

P A F T A D

The Role of the Media in Shaping Perceptions of Inequality: The Case of Indonesia

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First Draft: 30th June 2017

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Abstract

In recent years, policy makers and researchers have become increasingly focused on understanding inequality, however little causal analysis has been conducted about people's perceptions of inequality. This paper presents the first natural experiment about how information through the media shapes people's perceptions of their consumption relative to others. Descriptive analysis shows that on average there is a very weak relationship between people's perceptions of their place in the distribution and where they actually are. I conduct causal analysis by exploiting variation in the rollout of private television coverage due to geographic topography in the late 1990s and early 2000s in Indonesia. Increased access to private television channels is shown to cause richer people to better able to perceive their actual place in the distribution. Specifically, richer individuals living in villages that received all 10 private channels were better able to estimate their place in the distribution by 11 percentage points. This is 31.4% of the absolute value of the average difference between where people perceived themselves to be and their actual place in the distribution. This effect is likely due to the introduction of private television channels providing richer people with a better understanding of their standard of living relative to other parts of Indonesia. I modify existing models of other regarding preferences to show that additional information about the consumption of others is likely to lead richer people to realise they are relatively better off than they had thought. This research shows that imperfect information is contributing to misperceptions of inequality and this is likely to be reducing subjective wellbeing and increasing preferences for redistribution among relatively richer people.

1. Introduction

The importance of addressing inequality has been emphasised time and time again in recent years by organisations like the International Monetary Fund and world leaders such as the former President of the United States Barrack Obama. This has led to a significant amount of research on understanding the drivers of inequality and its negative consequences, such as how inequality can reduce economic growth (Ostry et al, 2014). However far less attention has been given to how people perceive inequality, especially in regards to what causes people to believe they are richer or poorer than other people in their country. There is only very limited causal research that has been conducted outside of laboratory settings about the role of information in shaping people's perceptions of their relative place in the distribution. Existing studies have solely focused on experimentally varying what

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information is available to online survey respondents. This is partly because it is challenging to find a natural, exogenous source of variation in information about inequality.

This paper presents the first natural experiment about the role of information in shaping people's perceptions of where they fit into their country's income distribution. I use an instrumental variable developed by Olken (2009) based upon variation due to topography in the rollout of private television coverage in the late 1990s and early 2000s in Indonesia. This is combined with the Indonesian Family Life Survey (IFLS), a dataset of 10040 households, which is one of the few existing panel surveys that includes questions about where people perceive themselves to be in the distribution. This approach of using the expansion of access to media in the developing world has been employed previously to show how greater information has improved gender outcomes, reduced social interactions and decreased migration (Jensen and Oster 2009, Olken 2009, Farré and Fasani 2013).

Descriptive analysis of the IFLS shows there are large differences between where people perceive themselves to be in the distribution and where they actual are. The cross-sectional data shows there is a 'median bias' whereby most people think they are in the middle of the distribution regardless of their actual place. Further, there is a weak relationship between actual and perceived place in the distribution, with a correlation coefficient of 0.19. The panel data, which tracks the same people over time, shows there is no relationship between changes in actual place or perceived place, with a correlation co-efficient of 0.01. The gap between actual and perceived place in the distribution is correlated with people's level of subjective wellbeing and preferences for redistribution. Specifically, overestimating (underestimating) ones place is associated with higher (lower) subjective wellbeing and lower (higher) support for redistribution.

Increased access to the media, in the form of increased private TV channels, is shown to cause richer people to better able to perceive their actual place in the distribution. Specifically, richer individuals living in villages that received all 10 private channels were better able to estimate their place in the distribution by 11 percentage points. This is 31.4% of the absolute value of the average difference between where people perceived themselves to be and their actual place in the distribution. However, there is little to no effect for people in the bottom half of the distribution. This effect is likely due to the introduction of private television channels providing richer people with a better understanding of their standard of living relative to other parts of Indonesia. Richer IFLS respondents tend to live in Java and Bali that on average have a higher standard of living than most other islands in Indonesia. Whereas poorer respondents would have been aware that Java, Jakarta in particular, had a higher living standard due to rural to urban migration and pre-existing exposure to the public television channel.

The structure of this paper is as follows. The second section provides a review of the literature on perceptions of inequality, the third section provides some descriptive analysis of perceptions of inequality in Indonesia and the fourth section presents a model of how information is likely to affect subjective wellbeing. The next three sections provide details of the empirical strategy, the results of the causal analysis and a discussion of these results, while section eight concludes.

2. Literature Review

This paper contributes to the literature on inequality by being the first to show how information shapes people's beliefs about where they sit in the distribution using a natural experiment. There is very limited causal analysis that has been done in the field on this topic and it exclusively relies on experimentally varying the provision of information. Most existing literature on perceptions of inequality, particularly in regards to perceptions of people's relative place in the distribution, are related to either subjective wellbeing or preferences for redistribution.

The link between subjective wellbeing and people's consumption relative to others has received a significant degree of attention in economic research. Veblen (1899) was the first to argue that person's utility is partly dependent on how their consumption compares to others and in reference to this theory he famously coined the term 'conspicuous consumption'. The explicit link between subjective wellbeing and relative income was hypothesised by Easterlin (1974) in his cross country 'paradox' that subjective wellbeing is not higher in richer countries. However doubt has been cast over this hypothesis by Stevenson and Wolfers (2008) who show that absolute improvements in income overtime is linked to increases in subjective wellbeing across countries. Within countries most studies show that subjective wellbeing does tend to be higher among those with higher consumption (Oswald, 1997, Diener et al., 2003, among others). For example, empirical analysis in Europe shows that poorer people tend to be less happy than richer people (Alesina et al 2004). Recent evidence from psychology, such as Starmans et al (2017), suggests that subjective wellbeing is more closely linked to perceptions of fairness as opposed to inequality in and of itself.

A causal connection between relative consumption and subjective wellbeing has been established in laboratory settings through experimentally varying information available to participants (Fehr et al, 2003). However there is substantially less research in a field setting that explores the role of information about inequality in shaping subjective wellbeing. Among the most well-known studies in this area is work by Card et al (2012) who conduct a randomised control trial on employees of the University of California. They show that providing people with information about the distribution of wages at the university lowers the subjective wellbeing of those earning below average and increased their job searching activities.

The other main focus of the literature on perceptions of inequality is its relationship with preferences for redistribution. A number of commonly cited theories on preferences for redistribution are dependent on people's place in the distribution now or in the future. These theories include the median voter theorem (Black, 1948), the prospect for upward mobility hypothesis (Benabou and Ok, 2001) and Piketty's (1995) model about the relationship between social mobility and support for redistribution. However these theories assume that people have a good understanding of not only their place in the distribution but also the overall level of inequality in the country they reside in. The subsequent section will show this is not the case in Indonesia.

Descriptive analysis on perceptions of inequality is very limited, especially in regards to the relationship between peoples actual and perceived place in the distribution. Three studies in the United States, Australia and Indonesia show that on average people greatly underestimate the level of inequality in their country and would prefer it to be much lower (Norton et al 2011, Norton et al 2014, Indrakesuma et al 2015). Davidai et al (2015) show that people, especially poorer individuals, tend to overestimate the level of upward mobility in the United States. In regards to perceived place in the distribution, a report by the think tank Bertelsmaan Stiftung, Bublitz (2016) shows that on average people tend to underestimate their actual place in the distribution in a number of high income countries. This paper builds upon this work by being the first to examine the relationship between actual and perceived place in the distribution in a developing country. In addition, it is the first study to provide descriptive analysis of the relationship between perceived and actual mobility over time.

Causal studies focused on the relationship between perceptions of inequality and support for redistribution are extremely rare. Similar to the case of subjective wellbeing, information about inequality has been varied experimentally to test how this alters preferences for redistribution. These studies have largely consisted of online randomised control trials in high income countries that provide accurate information about a respondent's place in the distribution and have shown varying effect sizes. Cruces et al (2013) show the provision of information about the place in the income distribution in Argentina significantly boosts support for redistribution among poorer people whereas Karadja et al (2017) show it lowers support among richer respondents in Norway. Kuziemko et al (2015) show that information about peoples place in distribution had an effect on support for increasing taxes on the rich when combined with details about inheritance taxes effecting the richest 0.1% of individuals. Examining the role of information about the global income distribution, Nair (2015) shows that providing information led to increased charitable giving and support for foreign aid among respondents in the US once they were informed of their actual place in the distribution.

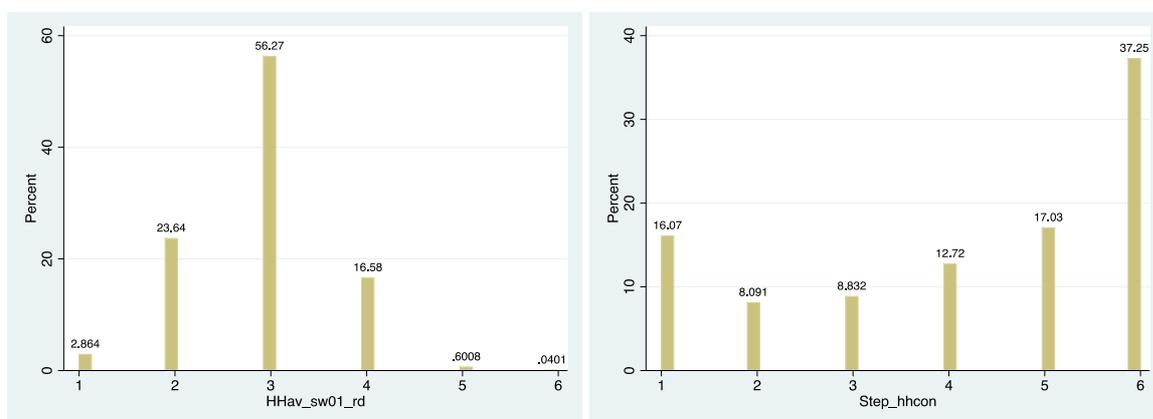
Collectively the literature on the role of information in shaping perceptions of inequality is in an infant stage, however there are some clear tendencies. These are that subjective wellbeing and preferences for redistribution tend to be related to what information people have about their consumption relative to others. An implication is misperceptions of inequality are likely to be distorting subjective wellbeing and political preferences. This highlights the contribution being made by this paper as it sheds light on the role of information in shaping people's perceptions of their relative place in the distribution.

3. Descriptive Analysis

The gap between where people perceive themselves to be and where they actually are in the distribution in Indonesia can be seen in regards to both cross-sectional and time series data. This gap in perceptions is correlated with people's subjective wellbeing and preferences for redistribution.

Cross sectional data

A 'median bias' exists in Indonesia whereby on average around 90% of individuals perceive themselves to be in the middle of the distribution according to multiple surveys. This paper largely relies on the 2007 round of the IFLS that asks respondents to place themselves on one of six steps across the distribution from poorest (1) to richest (6). The results are shown below whereby the graph on the left represents people's perceived place in the distribution and the graph on the right reflects their actual place. There is a weak correlation between actual and perceived place of 0.194 and a correlation of 0.014 between actual consumption and perceived place. On average, the absolute gap between actual and perceived place is around 35 percentiles and standard deviation of 19 percentiles. In other words, most people are unaware of their actual place in the income distribution.



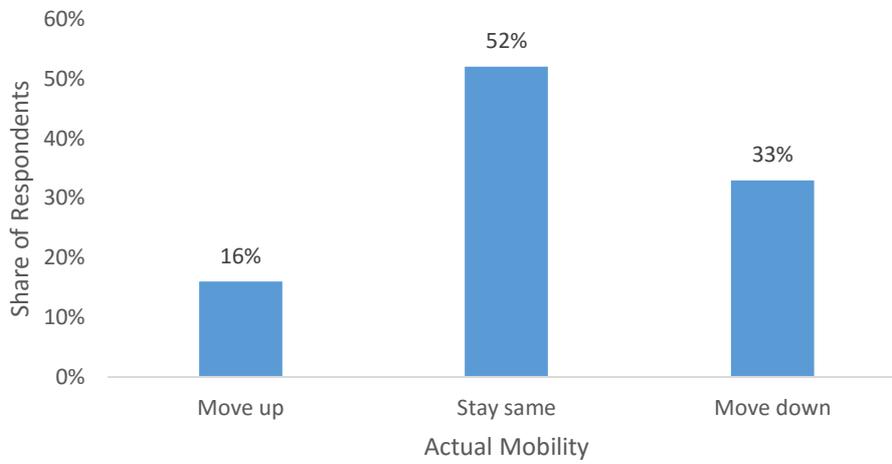
This stylised fact is reinforced by a 2014 nationally representative survey reported on by the World Bank that captures individual's perceptions of inequality and preferences for redistribution in Indonesia (Indrakesuma et al 2015). In this case, people are asked to place themselves on one of five steps (quintiles) that are equally divided into shares of 50 million Indonesians and ranked in order of household income. Even with slightly different wording of the question an almost identical result emerges. In this case, 90% of the distribution believe they are in middle three quintiles of the distribution, even though only 33% were. In addition, the correlation co-efficient between perceived and actual place in the distribution is 0.355 and perceived place in the distribution with household per capita consumption is 0.335.

Times series data

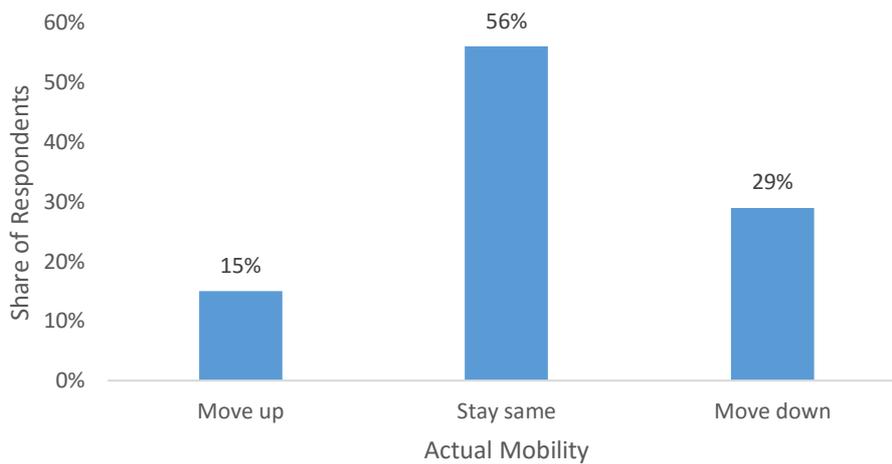
On average people are unable to accurately perceive whether they experience upward or downward mobility. The IFLS data from 2000 and 2007 rounds includes questions about people's perceived place in the distribution now, in the past and in the future. In all cases there is no relationship between actual and perceived mobility. For example, looking just at the 2007 round there is a correlation co-efficient between actual and perceived change in place in distribution is over the last 5 years of 0.01 and between change in household consumption per capita and change in perceived place of 0.00. This pattern can be seen in the three charts below, which are divided between those people who perceived they moved up (A), stayed the same (B) or moved down (C) the distribution. Each of the charts show

what actually happened for the people in these groups. It is clear there is no relationship between where people perceive themselves to be and where they actually were.

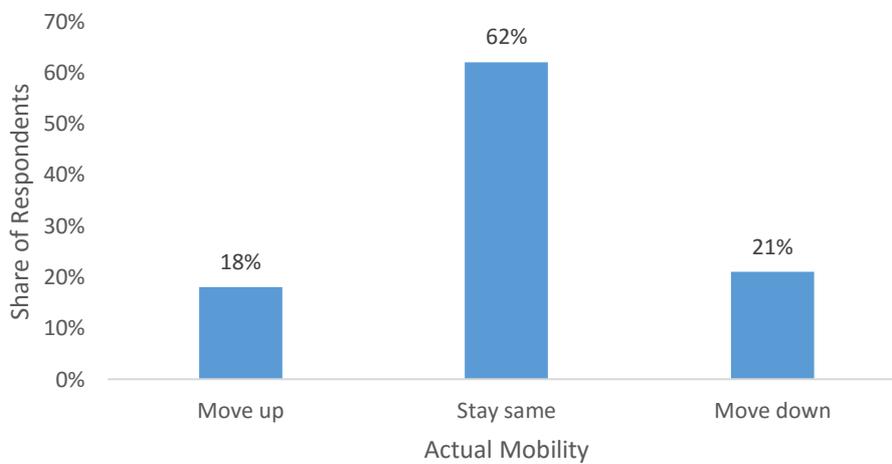
A - People who Perceived Upward Mobility



B - People who Perceived they had no change



C - People who Perceived Downward Mobility



Relationship with subjective wellbeing and support for redistribution

The descriptive analysis above highlights that there is a weak relationship between perceptions and reality of where people are in the distribution. This raises the question of whether perceptions or reality are more closely related to subjective wellbeing and support for redistribution, which have been the focus of existing literature on this topic. Analysis of the datasets referred to above show that overestimating (underestimating) one's place is associated with higher (lower) subjective wellbeing and lower (higher) support for redistribution. Whereas there is no relationship between the actual place in the distribution and subjective wellbeing as well as preferences for redistribution in Indonesia. These findings are discussed further below.

There is a clear relationship between how accurately people perceive their place in the distribution and subjective wellbeing (measured in regards to both contentment with current living standards and overall happiness). Poor people who overestimate their place are more likely to state their current standard of living is more than adequate for their needs, while richer people who underestimate their place are more likely to state that their living standards are less than adequate for their needs. For people on the poorest 'step' (bottom 17 percentage points of distribution) there is a positive correlation of 0.32 between contentment with current living standards and the gap between perceived and actual place in the distribution. Whereas the correlation between contentment with current living standards and the gap between perceived and actual place in the distribution for individuals in the top half of the distribution is around -0.25. This means poorer people are more content when they don't realise they are poor relative to others, while richer people are less content when they underestimate how rich they are relatively.

There is also a well-defined relationship between perceived place in the distribution and support for 'direct' redistribution in the form of cash transfers. Specifically, support for redistribution through cash transfers and other kinds of social protection is positively correlated with perceiving oneself as poorer than they actually are. Support for social protection falls from 55% of individuals who perceive themselves to be in the poorest 20% of the income distribution to 41% among the individuals who perceived themselves to be in the second richest quintile (note only one household perceived themselves to be in the richer quintile). Conversely, overestimating ones place in the distribution is positively associated with greater support for the government to focus on job creation programs as opposed to direct cash transfers. Support for job creation rises from 41% of individuals who perceive themselves to be in the poorest 20% of the income distribution to 55% among the individuals who perceived themselves to be in the second richest quintile.

The gap between perceptions and reality and the association of people's perceived place in the distribution with subjective wellbeing and preferences for redistribution begs the question of what is driving perceptions. The remainder of this paper examines the role of information, through exposure to the media, in shaping people's perceptions about where they sit in the distribution.

4. Model

Existing models of other regarding preferences, whereby people's relative consumption is factored into an individual's utility function, tend to conflate actual and perceived consumption. In other words, actual consumption is used as an adequate proxy for what individuals perceive others are consuming. However the descriptive analysis above would suggest a modified model is required. I construct a model building upon the existing literature to capture how utility is dependent on perceived consumption of others and I show how information can alter these perceptions.

The most commonly cited model of other regarding perceptions is by Fehr and Schmidt (1999), which formalises a utility function that depends on how an individual's consumption compares to those who are richer or poorer than them. In a simple setting where there is three people and person A consumes between the other two, person A's utility function can be expressed as follows:

$$U(c_A, c_O) = U(c_A) + \beta U(c_A - c_P) + \gamma U(c_R - c_A)$$

whereby;

c_A = Consumption of Individual A

c_P = Perceived Consumption of person poorer than c_A

β = Weighting of c_{Pp} relative to Own Consumption

c_R = Perceived Consumption of person richer than c_A

γ = Weighting of c_{Rp} relative to Own Consumption

I modify this model by factoring in that person A's utility is dependent on how they perceive the consumption of the other two individuals, as opposed to actual consumption levels. This is necessary as the descriptive analysis in the previous section highlights that people's perception of their consumption relative to others is only weakly related to what is actually the case. Further, subjective wellbeing and preferences for redistribution is more closely correlated with their perceived relative place. The simple three-person model becomes:

$$U(c_A, c_O) = U(c_A) + \beta U(c_A - c_{Pp}) + \gamma U(c_{Rp} - c_A)$$

whereby;

c_{Pp} = Perceived Consumption of Other Individuals poorer than c_A

c_{Rp} = Perceived Consumption of Other Individuals richer than c_A

I further modify this model to incorporate the role of information along the lines of Card et al (2012) who illustrate how information can effect subjective wellbeing. This formalises the role of information in effecting an individual's utility function that factors in how they perceive their consumption relative to others, as follows:

$$U(c_A, c_O, I) = U(c_A) + \beta U(c_A - E[c_{Pp} | I^P]) + \gamma U(E[c_{Rp} | I^R] - c_A)$$

whereby;

$I^P =$ Information about poorer person's consumption
 $I^R =$ Information about richer person's consumption

The degree to which individuals already have information about other people's consumption is likely to moderate the role of information in altering utility. For example, if people were already aware of the consumption of those richer than them receiving this information again is likely to have a limited effect. In this case, $c_{Rp} \approx c_R$ as people are already accurately perceiving the actual level of consumption of those richer than them.

Hypothesis – Richer people are less aware of poorer people's consumption and additional information about the consumption of others is likely to lead them to realise they are relatively richer than they had thought.

This can be formalised as follows, whereby for richer people the following information gap exists in time period 0:

$$c_{Pp} - c_P > c_{PR} - c_R$$

The provision of additional information in time period 1 is likely to lead richer individuals to revise their beliefs about their relative place in the distribution upwards, which is shown in the following:

$$(c_A - c_{Pp})_{t0} < (c_A - c_{Pp})_{t1}$$

This upward revision of perceived place in the distribution relative to others is likely to lead to greater subjective wellbeing and reduced support for redistribution.

A similar effect is not expected for poorer individuals as they are expected to be already more aware of the consumption of the poorest in society and are expected to have some understanding of the standard of living of richer individuals through existing information sources. In the case of Indonesia this would be through the high rate of urban to rural migration and the public television channel. After all, a key driver of urban to rural migration is people's belief that the standard of living in urban areas is significantly better than rural areas (Farré and Fasani 2013).

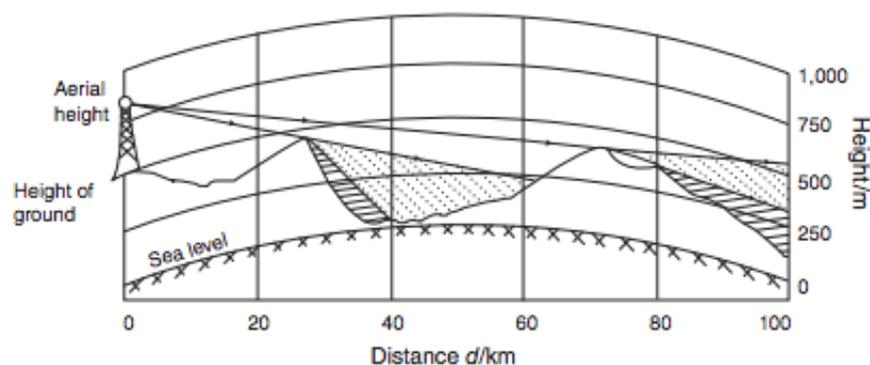
The empirical strategy in this paper tests this hypothesis that richer people have an existing information asymmetry, such that they have a better understanding of richer people's living standards than poorer people. This would lead to the rollout of private television in Indonesia leading richer people to revise upward their perceived place in the distribution.

5. Empirical Strategy

This paper follows a similar identification strategy to other studies that exploit variation in the expansion of media in developing countries throughout the 1990s and 2000s to understand the impact of additional information on a range of indicators. Variation in the rollout of television in India was used by Jensen and Oster (2009) to show how more

television exposure reduced the acceptance of domestic violence and preference for having a son. Similar gender outcomes were illustrated through variation in television coverage by La Ferrara et al (2007) in Brazil where watching soap operas was shown to reduce fertility. Differences in radio signal was used by Yanagizawa-Drott (2014) to show that an estimated 51,000 perpetrators, participated in the violence during the Rwandan genocide due to radio.

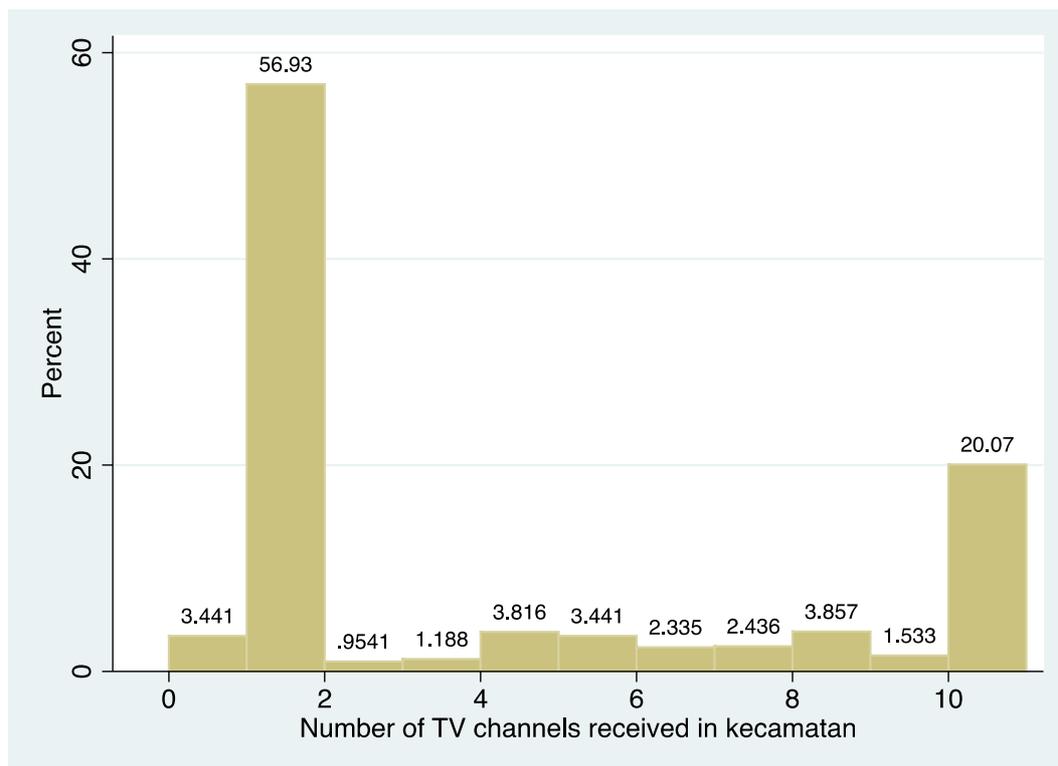
In Indonesia, variation in the rollout of television due to geographic topography has been employed to show the role of the media in reducing local social interactions (Olken, 2009) and decreasing migration (Farré and Fasani 2013). Specifically, Olken developed an instrument of the difference between television signal if terrain was flat (*FREE*) compared to what signal was actually received (*SIGNAL*), which is effected by the location of villages relative to mountains (this is shown in the chart below). He argues that once some basic geographic factors are taken into account, such as distance to major cities, the only difference in *SIGNAL* (once *FREE* is controlled for) between villages is due to topography, which varies randomly.



The number of television channels (*NUMCHANNELS*) available in rural villages increased from one up to eleven throughout the late 1990s and early 2000s. This was due to the rollout of private television channels over this time period as previously the government TV channel was the only one available. Using data from the 2006 PODES (Indonesian Village Census), Olken captures whether private TV channels were available in villages and if so how many. He shows that 97% of households report watching TV every day and access to more channels increases exposure to TV and the radio by an average of 14 mins per day per channel. Having access to more channels is not correlated with households being more likely own a TV and there is a strong relationship between TV and radio signal. In line with Olken's approach, for the remainder of this paper TV exposure is used a proxy for broader media exposure.

This paper follows the same approach as Farré and Fasani (2013) who overlay the instrument that Olken developed in combination with the 2007 round of the IFLS. They examine the role of TV exposure in effecting migration whereas the focus on this paper is its effect on perceptions of inequality. There is a total dataset of 8227 households in rural Indonesia that have data available on *NUMCHANNELS*, *SIGNAL* and *FREE* as well as a response to the IFLS question of their perceived place in the distribution. Two-thirds of these households were in Java or Bali, which had average living standards around 30-40% higher than the rest of Indonesia in the mid 2000s (Hill et al, 2008).

The distribution of *NUMCHANNELS* in each sub-district (which usually consists of around 10 villages) is shown in the chart below. The average number channels in each village is 4.00 and the standard deviation is 4.07. Around a fifth of villages had all eleven channels and more than half only had access to the government channel². Importantly, the government run TV channel did not emphasise the diversity in living standards across Indonesia as the nation’s leader for 31 years, Suharto, maintained a strong sense of unity to subdue separatist movements. As such it was not until private TV was introduced that Indonesians would have received media exposure about the differences in average standard of livings in other parts of the country.



The *NUMCHANNELS* in a village is not related to household consumption or key variables of interest once geographic variables are controlled for, as can be seen in the table below. The results are based upon equation (1) below

$$NUMCHANNELS = \alpha + X\delta_1 + \delta_2 GEOGRAPHY + \epsilon \quad (1)$$

whereby X is a list of key variables of interest and GEOGRAPHY is a list of geographic controls. Standard errors are clustered at the sub-district level as this is the unit of analysis that the television coverage varies at.

² 3.4% reported actually not having any TV channels available in their village.

	<i>NUMCHANNELS</i>
<i>Perceived place in distribution</i>	0.12 (0.12)
<i>Actual place in distribution</i>	-0.01 (0.04)
<i>Adult population</i>	0.13 (0.53)
<i>Number of hamlets</i>	-0.21 (0.52)
<i>Population share working agriculture</i>	-0.17 (1.61)
<i>Ethical fragmentation</i>	-2.94 (1.68)
<i>Religious fragmentation</i>	2.02 (2.80)
<i>Poverty rate</i>	-0.49 (1.02)

The first stage of the instrumental variable analysis is captured in the equation below:

$$NUMCHANNELS = \alpha + \gamma_1 SIGNAL + \gamma_2 FREE + \epsilon \quad (2)$$

The results of the first stage of the two stage least squares analysis are shown in the table below. In line with Olken (2009) and Farré and Fasani (2013), the *NUMCHANNELS* is adequately predicted by *SIGNAL* after controlling for *FREE*. The F-statistic of 32 is well over 10, which is commonly accepted as the minimum level required to avoid issues with weak instrument identification (Tock, Wright and Yogo, 2002). This first stage results suggests that *SIGNAL* after controlling for *FREE* can be used an instrument for *NUMCHANNELS* in the second stage equation.

First stage of instrumental variable analysis

	<i>NUMCHANNELS</i>
<i>SIGNAL</i>	0.028** (0.011)
<i>FREE</i>	0.097** (0.049)
<i>F-statistic</i>	32.26

Standard errors adjusted for 880 sub-districts

6. Results

The results of the instrumental variable analysis were determined through a modified version of the second stage equation shown below, where *NUMCHANNELS* is instrumented by *SIGNAL* after controlling for *FREE*.

$$DiffPerAct Place = \alpha + \gamma_1 NUMCHANNELS + \delta_1 GEOGRAPHY + \epsilon \quad (3)$$

whereby *DiffPerActPlace* is the difference between actual and perceived place in the distribution.

The issue with the specification in equation (3) is that *DiffPerActPlace* can be either positive or negative making the co-efficient γ_1 difficult to interpret. To address this the absolute value of *DiffPerActPlace* is taken and included in equation (4).

$$AbDiffPerAct Place = \alpha + \theta_1 NUMCHANNELS + \delta_1 GEOGRAPHY + \epsilon \quad (4)$$

A limitation of the specification of equation (4) is this does not allow for heterogeneous effects across the distribution. In other words, the effect of an additional channel on the gap between actual and perceived place in the distribution may well vary across income levels. To be able to capture this variation, for each 'step' of the distribution (for which there are six) a dummy is created along with an interaction term with the instrument. A simplified version of this specification is shown in equation (5). This approach means that the co-efficient η_1 represents the effect of an extra channel on the absolute gap between perceived and actual place in the distribution for a given step of the distribution.

$$AbDiffPerAct Place = \alpha + \eta_1 NUMCHANNELS \times STEP DUMMY + D_1 + \delta_1 GEOGRAPHY + \epsilon \quad (5)$$

where D_1 is a dummy variable for each step of the distribution, which allows the intercept to vary by step.

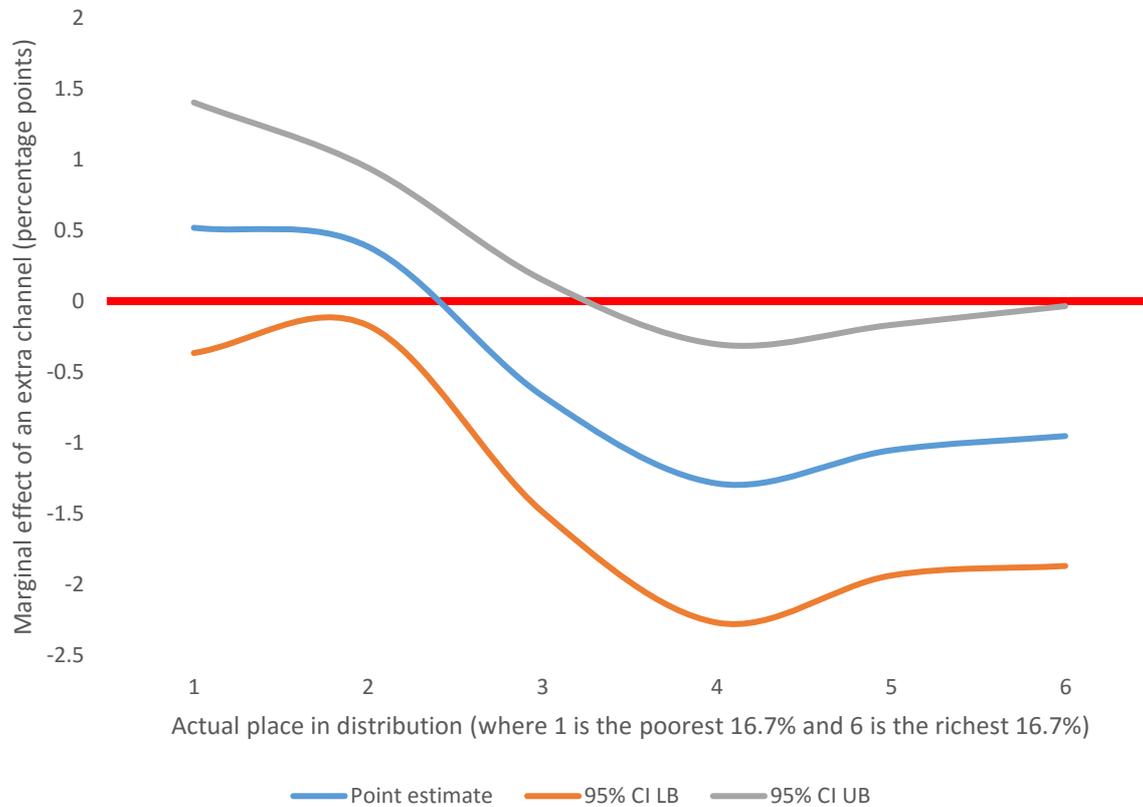
The main results of equation 5 are shown in the table and chart below.

	<i>AbsDiffPerActPlace</i>
<i>NUMCHANNELS</i>	0.031 (0.027)
<i>NUMCHANNELS_S2</i>	-0.008 (0.017)
<i>NUMCHANNELS_S3</i>	-0.071*** (0.025)
<i>NUMCHANNELS_S4</i>	-0.108*** (0.030)
<i>NUMCHANNELS_S5</i>	-0.094*** (0.027)
<i>NUMCHANNELS_S6</i>	-0.088*** (0.028)
<i>FREE CONTROLLED FOR</i>	X
<i>GEOGRAPHIC CONTROLS</i>	X

Standard errors adjusted for 833 sub-districts that had data available

The effect of an additional channel on the *AbDiffPerActPlace* varies considerably in sign and magnitude across the distribution as can be seen in the chart below. For the poorest three

'steps' there is no statistically significant effect of an extra channel. While an extra television channel decreases *AbDiffPerActPlace* for those in the top half of the distribution. In this case, extra information is assisting individuals to better estimate their place in the income distribution.



Specifically, a one extra TV channel is associated with people in the top half of the distribution being able better able to estimate their place by 1.1 percentage points. This effect is non-trivial, as those individuals who received all 10 private channels were better able to estimate their place in the distribution by 11 percentage points, which is 31.4% of the absolute value of the average difference between actual and perceived place in the distribution.

7. Discussion

The differential effects of additional information across the distribution is a powerful finding as it suggests the role of information in shaping perceptions of inequality is more nuanced than commonly thought. More information has not led all individuals to better be able to understand where they fit in the distribution. This is likely due to peoples existing misperceptions and the content of private television channels only partly filling in gaps in knowledge.

Prior to the expansion of access to television the IFLS respondents in rural areas would have had extremely limited access to information about the standard of living in other parts of

Indonesia. The only television network operating in these areas prior to the late 1990s was the government's television channel. A key focus of the Suharto era was ensuring Indonesia remained unified and the government run TV channel did not focus on the inequality of living standards across Indonesia.

With limited information sources it is unlikely that individuals would have known if their community's average living standard was above or below the rest of Indonesia. Although exposure to large urban areas in Java either directly or through networks would have provided greater information about the top end of the distribution. In Farré and Fasani (2013) they argue that urban living standards in Java are actually overestimated. Collectively, this imbalance of existing knowledge could have easily contributed to the underestimation of richer people's place in the distribution as they believed there are lots of rich people in urban areas but are unaware there are large number of poorer people on other islands.

This idea is captured in the model in section three whereby the gap in misperceptions at the bottom end of the distribution is greater than at the top end. In the simple three-person model, this existing misperception for richer people is as follows:

$$c_{P_p} - c_P > c_{P_R} - c_R$$

The expansion of private television channels across rural Java provided an influx of diverse information about the rest of Indonesia (and the world) that would have challenged individuals existing perceptions of their place in the distribution. It is anticipated that the new information would have shed light on how much poorer the average standard of living is on other islands (particularly Eastern Indonesia) and that living standards in urban areas in Java are not all as well off as previously thought. This would have led richer people to update their existing perceptions in an upward direction as they realise there are more poorer people or less richer people or both. This is formalised in the model as follows:

$$\begin{aligned} (c_A - c_{P_p})_{t_0} &< (c_A - c_{P_p})_{t_1} \\ (c_{R_p} - c_A)_{t_0} &> (c_{R_p} - c_A)_{t_1} \end{aligned}$$

This upward shift in ones perceived place in the distribution is consistent with the results reported in the paper. Richer people who underestimated their place would revise their perceptions upward and in doing so would reduce their underestimate.

8. Conclusion

This paper presents the first natural experiment of how information through the media shapes people's perception of their place in the distribution. Interestingly, the effect of information is asymmetric across the distribution, whereby only richer people revise their belief about where they belong in the distribution. This effect is non-trivial, as those individuals who received all 10 private channels were better able to estimate their place in

the distribution by 11 percentage points, which is 31.4% of the absolute value of the average difference between actual and perceived place in the distribution. I presented a modified version of a well-known model that outlines there is an 'upward bias' in peoples existing knowledge and the rollout of private television helped fill this gap in perceptions. The link between subjective wellbeing and preferences for redistribution with perceptions provides suggestive evidence that imperfect information is leading to lower subjective wellbeing and greater preferences for redistribution among richer people. Further research in this area could explore the behavioural implications of these misperceptions and examine how the provision of information about inequality could lead to more socially desirable outcomes.

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