

Revolution Not In My Backyard? Protest and Regime Support in an Electoral Autocracy

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Abstract

Contemporary revolutions are more likely to emerge from urban movements that involve participants of diverse socio-economic backgrounds. They are bound together by one common goal: overthrowing the authoritarian regime. The size of such a “negative coalition” plays a crucial role in determining the success or failure of the anti-regime movement, yet its formation process is not well investigated by social scientists. In this article, we examine how the exposure to protest led by the opposition shapes citizens’ attitude toward and support for the anti-regime camp. Analyzing the election outcomes at the polling-station level shortly after Hong Kong’s Umbrella Movement, we find that protest exposure, as measured by spatial proximity to protest sites, is positively correlated with the decline of electoral support for the opposition. We further find that the adverse cognitive impacts of protest exposure manifest themselves in elevating bystanders’ sense of economic insecurity, even though the protest causes no persistent income loss and generally boosts political efficacy.

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1 Introduction

Contemporary revolutions almost always start with a small-scale urban protest initiated by the opposition elite. Some of these protests developed into a large-scale social movement that eventually brought down the regimes (e.g. the Jasmine Revolution in Tunisia), because they were able to attract moderate citizens to form a sizeable “negative coalition” against the incumbent in the street or in the voting booth (Beissinger 2013). Yet, most anti-regime protests failed to forge a negative coalition large enough to topple the authoritarian incumbent. What affect the moderate citizens’ decision to join the anti-regime movement? Classic theories emphasize the role played by either structural factors (Llavador and Oxoby 2005; Tilly 2004) or state repression (Chang 2008; Lohmann 1994; Shadmehr and Boleslavsky 2015; Svolik 2009). In this article, we examine an important, albeit understudied, element that affects potential participants: perceived economic insecurity brought by anti-regime protests.

Unlike common civilian movements in democracies, anti-regime protests in autocracies aim to change the fundamental political order. They can easily escalate into full-blown conflict between the state and protesters led by the opposition, causing socio-economic instability that has adverse financial or psychological impacts not only on protesters, but also on bystanders. If the actual or perceived economic impacts are sufficiently large, the protests may end up alienating ordinary citizens, heightening their demand for the status quo. Unlike widely studied repression risks that confront protesters, the aversion to economic risks may persist even after the protest. When bystanding citizens disturbed by the protesters expect that the movement will jeopardize the economy, public support for the opposition likely wanes, resulting in reduced participation in the movement even in the absence of state repression.

We use Hong Kong’s Umbrella Movement as a case to examine how exposure to an anti-regime protest magnifies bystanders’ sense of economic insecurity, which in turn undermines their support for the opposition that organizes the protest. The Umbrella Movement, which broke out in the last quarter of 2014 and lasted for 79 days, provides a valuable case to test our argument. The protest did not result in large-scale social turbulence. No single protester or police officer was killed. In fact, not a

single bullet was fired during the entire protest period. Compared with many anti-regime protests that ended in bloodshed, non-violent civil resistance such as this stands a high chance of winning public sympathy (Chenoweth, Stephan, and Stephan 2011). Yet, we detect a remarkable negative impact of protest exposure, which is measured by spatial proximity to the protest sites. Using quasi-differences-in-differences (qDID) estimates to analyze the outcomes of the subsequent legislative election in Hong Kong, we find that the decline in vote share for the opposition is positively correlated with protest exposure. A one standard-deviation decrease in the distance between a constituency and the protest sites would cause a larger decline in vote share of the opposition candidates (between 3-6%). Turnout rate follows a similar pattern, although the magnitude is somewhat smaller.

Our results are robust to different proximity measures (driving time v. straight line), types of constituencies (territory-wide v. regional proportional representation), and clustered standard errors (constituencies v. geographical districts). In addition, we weight observations in our sample with their covariate balancing propensity score (Fong, Hazlett, Imai, et al. 2018) to remove the impact of other constituency characteristics. Our main results hold in the balanced sample created by weighting. We also replace the proverbial bifurcation of political camps with a constituency-level ideology measure calculated from the ideal points of all Hong Kong legislator candidates in the 5th and 6th Legislative Council (2012-2016 and 2016-2017). Using this indicator, we find significant results that protest proximity is positively correlated with anti-opposition sentiment.

Two placebo tests are conducted to verify the validity of our identification assumption. In the first, we apply the same qDID analysis to the two elections before the Umbrella Movement. Consistent with our expectations, spatial proximity in these “placebo” elections loses its prediction power for the vote share change of the opposition. In another placebo test, we construct a pseudo-independent variable based on the distance to a location, where the anti-regime protest supposedly took place but failed, and we find no significant effect for spatial proximity.

To confirm that perceived economic insecurity drives the election results, we apply data from Asian Barometer Survey to analyze how public opinion in Hong Kong was

affected by the protest. As predicted, the rise of respondents' anxiety over the city's economic prospect is more salient in districts near the protest sites, while the rise in their reported income does not vary with proximity. Besides, there is no difference in the change of political efficacy between those who live close to those sites and those who live far away, although the average level of political efficacy became higher after the protest. Finally, we use another individual level survey, the Hong Kong Election Study, to show that economic insecurity is a crucial determinant of respondents' choice between the regime and the opposition in the 2016 election. We further demonstrate that the negative impacts of the protest concentrate on citizens with lower income, while young women who are experienced in political participation are more likely to be mobilized by the opposition.

In addition to engaging the literature on revolutions, our research speaks to studies that explore the cognitive impacts of social movement via spatial proximity. For instance, Madestam et al. (2013) finds that tea party protests in the US significantly push the ideology of local voters to the far-right end. Wallace, Zepeda-Millán, and Jones-Correa (2014) argue that large-scale protests would reduce bystanders' sense of political efficacy due to the exposure to intra-movement conflicts and incoherent movement frames. In studying the 1992 Los Angeles Riot, however, Enos, Kaufman, and Sands (2018) point out that the riot had a strong electoral mobilization impact on voters who lived close to the event, suggesting that exposure to the event may enhance bystanders' belief that they can effect policy changes. On the other hand, Mazumder (2018) studies the Civil Rights protests in the United States during the 1960s, and finds that counties that experienced the protests in that period tend to be more sympathetic to the cause of the movement than those that experienced none. Wasow (2016) argues that voters in the 1960s were more likely to vote for the Democrats if they lived close to a non-violent civil right movement, and the opposite would happen if the movement became violent. These studies are based on the experience of a democracy. The cognitive impacts of social movement in autocracies, especially ones that are overtly anti-regime, are not well-understood. In this study, we propose a new channel – the elevation of perceived economic insecurity – through which protest exposure influences bystanders' political preference.

The rest of the article is organized as follows. In the next section, we demonstrate our theoretical framework. In Section 3, We discuss background information about Hong Kong’s political institutions and the Umbrella Movement, and then present our research design and hypotheses. Section 4 and 5 present the data and methods. Section 6 shows our constituency level results and robustness checks. We investigate the cognitive impacts of the protest at individual level in Section 7, and conclude in the last section.

2 Theoretical Framework

The modus operandi of revolutions has changed over time.¹ Most notably, about two thirds of successful revolutions since the 1980s have been urban revolutions (Beissinger 2013). These urban uprisings are different from peasant revolts or proletarian revolutions in important ways. In particular, they are less violent, more prone to success, and likely to occur in locations closer to power centers. Their mode of mobilization also tends to be more decentralized. Usually, tens of thousands of participants with diverse interests and organizational affiliations take to the streets simultaneously within a short period of time in the absence of a central authority leading the movement. However dissimilar their interests are, these individuals and groups share one common ground: overthrow the autocratic incumbent. The participant composition of such a “negative coalition” stands in stark contrast to the revolutions commonly characterized in sociological theories, in which class plays a decisive role (Moore 1966; Skocpol 1979).

The Orange Revolution is an illustrative example of contemporary revolutions. Analyzing a unique survey dataset, Beissinger (2013) finds that although participants in the Orange Revolution are dissatisfied with the Kuchma regime, only one third of them favor democracy and a multi-party system, and many disagree with members of the opposition elite. A similar pattern is found among revolutionaries in Russia (Rosenfeld 2017) and the Arab Spring (Beissinger, Jamal, and Mazur 2015).

The authoritarian incumbent is at a greater risk when the opposition is able to develop an urban protest into a large-scale anti-regime movement. Because members of a

¹Following Beissinger (2013), we define a revolution as “a mass uprising against an established government involving contested claims to sovereignty, with the aims of displacing the incumbent regime and substantially altering the political or social order.”

negative coalition by definition have little common interest beyond the shared hatred of the authoritarian incumbent, the size of the coalition, in theory, would be small when few citizens are deeply dissatisfied with regime. Yet, their satisfaction with the regime is often endogenously determined by the evolution of the initial protest led by the opposition elite. For instance, brutal state crackdowns on an anti-regime protest would (1) reveal the “true type” of the incumbent (Lohmann 1994), and (2) create a focal point for people to act collectively (Aytaç, Schiumerini, and Stokes 2017; Chang 2008), and hence lowering the cost of joining the coalition.

Nevertheless, the state is unlikely the only player that decides bystanders’ willingness to join an anti-regime movement. The behavior and ideology of the opposition manifested during the protest should also play an important role. In fact, the state and the opposition can be viewed as two “candidates” competing for power on a usually unlevel playing field. Previous studies have shown that the opposition could alter views and political efficacy of bystanders via organizing protests (Enos, Kaufman, and Sands 2018; Madestam et al. 2013; Mazumder 2018; Wallace, Zepeda-Millán, and Jones-Correa 2014). The impacts of protest exposure, however, are not confined to political efficacy and ideology. We argue that the exposure to protests led by the opposition may also stimulate the sense of economic insecurity among bystanders, which in turn affects their support for the anti-regime coalition².

An anti-regime protest inevitably disrupts socio-economic order. The opposition may initiate labor strikes, school boycotts, and occupy protests in public areas. The incumbent may retaliate by imposing curfews, shutting down public transport and online communication,³ and restricting the freedoms of individual citizens. Clashes between the protesters and the law enforcement may further foment unrest such as political violence, riots, and looting. Many medical studies have shown that exposure to social unrest such as terrorism is linked to the development of anxiety (For example, Schuster et al. 2001; Silver et al. 2002). For this reason, we have reason to predict that exposure to anti-regime protests affects not only the participants, but also the bystanders.

²Both Magaloni (2006) and Pan and Xu (2018) argue that the attitude towards the regime and the preference of economic policies consist of the two most important dimensions of social cleavage under autocracies. Our theory posits that an anti-regime protest affects public opinion along the economic dimension as well as the regime dimension.

³For instance, the Chinese authorities banned access to Instagram from mainland China shortly after the outbreak of the Umbrella Movement in Hong Kong (Hobbs and Roberts 2018).

Anxiety inflicted by anti-regime protests can take many forms. People may worry that the political confrontation may escalate into a civil war. If the anti-regime protest coincides with a larger secession movement or other ethnic conflicts, people may worry indiscriminate retaliation by the state targeting even civilians. In this article, we focus on only one type of anxiety: the sense of economic insecurity, which is related to worries about job prospect, business environment, and property damages. We choose this focus because the economic costs concern all citizens. For instance, the threat of state retaliation may not worry government supporters, but they would fear that the anti-regime protest may wreak havoc on the economy. Such anxiety is not an unfounded feeling. According to the estimates of Beissinger (2018), even a failed revolution would cause a 1% drop in annual economic growth, while the cost of a successful revolution is as high as 6%.

The elevated sense of economic insecurity will reduce citizens' support for the anti-regime movement, hence the size of the negative coalition. The cognitive mechanism is similar to the psychological impact of exposure to social instability. In studying the psychological impacts of the September 11 attacks, Huddy et al. (2005) find that Americans who experienced high degrees of anxiety are more risk averse, more likely to support a conciliatory approach toward terrorists, and less approving of the Bush administration. Similarly, studies find that exposure to violent protests would reduce support for the cause of the protesters (Sears and McConahay 1973; Wasow 2016) or increase the animosity toward the protesting group (Beber, Roessler, and Scacco 2014). In a similar vein, we predict that even for those who do not suffer substantive economic losses due to anti-regime protests, they likely experience heightened sense of economic insecurity, which in turn undermines their support for the anti-regime movement or the opposition who organizes it⁴.

The degree of perceived economic insecurity likely varies by one's protest exposure. In general, the salience of an event is associated with one's physical proximity to it (Latané 1981). For instance, Loewenstein et al. (2001) find that spatial proximity to terrorist attacks is positively and strongly correlated with emotional arousal. We, there-

⁴Authoritarian governments are keenly aware of citizens' aversion to socio-economic instability. It is fairly common to see the ruling party of these regimes portray itself in state propaganda as a force for stability Pearlman 2013.

fore, hypothesize that the sense of economic insecurity aroused by anti-regime protests should decrease in the distance away from ground zero of the unrest because mass mobilization, counter-mobilization, riots, curfews, and government crackdowns most probably take place at the protest sites. The spatial heterogeneity of the effects of protest exposure is potentially more stark in anti-regimes protests that occur in autocracies than garden-variety protests in democracies. The reason is that authoritarian incumbents tend to impose more severe media controls over the population, especially in times of political crises. Citizens who rely on state-controlled media to acquire political information may be able to gain only limited information about the protest. While state-controlled media may limit the influences of the protests through censorship, they cannot prevent citizens who live near the protest sites from experiencing the protests firsthand. Such an exposure may allow those citizens to obtain political information that would otherwise be unavailable from the mouthpiece of the state.

3 The Umbrella Movement in Hong Kong

The Umbrella Movement in Hong Kong provides a valuable case to evaluate our theory. It has the elements that are germane to a modern urban revolution. The city is highly developed. Its GDP per capita in 2014 is 40,247 US dollars, with only 0.13% of the population work in agriculture. But the wealth distribution is fairly unequal. The gini coefficient is 0.537 in 2011. Under the principle of “one country, two systems,” Hong Kong people enjoy a high degree of autonomy, including freedom of speech, freedom of association, and an independent judiciary. They have the right to elect 40 out of 70 seats in the Legislative Council, the city’s legislature. Opposition parties (known as the *pan-democratic camp*) are allowed to compete with the incumbent ruling coalition (known as the *pro-establishment camp*) in relatively fair elections.

The Umbrella Movement in Hong Kong has an additional advantage for theory testing. As an example of non-violent civil resistance, it inflicted socio-economic instability far lower than violent insurgencies. Chenoweth, Stephan, and Stephan (2011) point out that non-violent civil resistance is more likely to succeed, because it commands moral high grounds that help the protest win public support. For this reason, the Umbrella

Movement presents a hard case to test the validity of our central contention. In addition, the non-violent nature of the protest constrained the government's options to deal with the protesters. As we will discuss below, violent repression was not an optimal response. This in turn helps limit the scope of the cognitive impacts felt by the citizens; they were more likely struck by heightened sense of economic insecurity, rather than the fear of state persecution or other forms of political violence.

3.1 Background

Because Hong Kong is a “Special Administrative Region” of China, Beijing has a decisive influence over the selection Hong Kong’s chief executive – the head of the city – and 30 indirectly elected legislative seats.⁵ For this reason, many view Hong Kong as yet another electoral autocracy (Wong 2015). Hong Kong citizens have been fighting for the right to directly elect the chief executive since 1997, when the city’s sovereignty was transferred from the United Kingdom to China.

According to the Basic Law, the city’s mini-constitution, universal suffrage will be eventually implemented as the method to elect the chief executive, although the time frame is not clearly specified. Since the sovereignty transfer, pro-democracy activists and politicians alike continued to urge Beijing to honor its promise. To their dismay, the Chinese National People’s Congress (NPC) announced in 2014 that universal suffrage can be implemented on the condition that candidate nomination is effectively controlled by Beijing. This decision led many Hong Kong citizens to believe that Beijing shut the door on democratization. Benny Tai, a local law professor, called for an extensive occupy movement in protest of the NPC decision. Many pro-democracy groups and individuals supported the idea. Student activists initiated a territory-wide school boycott. Pro-democracy academics echoed by organizing teach-outs near government headquarters, where the student protest took place. Pro-democracy trade unions and opposition parties gradually joined the fray. The occupy protest met heavy-handed state repression. The liberal use of teargas and police over-reaction ended up provoking more people to take to the streets. Unarmed civilians blocked major downtown areas, ushering in the Umbrella

⁵The chief executive is elected by 1,200 members of the Election Committee, most of whom are pro-Beijing elites. The 30 seats are elected by similar small groups.

Movement that lasted 79 days.

The protest was unable to extract any concession from Beijing, partly because the protesters failed to agree on what concession they wanted from the authorities. Some participated in protest of the NPC decision, while others hoped to pressure Beijing to grant Hong Kong full democracy. Many joined in because of their dissatisfaction with the way that the police's use of teargas to disperse the peaceful demonstrators. No one group or individual was willing or able to claim leadership of the movement. Perhaps the only consensus among the occupy activists was that no one could represent anybody else. In fact, many occupy activists vigilantly rallied against any attempt to develop a central authority for the movement (*chai da tai*), for fear of being hijacked by other protest groups (Kwok and N. K. Chan 2017). Because their mutual distrust ran as deep as their distrust of the government, effective communication or negotiation with the authorities failed to emerge.⁶

Many protesters took pride in their involvement in a spontaneous and leaderless movement (Cheng and W.-Y. Chan 2017), although in the eyes of many bystanders, the movement lapsed into an aimless public nuisance. The number of tourists to the city experienced a rapid decline during the protest, while shops near the occupy sites reportedly suffered a significant drop in sales (Hong Kong's Information Services Department 2014). Admittedly, the socio-economic risks affected those who lived in or near the protest sites most, as they were the eyewitness of the inconveniences created right next to their residential buildings. Meanwhile, the government adopted an attrition tactic toward the movement (Yuen and Cheng 2017). It did not escalate the confrontation with the protesters, perhaps for fear that repression would reinforce the protesters' moral high grounds. For weeks, it took no action of clearing the protest sites, except that pro-establishment politicians and media continued to inveigh against the protesters for disrupting socio-economic order. Public support of the protest seemed waning, as even Benny Tai, the initiator of the occupy movement, urged the occupy groups to retreat (Reuters 2014).

The Umbrella Movement ended in the government's site-clearing operation, which

⁶Five student activists did partake in a televised formal talk with high-ranking government officials in the early phase of the protest. No follow-up talk emerged.

met no resistance. Most participants left the sites before the operation, but some activists waited to be arrested. Resistance continued in society. New political groups with an anti-China or localism platform were formed. Some of these *localist* groups participated in a legislative election that was held about two years later, in hopes of riding on the momentum of the Umbrella Movement or making a last-ditch effort to create a landslide victory for the opposition. The election outcomes, however, were not in favor of the opposition. In the absence of systematic, large-scaled electoral fraud, the opposition captured only one additional popularly elected seat.⁷

3.2 Hypotheses

The electoral results, which indicate the opposition elite's inability to forge a large negative coalition against the incumbent, provide rich data to evaluate the impacts of protest exposure on the public support for the opposition. In particular, we derive testable hypotheses in relation to the potential impacts of protest exposure:

Hypothesis 1. The decline of the opposition' vote share is more conspicuous in areas near the protest sites.

Hypothesis 2. Citizens' sense of economic insecurity rises more rapidly in areas near the protest sites.

In addition to the two main hypotheses, we will also check how the protest impacted Hong Kong citizens' sense of political efficacy and attitude towards democracy, the key movement frame of the protest. We present a simple model in the appendix A to derive these hypotheses more formally.

⁷Despite the absence of large-scaled electoral fraud in legislative elections, Wong (2017) finds that there is a systematic redistricting bias against the opposition in the election of the District Councils, the lowest elected tier in Hong Kong.

4 Data

4.1 Dependent Variables

We collect data from several sources. The first part of our dataset is the polling-station level voting records for Legislative Council elections in 2008, 2012 and 2016, which are publicly available from Hong Kong government’s election websites. For each election, we are able to obtain information about the lists of candidates, their party and camp, and how many votes they won in each polling station. We aggregate these records to the District Council Constituency (DCC) level – the lowest level for which digital maps and regional statistics are available⁸ – and calculate the vote share of each camp for all DCCs by summing votes of candidates from the same camp and dividing it by the total votes in that constituency.

In 2016, there were 539 polling stations located in 431 DCCs, which were scattered in the 18 geographical districts of the city. For brevity, we will use the term “constituency” when referring to a DCC and “district” when referring to one of the 18 geographical districts. Some new constituencies emerge in 2016. We drop them, as they do not permit inter-temporal comparison. This leaves us a sample of 401 constituencies for the main analysis, and 399 for the placebo tests.

The vote share of the opposition in each constituency is the dependent variable of interest in our test of Hypothesis 1. The opposition force consists of two factions, the *pan-democratic camp* and *localist*. There are two types of legislative seats in Hong Kong: the geographical constituencies and the functional constituencies. The former constituencies adopt universal suffrage. As for the latter, only five seats are popularly elected based on territory-wide proportional representation. Our analysis focuses on the geographical constituencies (henceforth, “regular seats”), together with these five popularly elected functional-constituency seats, which are commonly known as the “super seats.”

For a more fine-grained measurement of political preference, we construct an indicator of each constituency’s average ideology, based on the vote share and ideal point of elected legislators (see the method section for details). These ideal points are estimated using roll-call voting records of all the legislators from 2012 to 2017. The records are

⁸District Councils are also the lowest elected tier in Hong Kong.

published on Legislative Council’s website in XML format, and can be easily scraped by a web crawler. The total number of bills in this period is more than 4,000, so the estimation has a small variance (see Figure A2 in appendix B).

4.2 Variables of Interest

To measure proximity to protest sites, we use two quantities: the minimum straight-line distance and driving time to the four occupy sites. These measures are collected using digital map of DCCs in ArcGIS and two R packages: *geosphere* and *gmapsdistance*. The first package is used to calculate the straight-line distance, while the second one sends requests to Google Map via API to retrieve driving time between any two geographical points. We choose driving time instead of public transportation time, because the latter is not available for certain locations (i.e. the top of a hill)⁹. The two measures are our variables of interest, and will be denoted as *Straight-line* and *Driving time*, respectively.

4.3 Controls

We control a variety of demographic variables at the DCC level to reduce potential omitted variable bias. The data of these variables are downloaded from the websites of the 2011 census and 2016 by-census conducted by Hong Kong Census and Statistics Department.¹⁰ The variables collected range from local population structure to socio-economic attributes, including the share of elderly citizens, the share of college students, the share of trade and financial industry practitioners, median income, and median ratio of income over rent in each administrative unit. Unfortunately, most demographic variables at the DCC level are not available in the 2016 by-census. As a result, our control variables at the DCC level mainly rely on the 2011 census.

4.4 Individual-level Data

To examine the cognitive impacts of the protest and test Hypothesis 2, we use two independent public opinion surveys. The first is the *Asian Barometer Survey* (ABS).

⁹Our main findings will remain robust if we use public transportation time and drop constituencies with missing values. See Table A1 in the online appendix C for details.

¹⁰The department provides no individual level information.

Similar to Barometer Surveys in other continents, the ABS is a pooled cross-sectional data project aiming to investigate political views of Asian citizens. We analyze the Wave 3 and 4 data of the ABS Hong Kong data. The two waves of survey that we use were conducted approximately two years before and after the Umbrella Movement. Each wave has around 1,200 respondents. Questions in the ABS include each respondent's district of residence, demographic information, and political attitude in multiple dimensions¹¹. Its dynamic structure enables us to infer changes brought by the protest at each district.

The second survey data that we use come from the Hong Kong Election Study (HKES). The survey was implemented by professional survey companies (SSI and YouGov) using internet survey technologies. The sample is representative of the Hong Kong population. We focus on the pre- and post-election surveys of the 2016 Legislative Council election. The advantage of the HKES surveys is that they explicitly ask the vote choice of the respondents in the 2012 and 2016 elections. These two questions help us compare the political preference of the same individual before and after the protest, and link their vote choice to the perceived economic insecurity. After removing missing values and respondents who did not turn out in either election,¹² we have a sample of more than 1,000 observations.

5 Estimation Strategies

We adopt a quasi-differences-in-differences (qDID) approach to test our hypotheses derived in Section 3. We start from Hypothesis 1 on election results. As we have pointed out, in a Legislative Council election, citizens in Hong Kong vote for both regular legislative seats and “super seats” at the same time. Thus, we treat each type of seats as an independent election, and estimate the following equation for each of these two types:

$$\begin{aligned} Dem_VoteShare_{c,t} = & \mu + \beta \mathbb{1}\{PostUmbrella\} * Distance_c \\ & + \gamma \mathbb{1}\{PostUmbrella\} + \delta X_{c,t} + \alpha_c + \epsilon_{c,t} \end{aligned} \quad (1)$$

¹¹Unfortunately, the ABS data do not permit us to identify the residence of respondents at the DCC level.

¹²We do so to make results more interpretable. As we will show in following sections, turnout is not a crucial determinant of the election results.

where c and t indicate constituencies and years (2012 or 2016) respectively; $Dem_VoteShare_{c,t}$ is our outcome variable, the vote share of the opposition candidates in constituency c , year t ; $\mathbb{1}\{PostUmbrella\}$ is an indicator function which equals to 1 for observations from the 2016 election and 0 otherwise; $Distance_c$ is our key independent variable, driving time or minimum straight-line distance from constituency c to the occupy sites; $X_{c,t}$ refer to covariates of constituency c in year t ; α_c is constituency fixed effect, and ϵ_{ct} is the idiosyncratic random shock. Standard errors are clustered at constituency level to account for the temporal correlation of the outcome variable.¹³

To see the implication of equation (1) more clearly, we can take first difference on both sides. It is then obvious that we are estimating how the vote share changes for the opposition candidates in each constituency ($\Delta Dem_VoteShare_{c,t}$) depends on its distance to the occupy sites. The approach employed here differs slightly from the classic DID as we have no explicitly defined treated and control groups. The key identification assumption is still “parallel trend”, which assumes that in the absence of the Umbrella Movement, the vote share change of the opposition candidates in different constituencies remains more or less the same. Although this counterfactual scenario is unobservable (Holland 1986), it is feasible to indirectly test this identification assumption by conducting the analysis using election results before the Umbrella Movement. In that case, the estimate of β should be indistinguishable from zero. Otherwise, the vote share changes in different constituencies have been diverging before the protest, and we will have little reason to believe that the parallel trend assumption holds.

Another possibility is that the relationship between $\Delta Dem_VoteShare_{p,c}$ and $Distance_c$ is driven by some confounding variables that are correlated with both of them. Comparing with the classic DID approach, it means that there exist systematic differences in covariates among our groups determined by their treatment status (proximity to the occupy sites). For example, the protest happened in the business center of Hong Kong, and regions far away from the protest sites are relatively less developed. The existence of these discrepancies among constituencies may violate the parallel trend assumption if they contribute to the protest’s impact on vote share change. The traditional method

¹³Higher level clusters will be used in the robustness checks part.

to deal with this possibility is propensity score weighting (Abadie 2005), but it requires the group indicator to be binary rather than continuous. What we adopt is a novel approach proposed by Fong, Hazlett, Imai, et al. (2018), in which the authors develop a non-parametric algorithm to calculate the covariate balancing propensity score (CBPS) for a continuous independent variable. Weighting observations with the scores can create a balanced sample and cut off the ties between the DCC level covariates and the key predictor $Distance_c$.

We also try to directly control for the interaction of these covariates with the period dummy, $\mathbb{1}\{PostUmbrella\}$, in the regression. Thus, the effects of these characteristics are allowed to vary with time.¹⁴ We check the influence of migration by investigating the correlation between the ratio of emigrants and the distance to occupy sites at constituency level. To account for the influence of unobservable confounders, we use a sensitivity test following the approach in Carnegie, Harada, and Hill (2016). It illuminates the necessary magnitude of unobservable variables' impact to confound the main findings. Finally, a placebo group indicator (the distance to a fake protest site) is constructed to test whether it is the proximity that plays the key role in our case (see section 6.3).

A potential problem of our estimation is that the ideology of legislators may vary continuously, thus the underlying political preference change of Hong Kong citizens cannot be fully captured by the difference in the opposition's vote share. For example, we may over-estimate the preference change if some popular moderate opposition politicians joined the pro-establishment camp in the 2016 election. To alleviate this concern, we first estimate the ideal point of all the legislator candidates,¹⁵ then calculate the average ideology of each constituency by weighting each candidate's ideology score with his or her vote share in this constituency. Replacing the opposition's vote share with the average ideology, we will be able to measure the impact of the protest more accurately.

The test of Hypothesis 2 follows the same approach. However, since geo-location information in the ABS data is available only at the level of the 18 geographical districts,

¹⁴Here the covariates are chosen by our subjective judgement. To ensure that the choice is appropriate, we report in the online appendix the regression result with covariates selected by a machine learning algorithm known as LASSO (least absolute shrinkage and selection operator). The idea is similar to the popular method of using LASSO to select the proper instrumental variables (Belloni et al. 2012)

¹⁵The ideal point of elected legislators is estimated based on their roll-call records. Following the practice, we code vote Yea as 1, Nay as -1, and drop all the Absence or Abstain records. The estimation is done via EM algorithm proposed by Imai, Lo, and Olmsted (2016). The ideal point of lost candidates are treated as equal to the average ideological score of elected legislators from the same party.

rather than at the more fine-grained constituency level, we have to use the minimum distance between each district's geometric center and the occupy sites as the independent variable. And we control for district dummies rather than individual fixed effects, because the ABS data are pooled cross-sectional, not panel. Individual attributes such as gender, age, and education level are controlled to exclude confounders. The standard errors are clustered at district level. Our main focus is self-evaluated economic uncertainty, but we will also check respondents' attitude towards democracy and political efficacy to ensure that the results are not driven by other cognitive impacts. There are several questions related to each of the dimensions, and estimate one regression for each question may cause the problem of multiple inference (Anderson 2008). For this reason, we first standardize all the question answers, then run Principal Component Analysis (PCA) to generate one aggregate variable - PCA score - for each of the indicators. These PCA scores capture the main variation in the set of questions, and will be used as our dependent variable.

To verify the aggregate (DCC) level election results and check the potential problem of ecological fallacy, we repeat the qDID analysis using the vote choice of respondents in the 2012 and 2016 elections reported in the HKES data. As with the ABS data, in the HKES data geo-information is available only at the district level, although we can control for the individual level confounders. We further divide respondents into three categories based on their vote choice:¹⁶ *defectors*, who supported the opposition in 2012 but voted for the incumbent in 2016; *stayers*, who voted for the opposition in both elections; *joiners*, who switched from supporting the incumbent in 2012 to supporting the opposition in 2016¹⁷. We treat *stayers* as the benchmark, and test how *defectors* and *joiners* deviate from the benchmark along each dimension. The results will unveil determinants of the individual heterogeneity in response to the protest. Finally, we examine the correlation between the vote choice of respondents in 2016 and their reported economic insecurity.

¹⁶We follow the approach of Hale and Colton (2017).

¹⁷Respondents who voted for the incumbent in both 2012 and 2016 are dropped as they are not our main focus.

6 Protest Exposure and Electoral Support for Opposition

6.1 Changes in Opposition Vote Share After the Umbrella Movement

We start by showing maps of Hong Kong constituencies which depict the vote share change for the opposition between the 2012 and 2016 Legislative Council elections. The upper panel of Figure 1 is based on the election outcome of the super-seat election, whereas the lower one is for the regular-seat election. Darker colors indicate a larger vote share increase. Occupy sites are denoted by white stars on the map. It is noteworthy that for both elections, the opposition candidates' vote share increase is less pronounced in constituencies near the occupy sites.

We find the same pattern in Figure 2, which displays the bivariate relationships between the vote share change for the opposition and each constituency's distance to the occupy sites. On the left hand side of Figure 2, the independent variable is the driving time, and on the right hand side it is the straight-line distance. Graphs in the first and second row are for the super-seat and the regular-seat elections, respectively. The red lines are fitted with linear regression, and the shade areas mark their 95% confidence interval. It can be seen that as the distance decreases, the vote share of the opposition candidates drops more dramatically in both elections. In the last row of Figure 2, we divide the opposition into the *pan-democratic camp* and the *localist camp*. The pattern seems to be driven mainly by the former rather than the latter.

To verify findings obtained from Figures 1 and 2, we conduct regression analyses based on equation (1). The results are reported in Table 1. The first two columns show estimates from the super-seat election, and the next two columns are based on the regular-seat election. In all the cases the coefficient of our key predictor, the interaction of the distance to occupy sites and the indicator for the election after the protest, is statistically significant with the expected sign. The estimate suggests that the vote share reduction of opposition camp candidates after the protest will be 6% higher in the super seats election and 3% in the regular seats election if the constituency's driving time decreases by one standard deviation (about 10 minutes). Such an effect is highly salient given the fact that the standard deviation for the vote share change of the opposition

candidates in the two elections are 10% and 6% respectively. The result is similar if we use the straight-line distance. Moreover, the estimates also imply that the popularity of the opposition candidates really drops in constituencies close to the occupy sites after the Umbrella Movement ($\hat{\gamma} < 0$),¹⁸ and they perform better in the super-seat election than in the regular-seat election.¹⁹ In the last two columns, we estimate equation (1) separately for the *pan-democratic camp* and the *localist camp*. The coefficient on the interaction term is significantly positive only for the former. For the latter, the coefficient is even smaller than zero, although not precisely estimated. This again supports what we have found in Figure 2.

Table 2 displays the analytic results of turnout rate. Conventional wisdom suggests that the *pro-establishment camp* has well-established political machines that effectively mobilize supporters to turn out to vote in each election. In contrast, supporters of the opposition behave more spontaneously when it comes to voting. Therefore, a high turnout is more likely to reflect the success of the opposition. As may be seen in the first two columns, in both regular-seat and super-seat elections, there is a strong positive relationship between turnout rate and the opposition's vote share. On average, a 1% rise in turnout rate will boost the opposition's vote share by almost the same amount in super seats elections, and 0.21% in regular seat elections.

In addition, the change of turnout rate after the protest follows a similar trend as the vote share change of the opposition. As presented in the last two columns, the turnout rate is also a decreasing function of proximity to the protest. The average turnout rate becomes higher after the Umbrella Movement, as the coefficients of both the period dummy and the interaction term are positive. For this reason, the large-scale protest seems to have increased Hong Kong people's institutionalized political participation. The magnitude of the influence, however, is much lower compared with that on the vote share. Turnout rate is only 0.3 percent higher when the distance rises by one standard deviation. Given its relatively weak substantive significance, we have reason to believe that the protest did

¹⁸ $\hat{\gamma} > 0$ in the second column. But we believe that results based on driving time are more convincing than those based on straight-line distance. Since Hong Kong's territory is separated by the sea, straight-line distance may underestimate the transportation inconvenience.

¹⁹The regression results are robust if we weight each constituency with its number of voters. See Table A1 in appendix C.

change citizens' electoral support, rather than lowering their propensity to vote.²⁰

6.2 Robustness Checks

In Figure 3, we show how our estimates change after weighting observations with the covariate balancing propensity score (CBPS). Unweighted results are on the left and weighted results are on the right. The points represent estimated coefficients and the lines mark the range of 95% confidence intervals. All the estimates are standardized for the convenience of comparison. Covariates selected to calculate the score include the share of married citizens, the share of college students, the share of rich (monthly income higher than 20,000 HK dollars²¹) and poor (monthly income lower than 6,000 HK dollars²²) citizens, and the share of trade and financial industry practitioners. We also control for the share of Mandarin speakers.²³ The correlation between each of the covariates and the key independent variable, *Driving time*, is illustrated by the black segments below. Clearly, weighting significantly reduces the correlation coefficients. After weighting, most characteristics of constituencies do not vary with their proximity to the protest sites, which implies that the contribution of these covariates to the protest's impact is negligible. As can be seen from the first two rows (red segments), the coefficient on our variables of interest remain statistically significant even after weighting.

If we directly add the interaction of these covariates with the period dummy into the regression, the magnitude of the key coefficient will drop: more than 13% for the super-seat election and 47% for the regular-seat election. Yet, the estimates remain significant. For the pattern of migration, we find that neither the level or the change of emigration ratio is correlated with proximity. The result of this sensitivity analysis suggests that our estimates will still be significant, even if the unobservables are as predictive as the most predictive covariate. Details of these results are reported in Table A2 in appendix C and Figure A3, A4 in appendix B, respectively.

Table 3 presents estimates with alternative dependent variables or higher clustering levels. First the dependent variable is replaced by the estimated average ideology for

²⁰This is further confirmed by additional mediation analysis using the method proposed by Imai, Keele, et al. (2011). See Table A3 in appendix C.

²¹About 2,500 US dollars

²²About 764 US dollars

²³Cantonese, rather than Mandarin, is the common dialect in Hong Kong.

each constituency while the model specification remains the same. Results in the first two columns reveal that we can reach the same conclusion: constituencies close to the protest sites are more likely to become pro-government, and this is true for both the super-seat and the regular-seat election. In the last two columns of Table 3, we test the robustness of our standard error estimation by clustering at higher-level districts (there are 18 of them in Hong Kong), and calculate the standard errors via block bootstrap. The coefficients of the key predictor are always significant. The same holds if we use the Conley standard errors to account for the spatial correlation of constituencies (not reported).

6.3 Placebo Tests

Since the protest areas are mostly business and financial districts of Hong Kong, we may worry that our results reflect the repercussions of unobserved economic shocks, instead of the protest. For this reason, we construct a placebo independent variable, the distance to a location known as Tsim Sha Tsui (the position of which is marked by a white triangle in Figure 1). It is one of the business centers in Hong Kong, and was occupied in the beginning of the protest. However, the protesters there were dispersed by the police within three days. Tsim Sha Tsui is similar to other occupy sites in many respects, except that its occupy duration was exceptionally brief. As such, the spatial proximity effect that we identify in the previous analysis should not carry over to this site. In other words, proximity to Tsim Sha Tsui presents a useful placebo test on our central argument.

As may be seen in the third and fourth columns of Table 4, where we add our placebo independent variable (the distance to Tsim Sha Tsui), our key predictor is still significant with the expected sign. The coefficient on the placebo predictor, however, is either insignificant or with the wrong sign, and its magnitude is far too small compared to the key predictor. Since Tsim Sha Tsui is similar to other occupy sites except that the protest did not happen there, we can rule out the possibility that our main findings are driven by other factors closely correlated with business and financial districts, such as varying income and education levels.

In our second placebo test, we examine if the spatial proximity effect is unique to the studied period. If we identify a similar spatial proximity effect in elections prior to the Umbrella Movement, this would imply that the spatial proximity effect is unlikely due to the anti-regime protest. We compare the election outcomes between the 2008 and 2012 legislative elections. Because the super-seat election did not exist in 2008, we only consider the regular-seat election when investigating the vote share change for the opposition.²⁴ We replicate graph (c) and (d) in Figure 2, using the data from the 2008 and 2012 elections. These new graphs are shown in Figure 4.

No matter whether we use the driving time or the straight line distance as the independent variable, the difference in the opposition's vote share between the two elections is always fluctuating around a horizontal line. In other words, the vote share change for the opposition is fairly stable in all constituencies before the Umbrella Movement. In fact, we show in the online appendix that before the protest (i.e. in the 2008 and 2012 elections), the correlation between the opposition's vote share and the distance is negative while after the protest (in the 2016 election) it turns positive (see Figure A1 in appendix B). The first two columns of Table 4 confirm the finding: the coefficient on the interaction term is no longer significant. Its magnitude also becomes much smaller. This is exactly what we should expect when the parallel trend assumption holds.

7 Protest Exposure and Heightened Sense of Economic Insecurity

The previous section confirms our central claim (Hypothesis 1) that the decline of the support for the opposition is increasing in spatial proximity to the protest sites. It remains unclear how the protest influenced the sense of economic insecurity among Hong Kong citizens, and other variables such as their political efficacy and attitude towards democracy. In this section, we tackle these questions using public opinion data collected from the Asian Barometer Survey. The results illuminate the underlying mechanisms through which the anti-regime protest changes bystanders' mind.

As mentioned in the method section, our dependent variables in this section are

²⁴Only 35 seats were open to election before 2012.

PCA scores for each of the indicators we are interested in (perceived economic insecurity, political efficacy and attitude towards democracy).²⁵ The distribution of these scores is similar to normal distribution, and their signs have been adjusted, so that higher values mean improvement along this dimension.

In Table 5A and 5B, we present estimation results for each PCA score. Models in odd columns contain both the interaction term and the period dummy, and in even columns they have only the period dummy. In the latter case, the coefficient of *Post Umbrella* reflects the average change in the indicator before and after the protest. In the first two columns of Table 5A, we present estimates for the protest's impact on perceived economic insecurity. This score is calculated based on three questions about self-evaluated economic condition.²⁶ It is apparent that the Umbrella Movement significantly raised the citizens' anxiety of the society's economic situation in areas near the protest sites, and this rise of anxiety diminishes with the distance to those sites. The finding supports our Hypothesis 2.

A natural follow-up question is: Did the protest result in persistent economic loss to the protest areas? We answer this question using each respondent's reported income level provided by the ABS. As with other indicators, this variable, which consists of five levels arranged in an ascending order, is first normalized before the regression analysis. The result is reported in the last two columns of Table 5A. Interestingly, the average income level of these respondents actually became higher after the protest, and there is no systematic spatial variation. This is consistent with the finding in Beissinger (2018) that failed revolutions affect economic growth only in the short run.

In the appendix, we compare the frequency of occurrence of different key words combinations in *pro-establishment* newspapers, from 2014 to 2016. It turns out that the most noticeable combinations are “Occupy Central + Economy” and “Occupy Central + Rule of Law”²⁷ over the entire time span. Since the start of the protest, the *pro-establishment* newspapers have tried to connect it with the damage to Hong Kong's economic development and stability. Such an impression from reading newspapers can last longer than the economic influence per se. That may contribute to the existence of

²⁵In Table A7 of online appendix C we show results with each question as the dependent variable.

²⁶One example is: “How would you rate the overall economic condition of our country today?”

²⁷As discussed, *pro-establishment* media tend to call the movement “occupy central.”

perceived economic insecurity among our respondents.²⁸

The first two columns of Table 5B are on respondents' approval for democracy. We construct the PCA score using five related questions. As may be seen from the table, neither the time dummy nor the interaction term has a significant coefficient in column 1. The same is true for the period dummy in column 2. In the third and the fourth column we report results for political efficacy where three questions are used to generate the PCA score. It turns out that the average political efficacy becomes higher after the Umbrella Movement, but the change does not vary significantly by spatial proximity to the protest sites. These results are consistent with our intuition. First, the value of democracy has been well understood by Hong Kong citizens, thus their attitude can hardly be altered by a single protest. Second, the relatively free media environment in Hong Kong made the protest known to most citizens, and boosted political efficacy even in the mind of those who didn't really witness the protest.

To summarize, the co-evolution of economic insecurity and the opposition's vote share implies that the latter is possibly mediated by the former, rather than other variables. The increase of average political efficacy, on the other hand, explains the rise of the opposition's vote share in constituencies far away from the protest sites.

8 Heterogeneous Impacts of Protest Exposure

Table 6 shows results of the individual level qDID analysis using HKES data. The dependent variables are whether the respondent voted for the opposition (the first two columns), and whether the respondent voted (the last two columns) in the 2012 and 2016 elections. Even though the variation of the independent variable now is at district level, and the dependent variables take only three values $\{-1, 0, 1\}$ ²⁹, we can still observe significant estimates which confirm the constituency level findings: after the protest, many voters switched from the opposition to the *pro-establishment camp* in areas close to the occupy sites, and the turnout rate also drops in those areas. Irrespective of which measure of proximity we used, we find that when the distance increases by one

²⁸See Figure A7 in appendix B for more details

²⁹Note that we have removed all the respondents who didn't vote in either the 2012 or the 2016 election.

standard deviation, the probability for the respondent to switch camps will rise by around 2%. The effect's magnitude is comparable to that of previous results. As personal characteristics have been differenced out, we are confident that the finding is not driven by any unobservable individual-specific confounder.

After dividing respondents in HKES into three groups based on their vote choice in 2012 and 2016, we find that the relative size of *defectors*, *joiners*, and *stayers* is about 2: 1: 10. The first fourteen rows of Figure 5 displays the difference between *stayers* and the other two groups- *defectors* and *joiners*- in seven dimensions. Red lines represent *joiners* and blue lines represent *defectors*. The length of each solid line means the 95% confidence interval of the difference, and dotted lines mark the 90% confidence intervals. Not all the coefficients are precisely estimated due to the small sample size. From these comparisons, we know that *defectors* live closer to the protest sites, have lower political knowledge and lower personal income. On the other hand, *joiners* tend to be younger, more likely to be female, and to contact elected politicians, although they also seem to be less politically knowledgeable. The findings again confirm our claim that proximity matters. They further suggest that the protest's negative impact concentrate on those with a lower income level. In the appendix, we use the ABS data to show that protesters in the Umbrella Movement and *joiners* here are alike in many respects, which implies that the opposition succeeded in mobilizing only a narrow segment of the population³⁰.

The last two rows of Figure 5 (black lines) display the correlation coefficients of respondents' vote choice in the 2016 election with both perceived economic insecurity and political efficacy³¹. Although we possess no information on how the two indicators change between the two elections, the results show that respondents' tendency to vote for the opposition in 2016 is negatively correlated with the level of economic insecurity, and positively correlated with the level of political efficacy. Both coefficients are significant at 5% level, thus confirming the importance of economic insecurity in affecting voting behavior. The results also help explain the previous finding that the *pan-democratic camp*, the moderate wing within the opposition, suffered more than the radical *localists*. The latter possibly attracted citizens who feel more politically efficacious after the protest,

³⁰See Figure A5 in appendix B.

³¹To make the results coherent we also ignore respondents who always voted for the *pro-establishment* camp here.

while the former undertook the cost of disrupting socio-economic order.

9 Conclusion

Contemporary revolutions are more likely to break out in urban areas and involve participants of diverse socio-economic backgrounds who are bound together by the goal of overthrowing the authoritarian incumbent. The success and failure of such revolutions are determined less by the interaction of classes, as predicted by sociological theories of revolutions, but by protest dynamics, which in turn affect the size of the anti-regime coalition. When studying protest dynamics, extant works focus predominantly on the coercive responses of the regime. In this article, we examine how the variation in protest exposure shapes citizens' attitudes toward the anti-regime politicians. Using Hong Kong's Umbrella Movement as a case, we find that protest exposure, as measured by spatial proximity to protest sites, is indeed positively correlated with the decline of electoral support for the opposition that organized the anti-regime protest. We further find that the cognitive impacts of protest exposure manifest themselves in elevating bystanders' sense of economic insecurity.

Our findings have practical implications on anti-regime protests in autocracies. In particular, the opposition elite who organizes anti-regime protests in autocracies should strive to minimize citizens' perceived socio-economic disruptions of the protest, in order to shore up public support. One way to do it is to reduce the number of protest locations. It is better to organize a large protest in one location, rather than many smaller protests in multiple areas. In addition, the forms and duration of civil resistance also matter. Occupying public areas and obstructing public transport for a lengthy period of time are likely to disrupt socio-economic order more than symbolic public acts such as vigils and performing skits and pranks. That said, anti-regime protests may lack a central authority to exercise control over the duration, locations, and formats of the protest. In fact, the opposition in authoritarian regimes is always confronted with a dilemma between expanding their coalition and maintaining unity. A larger coalition poses a greater threat against the regime, but diversity within the coalition may foment dissension, which undermines the cohesiveness of the coalition and the effectiveness of the protest.

From the perspective of authoritarian incumbents, it is certainly in their interest to magnify the socio-economic impacts of an anti-regime protest, so that they can incite public resentment against it. This tactic is arguably more useful than relying on sheer coercion to deter ordinary citizens from joining in the protest, although studies of regime dynamics accord a lot more attention to the latter tactic. The threat of state repression only increases the cost of protest participation. It does not make the opposition elite less popular. Disapproval of the protest, however, implies citizens' shared stake in the political status quo. How authoritarian governments manipulate the public perception of anti-regime protests warrants more scholarly attention.

Our findings also highlight the importance of studying the cognitive impacts of protests in autocracies. As mentioned, contemporary revolutions often consist of participants with diverse socio-economic backgrounds, rather than of one particular class. These participants are more likely motivated by emotions than by information about the regime (Aytaç, Schiumerini, and Stokes 2017). The emotional reactions of bystanding citizens – namely, the potential protesters – are conditioned upon the cognitive impacts of the protest dynamics on citizens. Future research should accord greater attention to the protest dynamics, including the types of protest locations, duration of protests, and the transmission of protest messages through traditional and digital media, all of which may have substantive effects on the size and composition of the negative coalition against the authoritarian incumbents.

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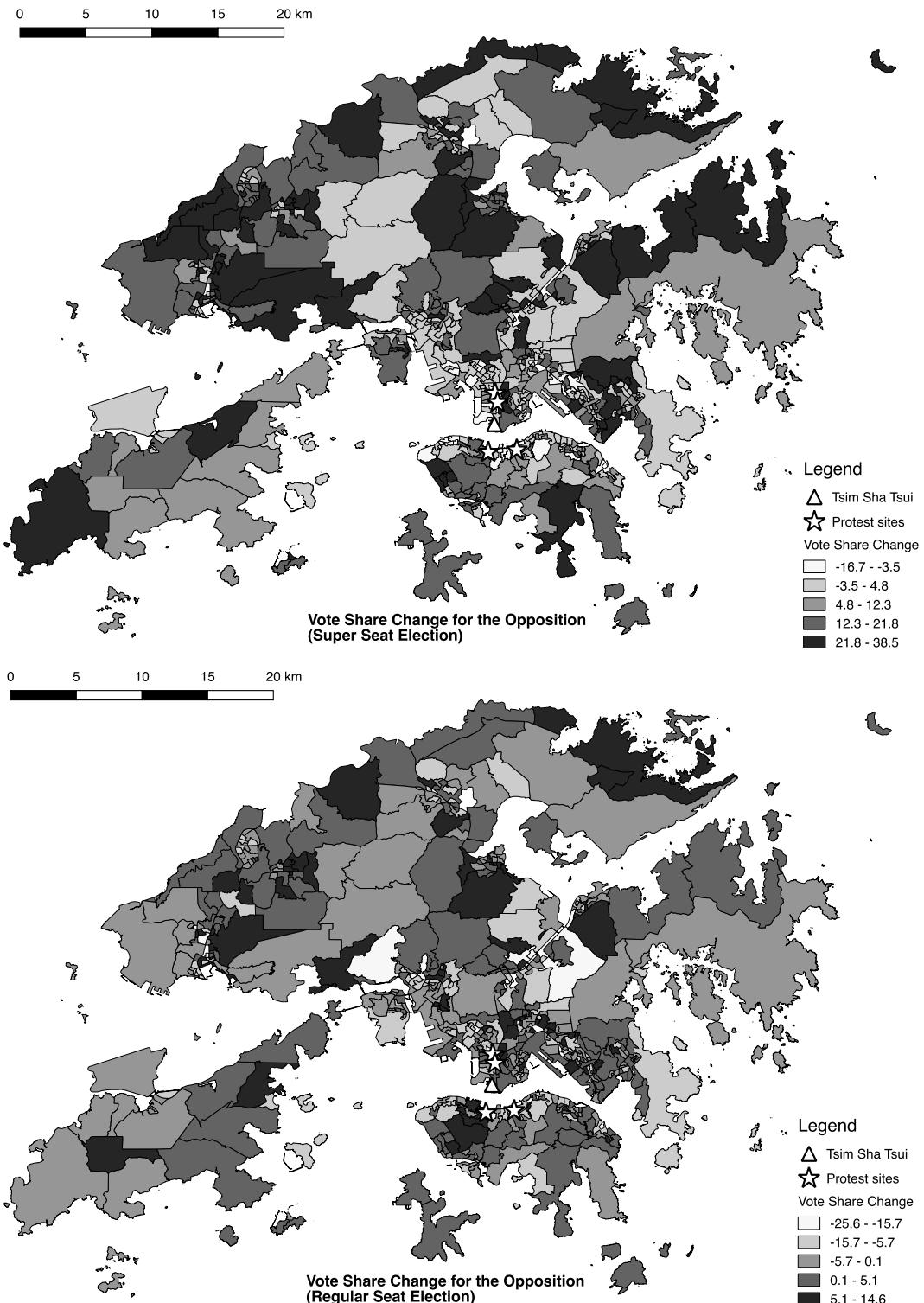
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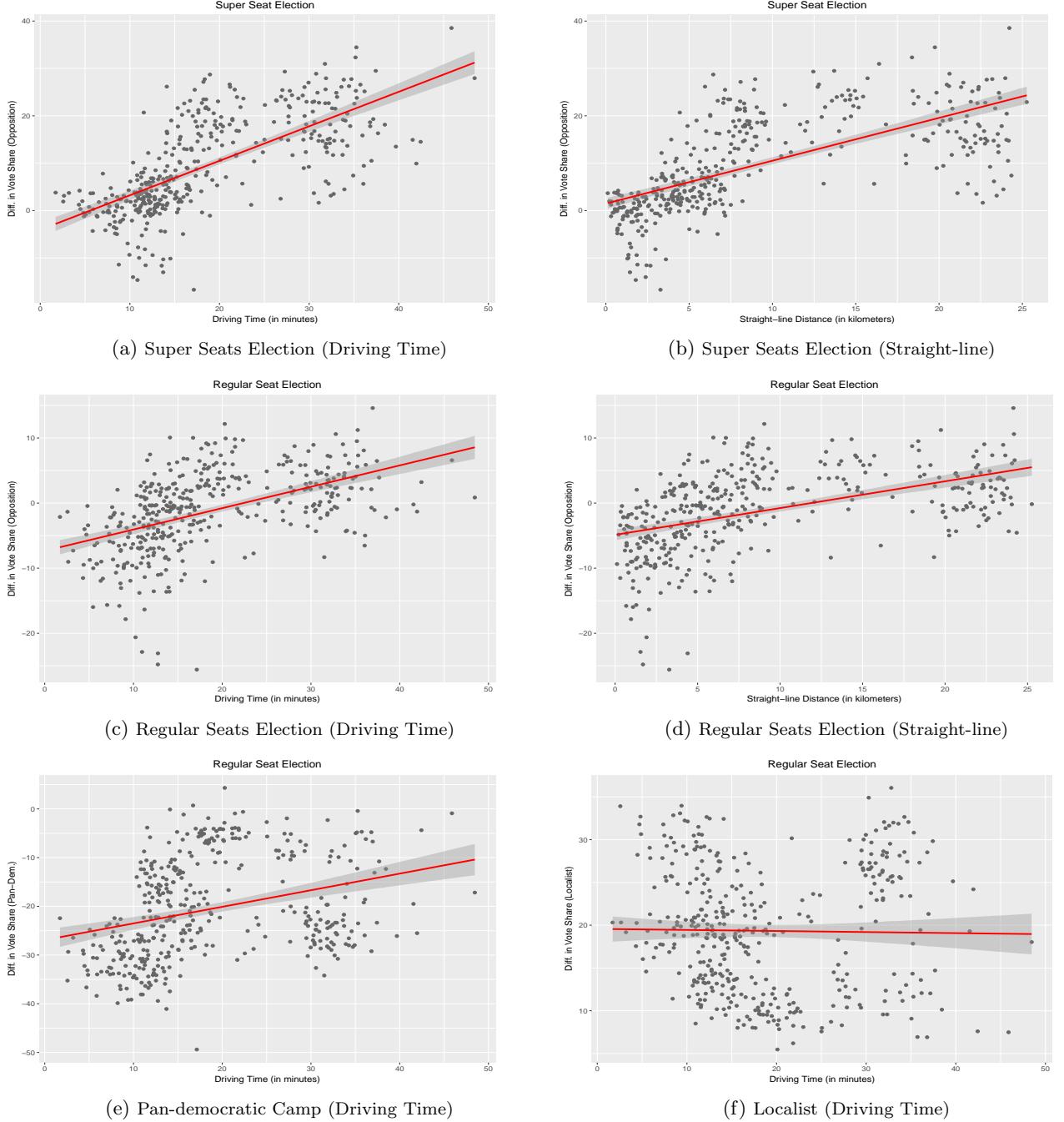
Figures

Figure 1: Vote share change for the opposition in the Legislative Council Election



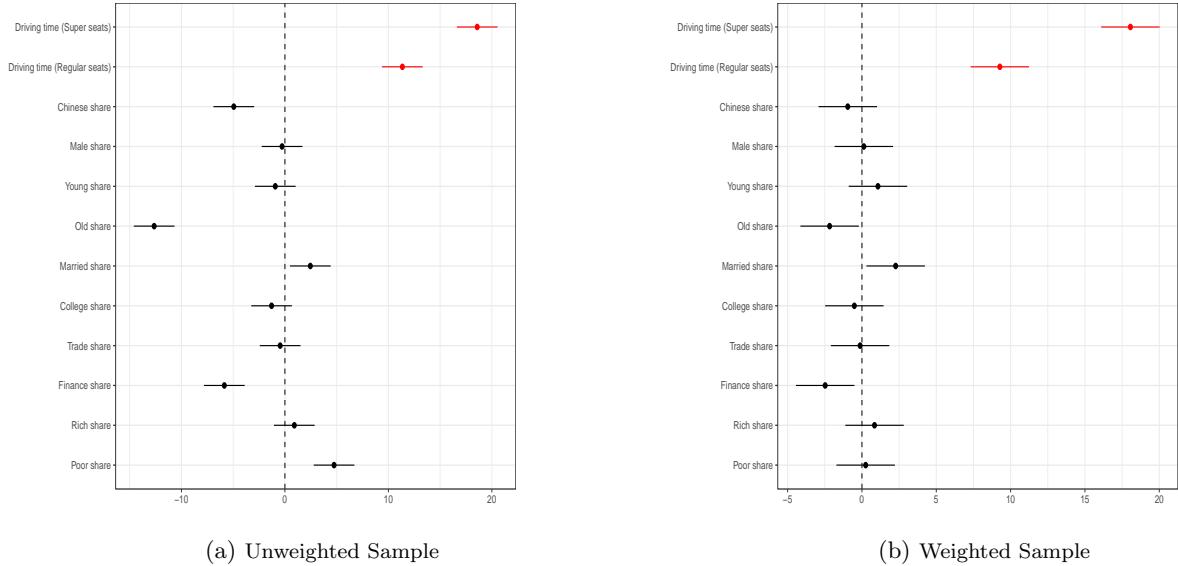
Notes: The two maps show the vote share change in each Hong Kong constituency for the opposition between the 2012 and 2016 Legislative Council Election. The upper one is for the super-seat election and the lower one is for the regular-seat election. Darker color indicates a larger vote share increase for the opposition. The white star represent the four protest sites, and the white triangle marks the location of Tsim Sha Tsui, where occupation was supposed to happen and failed to.

Figure 2: Relationship between the vote share change of the opposition and proximity to protest sites



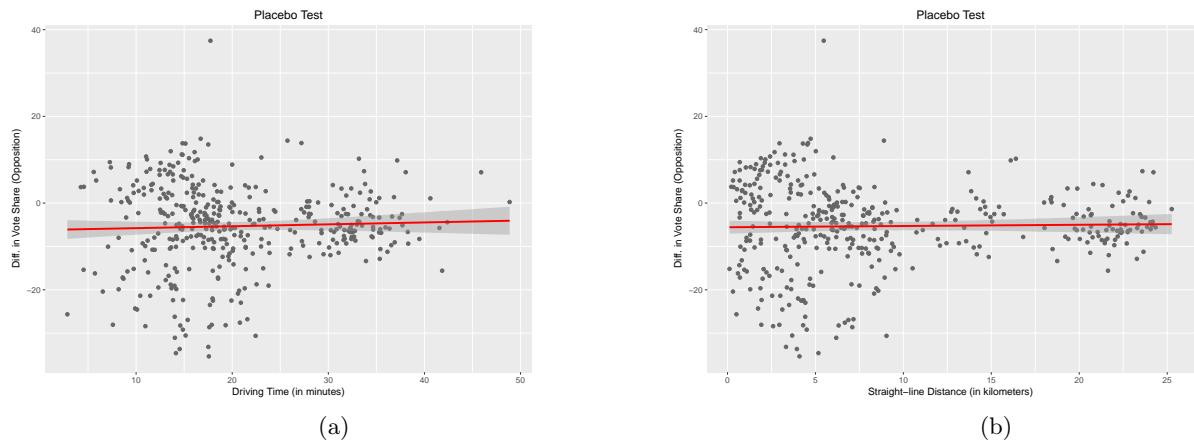
Notes: The figures show how the vote share change of the opposition between the 2012 and 2016 Legislative Council elections varies with the distance to the occupy sites. Each black spot in the graphs represents the vote share change in the corresponding constituency. The red line is the linear fit of the spots, with the grey area indicating its 95% confidence interval. The first two rows are for the super-seat and the regular-seat election respectively. The left column uses driving time as the independent variable and the right one uses straight-line distance. The last row plots the vote share change for the *pan-democratic camp* and *localists* between the two elections.

Figure 3: Results of CBPS weighting



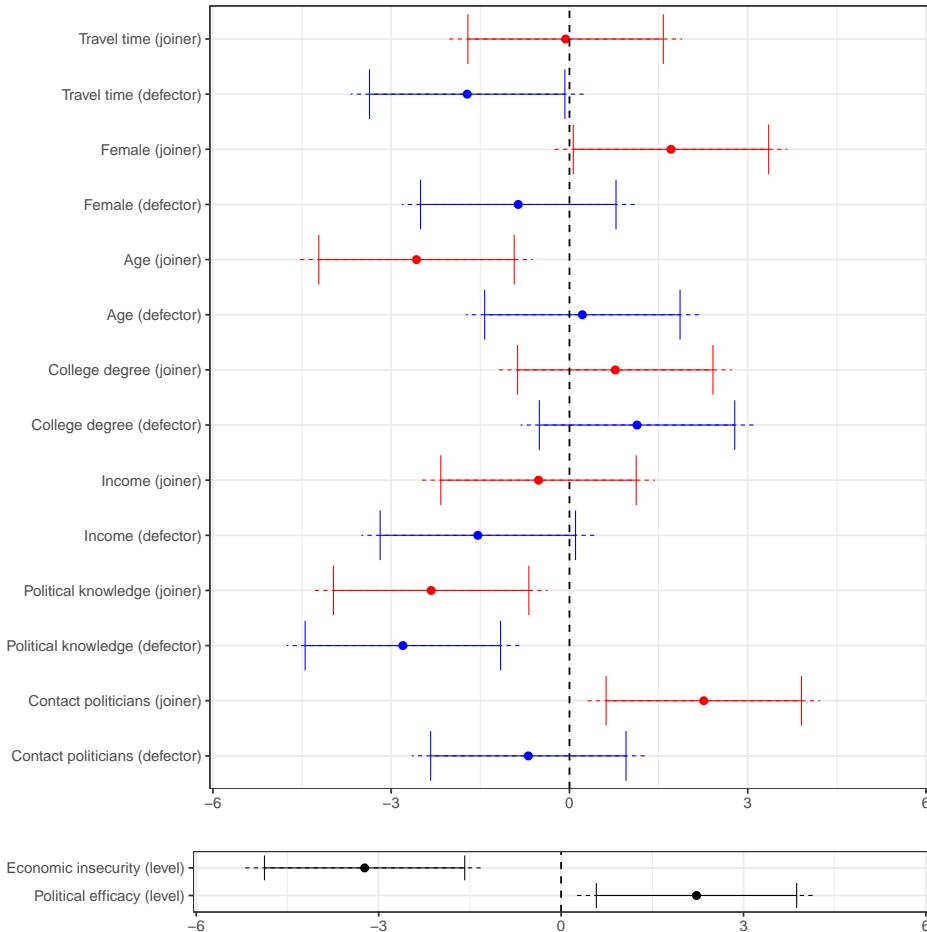
Notes: The figure compares the key independent variable's coefficient (red lines on the top) and its correlation with all the covariates (lines below the red one) in the original unweighted sample (on the left) and the sample weighted by Covariates Balancing Propensity Score (on the left). The range of each segment represents the estimate's 95% confidence interval. In both samples the key independent variable's coefficient is statistically significant. And in the weighted sample its correlation with covariates is fairly weak, suggesting that confounders are unlikely to drive the result.

Figure 4: Placebo Test using elections before the Umbrella Movement



Notes: The two figures present the relationship between the vote share change of the opposition in the two elections before the Umbrella Movement and the distance to the occupy sites. Each black spot in the graphs represents the vote share change in the corresponding constituency. The red line is the linear fit of the spots, with the grey area indicating its 95% confidence interval. The left graph uses driving time as the independent variable and the right one uses straight-line distance.

Figure 5: Differences among Defectors, Joiners and Stayers



Notes: This upper part of figure depicts the difference of defectors and joiners relative to stayers in nine dimensions. Defectors are voters who voted for the opposition in 2012 but voted for the *pro-establishment camp* in 2016 (marked by blue) and joiners behaved in the opposite way (marked by red). Each point indicates the average difference between this group and stayers. The lower part displays the correlation coefficients of respondents' tendency to vote for the opposition with their perceived economic insecurity and political efficacy. The solid line represents the 95% confidence interval of the difference, and the dotted line represents the 90% confidence interval.

Tables

Table 1: Main Results

	<i>Super Seats</i>	<i>Super Seats</i>	<i>Regular Seats</i>	<i>Regular Seats</i>	<i>Pan Dem.</i>	<i>Localist</i>
Driving time * Post Umbrella	0.728*** (0.055)		0.328*** (0.038)		0.341*** (0.068)	-0.012 (0.059)
Straight-line * Post Umbrella		0.905*** (0.077)		0.411*** (0.048)		
Post Umbrella	-4.058*** (1.034)	1.474* (0.750)	-7.343*** (0.844)	-4.878*** (0.632)	-26.916*** (1.378)	19.572*** (1.124)
Constituency FE	Y	Y	Y	Y	Y	Y
N	802	802	802	802	802	802

Notes: The results are from our difference-in-differences estimation based on equation (1). Constituency fixed effects are always controlled. In the first two columns the dependent variable is the vote share for the opposition in the super seats election before and after the Umbrella Movement, and in column three and four it is the vote share for the opposition in the regular seats election in the same era. In column five and six, the dependent variable is the vote share for the *pan-democratic* camp and *localist* in the regular seats election, respectively. Standard errors are clustered at constituency level. *p<0.05; **p<0.01; ***p<0.001.

Table 2: Results on Turnout

	<i>Vote Share for the Oppo.</i>		<i>Turnout</i>	<i>Turnout</i>
	<i>Super Seats</i>	<i>Regular Seats</i>	<i>Rate</i>	<i>Rate</i>
Turnout Rate	0.991*** (0.226)	0.212 (0.120)		
Driving time * Post Umbrella			0.039** (0.015)	
Straight-line * Post Umbrella				0.035† (0.018)
Post Umbrella	4.487*** (1.190)	-2.306** (0.705)	4.327*** (0.321)	4.736*** (0.230)

Notes: Dependent variables in the first two columns are the vote share for the opposition in the super and regular seats elections, and the independent variable is the turnout rate in the corresponding year and constituency. In the third column turnout rate is treated as the dependent variable and the independent variable is the interaction term as in Table 2 and 3. Standard errors are clustered at constituency level. †p<0.1; *p<0.05; **p<0.01; ***p<0.001.

Table 3: Alternative Dependent Variable and Standard Error

	<i>Super Seats</i>		<i>Regular Seats</i>	
	<i>Ideology</i>	<i>Higher cluster</i>	<i>Ideology</i>	<i>Higher cluster</i>
Driving time * Post Umbrella	0.003*** (0.0003)	0.728*** (0.128)	0.0003** (0.0001)	0.328*** (0.079)
Post Umbrella	-0.062*** (0.006)	-4.058 (3.115)	-0.016*** (0.003)	-7.343** (2.259)
Constituency FE	Y	Y	Y	Y
N	802	802	802	802

Notes: In column one and three, the dependent variable is the average ideological score for each constituency in the 2012 and 2016 elections. The scores are the weighted averages of each candidate's ideal point, where the weight is their vote shares in the constituency. In column three and four the dependent variables are the same as in Table 2, but the standard errors are clustered at district (there are totally 18 districts in Hong Kong) level instead of constituency level. Cluster bootstrapped standard errors are even smaller thus not reported.
 *p<0.05; **p<0.01; ***p<0.001.

Table 4: Placebo Tests

	<i>Prev. Elections</i>	<i>Prev. Elections</i>	<i>Super Seats</i>	<i>Regular Seats</i>
Driving time * Post Umbrella	0.044 (0.049)		0.765*** (0.098)	0.455*** (0.094)
Straight-line * Post Umbrella		0.028 (0.074)		
Driving time (placebo) * Post Umbrella			-0.001 (0.002)	-0.003 (0.002)
Post Umbrella	-6.225*** (1.861)	-5.576*** (1.216)	-3.673* (1.750)	-5.995*** (1.032)
Constituency FE	Y	Y	Y	Y
N	798	798	802	802

Notes: In column one and two, the dependent variable is the vote share for the opposition in the two regular seats elections before the Umbrella Movement (2008 and 2012). In column three and four the dependent variables are the same as in Table 2, but a placebo independent variable, the interaction of the period dummy and the distance to Tsim Sha Tsui, is included in the regression equation. Standard errors are clustered at constituency level. *p<0.05; **p<0.01; ***p<0.001.

Table 5A: Mechanisms (Perceived Economic Insecurity)

<i>With Interaction?</i>	<i>Perceived Economic Insecurity</i>		<i>Real Income</i>	
	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
Driving time * Post Umbrella	-0.026*** (0.004)		-0.008 (0.009)	
Post Umbrella	0.461*** (0.106)	-0.032 (0.076)	0.587** (0.228)	0.430*** (0.121)
District FE	Y	Y	Y	Y
Individual Attributes	Y	Y	Y	Y
N	2,070	2,070	1,857	1,857

Notes: Results in this table are similar to those in Table 5A. In column one and two, the dependent variable is the PCA score for perceived socio-economic risks, and in column three and four it is respondents' reported real income level. Standard errors are clustered at district level.

*p<0.05; **p<0.01; ***p<0.001.

Table 5B: Mechanisms (Democratic Values and Political Efficacy)

With Interaction?	Appr. for Democracy		Political Efficacy	
	Yes	No	Yes	No
Driving time * Post Umbrella	-0.003 (0.013)		0.009 (0.014)	
Post Umbrella	-0.202 (0.354)	-0.250 (0.196)	0.103 (0.258)	0.281** (0.104)
District FE	Y	Y	Y	Y
Individual Attributes	Y	Y	Y	Y
N	1,476	1,476	2,035	2,035

Notes: The estimation is based on ABS data, wave 3 and 4. In odd columns, both the interaction of the period dummy and the distance to the occupy sites, and the period dummy are added into the regression. In even columns only the period dummy is included. Dependent variables in all the columns are Principal Component Analysis scores for the corresponding indicator. For each two columns, the indicators are the approval for democracy, and political efficacy, respectively. Standard errors are clustered at district level. *p<0.05; **p<0.01; ***p<0.001.

Table 6: Vote Choice of HKES Respondents

	Vote for the Oppo.	Whether Voted
Driving time * Post Umbrella	0.002* (0.001)	0.001† (0.0005)
Straight-line * Post Umbrella	0.003* (0.001)	0.001† (0.0005)
Post Umbrella	-0.121*** (0.028)	-0.104*** (0.021) -0.025† (0.014) -0.017† (0.009)
Individual FE	Y	Y
N	2174	2174
		2174
		2174

Notes: The results are based on HKES data. Estimates are generated using the same quasi-differences-in-differences approach. The dependent variable for the first two columns is whether the respondent voted for the opposition in the 2012 and 2016 elections, and for the last two columns it is whether the respondent voted in the two elections. The independent variables are the same proximity measures (although at district level). Individual fixed effects are always controlled. Standard errors are clustered at district level. †p<0.1; *p<0.05; **p<0.01; ***p<0.001.