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The unintended consequences of internet diffusion: Evidence from Malaysia☆

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ABSTRACT

Can the introduction of the Internet undermine incumbent power in a semi-authoritarian regime? I examine this question using evidence from Malaysia, where the incumbent coalition lost its 40-year monopoly on power in 2008. I develop a novel methodology for measuring Internet penetration, matching IP addresses with physical locations, and apply it to the 2004 to 2008 period in Malaysia. Using distance to the backbone to instrument for endogenous Internet penetration, I find that Internet exposure accounts for 6.6 points, nearly half the swing against the incumbent party in 2008. I find limited evidence of increased turnover, and no evidence of an effect on turnout.

1. Introduction

Since its inception, much has been made of the Internet's potential as a democratizing force that frees information from the control of governments, implodes the distance between users around the world, and provides access to new viewpoints. Indeed, the Internet's ability to provide unfiltered access to information has caused consternation among many governments. This response has been notable in China, which has invested billions in keeping exposure to the Internet under tight rein. Social media has also been identified as a driving factor behind protests the world over, such as the recent revolutions across the Middle East. Despite a wealth of anecdotal evidence, however, little quantitative work has been conducted to test the ability of the Internet to foster democratization. The primary objective of this paper is to begin to fill this gap.

Malaysia serves as a particularly compelling test case in this regard. First, the ruling coalition, the Barisan Nasional (BN), enjoyed veto-proof control over all branches of government from 1969 to 2008. Although Malaysia holds regular democratic elections, the BN maintained power through strict controls on the judiciary, the police, and, importantly, the mass media.

Second, the BN's hold on power was so secure that it initiated an aggressive information and communications technology (ICT) led development strategy, based on an uncensored Internet. The government has invested heavily in the ICT sector since 1996 as a means to promote growth and enjoys a very high rate of Internet penetration—60% as of 2008. At the same time, to attract foreign direct investment (FDI), the government pledged not to censor the Internet. Third, since the Internet is uncensored, it has become home to a vibrant opposition blogosphere and a number of popular, independent news sites.

In March 2008 the BN lost its two-thirds majority in parliament for the first time since 1969, as well as control of 5 out of 13 states. In the aftermath, commentators argued that the Internet played a leading role in this outcome by providing access to alternative viewpoints. In the rush to promote an information economy, the government overlooked the consequences with regard to political control. This paper tests whether Internet penetration influenced voting behavior in Malaysia, focusing on the 2004 and 2008 elections.

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An important contribution of this paper is a novel measure of Internet penetration, which can be applied to almost any country. For most countries there are no geographically disaggregated measures of change in Internet access across time. To address this problem, I use a dataset that maps all of the IP addresses in Malaysia to approximate geographical locations. I aggregate the data up to the yearly period to deal with changes in assignment location across months. Next I use inverse-distance weighting interpolation to convert the data from the city level to the state legislature district level. Finally, I normalize by the number of eligible voters in a district to create the final measure. I find that this measure performs well when tested against census data from 2004.

To address problems of endogenous Internet placement and confounding political trends, I instrument for Internet growth. I calculate the shortest distance from each electoral district to the backbones of Malaysia's main Internet Service Providers (ISPs). An increase in distance to the backbone leads to higher costs of supplying Internet connectivity (e.g., digging new trenches and laying cabling). This provides exogenous variation in Internet supply across districts. I exploit differences across ISPs in terms of geographical constraints on the placement of their backbones to argue that distance to the backbone is unlikely to affect voting outcomes, conditional on covariates. The identifying assumption is that conditional on baseline district characteristics (ethnic distribution, GDP per capita, population density) distance to the backbone does not affect change in vote share independently of growth in Internet access.

Based on the identifying assumption, I show a large effect of Internet growth on election results: that the Internet can explain 6.6 points of the 14 point swing against the BN in the 2008 elections for state legislatures in peninsular Malaysia. I find limited evidence that Internet growth led to increased turnover and no evidence of an effect of Internet exposure on turnout.

To the best of my knowledge, this paper is the first to measure the Internet's effects on elections in a developing country. It relates most directly to literature on the political economy of the Internet: Gentzkow and Shapiro (2011) look at the effects of the growth of new media on ideological segregation in the U.S.A.; Czernich (2012) finds a positive effect on turnout; Jaber (2013) finds a positive effect on turnout and presidential vote share; Enikolopov et al. (2012) find an effect of corruption reporting in blogs on stock prices. Falck et al. (2014) find a negative effect of Internet on turnout. Campante et al. (2013) also find a negative effect of broadband on turnout, however, over time this negative effect reverts due to the endogenous response of the supply-side of politics to new media platforms.

This paper also relates to literature on the political economy of mass media technologies (DellaVigna and Kaplan, 2007; Enikolopov et al., 2011; Gentzkow, 2006; Durante and Knight, 2012; Durante et al., 2014) for television; (Besley and Burgess, 2002; Snyder and Strömberg, 2010; Gentzkow et al., 2011; Chiang and Knight, 2011; Gerber et al., 2009; Drago et al., 2014) for newspapers; and (Stromberg, 2004; Vigna et al., 2014; Adena et al., 2015) for radio.

More broadly, this paper relates to literature on the effects of information technology on development. Jensen (2007) looks at the effects of the introduction of mobile phones on fish markets in Kerala; Goyal (2010) similarly analyzes the effects of Internet kiosks on crop prices in Madhya Pradesh; and Jack and Suri (2014) explore the impact of mobile payment on informal risk sharing.

I start in Section 2 by outlining a general theoretical framework to help understand the main mechanism at play. Section 3, shows how the theoretical framework pertains to Malaysia, providing background on politics, media, and the Internet. In Section 4, I describe my data sources, before outlining my method for constructing a measure of Internet penetration. Section 5 presents my empirical strategy results. I start by exploring the strong correlation that exists in the data and then move on to the issue of identification. In Section 6, I examine additional outcomes. Section 7 provides intuition for the effects and Section 8 concludes.

2. Theoretical framework

In this section I discuss a simple framework for understanding how the Internet influences voting outcomes when all conventional sources of information are government-controlled. This is primarily accomplished by extending the insights from Besley and Prat (2006) to account for differences between traditional media outlets (e.g., TV, radio, print) and web-based media outlets.[1]

Besley and Prat (2006) present a two-period retrospective voting model, in which voters cannot directly monitor candidate performance, but must instead get their information on candidate quality from the media. The media faces two sources of profit: commercial profit and profit from collusion with the government. An incumbent can pay to capture each media outlet for a cost. Provided that the payoff to holding office exceeds the cost, an incumbent can "capture" the media, suppressing voter information on candidate quality and assuring reelection. In equilibrium an incumbent must capture all media outlets to assure reelection, since if one outlet deviates, all the electorate is informed.

The Internet can be modeled in this framework as a media outlet that differs from traditional outlets in two ways. First, it is too costly to capture (I provide a justification for this assumption in the context of Malaysia in Section 3.2). Second, the Internet is only accessible to a fraction of the population. If this fraction is less than fifty percent, incumbents can continue to win elections by capturing the traditional media, as less than half the population will become informed and incumbents only need a simple majority to win.

An equilibrium with capture can be sustained even if Internet penetration is above fifty percent. Two factors can raise the threshold of Internet penetration under which capture is still possible. First, Internet penetration is not uniformly distributed across districts, but rather rightward skewed so that a majority of districts have less than 50% penetration, but average penetration for the country as a whole is above 50%. Second, if population differs substantially across districts and more populous districts have higher rates of Internet penetration, the majority of the population can have Internet, but the incumbent can still win because populous, Internet connected voters count less than rural voters. In Section 4.3, I show that the distribution of Internet in Malaysia is rightward skewed and Internet access is higher in districts with higher fractions of the total population. This suggests the incumbent party can win elections by capturing the media even when Internet access is greater than 50% across the country as a whole.

The main empirical prediction is that an increase in Internet access will cause a decrease in the incumbent party's vote share, in the presence of media capture. Intuitively, the Internet allows voters to circumvent media controls, and thus enables them to receive negative signals on candidate quality. The incumbent party's vote share will shrink as an increasing fraction of the population gains access to negative signals. I test this prediction in detail in Section 5.

A secondary implication of Internet growth leading to lower incumbent vote shares is that it should also yield higher turnover. Section 6 finds limited evidence corroborating this prediction. Full details of the model can be found in the web appendix.

3. Background

3.1. Political regime

The theoretical framework above provides a useful method for thinking about the Internet's effect in Malaysia. Classified variously as "partly free",[2] a "flawed democracy",[3] and a "pseudo-democracy",[4] Malaysia's political regime combines democratic and autocratic elements.

[1] See web appendix for complete model.
[2] See Freedom House: <www.freedomhouse.org>.
[3] See Economist Intelligence Unit: <www.eiu.com>.
[4] See Case (2001).