Impact of forced displacement on mental well-being: Three Gorges Dam Project

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Abstract

This paper studies the impact of forced displacement due to the Three Gorges Dam project in China on mental well-being. Using data from a survey of individuals living in the affected area and a difference-in-differences model, we show that mental health of individuals who were designated to be displaced decreased, as measured by depression symptoms. Furthermore, impacts on mental health were not uniform across different dimensions of mental health and sub-populations. Men were more affected than women along several dimensions. Individuals with lowest level of education were more impacted than the rest in terms of higher anxiety. We also show that relocation circumstances matter. Being relocated farther away and with the whole village was more detrimental to mental well-being. Our complementary analyses suggest that these intention-to-treat effects are driven by actual relocation, and anticipation of relocation plays a smaller role. Finally, we show that although employment and income of most people were not statistically significantly affected and their land size increased, the probability of having a debt increased and access to schools decreased, which could be contributing to the negative impact on mental well-being. We conclude that policy makers should take into account the heterogeneity in the impact of displacement on individuals' welfare when planning similar infrastructure projects.

Keywords: forced displacement; mental well-being; Three Georges Dam project.

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1 Introduction

One of the largest hydraulic engineering projects in China, the Three Gorges Dam (TGD) on the Yangtze River was built with the objectives of controlling floods, generating hydroelectric power and improving navigation on the river (Stone, 2008). However, this project required submerging a densely populated area in China, thus leading to the relocation of 1.3 million people, the majority of whom were from Hubei Province and Chongqing Municipality. (Jackson and Sleigh, 2000; Xi et al., 2007)

As 1.3 million people were forced to migrate due to the Three Gorges Dam project (TGDP), policymakers faced a major challenge of how to displace people with minimum adverse impacts on their well-being. TGDP was conceived as a way to improve the livelihood of the general population in China. However, if the people affected by the construction cannot be resettled appropriately and suffer long-term distress due to the displacement, this project cannot be considered as "a success for all people". Mitigating negative effects of the TGDP is important for maximizing its overall impacts. As China has been recently developing similar projects, and more people will be affected by them, it is crucial to understand how such projects will affect people's well-being and what we can learn from them. Although the government intended a "developmental resettlement" in the case of the TGDP, which means that displacement should not be detrimental for displaced people (Padovani, 2016), anecdotal evidence suggests that a certain number of TGDP migrants returned to the region where they came from due to their inability to adapt to their new environment (Li, 2009; Peng, 2011). Although the relocatees were provided with housing, land or even jobs as compensation for their loss, many of them found life more difficult (Li et al., 2001). The duration of such feelings could result in mental ill-health.

We study the impact of forced displacement due to the TGDP in China on mental well-being using data from a survey of individuals living in the affected area and a difference-in-differences model. The survey was conducted twice: once in 2003 before relocation started and again in 2006, when more than half of the households designated to relocate were already relocated. We exploit the fact that the need to relocate was determined by the altitude of the household's location: in this stage of the project, all households located at or below 175 meters above see level needed to be relocated, because these areas was submerged, whereas the households located above 175 meters could stay. Our preferred model includes individual fixed-effects to account for possibly non-random attrition. Our main estimates are interpreted as intention-to-treat effects, and we also attempt to separate the effects of actual relocation and anticipation of relocation. Furthermore, we explore mechanisms that could contribute to the effects of the TGDP-induced displacement on mental well-being, such as changes in economic circumstances and access to facilities.

We hypothesize that displacement due to the TGDP negatively affects people's mental well-being. Our measures of mental well-being include depression, anxiety, low mood and low self-esteem, derived using principal component factor analysis from 20 questions about respondents' mental health symptoms. Depression, anxiety, and low mood are expected to be adversely affected by displacement, because these reflect people's negative feelings caused by displacement. It is less clear whether displacement has an adverse impact on low self-esteem: displacement is outside of people's control and thus may have no impact, but it can also reduce self-esteem if people do not do as well in their new jobs or social lives.

Heterogeneity analysis constitutes an important part of our study. The majority of related literature focuses on the impact of displacement on mental health but regards the displaced group as homogeneous. Individual circumstances may, however, play a significant role in the process of displacement and adaptation, a factor that is often not considered. First, due to the mountainous location, availability of land in the areas near TGDP was limited. As a result, some relocated households had to migrate far away from their origin, facing more economic and mental challenges than households who were relocated closer to their old homes (Li et al., 2001; Feng, 2004). Second, in some cases households were moved individually and in others the whole villages were moved, which may also affect the well-being of relocatees in different ways (Li, 1994). Those who are relocated by themselves may find it more challenging to adapt to the new life than those who are relocated together with the whole village, which forms their social network. On the other hand, those relocated by themselves may be moved to villages or towns that are closer to their old homes or where they have families and/or friends living in nearby unaffected locations.

Third, individuals may have different displacement experiences due to differences in their personal backgrounds and in turn be differently affected by TGDP-induced displacement. For example, the majority of the literature shows that women are likely to suffer more than men after traumatic experiences or events such as forced displacement (Araya et al., 2007; Taha and Sijbrandij, 2021; Shevlin et al., 2017; Sastry and VanLandingham, 2009; Mujeeb, 2015), even if some find no differences between women and men (Salah et al., 2013). In addition, evidence suggests that education might be correlated migrants' adaptation to their new life at the destination (Glenn and Weaver, 1981; Kessler, 1982; Padovani, 2016). People with higher levels of education tend to have higher income, awareness of mental well-being, and better access to treatment, all of which could have protective effect. Finally, evidence also suggests a correlation between mental health and marital status, although the direction of the impact is unclear (Booth and Amato, 1991; Glenn, 1975; Wade and Pevalin, 2004). On one hand, married people could be more negatively affected as they have not only themselves to worry about but also their spouses and often children. On the other hand, single individuals could be more negatively affected, because they don't have the support of their spouses.

Based on the discussion above, we formulate the following hypotheses about heterogeneous impact of TGDP-induced dislocation on mental well-being:

1. Women's mental well-being is more negatively affected than men's.

2. Larger negative impacts are expected for those with lower education levels.

3. Those who are displaced farther away from their origin locations are more negatively impacted.

Due to conflicting mechanisms discussed above we cannot form definite hypotheses regarding heterogeneity in terms of marital status or relocation model (single household versus whole village).

We find a negative average ITT effect of TGDP-induced displacement on depression (by 22% of a standard deviation) but not on anxiety, low mood or low self-esteem. The average effects, however, mask several important findings for some subpopulations. Men are more negatively affected than women contrary to our hypothesis. Not only their depression but also their low mood and low self-esteem increase because of TGDP-induced displacement. We find a large increase in anxiety of least-educated individuals. People who are designated to move farther away become more depressed than those who are designated to move to closer locations, as expected. Depression of people meant to move with the whole village increases more compared to those meant to move with their households only, and low self-esteem of both groups increases similarly. Our complementary analyses suggest that these intention-to-treat effects are driven by actual relocation, and anticipation of relocation plays a smaller role. Finally, we show that although employment and income of most people were not statistically significantly affected and their land size increased, the probability of having a debt increased and access to schools decreased, which could be contributing to the negative impact on mental well-being.

This study contributes to several lines of research. First, it is related to the literature on displacement and resettlement (Eisenman et al., 2003; Fussell and Lowe, 2014; Fazel et al.,2005; Porter and Haslam, 2005; Kasteler et al., 1968; Randell, 2016). Second, it adds to the literature on displacement due to the TGDP, which is mainly qualitative or descriptive (McDonald-Wilmsen, 2009; Wilmsen et al., 2011; Duan and Wilmsen, 2012; Wilmsen, 2016; Wilmsen and Van Hulten, 2017; Wilmsen, 2018; Tan et al., 2005). A series of studies on TGDP-related displacement on mental well-being use the same survey data as us and find negative effects. Comparing non-migrants and designated migrants who have already been displaced, Hwang et al. (2011) find negative and statistically significant short-term impacts of the forced displacement due to TGDP on mental and physical health. Hwang et al. (2010) explore the relationship between TGDP-induced displacement and depression by comparing non-migrants and designated migrants regardless of whether or not they had moved. Their results show that forced migration could aggravate depression levels. Cao et al. (2012) find a positive correlation between displacement and migrants' depression. They conclude that changes in social integration, socioeconomic status, and community resources could be mechanisms behind this correlation. However, these studies do not convincingly account for confounding factors and plausible differences between migrants and non-migrants. Additionally, they consider displaced households as a homogeneous group. One exception is a study by Xi et al. (2013) explore differential impacts for different age groups (18 to 30 , 31 to 50, and over 50 years old) and find no significant heterogeneous impacts.

We contribute to this literature by addressing non-random selection and attrition of designated migrants and quantifying heterogenous impacts of TGDP-induced displacement on the mental well-being of various subgroups of people in terms of their gender, education, marital status, and displacement circumstances. Furthermore, we analyze changes in designated migrant economics outcomes and access to key facilities as potential mechanisms.

The rest of the paper is organized as follows. Section 2 introduces background information about the TGDP, and Section 3 describes the data. Section 4 discusses the empirical framework, and Section 5 presents estimates of both the average and heterogeneous impacts of the TGDP on mental well-being and explores mechanisms. Finally, Section 6 concludes and discusses policy implications, limitations, and extensions of this study.

2 Background Information

The administration of displacement due to the TGDP was managed from the top down. The local authority followed the instructions from the provincial government, which was, in turn, guided by the central government. The TGDP progressed in four stages (Padovani, 2016).

During the first stage (1992-1997), people who lived on Sandouping Island and close to the foundation of the TGD were displaced within the same district but to a higher altitude. During the second stage (1998-2003), the water was raised up to 135 metres[1]. Then the water was raised up to 156 metres in the third stage (2004-2006), followed by a final rise to 175 metres in the fourth stage (2007-2009). In this way, the relocatees could be displaced at different times, which helped release some pressure from this mass displacement programme and allowed the government to have enough time to make plans for their housing, land and employment.[2]

The initial plan was to relocate people within the same area or at least within the same provincial district. Hubei and Chongqing are the two provincial districts affected by the TGDP, with Chongqing being affected more. As a consequence, Hubei was able to relocate all affected households within the provincial district, while Chongqing could not. Affected households from Chongqing had three options regarding where to relocate: move uphill (close to their old homes), move to live with relatives, or relocate outside the province (Padovani, 2016). As our sample is from Chongqing, the individuals in the sample faced all these choices for resettlement.

3 Data

The data used for this study include two waves of interviews of individuals residing in or near the area affected by the construction of the TGD.[3] The first wave of interviews started in 2002 and was completed in 2003. In total 1,530 individuals completed the survey. They came from five randomly selected communities in the "Wanxian Relocation and Development Region", in which 80% of the households that had to be relocated to accommodate the TGD

[1]Although Padovani (2016) indicates 139 metres, the Chinese government official website indicates 135 metres. https://china.gov.cn.admin.kyber.vip/jrzg/2006-10/27/content_425537.htm

[2]This information was obtained from the Chinese government website. 2006 Introduction to the Three Gorges Dam Project. http://www.gov.cn/test/2006-05/12/content_278989.htm

[3]The Three Gorges Dam migrant survey data is kindly shared by Dr Juan Xi to whom we are very grateful, because without this data our analysis would not be possible.

construction lived. The interview response rate for the first wave was 99%.[4] The sample consisted of 975 'designated migrants' who lived at the altitudes at or below 175 meters above sea level and had to relocate at some point in the future and 555 'non-migrants' who lived above 175 meters and did not have to relocate Hwang et al. (2007). Out of 1,530 respondents in the first wave, 1,070 (70%) were successfully followed and interviewed again in the second wave of the survey in 2006. Out of 686 re-interviewed designated migrants, 408 (60 %) were already moved to new locations, and the rest were yet to be relocated.

The respondents of the survey were usually household heads or other members of the household who could answer survey questions well. The sample size for our analysis is 1,510 in the first wave and 1,023 in the second wave, after eliminating 14 ineligible respondents who had already migrated before the first survey (but were included in the survey by mistake) and 53 observations who did not answer mental well-being survey questions. Since mental health is the focus of this study, dropping these observations could be problematic. People with worse mental health conditions may be less likely to respond to questions about mental health, because they may be unwilling to reveal their symptoms. To check whether this is the case, we regress the indicator of missing mental health response on an indicator for living at the altitude ≤ 175 above sea level, individual, and household characteristics (age, gender, whether they own their house, number of household members, household income, whether they were urban Hukou holder, and a dummy for missing income data). The results presented in Appendix Table A.1 show that the interviewees who did not answer the mental health questions were not significantly different from those who responded in terms of these characteristics, which alleviates our worries concerning sample selection after dropping these observations.

Table 1 displays the summary statistics of our mental health measures, which are the outcome variables of interest in this study. We construct these measures from 20 survey questions on mental health symptoms listed in Appendix Table A.2. These questions ask

[4]Although this rate is very high, it is regarded as normal for face-to-face interviews conducted in China (Hwang et al., 2007; Hwang et al., 2010; Hwang et al., 2011).

respondents whether they have experienced certain mental health symptoms in the past week, for example, whether they feel bothered, like everything is an effort, do not feel happy, that other people are unfriendly to them or do not like them. Each question uses a 1-4 response format to show the severity of the symptom: 1 = always; 2 = sometimes; 3 = rarely; and 4 = never. Unlike the previous studies mentioned in Section 1 which used the CES-D scale[5], this study uses principal component factor analysis to reduce the dimensionality of these 20 mental well-being questions and uncover different dimensions of mental well-being. We identify four uncorrelated factors, which based on the factor loadings (for ease of interpretation converted to regression scores, presented in Appendix Table A.2) we label as anxiety, depression, low mood, and low self-esteem. A *higher* value of factor implies *worse* mental health condition in that domain. As shown in Table Table 1, the mean and standard deviation of each mental health factor are around 0 and 1 by construction, respectively. The mean of each factor in Wave 1 is higher than that in Wave 2, which shows that, on average, the individuals had a better mental health status in 2003 before anyone moved. The range of each mental health factor is between -4.5 and 3.5.

Table 2 shows summary statistics of individual and household characteristics, measured in Wave 1 but presented in both waves to check for non-random attrition. The individual characteristics pertain to the individual in the household who responded to the survey. In the baseline survey, the average age of respondents was 45. Just under a half (45%) were male, and most (86%) of respondents owned their house. The average number of household members was four. Urban and rural location, as defined by respondent Hukou type, was equally distributed (51% versus 49%). As rural residents were more spread out than urban residents, urban residents were oversampled to lower expenses (Hwang et al., 2007). In the second wave, the sample characteristics look similar to the baseline survey. The only exception is that the proportion of urban residents (as defined by their location in Wave 1) dropped by 4 percentage points, which shows the rural residents were more likely to respond

[5]CES-D indicates "Center for Epidemiologic Studies Depression Scale", a 20-item scale measuring depressive symptom severity.

again in the second wave.

Table 3 summarizes the variables, on which the heterogeneity analysis is based; in addition to gender, these include education, marital status, whether designated to be relocated within or out of town and whether designated to be relocated alone or with the whole village, all measured in Wave 1. More than 80% of the respondents have general education (any education level from lower elementary to senior high school), while more than 11% of the sample are illiterate, around 90% of the sample are married, and more than 5% are widowed. Among all respondents the proportions of households who are designated to be relocated out of and within town are 14.6% and 31.2%, and the proportions of households designated to be relocated alone and with whole village are 15.5% and 39.2% in the first wave . The latter proportions have changed in the second wave, suggesting plausiby non-random attrition.

4 Empirical Framework

In this paper, we focus on the estimation of intention-to-treat effects, that is, our objective is to estimate the effects of being *designated* to relocate due to the TGDP on mental well-being and other outcomes. Whether a household is designated to relocate or not is determined by the altitude of their residence. We do not estimate the average effect on the treated by instrumenting relocation with the altitude because of the likely violation of the exclusion restriction. Living at a lower altitude and therefore being designated to relocate may affect mental well-being not only via the relocation probability but also directly due to the anticipation affects. The households that are designated to relocate but have not yet relocated by 2006 (wave 2)[6] could be worried about impeding relocation and its consequences on themselves and their families, which would negatively affect their mental well-being. ITT is also a policy-relevant parameter in this case, because it measures the 'full' effect of the TGDP, consisting of the effect of displacement and the effect of the anticipation of displacement.

To identify the (ITT) effects of TGDP-induced displacement on mental well-being, we

[6]Only 60% of the designated migrants were relocated by 2006.

estimate the following difference-in-differences model to allow differences between the treatment and control groups observed in Table 4, as well as any unobserved differences.

$$MH_{it} = \alpha_i + \beta_1 Below175m_i + \beta_2 Post_t + \beta_3 Below175m_i * Post_t + \delta X_i + u_{it} \qquad (1)$$

where MH_i represents one of the four standardized mental health factors from principal component factor analysis, $Below175m_i$ is an indicator variable for living at or below 175 meters above sea level and thus belonging to the treatment group of designated migrants, and $Post_t$ denotes the year 2006, when some of the designated migrants were relocated, and X_i is a vector of control variables: age, gender, household income, an indicator for urban Hukou, an indicator for house ownership, and the number of household members, all measured in Wave 1. Inclusion of these variables mitigates the concern about the differential changes in the composition of the treatment and control groups given we have some attrition. To further address this concern, we use balanced sample and include inverse Mills ratio. Finally, we estimate equation (1) by fixed effects.

The parameter of interest is β_3, which measures the difference in mental health between the treatment and control groups in year 2006 net of the difference in mental health between these groups in year 2003. The key assumption is that the mental health of the treated group would have changed in the same way as the mental health of the control group in absence of the policy (displacement due to the TGDP), known as the parallel trend assumption. As we only have two waves of the data, we cannot test this assumption. Instead in Table 4, we compare the treatment and control groups in terms of observable characteristics measured in wave 1 to see how plausible this assumption is. These characteristics include gender, age, whether the individual owns a house, the number of household members, household income and whether the individual holds urban Hukou. Additionally, we regress each characteristic on the indicator of the treatment group (column 3). β_3 suggests that the treatment group has more males and smaller households, but fewer house owners and urban Hukou holders, which suggests that the designated migrants are more economically disadvantaged. As a robustness check we re-estimate the main regressions using treatment and control groups matched on these characteristics, which makes the parallel trend assumptions more convincing.

We should also note that parameter β_3 may underestimate the full TGDP-induced displacement impact on mental health, because already in 2003 (Wave 1), many designated migrants knew that they would be displaced[7], which could have negatively affected their mental well-being. In the DiD model we estimate, this early anticipation effect is netted out.

The main focus of this study is the heterogeneous impact of TGDP-induced displacement, because the expectation is that people with different characteristics could be affected differently, as discussed in the introduction. Therefore, we estimate equation (1) separately by gender, education level, and marital status. Additionally, we estimate the following regressions with triple interactions to establish if the differences in the effects across groups are statistically significant:

$$\begin{aligned} MH_{it} = {} & \alpha_i + \beta_1 Below175m_i + \beta_2 Post_t + \beta_3 w_i + \delta_1 Below175m_i * Post_t \\ & + \delta_2 Post_t * w_i + \delta_3 Below175m_i * w_i \\ & + \gamma Below175m_i * Post_t * w_i + \sigma X_i + u_{it} \end{aligned} \tag{2}$$

where w_i represents gender, education, or marital status. Other variables are defined as in equation (1). The parameter of interest is γ, which shows the differential impact on mental well-being on a specific group compared to the base group.

To test the hypothesis that relocation circumstances moderate effects of forced displacement on mental well-being, we also explore heterogeneity by whether the household is designated to move out of town or within town and whether the household is supposed to move

[7]The survey shows that most (88%) of the designated migrants were aware in Wave 1 that they would be displaced. Furthermore, 59% of the designated migrants knew which year exactly they would be displaced.

with the village or alone:

$$MH_{it} = \alpha_i + \beta_1 Move1_i + \beta_2 Move2_i + \beta_3 Post_t \\ + \beta_4 Move1_i * Post_t + \beta_5 Move2_i * Post_t + \delta X_i + u_{it}, \tag{3}$$

where $Move1_i$ and $Move1_i$ indicate moving circumstances. We interpret the results of these regressions with caution, because decisions on how far and how the households are relocated may be endogenous.

As we know which designated migrants were relocated in 2006, we can also separately estimate effects of relocation on those who were relocated and anticipation effects on those those who were not yet relocated.

$$MH_{it} = \alpha_i + \beta_1 Relocated_i + \beta_2 Notyetrelocated_i + \beta_3 Post_t \\ + \beta_4 Relocated_i * Post_t + \beta_5 Notyetrelocated_i * Post_t + \delta X_i + u_{it} \tag{4}$$

The causal interpretation in this model is less convincing, however, because the selection into earlier relocation within the treatment group could be systematic. As a result the parallel trend assumption requiring that the outcomes of both relocated and designated but not yet relocated households would have evolved over time in the same way as the outcomes of the control households in the absence of TGDP is less plausible. Nonetheless, the estimates of this regression give us insights into whether ITT effects are driven solely by relocation or there are also anticipation effects. We also estimate equation (4) by gender, education, and marital status.

Finally, to investigate the mechanisms behind the impact of TGDP-induced dislocation on mental well-being we also estimate its effects on the following economic and access outcomes: employment, income, debt, land size, access to school and doctor.

5 Results

5.1 Average ITT effects of TGDP-induced dislocation on mental well-being

Table 5 presents the (ITT) effects of GDP-induced dislocation on four mental well-being measures: anxiety, depression, low mood, and low self-esteem. The figures in column (2) of this table are the estimates of coefficients β_1, β_2, and β_3 in the DiD model represented by equation 1. These regressions use all available observations and control for age, gender, household income (as well as an indicator for missing income), an indicator for urban Hukou, an indicator for house ownership, and the number of household members, all measured in Wave 1. As a higher value of the factor indicates a higher level of anxiety, depression, low mood, or self-esteem, positive (negative) coefficients are interpreted as negative (positive) effects on mental well-being. Additionally, we present the estimates of a naive model comparing treatment and control groups in wave 2, when some designated migrants were relocated in column (1). In column (3), we present the estimates of fixed effects DiD regressions estimated using the balanced sample of individuals observed in both waves.

Column (1) of Table 5 shows that in a naive model mental well-being of the treatment group (those living at the altitudes below 175 meters and thus designated to relocate) is worse compared to the control group (those living at the altitudes above 175 meters) in terms of both higher depression and low mood as measured in wave 2. In DiD model, however, only the effect on depression remains statistically significant, as already in wave 1, before any households were relocated, low mood of the treatment group was lower and low mood of both groups increased at a similar rate from wave 1 to wave 2. Although depression of the treatment group was also higher in wave 1, it increased more from wave 1 to wave 2 in the treatment group than in the control group. We cannot rule out that the differences in depression and low mood in wave 1 are due to the anticipation effect, because most of the households were aware that they will need to move already in wave 1. This anticipation effect is not reflected in the DiD estimates. The estimates of the FE DiD model show that TGDP-induced dislocation increased depression by 22.1% of a standard deviation, which is a substantial effect.

The estimates of DiD and FE DiD models are qualitatively similar, but there are some differences, which suggests that attrition is correlated with individual-specific unobserved variables. And FE DiD estimates are more precise. Therefore, in the rest of the regressions, we present FE DiD estimates. We further investigate attrition in Appendix Tables A.3 - A.6, one for each of mental well-being measures. In these tables, column (1) presents DiD estimates based on full unbalanced sample, and column (2) those based on balanced sample. Column (3) controls for the inverse Mills ratio (Mills, 1926) computed using the observed variables from wave 1 (same as controls) to correct for attrition. Column (4) presents FE DiD estimates. In all tables, we observe differences between the estimates based on unbalanced and balanced samples suggesting that the attrition is not random and justifying the use of FE DiD model. Adding inverse Mills ratio or individual FEs in a balanced sample does not affect the estimates, as expected. We are aware that attrition still may bias our estimates, if those who could not be surveyed in wave 2 were individuals from treatment group whose mental well-being decreased less or more compared to the surveyed individuals. In the first case our estimates would be biased upwards and in the second case downwards. We come back to this issue in the discussion.

Appendix Tables A.3 - A.6 also present the estimates of the correlations of control variables (measured in wave 1) with mental health outcomes. Focusing on the DiD estimates in columns (2) based on the balanced sample, all measures of mental distress decrease with education, and are higher for individuals living in urban areas (those with urban Hukou). On average, men report lower levels of depression but higher levels of *low self-esteem* than women. Cohabiting individuals are least depressed, and widowed individuals are most depressed, but there are very few individuals in these categories. Low self-esteem is found to decrease with age.

5.2 Heterogeneous ITT effects of TGDP-induced displacement on mental well-being

Although the estimates presented in Table 5 suggest that TGDP-induced displacement only affected depression but not other dimensions of mental well-being, the average effects may hide negative effects on anxiety, low mood, and self-esteem for some subpopulations. The impact on depression may also not be homogeneous. In Table 6, we estimate ITT effects of TGDP-induced displacement by gender, education, and marital status.

This table shows that illiterate individual's anxiety is substantially higher (by 54.3% of a standard deviation) due to TGDP-induced displacement even if the overall effect was not significant. This finding is in line with our hypothesis that less-educated would be more negatively affected. Illiterate individuals may be most worried about their employment and income prospects in the new location. They may also not have knowledge and/or resources to access mental health support or treatment. No effects on other mental well-being measures of illiterate individuals are found, and the sample size is quite small.

Table 6 also shows that men are negatively affected by TGDP-induced displacement not only in terms of depression but also in terms of low mood and low self-esteem, which are found to increase by 25% and 24.3% of a standard deviation, respectively. No statistically significant effects are found on women's mental well-being, although the coefficient in depression regression is positive and quite large in magnitude even if not precisely estimated. This finding is contrary to what was expected, because generally women are considered to be more sensitive to negative shocks. Men may, however, consider themselves responsible for providing for the family in the new location, and failing to do so may affect their depression, mood and self-esteem.

The final finding in Table 6 is that the effect of TGDP-induced displacement on depression is driven by individuals with general education and married/cohabiting individuals. However, the lack of statistical significance in the other groups may be explained by small sample sizes, and our results do not necessarily imply that these groups are not affected.

To check whether the differences in TGDP-induced displacement effects across the groups are statistically significant, we also estimate a triple difference FE model, and present the main coefficients in Appendix Table A.7. This table shows that the difference in the impact on anxiety between individuals with no education and those with general education is statistically significant. The effects on low mood and low self-esteem are also statistically different between men and women. In depression regressions, however, we cannot reject the null hypothesis that the effects are homogeneous across all groups.

In Table 7 we analyze whether the ITT effect of TGDP-induced displacement varies by where and how households are designated to move. This information was known to many households in wave 1 before the actual relocation took place. In panel A, we divide the treatment group by whether the household is *designated* to move close or far. In panel B, the treatment group is divided by whether the household is *designated* to move with the whole village, by themselves, or in another way. As discussed in the introduction, we expect the individual to be more affected if they are *designated* to be moved farther away and by themselves, as these are more disruptive and thus more stressful moves.

Inline with our hypothesis, we find that anxiety and depression of those designated to move farther away are, indeed, more negatively affected: their anxiety increases by 37.8% of a standard deviation and their depression by 68.5% of the standard deviation. Depression of those designated to move closer is affected to a lesser extent (by 19.7% of a standard deviation) and no statistically significant effect on their anxiety is found. On the other hand, a statistically significant effect on low self-esteem is found only among households designated to move closer, for which we do not have a good explanation.

To the contrary, we do not find that those designated to move by themselves are more negatively affected in terms on their mental health than those designated to move with the whole village. We find an increase in *low* self-esteem of both those designated to move with the village (by 24.7% of a SD) and those designated to move by themselves (by 27.3% of a SD). The increase in depression is larger and statistically significant only among the households designated to move with the whole village (equal to 58.1% of a SD). There are several potential explanations for this unexpected results. Those designated to move with the village could be moving farther away from their current home and social connections and/or to less populated rural areas. It is easier to relocate individual households to nearby villages where they are likely to have friends and relatives. Another potential explanation is that depression may be 'contagious' within the social network. Having the whole village relocated may induce a compounding feeling of defeat. It could be also difficult to build a social network in the new location when the old social network exists.

5.3 Relocated versus 'designated but not yet relocated' households

The ITT estimates presented above capture both the effect of relocation and the effect of anticipation of relocation, because only 60% of the households in the treatment group were relocated in 2006 (wave 2) and the rest were yet to be relocated. In **??**, we attempt to separate the two effects, keeping in mind that the order of relocation may not have been random and the causal interpretation of the estimates is not warranted.

The results show that the effect on depression is larger (33.7 % of a SD) and statistically significant only for those households in the treatment group that were already relocated. In FE DiD regression, we also find evidence of an increase in low self-esteem by 19.7% of a SD of the relocated households, whereas the effect on designated but not yet relocated households is negative but not statistically significant. Column (1) shows that we would incorrectly conclude that relocation statistically significantly increased anxiety and low mood, if we simply compared the outcomes of relocated and designated but not yet relocated households to the outcomes of the control group.

In Table 9 we present the same analyses by gender, education, and marital status. The results show that the estimates in the ITT effects presented in Table 6 are driven by relocated households. We find a large (76.4% of a SD) increase in anxiety of relocated illiterate individuals. Negative effects of men's depression, low mood, and low self-esteem are statistically significant only in the sample of already-relocated households, as are negative effects on depression of individuals with general education and those who are married/cohabiting. There are several new findings. First, relocated women's depression is found to increase similarly to relocated men's (36.3% versus 32.6%), even if no statistically effect is found for not-yet-relocated women (or men). Second, relocated illiterate and married/cohabiting individuals are negatively affected in terms of low self-esteem (by 30.2% and 17.6% of a SD, respectively), although no statistically signifinact ITT effects are found in these groups in Table 6. Finally, low self-esteem of not-yet-relocated females and single individuals are estimated to decrease (by 30.9% and 97.8% of a SD). We can only speculate that these individuals may have opportunities to take on new duties and roles now that many other individuals in their communities are gone, which increases their self-esteem.

5.4 Exploration of mechanisms: Effects of TGDP-induced displacement on economic outcomes and access to facilities

Although displacement can have direct effects on mental well-being as it is a very disruptive and stressful event, mental well-being of affected individuals may also be affected indirectly via changes in their economics circumstances and access to key facilities, like schools and health care services. In this subsection, we explore how TGDP-induced displacement affected individual's employment, income, land ownership, and access to schools and doctors.

Table 10 shows that TGDP-induced displacement had no statistically significant effects on the probability of having a job or household income, although both coefficients in FE DiD model are negative. This is not surprising as the government committed to securing employment to the relocated individuals in the new locations. Furthermore, households who were designated to move to accommodate TGD construction have more land than those who were not affected, consistent with people moving to more rural, less populated areas where they were given more land.[8] On the other hand, the households in the treatment group ar more likely to have debt (by 14.1 percentage points [ppt]), which could be due to moving and resettling costs.[9] Table 10 shows that TGDP-induced displacement reduced access to schools: individuals in the treatment group are 9.19 ppt less likely to report that it is convenient to get their children to school. No statistically significant effect on access to doctors is found, however.

In Table 12 we explore heterogeneity in the impact of TGDP-induced displacement by demographic characteristics. We do not find statistically significant effects on employment or income in any of the groups. A higher probability of having debt is found in all groups, except for most educated and single individuals with larger effects for women (than men) and illiterate individuals. Women-led and less-educated households could have lower savings and need to borrow in order to cover relocation costs. An increase in land size is observed in all groups, although the effects are not statistically significant for illiterate and single individuals, and the effect is larger for men than women, possibly because rural households are more likely to be led by men. Reduced convenience in getting children is observed in all larger samples with little variation in magnitude. The average effects mask negative effects of TGDP-induced displacement in some groups: those with general education and single individuals. On the other hand, illiterate individuals experience an increase in convenience in getting to the doctor, implying that effects of displacement on access to health care services may not be homogeneous.

In Table 13, we investigate whether TGDP-induced displacement effects vary by moving circumstances. It shows that those who are relocated farther away experience a large (25.8 ppt) drop in employment probability[10], even if no effect is found for those who are relocated closer. The drop in income, however, is comparable between the two groups even if it is only statistically significant for those who move close. Together these findings suggest that

[8] Only farmers can own land in China.

[9] In this case, all three model results are consistent suggesting comparability on the treatment and control groups and 'random' attrition in terms of economic outcomes.

[10] As do those in 'other' relocation modes but it is a small and heterogeneous group.

government did not fully succeeded in protecting the individuals who need to relocate to accommodate TGD construction. An increase in debt is also observed in all groups. As expected, the increase in land size is larger for the households relocated farther away and with the whole village, because these households are more likely to be relocated to rural areas with greater access to land. A related finding is that reduced access to schools and doctors is only observed in these two groups as well. Overall, Table 13 shows that average effects hide negative effects on the households facing more disruptive relocation circumstances.

Finally, in Table 14 and Table 15 we separate the effects of actual relocation and anticipation of relocation. As expected the effects on economic outcomes are larger in magnitude for already-relocated households. No statistically significant effects are found on economic effects of not-yet-relocated households, whereas the probability of debt and land size of already-relocated are statistically significantly increased (by 21.7 ppt and 14.34 units, respectively). No statistically significant effects on access to doctor are found in either subgroup, but both already-relocated and not-yet-relocated households have worse access to schools (by 11.1 ppt and 6.35 ppt, respectively). The decrease in convenience of getting children to school for not-yet-relocated households could be explained by schools closing down in the areas below 175 meters in preparation for the dam construction.[11]

6 Discussion

This paper explores the impact of forced displacement on people's mental health using China's Three Gorges Dam Project (TGDP) as a case study. For the identification we exploit the fact that whether households needed to relocate or not was determined by the altitude of their residential location. Using two waves of longitudinal survey data we estimate a difference-in-differences model with individual fixed effects. As in the second wave not all designated migrants have been relocated yet, our estimates are Intention-to-treat Effects.

[11] In Appendix table A.8 we also present actual-relocation and anticipation-of-relocation effects on economic and access outcomes by gender, education, and marital status, but there are no noteworthy results, and the sizes of some groups are small.

We first provide estimates of average TGDP effects on four dimensions of mental well-being (depression, anxiety, low mood, and self-esteem). Then, we perform heterogeneity analyses by a set of pre-determined individual characteristics and relocation circumstances, which constitutes one of the main contributions of the paper in addition to addressing non-random selection into treatment and attrition. We also attempt to separate the effects of actual relocation and anticipation of relocation. Furthermore, we explore mechanisms that could contribute to the effects of the TGDP-induced displacement on mental well-being, such as changes in economic circumstances and access to facilities.

Although we find a negative average ITT effect of TGDP-induced displacement on depression only, heterogeneity analysis reveals several other important findings. Men are more negatively affected than women contrary to our hypothesis in terms of depression, low mood and low self-esteem. We find a large increase in anxiety of least-educated individuals. People who are designated to move farther away become more depressed than those who are designated to move to closer locations, as expected. A related findings is that depression of people meant to move with the whole village increases more compared to those meant to move with their households only. These intention-to-treat effects appear to be driven by individuals who were already relocated in wave 2. Finally, we show that although employment and income of most people were not statistically significantly affected and their land size increased, the probability of having a debt increased and access to schools decreased, which could be contributing to the negative impact on mental well-being.

Our results suggest that the experience of designated migrants varies, given their different characteristics and relocation circumstances. In the case of the TGDP, migrants of different gender and education levels were affected differently. How far and with whom individuals were meant to move mattered as well. This is usually ignored when designing displacement policies. Therefore, adopting a more tailored policy is the key to the "developmental resettlement" that aims to support a better livelihood after displacement.

Our results only measure the short-term impacts of TGDP-induced displacement, as the long-term data is not available at the moment. From the qualitative study by Wilmsen and Van Hulten (2017), the long-term overall impact could be milder (or less negative) than the short-term effects, and the conclusions of heterogeneity analysis could be different. As an extension, the households could be interviewed again to evaluate whether any effects on mental health persist almost two decades after the displacement.

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Table 1: Descriptive statistics of standardized mental health factors

		No. of Obs.	Mean	Std. Dev.	Min	Max
1st wave	Anxiety	1,510	0.020	1.021	-3.340	3.378
	Depression	1,510	0.051	1.015	-4.106	2.043
	Low mood	1,510	0.062	1.051	-3.687	2.104
	Low self-esteem	1,510	0.035	1.026	-3.880	2.049
2nd wave	Anxiety	1,023	0.005	0.996	-3.042	2.752
	Depression	1,023	-0.103	0.995	-3.268	2.221
	Low mood	1,023	-0.095	0.968	-3.913	2.213
	Low self-esteem	1,023	-0.005	0.971	-3.416	2.091

Table 2: Descriptive statistics of individual and household characteristics

		No. of Obs.	Mean	Std. Dev.	Min	Max
1st wave	Age	1,510	45.060	13.821	15	97
	Male	1,510	0.447	0.497	0	1
	House owner	1,510	0.862	0.345	0	1
	Number of household members	1,510	3.869	1.431	1	9
	Household income	1,510	0.120	0.301	0.001	10
	Urban Hukou holder	1,510	0.511	0.500	0	1
2nd wave	Age	1,023	44.390	13.111	17	80
	Male	1,023	0.451	0.498	0	1
	House owner	1,023	0.879	0.327	0	1
	Number of household members	1,023	3.950	0.327	1	9
	Household income	1,023	0.117	0.334	0.001	10
	Urban Hukou holder	1,023	0.470	0.499	0	1

*Household income in 100,000 RMB.

Table 3: Descriptive statistics of characteristics used in heterogeneity analysis

	No. of Obs.		Percentage	
	First wave	Second wave	First wave	Second wave
Education	1,510	1,023		
Illiterate	167	115	11.1%	11.2%
General Education	1,219	831	80.7%	81.2%
Technical Education	101	57	6.7%	5.6%
College	23	20	1.5%	2.0%
Marital Status	1,510	1,023		
Never Married	66	16	4.4%	1.6%
Married	1,341	932	88.8%	91.1%
Divorced	25	18	1.7%	1.8%
Cohabit	1	2	0.1%	0.2%
Widowed	77	55	5.1%	5.4%
Displacement Distance	898	741		
Out of town	131	127	14.6%	17.1%
Within town	280	277	31.2%	37.4%
No displacement	487	337	54.2%	45.5%
Displaced alone vs. not	1,356	752		
Alone	210	143	15.5%	19.0%
With village	531	189	39.2%	25.1%
Others	128	83	9.4%	11.0%
No displacement	487	337	35.9%	44.8%

Note: For education, the category "general education" includes any education level from lower elementary school to senior high school except for the technical high school, and the category "technical education" includes technical high school and technical college.

Table 4: Balance of individual and household characteristics between treatment and control groups in wave 1

	(1)	(2)	(3)
	treatment group mean	Control group mean	Difference treatment vs. control
Male	0.468	0.402	0.066**
	(0.499)	(0.491)	(0.027)
Age	45.451	44.240	1.210
	(13.625)	(14.203)	(0.761)
House Owner	0.834	0.920	-0.097***
	(0.372)	(0.272)	(0.022)
Number of household members	3.917	3.768	0.149*
	(1.522)	(1.213)	(0.079)
Household income	0.120	0.119	0.001
	(0.348)	(0.163)	(0.017)
Urban Hukou holder	0.495	0.544	-0.050*
	(0.500)	(0.499)	(0.027)
Sample size	1,023	487	1,510

Note: Treatment group includes individuals residing at or below 175 meters above sea level in 2003. Control group includes individuals residing above 175 meters above sea level in 2003 (wave 1). The results in column 3 are obtained by regressing the variables of interest on treatment status. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 5: ITT effects of TGDP-induced dislocation on mental well-being

	Wave 2	DiD	FE DiD
	(1)	(2)	(3)
Anxiety			
Post		0.0367	-0.0526
		(0.067)	(0.069)
Altitude $\leq$ 175	0.0666	0.0861	
	(0.065)	(0.056)	
Altitude $\leq$ 175 * Post		-0.0214	0.0521
		(0.084)	(0.084)
Depression			
Post		0.0585	0.0717
		(0.066)	(0.068)
Altitude $\leq$ 175	0.234***	0.0877*	
	(0.063)	(0.053)	
Altitude $\leq$ 175 * Post		0.155*	0.221***
		(0.082)	(0.084)
Low Mood			
Post		0.162**	0.174**
		(0.069)	(0.067)
Altitude $\leq$ 175	0.149**	0.127**	
	(0.064)	(0.057)	
Altitude $\leq$ 175 * Post		0.0166	0.0421
		(0.085)	(0.083)
Low Self-esteem			
Post		0.0006	-0.0216
		(0.069)	(0.068)
Altitude $\leq$ 175	0.0227	-0.0129	
	(0.065)	(0.055)	
Altitude $\leq$ 175 * Post		0.0357	0.0632
		(0.084)	(0.086)
Observations	1,023	2,533	2,018

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

Table 6: Heterogeneity in ITT effects of TGDP-induced displacement on mental well-being by demographic characteristics

	Anxiety	Depression	Low Mood	Low Self-esteem	Observations
A. Female					
Altitude $\leq$ 175 * Post	0.087	0.188	-0.12	-0.0719	1,106
	(0.109)	(0.119)	(0.109)	(0.110)	
B. Male					
Altitude $\leq$ 175 * Post	-0.00431	0.270**	0.250*	0.243*	912
	(0.130)	(0.116)	(0.131)	(0.137)	
C. Illiterate					
Altitude $\leq$ 175 * Post	0.543*	0.179	-0.262	-0.0252	164
	(0.304)	(0.325)	(0.272)	(0.300)	
D. General education					
Altitude $\leq$ 175 * Post	-0.0119	0.221**	0.0779	0.125	1,662
	(0.094)	(0.095)	(0.094)	(0.094)	
E. Higher education					
Altitude $\leq$ 175 * Post	-0.158	0.14	0.0912	-0.289	62
	(0.394)	(0.251)	(0.411)	(0.522)	
F. Married/Cohabiting					
Altitude $\leq$ 175 * Post	0.0151	0.211**	0.0887	0.0618	1,748
	(0.090)	(0.088)	(0.087)	(0.090)	
G. Single					
Altitude $\leq$ 175 * Post	0.121	-0.244	0.157	0.175	108
	(0.353)	(0.525)	(0.523)	(0.369)	

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

Table 7: Heterogeneity in ITT effects of TGDP-induced displacement on mental well-being by relocation circumstances

	Anxiety	Depression	Low Mood	Low Self-esteem
A. Relocation distance				
Post * Move close	-0.0868	0.197*	0.124	0.303***
	(0.102)	(0.105)	(0.102)	(0.107)
Post * Move far	0.378***	0.685***	0.0146	0.102
	(0.133)	(0.144)	(0.133)	(0.136)
B. Relocation model				
Post * Move w/ village	0.118	0.581***	0.0765	0.247**
	(0.126)	(0.127)	(0.116)	(0.119)
Post * Move w/ own HH only	0.0739	0.157	0.179	0.273**
	(0.115)	(0.121)	(0.119)	(0.131)
Post * Move other modes	0.021	0.0105	-0.105	0.00962
	(0.143)	(0.160)	(0.175)	(0.160)

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sample consists of 1,466 and 1,670 individual-year observations in panel A and B, respectively.

Table 8: Impact of TGDP-induced dislocation on mental well-being: Relocated versus designated but not yet relocated households

	Wave 2	DiD	FE DiD
A. Anxiety			
Post		0.0123	-0.0526
		(0.062)	(0.069)
Relocated	0.210***	0.142**	
	(0.073)	(0.060)	
Post x Relocated		0.0487	0.103
		(0.092)	(0.093)
Designated but not yet relocated	-0.13	-0.0168	
	(0.080)	(0.071)	
Post x Designated but not yet relocated		-0.0962	-0.0225
		(0.106)	(0.101)
B. Depression			
Post		-0.0401	0.0717
		(0.061)	(0.068)
Relocated	0.328***	-0.1000*	
	(0.073)	(0.060)	
Post x Relocated		0.439***	0.337***
		(0.093)	(0.096)
Designated but not yet relocated	0.105	-0.0626	
	(0.075)	(0.068)	
Post x Designated but not yet relocated		0.16	0.0509
		(0.100)	(0.098)
C. Low Mood			
Post		0.083	0.174**
		(0.063)	(0.068)
Relocated	0.247***	0.0908	
	(0.071)	(0.062)	
Post x Relocated		0.147	0.0511
		(0.093)	(0.094)
Designated but not yet relocated	0.0145	-0.101	
	(0.077)	(0.069)	
Post x Designated but not yet relocated		0.104	0.0287
		(0.102)	(0.101)
D. Low Self-esteem			
Post		0.024	-0.0216
		(0.063)	(0.068)
Relocated	0.0364	-0.1	
	(0.071)	(0.063)	
Post x Relocated		0.136	0.197**
		(0.093)	(0.096)
Designated but not yet relocated	0.00381	0.190***	
	(0.080)	(0.071)	
Post x Designated but not yet relocated		-0.200*	-0.134
		(0.106)	(0.106)
Observations	1,023	2,533	2,018

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

Table 9: Relocated versus designated but not yet relocated households: Heterogeneity by demographic characteristics

	Anxiety	Depression	Low Mood	Low Self-esteem
A. Female				
Relocate x Post	0.111	0.363***	-0.17	0.106
	(0.122)	(0.141)	(0.127)	(0.126)
Designated but not yet relocated' x Post	0.0556	-0.0442	-0.0527	-0.309**
	(0.131)	(0.135)	(0.130)	(0.132)
B. Male				
Relocate x Post	0.0724	0.326**	0.310**	0.327**
	(0.143)	(0.129)	(0.141)	(0.149)
Designated but not yet relocated' x Post	-0.131	0.177	0.15	0.104
	(0.157)	(0.140)	(0.159)	(0.173)
C. Illiterate				
Relocate x Post	0.764**	0.313	-0.477*	-0.0807
	(0.322)	(0.337)	(0.280)	(0.313)
Designated but not yet relocated' x Post	-0.249	-0.303	0.508	0.174
	(0.356)	(0.529)	(0.504)	(0.474)
D. General education				
Relocate x Post	-0.0103	0.327***	0.122	0.302***
	(0.105)	(0.109)	(0.106)	(0.105)
Designated but not yet relocated' x Post	-0.0139	0.0793	0.0185	-0.115
	(0.112)	(0.108)	(0.110)	(0.115)
E. Higher education				
Relocate x Post	-0.205	0.0951	0.155	-0.382
	(0.364)	(0.286)	(0.630)	(0.624)
Designated but not yet relocated' x Post	-0.102	0.193	0.0168	-0.181
	(0.672)	(0.315)	(0.417)	(0.642)
F. Married/Cohabiting				
Relocate x Post	0.0706	0.307***	0.11	0.176*
	(0.101)	(0.103)	(0.098)	(0.103)
Designated but not yet relocated' x Post	-0.0585	0.0835	0.0608	-0.09
	(0.107)	(0.100)	(0.106)	(0.109)
G. Single				
Relocate x Post	0.317	0.0801	0.137	0.598
	(0.367)	(0.534)	(0.546)	(0.372)
Designated but not yet relocated' x Post	-0.413	-1.128	0.211	-0.978**
	(0.480)	(0.696)	(0.619)	(0.492)

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

Table 10: ITT effects of TGDP-induced displacement on economic outcomes

	Wave 2	DiD	FE DiD
A. Have job			
Post		0.152***	0.133***
		(0.038)	(0.038)
Altitude $\leq$ 175	0.0251	0.0979***	
	(0.040)	(0.031)	
Altitude $\leq$ 175 * Post		-0.0557	-0.042
		(0.049)	(0.048)
Observations	506	1,277	1,277
B. Family income (annual)			
Post		1,807*	2,938***
		(1,075.000)	(637.700)
Altitude $\leq$ 175	-498.2	939.4	
	(974.800)	(1,319.000)	
Altitude $\leq$ 175 * Post		-1,458	-2,832
		(1,716.000)	(1,777.000)
Observations	1,021	2,485	2,485
C. Have debt			
Post		0.00121	0.00904
		(0.030)	(0.028)
Altitude $\leq$ 175	0.162***	0.0147	
	(0.031)	(0.024)	
Altitude $\leq$ 175 * Post		0.150***	0.141***
		(0.038)	(0.036)
Observations	1,020	2,530	2,530
D. Land owned (unit: fen)			
Post		0.393	0.0872
		(1.466)	(1.378)
Altitude $\leq$ 175	10.80***	0.161	
	(1.996)	(0.930)	
Altitude $\leq$ 175 * Post		9.831***	9.434***
		(2.086)	(2.083)
Observations	493	1,232	1,232

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

Table 11: ITT effects of TGDP-induced displacement on access to facilities

	Wave 2	DiD	FE DiD
A. Convenience getting to school			
Post		0.0244	0.0153
		(0.025)	(0.024)
Altitude $\leq$ 175	-0.179***	-0.0676***	
	(0.027)	(0.021)	
Altitude $\leq$ 175 * Post		-0.108***	-0.0919***
		(0.033)	(0.032)
Observations	1,020	2,499	2,499
B. Convenience seeing doctor			
Post		-0.0246	-0.021
		(0.019)	(0.017)
Altitude $\leq$ 175	-0.0960***	-0.0691***	
	(0.023)	(0.016)	
Altitude $\leq$ 175 * Post		-0.0277	-0.0337
		(0.026)	(0.025)
Observations	1,023	2,533	2,533

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

Table 12: Heterogeneity in ITT impact of TGDP-induced displacement on mental well-being by demographic characteristics

	Employed	Income	Debt	Land owned	Convenient school	Convenient doctor
A. Female						
Altitude ≤ 175 * Post	-0.0689	-535.1	0.172***	6.504**	-0.0715*	-0.0412
	(0.061)	(1,395.000)	(0.047)	(2.725)	(0.041)	(0.032)
B. Male						
Altitude ≤ 175 * Post	-0.00911	-5,470	0.0892*	13.80***	-0.110**	-0.0208
	(0.076)	(3,405.000)	(0.054)	(3.173)	(0.050)	(0.040)
C. Illiterate						
Altitude ≤ 175 * Post	0.100	-1,875	0.297**	7.262	0.0943	0.222*
	(0.097)	(2,032.000)	(0.133)	(6.097)	(0.116)	(0.114)
D. General education						
Altitude ≤ 175 * Post	-0.0631	-2,703	0.120***	8.270***	-0.109***	-0.0607**
	(0.055)	(2,082.000)	(0.039)	(2.295)	(0.035)	(0.026)
E. Higher education						
Altitude ≤ 175 * Post	0	-7,814	0.0214		0.000	0.0556
	(0.085)	(6,736.000)	(0.199)		(0.154)	(0.166)
F. Married/Cohabiting						
Altitude ≤ 175 * Post	-0.0379	-3,083	0.148***	10.07***	-0.0836**	-0.0276
	(0.052)	(2,007.000)	(0.038)	(2.221)	(0.034)	(0.027)
G. Single						
Altitude ≤ 175 * Post	0.0833	-3,557	-0.0075	9.583	-0.161	-0.195**
	(0.125)	(3,988.000)	(0.190)	(5.795)	(0.131)	(0.087)

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

Table 13: Heterogeneity in ITT impact of TGDP-induced displacement on mental well-being by relocation circumstances

	Employed	Income	Debt	Land owned	Convenient school	Convenient doctor
A. Moving distance						
Post * Move close	-0.0218	-4,775***	0.199***	-0.111	-0.0116	0.0101
	(0.058)	(1,333.000)	(0.045)	(2.874)	(0.042)	(0.035)
Post * Move far	-0.258**	-4,662	0.213***	31.38***	-0.316***	-0.106*
	(0.127)	(8,241.000)	(0.066)	(2.911)	(0.064)	(0.058)
B. Moving model						
Post * Move w/ village	0.0513	-419	0.167***	17.85***	-0.221***	-0.0913**
	(0.091)	(1,813.000)	(0.055)	(2.889)	(0.051)	(0.042)
Post * Move w/ own HH only	-0.0437	-4,491*	0.211***	8.138*	0.0064	-0.00735
	(0.078)	(2,317.000)	(0.057)	(4.303)	(0.053)	(0.049)
Post * Move other modes	-0.170**	-13,244	0.280***	1.468	-0.0524	0.0692
	(0.070)	(11,859.000)	(0.067)	(3.713)	(0.079)	(0.061)

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

Table 14: Impact of TGDP-induced dislocation on economic outcomes: Relocated versus designated but not yet relocated households

	Wave 2	DiD	FE DiD
A. Employed			
Post		0.118***	0.133***
		(0.040)	(0.038)
Relocated	-0.0519	0.00584	
	(0.046)	(0.038)	
Post x Relocated		-0.0585	-0.0663
		(0.063)	(0.055)
Designated but not yet relocated	0.108**	0.170***	
	(0.046)	(0.042)	
Post x Designated but not yet relocated		0.0156	-0.0173
		(0.065)	(0.057)
B. Family income (annual)			
Post		1,589	2,938***
		(1,030.000)	(638.000)
Relocated	-475.1	2,541	
	(1,159.000)	(2,551.000)	
Post x Relocated		-3,249	-4,589
		(2,923.000)	(2,811.000)
Designated but not yet relocated	-530.2	-1,555*	
	(1,179.000)	(938.900)	
Post x Designated but not yet relocated		1,305	-281.1
		(1,496.000)	(1,058.000)
C. Have debt			
Post		0.00456	0.00904
		(0.028)	(0.028)
Relocated	0.255***	0.0279	
	(0.035)	(0.027)	
Post x Relocated		0.219***	0.217***
		(0.043)	(0.041)
Designated but not yet relocated	0.0344	0.0111	
	(0.036)	(0.030)	
Post x Designated but not yet relocated		0.0258	0.0279
		(0.047)	(0.042)
D. Land owned (unit: fen)			
Post		1.269	0.0872
		(1.429)	(1.379)
Relocated	14.95***	1.953*	
	(2.331)	(1.099)	
Post x Relocated		12.29***	14.34***
		(2.486)	(2.556)
Designated but not yet relocated	3.051	2.579*	
	(2.288)	(1.413)	
Post x Designated but not yet relocated		-0.279	-0.167
		(2.522)	(2.075)

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

Table 15: Impact of TGDP-induced dislocation on economic outcomes: Relocated versus designated but not yet relocated households

	Wave 2	DiD	FE DiD
A. Convenience getting to school			
Post		0.0490**	0.0153
		(0.023)	(0.024)
Relocated	-0.220***	-0.0648**	
	(0.032)	(0.026)	
Post x Relocated		-0.149***	-0.111***
		(0.040)	(0.039)
Designated but not yet relocated	-0.121***	-0.0182	
	(0.032)	(0.026)	
Post x Designated but not yet relocated		-0.102**	-0.0635*
		(0.041)	(0.035)
B. Convenience seeing doctor			
Post		0.00774	-0.021
		(0.018)	(0.017)
Relocated	-0.111***	-0.0443**	
	(0.027)	(0.021)	
Post x Relocated		-0.0667**	-0.0361
		(0.033)	(0.032)
Designated but not yet relocated	-0.0754***	-0.0135	
	(0.028)	(0.021)	
Post x Designated but not yet relocated		-0.0621*	-0.0303
		(0.034)	(0.027)

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

Appendix A. Additional tables

Table A.1: Correlations between missing mental health information and individual characteristics in wave 1

Altitude $\leq$ 175	0.002
	(0.006)
Age	0.000
	(0.000)
Male	-0.004
	(0.006)
House owner	0.014
	(0.009)
Number of household members	0.001
	(0.002)
Household income	-0.006
	(0.010)
Urban Hukou holder	-0.001
	(0.006)
Dummy for missing income data	-0.014
	(0.017)
No. of Obs.	1,530

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Presented figures are coefficients of the regression of missing mental health indicators and personal and household characteristics.

Table A.2: Principal Component Factor Analysis - Regression Scores

	Factor 1 Anxiety	Factor 2 Depression	Factor 3 Low mood	Factor 4 Low self-esteem
	(1)	(2)	(3)	(4)
Always feel bothered	0.204	-0.009	0.000	-0.112
Always feel everything you do need great effort	0.233	-0.046	-0.043	-0.068
Always feel that you are not as good as others	-0.333	0.109	0.386	0.090
Always find yourself difficult to focus on what you are doing	0.216	-0.026	-0.124	-0.015
Always feel sad	0.029	0.204	0.019	-0.069
Always feel scared	-0.181	0.457	-0.053	-0.088
Always feel lonely	-0.167	0.348	0.050	0.001
Always cry	-0.129	0.389	-0.047	-0.077
Always feel not like talking	0.062	0.047	-0.009	0.075
Always feel difficult to fall asleep	0.181	0.008	-0.060	-0.053
Do not always feel life is happy	-0.052	-0.056	0.388	0.015
Always feel hard to get rid of bad mood, even with help from families and friends	0.162	-0.035	0.006	0.024
Always feel your life is unsuccessful	0.248	-0.155	0.026	-0.007
Do not always feel happy	-0.024	-0.020	0.354	-0.028
Always get frustrated no matter what you do	0.213	-0.090	0.028	0.009
Do not always feel your future is promising	-0.018	-0.063	0.353	-0.091
Always feel that other people are unfriendly to you	-0.114	-0.097	-0.003	0.573
Always feel not like eating	0.059	0.068	-0.077	0.101
Always feel in a bad mood	0.151	-0.021	0.017	0.056
Always feel that other people do not like you	-0.105	-0.087	-0.020	0.557

Note: The names of four factors are given based on the mental health questions which have higher scores (in absolute value), as the higher the score in absolute value, the higher correlation between the factor and mental health question.

Table A.3: ITT effects of TGDP-induced dislocation on anxiety

	(1)	(2)	(3)	(4)
Inverse Mills ratio			-1.035	
			(3.620)	
Post	0.0367	-0.0526	-0.0526	-0.0526
	(0.067)	(0.074)	(0.074)	(0.069)
Altitude $\leq$ 175	0.0861	0.016	0.0593	
	(0.056)	(0.068)	(0.167)	
Altitude $\leq$ 175 * Post	-0.0214	0.0521	0.0522	0.0521
	(0.084)	(0.092)	(0.092)	(0.084)
Age	0.00132	0.00169	0.00459	
	(0.002)	(0.002)	(0.010)	
Male	-0.0158	0.00641	-0.0176	
	(0.042)	(0.047)	(0.097)	
Education level - lower elementary	-0.171**	-0.195**	-0.147	
	(0.085)	(0.096)	(0.195)	
Education level - higher elementary	-0.200***	-0.250***	-0.225*	
	(0.077)	(0.085)	(0.120)	
Education level - junior high school	-0.221***	-0.255***	-0.211	
	(0.075)	(0.084)	(0.176)	
Education level - senior high school	-0.340***	-0.348***	-0.310*	
	(0.094)	(0.104)	(0.169)	
Education level - technical high school	-0.503***	-0.495***	-0.444*	
	(0.127)	(0.142)	(0.227)	
Education level - technical college	-0.749***	-0.483***	-0.185	
	(0.151)	(0.166)	(1.051)	
Education level - university	-0.276*	-0.270*	-0.35	
	(0.149)	(0.162)	(0.322)	
Marital status - married	0.0832	0.0843	0.136	
	(0.103)	(0.112)	(0.214)	
Marital status - divorced	0.064	0.269	0.604	
	(0.184)	(0.227)	(1.183)	
Marital status - cohabit	-0.0177	0.00972		
	(0.110)	(0.118)		
Marital status - widowed	0.243*	0.306*	0.376	
	(0.143)	(0.160)	(0.290)	
Urban Hukou (baseline)	0.177***	0.181***	0.291	
	(0.048)	(0.054)	(0.390)	
Own a house (baseline)	-0.0587	-0.0221	-0.0805	
	(0.062)	(0.071)	(0.218)	
Number of household members (baseline)	0.000417	-0.00323	-0.0246	
	(0.014)	(0.016)	(0.075)	
Household income (baseline)	-0.152*	-0.12	-0.0776	
	(0.082)	(0.075)	(0.165)	
Dummy variable indicating missing data	0.228*	0.197	0.391	
in household income (baseline)	(0.126)	(0.139)	(0.691)	
Sample	Unbalanced	Balanced	Balanced	Balanced
Observations	2,533	2,018	2,016	2,018
R-squared	0.032	0.028	0.028	0.001

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

Table A.4: ITT effects of TGDP-induced dislocation on depression

	(1)	(2)	(3)	(4)
Inverse Mills ratio			-4.729	
			(3.794)	
Post	0.0585	0.0717	0.0717	0.0717
	(0.066)	(0.073)	(0.073)	(0.068)
Altitude $\leq$ 175	0.0877*	0.0287	0.226	
	(0.053)	(0.065)	(0.171)	
Altitude $\leq$ 175 * Post	0.155*	0.221**	0.222**	0.221***
	(0.082)	(0.090)	(0.090)	(0.084)
Age	0.00192	0.00156	0.0148	
	(0.002)	(0.002)	(0.011)	
Male	-0.363***	-0.346***	-0.456***	
	(0.040)	(0.044)	(0.100)	
Education level - lower elementary	-0.0348	-0.0961	0.122	
	(0.091)	(0.102)	(0.204)	
Education level - higher elementary	-0.227***	-0.256***	-0.145	
	(0.082)	(0.090)	(0.131)	
Education level - junior high school	-0.201**	-0.216**	-0.0149	
	(0.080)	(0.088)	(0.187)	
Education level - senior high school	-0.271***	-0.265**	-0.0935	
	(0.097)	(0.108)	(0.179)	
Education level - technical high school	-0.345***	-0.388***	-0.152	
	(0.112)	(0.124)	(0.232)	
Education level - technical college	-0.106	-0.116	1.246	
	(0.136)	(0.164)	(1.113)	
Education level - university	-0.0545	0.0276	-0.342	
	(0.146)	(0.163)	(0.335)	
Marital status - married	0.0683	0.106	0.344	
	(0.088)	(0.097)	(0.214)	
Marital status - divorced	0.35	0.0375	1.568	
	(0.242)	(0.221)	(1.255)	
Marital status - cohabit	-0.698***	-0.662**		
	(0.248)	(0.279)		
Marital status - widowed	0.482***	0.453***	0.771***	
	(0.143)	(0.161)	(0.298)	
Urban Hukou (baseline)	-0.0712	-0.139***	0.364	
	(0.048)	(0.054)	(0.405)	
Own a house (baseline)	-0.0075	0.00681	-0.26	
	(0.062)	(0.070)	(0.227)	
Number of household members (baseline)	-0.025	-0.0362**	-0.134*	
	(0.016)	(0.017)	(0.080)	
Household income (baseline)	0.0173	0.0476*	0.241	
	(0.037)	(0.026)	(0.159)	
Dummy variable indicating missing data	0.165	0.208	1.092	
in household income (baseline)	(0.135)	(0.172)	(0.736)	
Sample	Unbalanced	Balanced	Balanced	Balanced
Observations	2,533	2,018	2,016	2,018
R-squared	0.075	0.08	0.08	0.035

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

Table A.5: ITT effects of TGDP-induced dislocation on low mood

	(1)	(2)	(3)	(4)
Inverse Mills ratio			-1.904	
			(3.732)	
Post	0.162**	0.174**	0.174**	0.174**
	(0.069)	(0.075)	(0.075)	(0.068)
Altitude $\leq$ 175	0.127**	0.0961	0.176	
	(0.057)	(0.068)	(0.173)	
Altitude $\leq$ 175 * Post	0.0166	0.0421	0.0414	0.0421
	(0.085)	(0.092)	(0.092)	(0.083)
Age	-0.000441	0.000524	0.00585	
	(0.002)	(0.002)	(0.011)	
Male	0.0573	0.0527	0.00846	
	(0.042)	(0.045)	(0.099)	
Education level - lower elementary	-0.0787	-0.0879	-0.000102	
	(0.088)	(0.099)	(0.202)	
Education level - higher elementary	-0.063	-0.0267	0.018	
	(0.077)	(0.085)	(0.122)	
Education level - junior high school	-0.0575	-0.034	0.0468	
	(0.078)	(0.085)	(0.183)	
Education level - senior high school	-0.0969	-0.129	-0.0599	
	(0.100)	(0.110)	(0.178)	
Education level - technical high school	-0.420***	-0.422***	-0.327	
	(0.121)	(0.128)	(0.230)	
Education level - technical college	-0.549***	-0.639***	-0.091	
	(0.150)	(0.170)	(1.091)	
Education level - university	-0.388**	-0.329*	-0.478	
	(0.180)	(0.199)	(0.352)	
Marital status - married	-0.0274	-0.0834	0.0125	
	(0.098)	(0.110)	(0.209)	
Marital status - divorced	0.31	0.44	1.056	
	(0.224)	(0.294)	(1.256)	
Marital status - cohabit	-1.239***	-1.295***		
	(0.199)	(0.194)		
Marital status - widowed	0.334**	0.266	0.395	
	(0.146)	(0.166)	(0.294)	
Urban Hukou (baseline)	0.179***	0.152***	0.354	
	(0.049)	(0.054)	(0.400)	
Own a house (baseline)	-0.0746	-0.0316	-0.139	
	(0.065)	(0.072)	(0.219)	
Number of household members (baseline)	-0.0423***	-0.0412**	-0.0805	
	(0.014)	(0.016)	(0.079)	
Household income (baseline)	-0.175***	-0.162***	-0.0838	
	(0.066)	(0.061)	(0.165)	
Dummy variable indicating missing data	0.422***	0.433***	0.789	
in household income (baseline)	(0.138)	(0.166)	(0.712)	
Sample	Unbalanced	Balanced	Balanced	Balanced
Observations	2,533	2,018	2,016	2,018
R-squared	0.054	0.059	0.057	0.025

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

Table A.6: ITT effects of TGDP-induced dislocation on low self-esteem

	(1)	(2)	(3)	(4)
Inverse Mills ratio			-2.794	
			(3.937)	
Post	0.000604	-0.0216	-0.0216	-0.0216
	(0.069)	(0.074)	(0.074)	(0.068)
Altitude $\leq$ 175	-0.0129	-0.0441	0.0713	
	(0.055)	(0.066)	(0.177)	
Altitude $\leq$ 175 * Post	0.0357	0.0632	0.0665	0.0632
	(0.084)	(0.092)	(0.092)	(0.086)
Age	-0.00741***	-0.00752***	0.000303	
	(0.002)	(0.002)	(0.011)	
Male	0.174***	0.181***	0.116	
	(0.042)	(0.046)	(0.102)	
Education level - lower elementary	-0.0364	-0.101	0.0279	
	(0.094)	(0.102)	(0.204)	
Education level - higher elementary	-0.0517	-0.0879	-0.0222	
	(0.083)	(0.090)	(0.127)	
Education level - junior high school	-0.314***	-0.338***	-0.219	
	(0.084)	(0.091)	(0.188)	
Education level - senior high school	-0.295***	-0.290***	-0.188	
	(0.100)	(0.112)	(0.179)	
Education level - technical high school	-0.277**	-0.246*	-0.107	
	(0.124)	(0.141)	(0.244)	
Education level - technical college	-0.296*	-0.297	0.508	
	(0.155)	(0.183)	(1.164)	
Education level - university	-0.403**	-0.353*	-0.571	
	(0.171)	(0.193)	(0.364)	
Marital status - married	-0.137	-0.206*	-0.0652	
	(0.105)	(0.116)	(0.219)	
Marital status - divorced	0.158	0.189	1.093	
	(0.202)	(0.230)	(1.294)	
Marital status - cohabit	0.881	0.811		
	(0.779)	(0.783)		
Marital status - widowed	-0.041	-0.103	0.0855	
	(0.154)	(0.175)	(0.312)	
Urban Hukou (baseline)	-0.162***	-0.178***	0.119	
	(0.049)	(0.055)	(0.420)	
Own a house (baseline)	0.00144	-0.00639	-0.164	
	(0.063)	(0.073)	(0.235)	
Number of household members (baseline)	-0.0048	-0.00352	-0.0612	
	(0.015)	(0.017)	(0.082)	
Household income (baseline)	-0.0112	0.000567	0.115	
	(0.053)	(0.056)	(0.171)	
Dummy variable indicating missing data	-0.215*	-0.212	0.311	
in household income (baseline)	(0.123)	(0.151)	(0.769)	
Sample	Unbalanced	Balanced	Balanced	Balanced
Observations	2,533	2,018	2,016	2,018
R-squared	0.042	0.044	0.044	0.001

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

Table A.7: Heterogeneity in ITT effects of TGDP-induced displacement on mental well-being: Triple difference FE estimates

	Anxiety	Depression	Low Mood	Low Self-esteem
A. Gender				
Altitude $\leq$ 175 * Post	0.087	0.188	-0.12	-0.0719
	(0.109)	(0.119)	(0.109)	(0.110)
Altitude $\leq$ 175 * Post * Male	-0.0913	0.0816	0.370**	0.315*
	(0.169)	(0.166)	(0.170)	(0.176)
B. Education				
Altitude $\leq$ 175 * Post	0.00857	0.233**	0.0816	0.105
	(0.092)	(0.092)	(0.093)	(0.092)
Altitude $\leq$ 175 * Post * Illiterate	0.537**	-0.182	-0.371	-0.253
	(0.266)	(0.284)	(0.247)	(0.271)
Altitude $\leq$ 175 * Post * Higher education	-0.295	-0.0753	0.162	-0.36
	(0.353)	(0.265)	(0.354)	(0.509)
C. Marital Status				
Altitude $\leq$ 175 * Post	0.107	0.271	-0.213	0.0732
	(0.255)	(0.318)	(0.317)	(0.296)
Altitude $\leq$ 175 * Post * Married	-0.0549	-0.0539	0.283	-0.0206
	(0.270)	(0.329)	(0.329)	(0.309)
Observations	2,018	2,018	2,018	2,018

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

Table A.8: Relocated versus 'designated but not yet relocated' households: Heterogeneity in impact on economic and access outcomes

	Employed	Income	Debt	Land owned	Convenient school	Convenient doctor
A . Female						
Relocate x Post	-0.0866	-922.4	0.249***	13.05***	-0.0711	-0.0348
	(0.067)	(2,063.000)	(0.056)	(3.392)	(0.053)	(0.043)
Designated but not yet relocated' x Post	-0.0519	-24.83	0.0699	-4.955*	-0.072	-0.0497
	(0.075)	(1,197.000)	(0.054)	(2.609)	(0.046)	(0.034)
B . Male						
Relocate x Post	-0.0423	-8,431	0.164***	17.16***	-0.146**	-0.0314
	(0.091)	(5,248.000)	(0.060)	(3.824)	(0.059)	(0.049)
Designated but not yet relocated' x Post	0.0271	-681.4	-0.0356	6.437**	-0.05	-0.0031
	(0.087)	(1,863.000)	(0.065)	(3.241)	(0.056)	(0.046)
C . Illiterate						
Relocate x Post	0.1	-2,791	0.325**	8.917	0.119	0.208*
	(0.097)	(2,071.000)	(0.142)	(6.753)	(0.127)	(0.125)
Designated but not yet relocated' x Post	0.1	1,180	0.199	1.589	0	0.269**
	(0.097)	(4,651.000)	(0.140)	(5.765)	(0.095)	(0.122)
D . General education						
Relocate x Post	-0.0903	-4,742	0.190***	13.56***	-0.149***	-0.0703**
	(0.065)	(3,464.000)	(0.046)	(2.871)	(0.043)	(0.034)
Designated but not yet relocated' x Post	-0.0362	9.031	0.0252	-0.879	-0.0566	-0.0478*
	(0.064)	(1,106.000)	(0.046)	(2.295)	(0.038)	(0.028)
E . Higher education						
Relocate x Post	0	-3,411	0.23		0.167	0.341*
	(0.085)	(7,419.000)	(0.288)		(0.184)	(0.183)
Designated but not yet relocated' x Post	0	-12,217*	-0.222		-0.167	-0.278
	(0.085)	(6,740.000)	(0.184)		(0.184)	(0.205)
F . Married/Cohabiting						
Relocate x Post	-0.0814	-5,320	0.223***	15.14***	-0.0972**	-0.0272
	(0.061)	(3,325.000)	(0.044)	(2.768)	(0.042)	(0.035)
Designated but not yet relocated' x Post	-0.00215	-150.5	0.0476	0.462	-0.0658*	-0.028
	(0.060)	(1,092.000)	(0.045)	(2.185)	(0.037)	(0.029)
G . Single						
Relocate x Post	0.0724	-2,197	0.113	15.14**	-0.217	-0.233**
	(0.129)	(3,941.000)	(0.211)	(6.676)	(0.143)	(0.103)
Designated but not yet relocated' x Post	0.125	-6,957	-0.336*	1.25	-0.00758	-0.0909
	(0.119)	(5,148.000)	(0.190)	(6.250)	(0.219)	(0.156)

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