-0.0048** (0.0019)	-0.0030* (0.0016)	-0.0030* (0.0017)
House tenure-Other	-0.0021*** (0.0005)	-0.0003 (0.0011)	-0.0017** (0.0008)	-0.0020** (0.0008)
Household Size	-0.0004*** (0.0001)	-0.0004* (0.0002)	-0.0004*** (0.0001)	-0.0003** (0.0002)
Access to Health centres (reference very difficult)				
Access to Health centres-Difficult		-0.0005 (0.0020)		
Access to Health centres-Easily		-0.0029 (0.0020)		
Access to Health centres-Very Easily		-0.0039* (0.0023)		
Access to Transportation Points (reference very difficult)				
Access to Transportation Points-Difficult		-0.0031 (0.0021)		
Access to Transportation Points-Easily		-0.0027 (0.0024)		
Access to Transportation Points-Very Easily		-0.0033* (0.0020)		
Urban Area	-0.0110*** (0.0004)	-0.0063*** (0.0009)	-0.0081*** (0.0005)	-0.0092*** (0.0006)
Employed (No)	0.0012*** (0.0004)			
Wealth			-0.0009*** (0.0002)	
Limited activities because of mental or physical health problems (No)				-0.0174*** (0.0038)
Observations	139,705	27,152	61,506	55,783
R-squared	0.2739	0.1447	0.1943	0.1717

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4: Probit Selection Equations and Determinants of Different Types of Health Insurance

VARIABLES	(1) Private Vs Public	(2) Private Vs Public	(3) No Insurance Vs Public and Private	(4) No Insurance Vs Public and Private	(5) Green Card Vs No Insurance	(6) Green Card Vs No Insurance
Gender (Female)	0.0027 (0.0113)	0.0149 (0.0227)	-0.1679*** (0.0063)	-0.2441*** (0.0129)	-0.0324*** (0.0104)	-0.0500** (0.0197)
Age	-0.0026*** (0.0005)	-0.0068*** (0.0010)	-0.0121*** (0.0003)	-0.0149*** (0.0006)	-0.0016*** (0.0005)	0.0022** (0.0009)
Logarithm of Household Income	-0.0969*** (0.0093)	-0.1218*** (0.0137)	-0.4010*** (0.0059)	-0.2008*** (0.0083)	-0.3586*** (0.0142)	-0.2556*** (0.0158)
Marital Status (Never Married)						
Marital Status-Married	-0.0479*** (0.0163)	0.0695** (0.0318)	-0.3025*** (0.0089)	-0.3829*** (0.0177)	0.1658*** (0.0136)	0.1234*** (0.0255)
Marital Status-Widowed	-0.1721*** (0.0324)	-0.1610** (0.0680)	-0.2016*** (0.0175)	-0.5005*** (0.0380)	0.2332*** (0.0279)	0.3478*** (0.0558)
Marital Status-Divorced	0.0875* (0.0528)	0.1730** (0.0779)	0.3422*** (0.0247)	0.2274*** (0.0390)	-0.0181 (0.0418)	-0.0545 (0.0613)
Education Level (reference Illiterate)						
Education Level-Not completed school	-0.0425* (0.0246)	0.0462 (0.0517)	-0.3361*** (0.0134)	-0.0220 (0.0305)	-0.0841*** (0.0166)	-0.1837*** (0.0354)
Education Level-Primary School	-0.0436** (0.0191)	-0.0078 (0.0410)	-0.1373*** (0.0103)	-0.0053 (0.0236)	-0.3025*** (0.0143)	-0.5030*** (0.0292)
Education Level-Primary Education	-0.1482*** (0.0277)	-0.0031 (0.0565)	-0.4774*** (0.0149)	-0.3771*** (0.0313)	-0.2095*** (0.0203)	-0.4013*** (0.0384)
Education Level-Secondary School	-0.1689*** (0.0262)	-0.0253 (0.0564)	-0.2197*** (0.0145)	-0.0333 (0.0315)	-0.3827*** (0.0255)	-0.6500*** (0.0459)
Education Level-High School	-0.2224*** (0.0245)	0.0458 (0.0529)	-0.3002*** (0.0133)	-0.1081*** (0.0299)	-0.5425*** (0.0236)	-0.7905*** (0.0437)
Education Level-Senior School	-0.3177*** (0.0301)	-0.0902 (0.0587)	-0.3821*** (0.0176)	-0.2029*** (0.0323)	-0.7040*** (0.0377)	-0.8815*** (0.0528)
Education Level-College	-0.7266*** (0.0496)	-0.1466** (0.0742)	-0.4509*** (0.0242)	-0.3189*** (0.0413)	-1.0337*** (0.0733)	-1.1444*** (0.0956)
Education Level-University	-0.4591*** (0.0358)	-0.1434** (0.0561)	-0.4712*** (0.0208)	-0.2925*** (0.0372)	-1.1953*** (0.0738)	-1.3873*** (0.0954)
Employed (No)	-0.1368*** (0.0119)	-0.0186 (0.0231)	-0.1260*** (0.0067)	0.0155 (0.0134)	0.1076*** (0.0105)	0.2237*** (0.0195)
House Size	0.0019*** (0.0002)	0.0016*** (0.0003)	-0.0001 (0.0001)	-0.0012*** (0.0002)	-0.0025*** (0.0002)	-0.0024*** (0.0003)
Household Size	0.0382*** (0.0026)	0.0350*** (0.0046)	0.1137*** (0.0014)	0.0724*** (0.0029)	0.0676*** (0.0019)	0.0824*** (0.0040)
Wealth	-0.0452*** (0.0048)	-0.0509*** (0.0099)	-0.1941*** (0.0024)	-0.1549*** (0.0052)	-0.0692*** (0.0029)	-0.1232*** (0.0069)
Access to Health centres (reference very difficult)						
Access to Health centres-Difficult		0.0160 (0.0633)		0.0265 (0.0363)		-0.0728 (0.0453)
Access to Health centres-Easily		-0.0138 (0.0644)		0.0222 (0.0364)		-0.0070 (0.0468)
Access to Health centres-Very Easily		0.0297 (0.0800)		-0.0070 (0.0456)		0.0013 (0.0656)
Access to Transportation Points (reference very difficult)						
Access to Transportation Points-Difficult		-0.0856 (0.0642)		-0.0417 (0.0373)		0.1556*** (0.0476)
Access to Transportation Points-Easily		-0.1321** (0.0647)		-0.0363 (0.0368)		0.0859* (0.0480)
Access to Transportation Points-Very Easily		-0.1856** (0.0798)		-0.0733 (0.0449)		0.0707 (0.0650)
Urban Area	-0.0490*** (0.0120)	-0.1119*** (0.0245)	-0.0623*** (0.0063)	-0.0977*** (0.0144)	-0.0446*** (0.0101)	-0.1270*** (0.0214)
Observations	252,507	88,633	327,288	99,778	107,790	24,825
Wald chi square	38,364.67 [0.000]	2,655.314 [0.000]	26,031.78 [0.000]	7,930.50 [0.000]	16,465.08 [0.000]	4,155.62 [0.000]

Notes: Robust standard errors in parentheses, p-values within brackets *** p<0.01, ** p<0.05, * p<0.1

Table 5: Propensity Score and Average Treatment Effects on Health Expenditures and OOPECTP for the Types of Health Insurance

VARIABLES	OOPEs	OOPECTP	CataEx 10% Threshold	CataEx 20% Threshold	CataEx 30% Threshold	CataEx 40% Threshold
Private Vs Public	14.662*** (4.708)	0.0057*** (0.0017)	0.0117 (0.0081)	0.0093** (0.0045)	0.0073*** (0.0025)	0.0030* (0.0016)
No-Insurance Vs Public-Private	6.6725*** (1.141)	0.0039*** (0.0008)	0.0197*** (0.0032)	0.0093*** (0.0021)	0.0021** (0.0010)	0.0009 (0.0008)
Green Card Vs No-Insurance	-12.409*** (2.191)	-0.0063*** (0.0016)	-0.0187*** (0.0067)	-0.0178*** (0.0046)	-0.0099*** (0.0031)	-0.0013 (0.0019)

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6: Propensity Score Matching and Average Treatment Effects

VARIABLES	OOPEs	OOPECTP	CataEx 10% Threshold	CataEx 20% Threshold	CataEx 30% Threshold	CataEx 40% Threshold
Public Vs Other	-6.0988*** (1.4613)	-0.0056*** (0.0004)	-0.0046 (0.0033)	-0.0090** (0.0012)	-0.0031*** (0.0008)	-0.0011** (0.0005)
Private Vs Other	5.123 (4.078)	0.0016 (0.0021)	-0.0082 (0.0095)	-0.0018 (0.0020)	-0.0008 (0.0013)	0.0005 (0.0009)
Green Card Vs Other	0.5919 (4.078)	0.0022 (0.0014)	-0.0053 (0.0043)	-0.0009 (0.0020)	0.0001 (0.0013)	-0.0004 (0.0009)
No-Insurance Vs Other	8.523*** (1.912)	0.0054*** (0.0005)	0.0141*** (0.0043)	0.0110*** (0.0014)	0.0041*** (0.0006)	0.0014*** (0.0006)

Notes: Standard errors in parentheses *** p<0.01, ** p<0.05

Table 7: Test for Propensity Score before and After Matching

	Private Vs Public	No Insurance Vs Public-Private	Green Card Vs No-Insurance	Public Vs Other	Private Vs Other	Green Card Vs Other	No-Insurance Vs Other
Gender	0.66 (0.507)	1.33 (0.184)	-0.86 (0.391)	-1.41 (0.158)	1.52 (0.129)	-1.16 (0.245)	1.11 (0.231)
Age	-1.17 (0.244)	1.54 (0.115)	-1.51 (0.123)	1.16 (0.315)	-0.94 (0.345)	-1.25 (0.224)	1.50 (0.124)
Household Income	-0.44 (0.662)	1.30 (0.172)	0.91 (0.361)	0.32** (0.153)	1.59 (0.121)	-1.52 (0.125)	-1.55 (0.116)
Marital Status	-1.99* (0.092)	-1.79* (0.073)	-5.25 (0.000)	-2.39** (0.017)	-3.94*** (0.000)	-1.32 (0.187)	-1.70* (0.089)
Education level	1.43 (0.112)	1.76** (0.081)	-0.34 (0.731)	0.04 (0.15)	1.13 (0.314)	1.70* (0.096)	1.01 (0.242)
Employed	-2.42** (0.024)	-1.36 (0.173)	-0.31 (0.759)	0.46 (0.644)	-0.33 (0.745)	1.26 (0.209)	-0.32 (0.753)
Household Size	0.92 (0.355)	2.23 (0.026)	-1.61 (0.108)	2.71*** (0.007)	1.84* (0.066)	-1.10 (0.257)	-1.19 (0.235)
Wealth	0.34 (0.732)	1.02 (0.293)	-1.57 (0.113)	-1.91* (0.056)	1.41 (0.146)	-6.18*** (0.000)	2.16** (0.031)
Urban area	-0.96 (0.338)	1.17 (0.266)	2.00** (0.045)	-0.52 (0.605)	0.95 (0.340)	1.57 (0.119)	1.42 (0.132)

Notes: Standard Errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 8: DID for OOPECTP and OOPEs and Various Cases

Coefficients		Coefficients	
Panel A: Green Card Vs Public Health and OOPECTP		Panel B: Green Card Vs Public Health and OOPEs	
Treat (1 for Green Card, 0 for Public Health Insurance)	0.0106 (0.507)	Treat (1 for Green Card, 0 for Public1)	19.944 (17.002)
Post-Period (1 for 2008 and after)	-0.0783*** (0.0150)	Health Insurance	
Treat*Post-Period	-0.0294** (0.0142)	Post-Period (1 for 2008 and after)	27.540** (13.292)
No. Observations	20,555	Treat*Post-Period	-34.691** (19.377)
R Square	0.1305	No. Observations	20,555
Panel C: Green Card Vs Public Health Placebo OOPECTP test 2007		Panel D: Green Card Vs Public Health Placebo OOPEs test 2007	
Treat (1 for Green Card, 0 for Public Health Insurance)	0.0043 (0.106)	Treat (1 for Green Card, 0 for Public1)	22.571 (21.533)
Post-Period (1 for 2007 and after)	-0.0431*** (0.0113)	Health Insurance	
Treat*Post-Period	-0.0058 (0.0142)	Post-Period (1 for 2008 and after)	30.700 (25.445)
No. Observations	20,555	Treat*Post-Period	-27.972 (22.842)
R Square	0.0834	No. Observations	20,555
Panel E: Rural Vs Urban and Public Health Insurance OOPECTP		Panel F: Rural Vs Urban and Public Health Insurance OOPEs	
Treat (1 for Rural Area and Public Health, 0 for Urban Area and Public Health Insurance)	0.0088*** (0.0101)	Treat (1 for Rural Area and Public Health, 0 for Urban Area and Public Health Insurance)	10.046*** (2.101)
Post-Period (1 for 2008 and after)	-0.0460*** (0.0028)	Post-Period (1 for 2008 and after)	4.596** (2.291)
Treat*Post-Period	-0.0040*** (0.0014)	Treat*Post-Period	-6.905** (3.426)
No. Observations	37,160	No. Observations	37,160
R Square	0.1052	R Square	0.0997
Panel E: Rural Vs Urban and Public Health Insurance OOPECTP Placebo test 2007		Panel F: Rural Vs Urban and Public Health Insurance OOPEs Placebo test 2007	
Treat (1 for Rural Area and Public Health, 0 for Urban Area and Public Health Insurance)	0.0105*** (0.0090)	Treat (1 for Rural Area and Public Health, 0 for Urban Area and Public Health Insurance)	6.400*** (2.044)
Post-Period (1 for 2008 and after)	-0.0471*** (0.0029)	Post-Period (1 for 2008 and after)	2.215* (1.144)
Treat*Post-Period	-0.0012 (0.0014)	Treat*Post-Period	1.558 (3.312)
No. Observations	37,160	No. Observations	37,160
R Square	0.1054	R Square	0.0988

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 9: DID for OOPECTP and OOPEs Using Logarithms

Coefficients		Coefficients	
Panel A: Green Card Vs Public Health and OOPECTP		Panel B: Green Card Vs Public Health and OOPEs	
Treat (1 for Green Card, 0 for Public Health Insurance)	0.0446 (0.106)	Treat (1 for Green Card, 0 for Public1)	0.1670 (0.212)
Post-Period (1 for 2008 and after)	-0.1082*** (0.0310)	Health Insurance	
Treat*Post-Period	0.2129** (0.0982)	Post-Period (1 for 2008 and after)	0.7074* (0.378)
No. Observations	19,798	Treat*Post-Period	-0.260** (0.130)
R Square	0.1266	No. Observations	19,798
		R Square	0.8773

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10: DID and Conditional Logit Estimates for Catastrophic Health Expenditures and Green Card

	CataEx 10%	CataEx 20%	CataEx 30%	CataEx 40%
Treat (1 for Green Card, 0 for Public Health Insurance)	0.0729 (0.0454)	0.0222 (0.0298)	0.0380* (0.0200)	0.0180* (0.0105)
Post-Period (1 for 2008 and after)	-0.3307*** (0.0818)	-0.0867* (0.0456)	-0.0812** (0.0182)	-0.0485** (0.0225)
Treat*Post-Period	-0.2227*** (0.0796)	-0.0961** (0.0433)	-0.0876** (0.0350)	-0.0599*** (0.0220)
No. Observations	20,092	14,983	11,887	7,396
LR Square	432.29 [0.000]	248.49 [0.000]	128.82 [0.000]	104.45 [0.000]

Notes: Standard errors in parentheses, p-values within brackets *** p<0.01, ** p<0.05, * p<0.1