Quasi-Experimental Evidence on the Political Impacts of Education in Vietnam

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QUASI-EXPERIMENTAL EVIDENCE ON THE POLITICAL IMPACTS OF EDUCATION IN VIETNAM

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Abstract

In this study, I estimate the causal effects of education on political outcomes in Vietnam using data from Vietnam's World Values Survey. To address the potential endogeneity problem of education, I employs the 1991 compulsory schooling reform in Vietnam to instrument for exogenous changes in schooling years with a regression discontinuity design. I find that in general education does cause favorable impacts on political outcomes in Vietnam using the whole sample. In particular, one more year of schooling results in increases in the probabilities of political concern and political participation by about 6–12% points and 6–8% points, respectively. However, I strikingly find that for those whose at least lower secondary degree, more schooling years they achieve less political concern they have.

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1 INTRODUCTION

The study of the relationship between schooling and political outcomes such as political knowledge, concern, ideology or political participation has been long interest among political scientists and economists alike. The literature shows that schooling years are positively associated with measurable political outcomes. In particular, previous studies conclude that people with higher schooling level tend to have greater political concern, deeper understanding of political issues, or larger likelihoods of political participation (for examples Dunn, 2011; Nie *et al.,* 1996; Schlozman *et al.*, 201; Verba *et al.*, 1995; Weakliem, 2002; Weil, 1985). Nevertheless, the academic controversy on whether education is really a cause or it merely a proxy of political outcomes has continuously occurred among social researchers for decades (Berinsky and Lenz, 2011; Kam and Palmer, 2008; Persson, 2013) because only a moderate number of studies implemented so far provides the dependable causal effects of education on political outcomes conducted using state-of-the-art research methods (Persson, 2015).

A pivotal challenge facing researchers in estimating the credible causal effects of schooling on political outcomes is the endogeneity of education (Berinsky and Lenz, 2011; Kam and Palmer, 2008; Meyer, 2016). One of the most frequently problems that induces the endogeneity is omitted variables that determine both one's schooling level and political outcomes (Bauer *et al.*, 2015). For example, there may be some innate personality characteristics that simultaneously affect an individual's educational enrollment and the likelihood of political outcomes (Meyer, 2016). The estimates from the studies that were unable to islolate the impact of education from other and important latent factors such as socioe-conomic status (Jennings and Niemi, 1968), ability (Spence, 1973) or parental resources (Nie *et al.*, 1996) may therefore suffer from unobserved variable bias and thus do not indicate the reliable causal effects of education on political outcomes.

This study in contrast contributes to the literature evidence on the estimates of the 'true' causal impacts of education on political concern and participation in Vietnam using a regression discontinuity design (RDD) a state-of-the-art technique in applied

econometrics to address the endogeneity of education.[1] Vietnam a country that recently has made a transition from a central planning economy to a market-based economy and simultaneously experienced massive expansions in education is a very interesting case to investigate this research problem.

Preferably, one desires to make a comparison between the outcome of an individual who receives the treament and the outcome of that person in the case not receiving the treament. However, it is apparently very difficult to estimate such a non-treatment result for a treated in the real world. To address this problem, the implement of experiments in which individuals are randomly assigned to the treament schooling years or educational level in this case is the most powerful and feasible research design for performing causal inference about the impacts of education on political outcomes in the one hand.[2] Notwithstanding, experimental data is infrequently available and thus there is a lack of experimental evidence on the causal links between education and political outcomes.[3]

In the other hand, the application of quasi-experimental designs by utilizing natural experiments or matching strategies is recently a growing trend to make causal inference in political science in general or to investigate the causal effects of education on political outcomes in particular using observational data, especially in the context of experimental data scarcity (Keele, 2015; Mayer, 2011; Samii, 2016). Recent studies exploits a compulsory schooling reform as an instrument for changes in education and reply on a regression discontinuity design to estimate the causal links of interest (Meyer, 2016; Persson *et al.*, 2016).

In this study, I employ a RDD a cutting edge econometric technique to evaluate the causal association between education and political outcomes in Vietnam. Although this study does not rely on a randomized control trial, it takes advantages of a quasi-experiment as a feasible research design to guarantee the balance between the treatment and control groups to isolate the causal effects of education for other effects on political outcomes.

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[1] Although there is a lack of studies using a RDD as identification strategy to address the endogeneity and estimate the causal impacts of education on political outcomes, it has been widely applied in applied economics recently (Kyriakides and Luyten, 2009; Luyten, 2006).

[2] For instance, see Angrist and Pischke (2015) for a helpful reference of causal inference using experiments.

[3] Sondheimer and Green (2010) is one of rarely limited studies that conduct experiment to estimate the causal impacts of education on political outcomes.

In particular, I exploits a compulsory schooling reform in Vietnam that was promulgated in 1991 as an exogenous shifts in individuals' education to vanquish the endogenity challenge and I exploit the timing of the reform to create a RDD. According to the reform, children aged less than 15 in 1991 have to complete the primary education. Hence, these children who fully exposed to the reform are more likely to complete primary education and then a higher level of schooling compared to the those who were out-of-the reform. In the same logic, I use individuals whose ages being equal to 14 and less in 1991 as a treatment group and those aged from 15 and over as a control group. I use the instrumental variable (IV) approach to estimate the causal association between schooling and political outcomes in Vietnam. I use a sample from two waves of the World Values Survey (WVS) for Vietnam (2001 and 2006 Vietnam-WVS) in which both information on education and political outcomes is available.

Most available studies on the relationship between education and political outcomes have conducted in strongly institutionalized democracies. However, there has been recently a growing trend to explore this research problem from non-consolidated democracies or even autocracies in order to fullfil the research gap (Croke *et al.*, 2016; Larreguy and Marshall, 2016; Levitsky *et al.*, 2009). This study provides evidence on the causal impacts of eductaion on political outcomes from a very different political institution in the world, a Marxist-Leninist regime with a singular political system.

To the best of my knowledge, there is no quantitative research on the association between education and political concern and political participation in Vietnam. The lack of such studies because a fact that although information on education is mostly available form many surveys in Vietnam, there is extremely a limited information on political concern and political participation. Fortunately, the World Values Survey that contains available information on political concern and political participation allows me to carried out such a study for Vietnam. Using a RDD this study is first conducted so far in Vietnam and aims to test the hypothesis that having one more year of schooling promotes Vietnamese citizens to pay more attention to political themes and boosts the probability of taking part in political activities.

In terms of the results, I find that in general education does cause favourable impacts on political concern and political participation in Vietnam. In particular, Vietnamese citizens who have one more year of schooling are more likely to pay their attention to political

topics or to treat political issues as major problems in their lives by the probabilities of 6–12% points. In addition, having an additional schooling years results in increases in the likelihoods to participate in political activities or a member of a political organization by about 6–8% points. The findings in this study provide more evidence on the positive relationship between education and political outcomes. The results are strongly robust to various econometric specifications using the whole sample.

This paper will proceed as follows. Section 2 presents insitutional backgrounds for the current study and the review of related literature from previous studies in the same research topic. Next, section 3 describes data sources and the sample while section 4 provides how emprical strategy is constructed to estimate the causal effects of schooling on political concern and participation. Section 5 reports empirical results while section 6 provides some robustness checks for the baseline results using various sub-samples and other different specifications compared to main models. Section 7 provides further analysis with heterogeneity and the alternative results using a different estimation approach. Finally, discussion and conclusion are made in section 8.

2 INSTITUTIONAL BACKGROUNDS AND RELATED LITERATURE

2.1 Institutional Backgrounds

Providing education for all citizens has been consistenly a high priority of Vietnam's public policies since the national reunification of the country in 1975. However, due to the difficulties of the post-war time, Vietnam was lack of resources for its education development.

During the period of 1975–1986, Vietnam had a lack of resources for developing its economy, including educational system. Moreover, the economy was based on an closed system and the weak function of market incentives and forces. Therefore, there were inactive labor markets and educational system in Vietnam during the same time. In 1986, Vietnam lunched its economic reform that redirected its economy from a central planning to a market-oriented system under a common name of *Doi Moi* (renovation). This event has been regarded as a 'turning' point for the economy's taking off after the era of Vietnam war. The rennovation has changed the economy and many aspects of the society through the adoption of open policy and the enhanced participation in international

intergration. Moreover, the introduction of market-based economy allowed the active economic activities and the development of labor markets in Vietnam.

Under the *Doi Moi*, the reform of Vietnam's educational system took place as a consequence during the same period. Importantly, the government of Vietnam introduced the Law on Universal Primary Education (LUPE) in 1991 as an effort to boost access to general education especially primary education for disadvantaged or minor ethnic groups. According to LUPE, primary education are compulsory for all Vietnamese children aged less than 15. The education system in Vietnam is a mainly state-based system and traditionally it functions based on the public budget. Moreover, the government also allows the investments from the private section and therefore resources for education development in Vietnam are increasingly accumulated.

The 1991 compulsory education reform has created the sizable expansions of education systems especially for primary education and increases in primary schooling enrollment rates as a consequence. Figure 1 apparently shows the differences in the gross primary schooling attainment ratios between the before and after 1991 periods. Demonstratively, the ratios were 104–109% during 1983–1990 while the post-reform period recorded the rates of 110–114% (World Bank, 2016).

2.2 Related Literature

Most available studies in the causal relationship between education and political outcomes are under democratic settings. The results of positive causal effects of schooling on political outcomes has been well-established from developed countries, for examples the United States (Dee, 2004; Sondheimer and Green, 2010; Dinesen *et al.*, 2016; Milligan *et al.*, 2004), the United Kingdom (Persson, 2014), Norway (Persson *et al.*, 2016), Denmark (Andersen and Hoff, 2001; Dinesen *et al.*, 2016), Sweden (Persson, 2011; Persson *et al.*, 2016) or a collection of European countries (Borgonovi *et al.*, 2010).[4]

[4] However, the literature arguably finds that all educational levels are by no means causally linked to increases in political outcomes (Berinsky and Lenz, 2011; Kam and Palmer, 2008; Tenn, 2007). In other words, whether schooling produces postive impacts on political outcomes depends on types or levels of education, for example in Norway (Pelkonen, 2012).

Meanwhile, there are few studies on the causal association between education and political outcomes from weakly institutionalized democracies or authoritarian regimes. This section provides the summary of previous studies' findings that were carried out so far from some countries that are far from strong democracies. Wantchekon *et al.* (2015) utilize the establishment of the first schools ceremonially inaugurated in colonial regions as a credible exogenous shift origin in education attainment and find positive and enormous impacts of education on political participation in Benin. Specifically, Beninese citizens who were fully exposed to the first formal educational establishment during the colonial era and their next generations are significantly more likely to become political activists or members of a political party. Larreguy and Marshall (2016) exploit the 1976 universal primary education reform as a source of exogenous change in schooling attainment to estimate the causal effects of education on political outcomes in Nigeria, a tenuously institutionalized democracy. They find that education causes increases in citizens' political concern, voting, and local authority interaction or community activity participation.

Recently, Friedman *et al.* (2016) provide causal evidence on the effects of education in Kenya using an experiment in which a randomized merit scholarship competition that lifted school performance and secondary education for ethnically disadvantaged adolescent girls is employed to model exogenous variations in experimentees' schooling. They identify that secondary education increases women's political information and knowledge, decreases the sufferance of gender-biased violence and are less obsequious to political power. Yet, this study finds no signficant evidence on the favourable impacts of schooling on other outcomes such as political effectiveness, public involvement or voting premeditation in Kenya.

In the other hand, Croke *et al.* (2016) remarkably find that education is negatively linked to political participation, including voting activities, connecting with local authority and taking part in public congress in Zimbabwe. Using the 1980 Zimbabwean educational reform with more access to secondary schooling that provided a natural experiment to address the endogeneity problem of the relationship between education and political outcomes, they arguably indicate that in an electoral authoritarian regime like Zimbabwe educated citizens tend to deliberately disengage from political participation. This finding substantially challenges conventional wisdom that has been well-established in the

literature that education has positive impacts on political outcomes. They also propose an intriguing hypothesis that educated residents in autocracies believe that political participation is regarded as supporting autocrats and futile for the development of society and thus they intentionally release involvements in political activities.

3 DATA AND THE SAMPLE

This study use data from the World Values Survey (WVS).[5] The WVS is one of the biggest survey that has collected information on changes in human attitudes, values, and beliefs and its impacts on social and political lives since 1981. Importantly, the WVS includes nationally representative surveys for almost 100 countries that is made up of about 90% of the total population of the world.

Regarding the data for this study, I use two WVS waves for Vietnam in 2001 and 2006. The 2001 WVS includes 1000 respondents while the 2006 WVS consists of 1495 respondents. I pool the 2001 WVS and 2006 WVS to create a pooled cross-sectional sample of respondents with a total of 2495 individuals.

The independent variable of interest is education that is measured by the number of schooling years. The number of schooling years is corresponding to the highest educational level for an individual. There are 2475 individuals who have education information that is made up of about 99.20% of the total pooled sample. Meanwhile, the dependent variable is political concern and political participation. Political concern is a dummy variable that equal one if the respondent stated that politics and political topics are central in her or his life and zero otherwise. If a respondent has political concern, she or he spends time to follow political news or information. The remainding dependent variable is political participation that is one if a respondent participates in a political organization or political activities at the time of survey and zero otherwise. There are 2495 observations that contain information on political concern and political participation equivalent to 100% of the total pooled sample. Combining both the information sets of education and political concern and political participation, there are 2475 individuals.

[5] We can fully access the WVS datasets from http://www.worldvaluessurvey.org.

The analysis only limits to individuals who were born arround the timing of the educational reform. The reform was legally based on the 1991 Law on Universal Primary Education. According to the law, all children aged 6–14 have to go to and complete primary education since 1991, and 1991 become the timing of the educational reform in Vietnam. In other words, all children aged less than 15 in 1991 are much more likely to have higher schooling years. As a result, I choose age of 15 in 1991 as the pivot age for creating the pre- and post-reform groups. In particular, individual aged less than 15 generally constitute the pre-reform group and those aged from 15 is made up of the post-reform group.

To be clear, let $d_i = (a_i - 15)$ is the distance to the reform that is measured by the difference in years between the age of a respondent in 1991 and the pivot age in 1991 of being out of the reform (15 years old). The value of $d_i < 0$ indicate an individual i has the age less than 15 in 1991 and thus is fully exposed to the reform while an individual with $d_i > 0$ is apparently out of the reform. The cutoff point is $d_i = 0$. I use a bandwidth of $d_i = \pm 15$ years old to establish a final sample for the analysis of 1450 individuals aged 0–30 in 1991, that is equivalent to 58.59% of the total individuals who have both information on education and political outcomes (2475 observations). Specifically, among 1450 observations for the analysis, there are 594 individuals (40.97%) with $d_i \in [-15, -1]$ who are regarded as the treatment group and 856 individuals (59.03%) with $d_i \in [0,15]$ who are considered as the control group.

The descriptive statistics of the sample is presented in Table 1. Among 1450 respondents, there are about 68% of respondents who indicated that they have paid their attention to political issues because political topics are very important in their daily lives. Meanwhile, approximately 18% of respondents have already participated in political activities or have been a member of a legal political organization in Vietnam. The average value of schooling years for the sample is 8.1 and the mean age of the respondents is nearly 30.5. Moreover, 48% is male in the sample.

The sample also shows its representative across the country with a highly balanced distribution of respondents among geographical regions. The percentages of respondents from North, Central and South are 36%, 29% and 35% respectively. Essentially, 41% of the observations from the sample were fully exposed to the 1991 educational reform in

Vietnam. It is arguably reasonable to have such a ratio between the treatment and the control groups to conduct a regression discontinuity as this study.

4 EMPIRICAL STRATEGY

To investigate the association between schooling years and political outcomes, one desires to estimate the following regression equation:

$$P_i = \alpha + \beta S_i + \varphi \boldsymbol{X}_i' + \varepsilon_i \quad (1)$$

where P_i indicate political outcomes such as political concern and political participation for individual i, S_i is the number of schooling years for the corresponding respondent, and $\boldsymbol{X}_i'$ is a vector of characteristics of the respondent such as age in 1991, age in the survey time, dummy for male and survey year fixed effects. The coefficient of interest from equation (1) is β that indicates the impacts of schooling on political outcomes. However, the OLS estimate from (1) likely produces an biased estimate of β due to the endogeneity problem. The problem potentially stems from the existence of unobserved characteristics that determines both one's schooling and political outcomes.

In this study, to address the problem of omitted variables I employ an exogenous variation in schooling induced by a compulsory schooling reform in 1991 in Vietnam. In particular, I use a RDD (Lee and Lemieux, 2010) to establish the impact of compulsory education reform on political concern and political participation in Vietnam using a two-stage least square (2SLS) estimation. In the first stage, I estimate the following regression equation:

$$S_i = \alpha + \alpha_1 D_i + \gamma_1 d_i + \gamma_2 D_i * d_i + \alpha_2 \boldsymbol{X}_i' + \varepsilon_i \quad (2)$$

where d_i is the distance to the reform, D_i is a dummy variable for whether the age of respondent in 1991 was less than 15, mathematically $D_i = \begin{cases} 1 \text{ if } & a_i < 15 \\ 0 \text{ if } & a_i \geq 15 \end{cases}$. The equation (2) is used to achieve the predicted values for S_i that are then used for the second stage of the estimation procedure. Subsequently, I estimate the second stage regression using the following linear probability form:

$$P_i = \beta + \beta_1 S_i + \lambda_1 d_i + \lambda_2 D_i * d_i + \beta_2 \boldsymbol{X}_i' + \epsilon_i \quad (3)$$

The coefficient of interest (β_1) estimated from (3) is infered as the causal impact of schooling on political outcomes.

Arguably, the slope of the regression equation may change at two sides arround the pivot age of the respondent in 1991. Therefore I apply the quadratic forms to control this potential change. Equations (2) and (3) respectively become the following equations:

$$S_i = \alpha + \alpha_1 D_i + \gamma_1 d_i + \gamma_2 D_i * d_i + \gamma_3 d_i^2 + \gamma_4 D_i * d_i^2 + \alpha_2 \boldsymbol{X}_i' + \varepsilon_i \quad (4)$$

and

$$P_i = \beta + \beta_1 S_i + \lambda_1 d_i + \lambda_2 D_i * d_i + \lambda_3 d_i^2 + \lambda_4 D_i * d_i^2 + \beta_2 \boldsymbol{X}_i' + \epsilon_i \quad (5)$$

I report estimated results for both linear including equations (2) and (3) and polynomial specifications including equations (4) and (5). Notably, the coefficients $\gamma_3 = \gamma_4 = 0$ and $\lambda_3 = \lambda_4 = 0$ in the case of linear specifications.

5 EMPIRICAL RESULTS

5.1 First stage results: Impacts of compulsory schooling reform on education

Figure 1 demonstrates the effects of compulsory schooling reform on schooling years for all individuals using the sample for analysis in this study with the distance to the reform (d_i) presented along the horizontal axis. There is a vertical line at the point $d_i = 0$ that separates the sample into the treatment and the control groups. The respondents immediately on the left hand side of the vertical line are regarded as the treatment group that is fully exposed to the reform and those on the opposite side of the vertical line are reckoned as the control group. In addition, Figure 2 apparently indicates the discontinuity on schooling years of respondents, in particular those aged less than 15 in 1991 ($d_i < 0$) encountered a larger leap in education compared to respondents aged 15 and over in 1991 ($d_i \geq 0$).

Table 2 summarizes the first stage regression results. The results indicate the highly robust and positive impacts of the 1991 educational reform on an individual's schooling years using both linear and quadratic functional forms for both samples with ± 15 and

±10 bandwidths. The estimated coefficients are almost statistically significant for the traditional levels. Columns 1–2 of Table 2 shows that the educational reform on average results in increases of 1.27 and 1.12 schooling years for bandwidths of ±15 and ±10 respectively using the linear functional form for the estimations. When using the quadratic regression form, the impacts are respectively 0.77 and 0.26 for bandwidths of ±15 and ±10 as indicated in columns 3–4 although the estimated coefficient in column 4 loses its significance.

5.2 Second stage results: Impacts of education on political outcomes

Table 3 presents the baseline results for the second stage regressions that estimate the causal effects of education on political outcomes. To address a potential problem that error terms are probably correlated between respondents' age and age in 1991, I cluster standard errors in a two way manner at age and age in 1991. I find statistically significant local average treatment effect (LATE) of schooling years on political outcomes as shown in Table 3.

In particular, Panel A of Table 3 demonstrates the positive causal association between schooling years and political concern. The estimated coefficients are statistically significant at 1% and 5% levels. The respondents tend to pay more attention on politics and to treat political issues as meaningful topics in their daily lives when they have more schooling years. In particular, having one more year of schooling increases the probablity for focusing on political topics by about 11–12% points and 6–7% points for linear and quadratic functional forms respectively. The probablities are higher when using the linear functional forms than the probablities with the quadratic ones. Columns 1–2 show that the respondents who have an additional schooling year are correlated to political concern higher than the counterparts by 11% and 12% points for bandwidths of ±15 and ±10 respectively. Meanwhile, the corresponding figures for the quadratic regression functions are 7% (the first stage F-stat of 13.62) and 6% (the first stage F-stat of 13.48) for bandwidths of ±15 and ±10 as in columns 3–4.

The results from Panel B of Table 3 show that the respondent having one more year of schooling is favourably associated with political participation by the likelihoods of 6–8% points. The estimated coefficients are statistically significant at 1%, 5% and 10% and

strongly robust to various functional regression forms. Specifically, one extra year of education is respectively linked to 8% and 6% points rises in the probability that a respondent participated in political activities or was a member of a political organization for bandwidths of ±15 (columns 1 and 3) and ±10 (columns 2 and 4) regardless of the functional forms used.

One problem that is crucially neccessary for the discussion when a study applies 2SLS estimations is the weak instruments. Table 3 also presents the first stage F-stat that indicates the exclusion of weak instruments. In particular, the first stage F-stats are all larger than 10 as the rule of thumb value for both political concern (Panel A) and political participation (Panel B) (Stock *et al.*, 2002).

6 ROBUSTNESS CHECKS

In addition the baseline estimation results, I also conduct some robustness checks using sub-samples by firstly using various bandwidths and secondly changing specifications for the estimations. The robustness checks are respectively presented in Tables 4–5.

First, I respectively restrict the sub-samples using various bandwidths to compare the corresponding results to the baseline estimates. There are four bandwidths including 14 (columns 1–2), 13 (columns 3–4), 12 (columns 5–6), and 11 (column 7–8). The results are in Table 4. In general, the estimated coefficients using various bandwidths from Table 4 indicate that the baseline estimates are strongly robust regardless of bandwidths used to create the sample for the analysis. Table 4 shows the positive impacts of schooling on political concern and political participation using various bandwidths compared to the baseline estimates from Table 3. The estimated coefficients remain statistical significances at 1%, 5% or 10%.

In particular, Panel A of Table 4 presents the estimates of the effects of education on political concern. The respondents who have an additional year of schooling are more likely to concern political issues by about 10–11% points with linear regressions and 5–7% points with quadratic regressions. There are negligible changes in the impacts compared to the baselines. Meanwhile, Panel B of Table 4 also indicates the same pattern for the impacts of schooling on political participation using different bandwidths. The impacts are about 5–8% points and 5–9% points when using linear regressions and

quadratic regressions respectively. The results are arround the baseline coefficients as in Table 3. The first stage F-stats also satistify the requirement for the exclusion of weak instruments with values that are larger than 10 for all estimations given available bandwidths.

Second, I estimate some regressions using different specifications to test the sensitivity of the baseline estimates. The results are presented in Table 5. Firstly, I exclude the survey year fixed effects from the specifications (columns 1–4). I find that there are almost no differences in the impacts of an additional year of schooling on the probability of political concern (Panel A) and political participation (Panel B) both in the direction and the magnitude of the imapcts compared to the baseline estimates. In particular, one more year of schooling tends to be asscociated with higher probabilities of political concern by 11–12% points (linear functional forms) and 6–7% points (quadratic functional forms) and higher probabilities of political participation by 6–8% points (for both linear and quadratic functional forms). Secondly, I estimate the augmented regression models that include the birth year by survey year fixed effects (columns 5–8). I find that the estimated coefficients are strongly robust relative to the baseline results for both political concern (Panel A) and political participation (Panel B). In particular, the possibilities for a respondent having one more year of education to concern political issues are 11–12% points (linear functional forms) and 6–7% points (quadratic functional forms) higher than a respondents less than one year of schooling. Meanwhile, having an additional year of schooling results in increases of 6–8% points (for both linear and quadratic functional forms) in the likelihoods of political participation.

7 FURTHER ANALYSIS

7.1 Heterogeneity analysis

One highlighing point which is very critical to discuss from the literature on the causal links between education and political outcomes is that political outcomes are probably negatively associated with schooling years. Some previous studies from developed countries where strongly institutionalized democracies functions find that different levels of schooling have opposite causal impacts on political outcomes (Berinsky and Lenz, 2011; Kam and Palmer, 2008; Tenn, 2007; Pelkonen, 2012). In non-consolidated

democracies or autocracies, although the finding of positive assocications between education and political outcomes is dominantly well-documented, the adverse impacts are also found from the literature (Croke *et al.*, 2016).

In this sub-section, I provide the test that whether there are different impacts of education on political outcomes using different sub-groups of schooling years in Vietnam. Strategically, I separate the whole sample into three sub-groups including (i) 0–5 schooling years, (ii) 6–9 schooling years, and (iii) >10 schooling years. The first sub-group are corresponding to the respondents who have the lowest levels of education (no education, some primary and compeleted primary education) while the second sub-group consists of the respondents who have medium schooling levels (some lower secondary and completed secondary education) and the third sub-group contains the individuals with the highest schooling levels (some upper secondary, completed upper secondary, some college and completed college eduction).

Table 6 presents the estimation results for three sub-groups of respondents corresponding to various sub-groups of schooling years. Panel A shows the results for political concern. I find no significant impacts of schooling years on political concern for the sub-group of 0–5 schooling years as indicated in columns 1–4. Meanwhile, in the sub-group of 6–9 schooling years (columns 5–8) I find significantly and positively large impacts of schooling years on political concern compared to the baseline estimates in Table 3. In particular, one more schooling year of results in increases in the probablity of having political concern by about 48–57% points and 18–28% points for linear and quadratic functional forms, respectively. However, I extraordinarily find significant adverse impacts of schooling years on political concern for the sub-group of 10–16 schooling years as shown in columns 10 and 11. Specifically, for one whose a number of schooling years of minimum 10 having an additional schooling year tend to decreases in the probability of political concern by 11–18% points. This exceptional finding supports the negative association between education and political participation in Zimbabwe (Croke *et al.*, 2016).

Panel B of Table 6 presents the estimated results for the impacts of schooling years on political participation. The estimated coefficients for the sub-groups of 0–5 and 10–16 schooling years lose its statistical significances. I only find the statistically significant

impacts of schooling years on political participation for the sub-group of 6–9 schooling years.

7.2 Instrumental variable probit regression results

In addition to estimating 2SLS specifications, I also estimate IV-Probit specifications for the causal effects of education on political outcomes. Table 7 provides the estimation results of the impacts using IV-Probit models. Generally, I find positive impacts of schooling years on both political concern and political participation. The estimated coefficients are all statistically significant at 1%.

Remarkably, the magnitudes of the impacts using IV-Probit estimations for all specifications and bandwidths used are larger than the baseline impacts using 2SLS estimations from Table 3. Panel A of Table 7 presents the estimated coefficients for the impacts of education on political concern. Specifically, the impacts of one more year of schooling on increases in the likelihoods of political concern of between 26–28% points for linear specifications as in columns 1–2 and 18–19% points for quadratic specifications as in columns 3–4 of Table 7.

The estimation results for the causal impacts of education on political participation using IV-Probit models are presented in Panel B of Table 7. Having a marginal year of schooling increases the probability to take part in political activities or a political organization by approximately 22–28% points using linear specifications in columns 1–2 and 24–28% points using quadratic specifications in columns 3–4.

8 DISCUSSION AND CONCLUSION

Using a compulsory education reform as an instrument for exogenous shifts in education to estimate the causal effects of schooling on political outcomes has been more widely applied in social sciences in general and political science in particular (Meyer 2016; Persson *et al.*, 2016). In the analogous manner, in this study I use data from World Values Survey to quantify the causal effects of schooling years on political concern and political participation in Vietnam. Regarding the estimation method, I use the law of compulsory primary education in 1991 in Vietnam to instrument for schooling years and address the

endogeneity problem of education and political outcomes. Importantly, I aim to resolve previous works' disadvantages that treats education as exogenous determinant in an attempt to estimate its "true" causal effects on political outcomes. Generally, I find that schooling does robustly cause favorable impacts on political concern and political participation. In particular, having one more year of schooling causally results in increases in the probablity of political concern and the likelihood of political participation by about 6–12% points and 6–8% points respectively.

Having manifested assertively positive effects of schooling years on political concern and political participation in Vietnam, this examination consequently advocates preceding findings in other countries (Sondheimer and Green, 2010; Dinesen *et al.*, 2016).

Almost previous studies are done from developed countries where democracy systems exist. Therefore, there is a promotion to investigate the research problem for other countries which have alternative politicial systems for examples non-consolidated democracies or autocracies. Vietnam is a country that has a singular political system with a communism-based ideology. To some extent, one can classfify this country as a weakly institutionalized regime in general. In general, I find that education has positive impacts on political concern and political participation in Vietnam using the whole sample in this study.

More importantly, the literature indicates that educated citizens from non-consolidated democracies or autocracies tend to pay less their attention to political issues and more likely avoid political participation as a way to show their disregards for the dictators in their countries (Croke *et al.*, 2016). I also find that for the sub-group of respondents who have the lowest educational level with a lower secondary degree an additional year of schooling is causally associated with decreases in the probabilities of political concern by about 11–18% points. This finding partially supports the result that education and political outcomes have a negative relationship from Croke *et al.* (2016) for the case of Zimbabwe where a weakly institutionalized democracy exists.

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Table 1. Descriptive statistics of the sample (N=1450)

Variable	Definition	Mean	SD	Min	Max
Political concern	The respondent regards politics as an important topic in her or his life (=1 if yes, =0 otherwise)	0.68	0.46	0	1
Political participation	The respondent voluntarily participates in a political organization or the member of party (=1 if yes, =0 otherwise)	0.18	0.39	0	1
Schooling years	The number of completed schooling years corresponding to the educational level achieved (years)	8.14	3.21	0	16
Reform	The exposure to the educational reform, respondent's age in 1991 is less than 15 (=1 if yes, =0 otherwise)	0.41	0.49	0	1
Age	The age of respondent in the time of survey (years)	30.49	7.76	17	45
Age in 1991	The age of respondent in 1991 (years)	17.17	7.90	3	30
Male	The respondent is male (=1 if yes, =0 otherwise)	0.48	0.50	0	1
Married	The respondent is married (=1 if yes, =0 otherwise)	0.66	0.47	0	1
Children number	The respondent's number of children (numbers)	1.45	1.35	0	9
North	The location is in North of Vietnam, including Red River Delta, Northeast and Northwest (=1 if yes, =0 otherwise)	0.36	0.48	0	1
Central	The location is in Central of Vietnam, including North Central, Central Coast and Central Highlands (=1 if yes, =0 otherwise)	0.29	0.45	0	1
South	The location is in South of Vietnam, including Southeast and Mekong River Delta (=1 if yes, =0 otherwise)	0.35	0.48	0	1

Table 2. Impacts of compulsory schooling reform on schooling years: First-stage results

	Dependent variable: Schooling years			
	(1)	(2)	(3)	(4)
Reform	1.27***	1.12***	0.77*	0.26
	(0.32)	(0.35)	(0.44)	(0.48)
R squared	0.06	0.07	0.06	0.07
Functional form	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10
N	1450	1081	1450	1081

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Table 3. Impacts of education on political outcomes: Baseline results, 2SLS regressions

	(1)	(2)	(3)	(4)
Panel A. Dependent variable: Political concern				
Schooling years	0.11***	0.12**	0.07**	0.06**
	(0.04)	(0.05)	(0.03)	(0.03)
First stage F-stat	14.09	12.69	13.62	13.48
Functional form	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10
N	1450	1081	1450	1081
Panel B. Dependent variable: Political participation				
Schooling years	0.08***	0.06*	0.08***	0.06**
	(0.02)	(0.03)	(0.02)	(0.02)
First stage F-stat	14.09	12.69	13.62	13.48
Functional form	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10
N	1450	1081	1450	1081

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Table 4. Impacts of education on political outcomes: Robustness checks with various bandwidths, 2SLS regressions

	Bandwidth: ±14		Bandwidth: ±13		Bandwidth: ±12		Bandwidth: ±11	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Dependent variable: Political concern								
Schooling years	0.11***	0.06**	0.10***	0.05*	0.10***	0.05*	0.10**	0.07*
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
First stage F-stat	14.27	13.59	12.80	12.15	10.88	11.96	10.98	12.24
Functional form	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic
N	1399	1399	1360	1360	1295	1295	1195	1195
Panel B. Dependent variable: Political participation								
Schooling years	0.08***	0.09***	0.08***	0.09***	0.07***	0.09***	0.05*	0.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
First stage F-stat	14.27	13.59	12.80	12.15	10.88	11.96	10.98	12.24
Functional form	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic
N	1399	1399	1360	1360	1295	1295	1195	1195

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Table 5. Impacts of education on political outcomes: Robustness checks with various fixed effects, 2SLS regressions

	Excluding survey year fixed effects				Including birth year by survey year fixed effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A. Dependent variable: Political concern							
Schooling years	0.11***	0.12**	0.07**	0.06**	0.11***	0.12**	0.07**	0.06**
	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)	(0.05)	(0.03)	(0.03)
First stage F-stat	14.11	12.72	13.64	13.50	14.08	12.68	13.61	13.46
Functional form	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10	±15	±10	±15	±10
N	1450	1081	1450	1081	1450	1081	1450	1081
	Panel B. Dependent variable: Political participation							
Schooling years	0.08***	0.06*	0.08***	0.06**	0.08***	0.06*	0.08***	0.06**
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
First stage F-stat	14.11	12.72	13.64	13.50	14.08	12.68	13.61	13.46
Functional form	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10	±15	±10	±15	±10
N	1450	1081	1450	1081	1450	1081	1450	1081

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Table 6. Impacts of education on political outcomes: Heterogeneity, 2SLS regressions

	Schooling years: 0–5				Schooling years: 6–9				Schooling years: 10–16			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. Dependent variable: Political concern												
Schooling years	0.11	0.05	–0.14	–0.11	0.48***	0.57*	0.28***	0.18**	–0.05	–0.11***	–0.18*	–0.18
	(0.08)	(0.10)	(0.59)	(0.12)	(0.15)	(0.25)	(0.08)	(0.08)	(0.04)	(0.04)	(0.10)	(0.18)
First stage F-stat	1.51	1.66	1.38	1.90	8.76	6.90	8.01	10.18	14.53	14.01	13.70	12.19
Functional form	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10	±15	±10	±15	±10	±15	±10	±15	±10
N	318	236	318	236	829	619	829	619	303	226	303	226
Panel B. Dependent variable: Political participation												
Schooling years	–0.03	–0.12	0.11	0.01	0.27**	0.27	0.29*	0.10	0.002	0.06	0.01	–0.10
	(0.10)	(0.12)	(0.17)	(0.07)	(0.12)	(0. 23)	(0.15)	(0.08)	(0.05)	(0.06)	(0.09)	(0. 21)
First stage F-stat	1.51	1.66	1.38	1.90	8.76	6.90	8.01	10.18	14.53	14.01	13.70	12.19
Functional form	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10	±15	±10	±15	±10	±15	±10	±15	±10
N	318	236	318	236	829	619	829	619	303	226	303	226

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Table 7. Impacts of education on political outcomes: IV-Probit regressions

	(1)	(2)	(3)	(4)
Panel A. Dependent variable: Political concern				
Schooling years	0.26***	0.28***	0.19***	0.18***
	(0.04)	(0.03)	(0.05)	(0.06)
Wald test of exogeneity	11.94	8.96	6.22	3.82
(Prob > chi2)	(0.00)	(0.00)	(0.01)	(0.05)
Log pseudolikelihood	–4582.28	–3443.58	–4580.18	–3440.37
Functional form	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10
N	1450	1081	1450	1081
Panel B. Dependent variable: Political participation				
Schooling years	0.28***	0.22***	0.28***	0.24***
	(0.04)	(0.08)	(0.04)	(0.06)
Wald test of exogeneity	8.64	1.95	8.79	3.83
(Prob > chi2)	(0.00)	(0.16)	(0.00)	(0.05)
Log pseudolikelihood	–4322.52	–3237.80	–4319.46	–3235.26
Functional form	Linear	Linear	Quadratic	Quadratic
Bandwidth	±15	±10	±15	±10
N	1450	1081	1450	1081

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The two way clustered (age and age in 1991) standard errors are reported in parenthesis. Controls consist of age, age squared, age in 1991, married status, male, children number, and dummies for location (north, central and south) and survey year fixed effects.

Figure 1. The primary education enrollment ration in Vietnam, 1983-1997

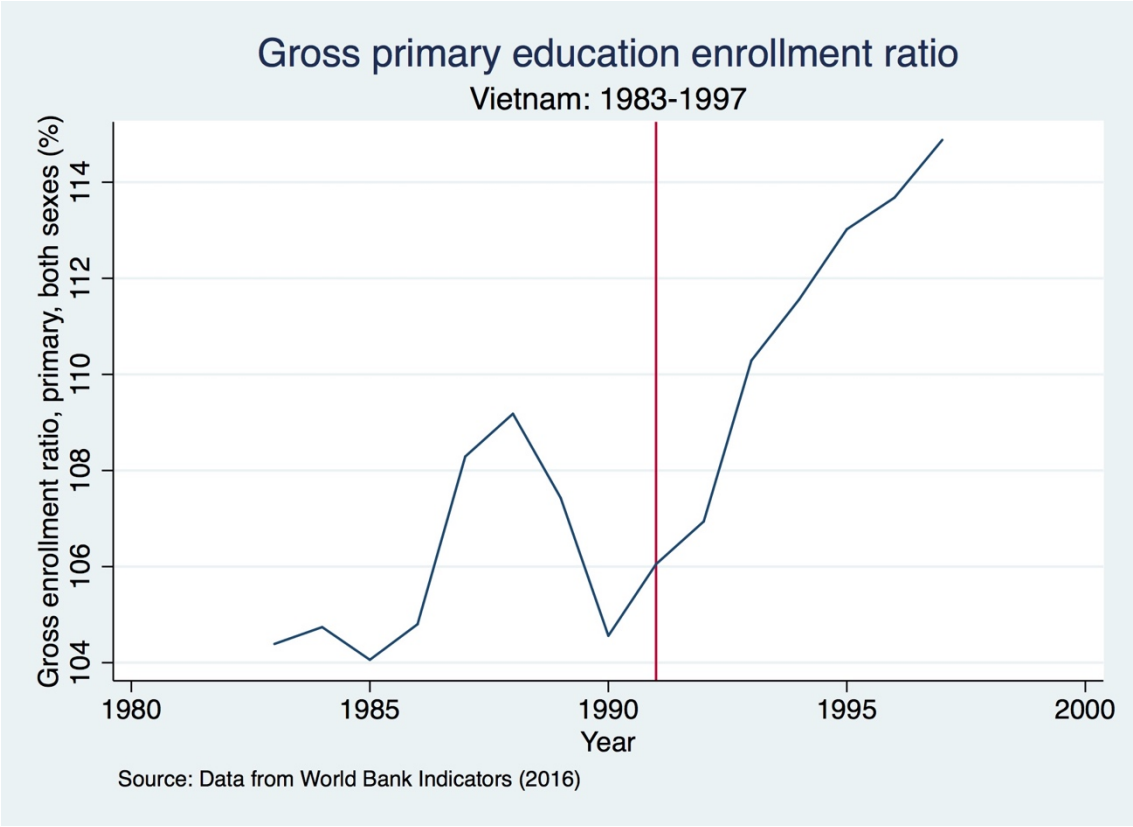

Figure 2. The impact of compulsory primary education on schooling year