

## **Building an Integrated Market in a Segmented Setting**

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## **Abstract**

Social segmentation is a regular feature of diverse populations, but integration across actors is central to market functionality. A central question for building markets in diverse environments is therefore how to reverse the segmenting influence of group identity so information is accessible and influential across groups. I address this question with a case study of investor recruitment into Kenya's nascent capital market, theorizing sources of both segmentation and integration in a society organized according to tribal groups. This setting expands research into a novel setting where detailed data is available on the timing and location of new investors. Consistent with prior research, I find that new investors are upwards of 50 per cent more influenced by previous profits of geographically proximate coethnics peers than the profits earned by non-coethnics. However, the influence of socially similar peers varies according to attributes of the local setting. Consistent with evidence of integration across ethnic groups, the influence of coethnic peers attenuates in ethnically homogeneous and higher income settings. However, the influence of coethnics increases as a function of the size of the local investing population. These results imply that attributes of the local context influence this nascent market's development through mechanisms of both ethnic segmentation and ethnic integration. Implications of these dual mechanisms for organization theory, economic sociology, and public policy are discussed.

Two basic requirements of a functional market are the availability of information needed for informed decision making and a critical mass of participants to make use of that information (e.g., Akerloff, 1970; Grossman & Stiglitz, 1980). Stark examples of the challenges posed by information asymmetries and limited size are seen in the development struggles of many of the world's newly created capital markets. More than half of the world's 140 stock exchanges have been created since the early 1980's, with approximately two-thirds of these nascent capital markets located in developing countries (Mondo Visione, 2007). The *de jure* creation of these stock markets, however, has not guaranteed their *de facto* functionality, as the majority of them have failed to recruit a critical mass of investors necessary to mobilize nascent capital in support of economic development (Kenny & Moss 1998; Singh 1999). In these settings, academic researchers and policy makers alike should be interested in the question of how to mobilize enough investors to populate a nascent national capital market.

In this paper, I link social structure to market development by studying the relative influence of information about prior performance experiences of socially similar versus dissimilar others on investor recruitment. Established literatures studying social movement mobilization and diffusion of new innovations demonstrate that recruitment of new participants is best accomplished when potential adopters hear about new opportunities from socially similar others. In studies of the spread of practices as varied as high risk political activism (McAdam, 1986; Gould 1991; Viterna, 2006), labor union membership (Hedstrom, 1994), and Japanese management styles (Ouchi, 1981) influence is strongest when physically proximate and socially similar prior adopters convey information on the benefits of participation. Scholars studying inter-personal networks find similar patterns in relationship formation, as actors sharing homophilous traits that enter the opportunity space provided by physical proximity are the most likely to form ties initially as well as more likely to form stronger ties in the long run (McPherson & Smith-Lovin, 2001; Reagans, 2011). The generalizable finding across these literatures is that physical proximity and social similarity combine to convey the legitimacy of a practice to potential adopters.

But is this pattern of increasing influence by similar others desirable in the development of a nascent national market? Policy makers and academics alike understand that market construction is often

a vital part of nation building (Evans, 1995; March and Olsen, 1989; Fligstein, 1996), a process that benefits from *connecting* previously disconnected actors and thus facilitating exchange rather than exclusion between them, particularly in the form of giving and receiving information about opportunities and outcomes. Socially constructed boundaries between groups function as building blocks for multiple forms of market segmentations, including limitations on information flows and reduced willingness to consider information from or about diverse others (Lamont & Fournier, 1992; for a review, see Lamont & Molnar 2002). While social movements benefit from clearly framing grievances against a distinct target (Snow & Benford, 1998) and in doing so foster or utilize shared identity between participants (McAdam, 1988; Gould, 1995; Fireman & Gamson, 1979), a nascent market's development may be hindered by group-centric clustering either because disparate groups are less likely to form connections necessary for conveying information (e.g. Ingram & Morris, 2007; McPherson & Smith-Lovin 2001 for a review) or because actors devalue information from socially different sources (Rao et al. 2001; Burt 2011: 195-198). Because reliance on members of one's own social group is expected to be particularly important when formal institutions have not emerged to provide a framework for trustworthy action (Zucker, 1986), it is especially important to understand social segmentation processes in developing countries which often lack supportive formal institutional environments. Political scientists and development economists have provided examples of the effects of segmentation on economic development, showing that socially diverse populations are less likely to support public goods spending on infrastructure and education spending (Alesina & La Ferrara, 2005; Collier, 2000; Easterly & Levine, 1997), instead supporting local projects that benefit a specific group.

Organization theory research has tended to focus on the positive aspects of social similarity, which research directly attending to economic development issues has addressed the effects of social group segmentation. In this paper, I attend to the mechanisms that break this pattern. This paper expands economic sociology research on market construction by investigating how to achieve *integration* between socially different previous and potential adopters and thus attenuate social segmentation in markets. I first investigate the extent to which new investor recruitment in a nascent capital market is a function of the

profits earned by socially similar versus dissimilar existing investors. Consistent with a range of earlier work, I predict that profits earned by socially similar prior investors will be more influential than profits earned by socially dissimilar investors, controlling for the geographic proximity of both. But this segmentation pattern is potentially contrary to the goals of market construction, and both policy makers and academics will be interested in studying mechanisms that promote integration instead. I investigate remedies for social segmentation by focusing on the role of local context (Feld, 1981), theorizing that some social structural and socio-demographic attributes of locales may produce amplify or attenuate patterns of social segmentation. Understanding the conditions under which socially dissimilar others become more influential extends earlier work on mobilization and contagion into processes underlying market construction in diverse developing settings.

Empirically, the paper conducts a case study of a recent wave of investor mobilization into Kenya's frontier stock market, the Nairobi Securities Exchange (NSE). Founded in the 1950s by British colonialists, the NSE failed to contribute significantly to the country's economic development for decades, largely because low levels of participation by domestic investors limited the mobilization of private savings and restricted liquidity in the secondary market needed to attract foreign investors (Bishop, 1988; Ngugi, 2003). In 2005, the Kenyan state passed a package of market liberalization policies designed to incentivize domestic participation in the NSE. In terms of numbers of investors recruited, the effort was a great success. Between early 2006 and late 2008, the number of domestic investors grew from 140,000 to almost 1.4 million in a country where fewer than three million households earn at least double the poverty wage. But this investor mobilization occurred in a diverse and contentious setting, as Kenya is socially and politically organized by ethno-linguistic tribal groups. The combination of state-level incentives to purchase shares and a socially fractured landscape through which the practice can diffuse provides a unique opportunity to extend research on the role of social relations in mobilization and diffusion to the study of market construction, an opportunity made more attractive by the scarcity of previous research investigating these issues in sub-Saharan Africa.

The empirical analysis uses a unique dataset that combines the NSE's electronic records of the timing of each investor's first and subsequent share purchases, profits and losses they experience in their investments, and their geographic location. Lacking data on the ethnic identity and interpersonal ties between existing and potential investors, I exploit data from the Kenyan National Bureau of Statistics (KNBS) that measures the proportional population of every city, town, and village belonging to more than a dozen ethno-linguistic tribal groups. For simplicity, I refer to these varying administrative units as "towns." I use these data to predict town-level recruitment of new investors over time as a function of the profits earned in geographically proximate towns, measuring profits separately for the portions of those peer towns that are ethnically similar and different than the focal town. Consistent with prior research, I find that profits earned on prior investments by investors in towns with ethnically similar populations are more influential in recruiting new investors than those of non-coethnics. The influence of coethnic peers, however, attenuates in ethnically homogeneous towns, towns whose ethnic populations are more in the minority in its region, and in more wealthy towns. In contrast, segmented influence of coethnics grows slightly as more investors are recruited into the market. A concluding discussion considers the implications of these dual mechanisms for organization theory, economic sociology, and public policy.

## **EMPIRICAL SETTING: THE RISE OF RETAIL SHAREHOLDING IN KENYA**

This section familiarizes the reader with the empirical setting, first with a brief historical background of the Kenyan market and then with descriptive accounts of how the growth of investor participation in Kenya makes it a rich setting for studying the effects of prior performance of (dis)similar others. The Nairobi Securities Exchange (NSE) was established in 1954 by British colonial businessmen who sold shares of their Kenya-based enterprises to a closed group of fellow colonialists in order to share risk in their ventures (for a more complete history of the NSE see Kimura and Amoro, 1999; Ngugi, 2003). Indigenous Kenyans were prohibited from participating in the exchange until Kenya's independence in 1963, and more than four decades later participation in the NSE was *de facto* restricted to Kenyan elites, as newly floated shares on the NSE were priced relatively high and sold in large lots to a

small group of pension funds, government officials, and stockbrokers serving wealthy Kenyans (Ngugi, 2003). The NSE was called “a stock exchange in name only” by the head of the USAID delegation in 1988, who concluded that the low rate of investor participation was a key factor leading to distorted share prices, reduced trading volume and constrained liquidity (Bishop, 1988).

Barriers to entry for small-scale Kenyan shareholders were directly addressed in the Privatization Act of 2005. With the goal of better accessing nascent domestic capital and increasing liquidity in the secondary market through increased domestic participation, the Act gave state regulators oversight of several key features of initial public offers, including the initial share price to be charged, the minimum number of shares required for an IPO subscription, and the percentage of floated shares reserved for retail investors. With passage of the Act, the state effectively forced listing firms to make a high percentage of IPO shares available to average Kenyans who could now buy in smaller, more affordable lots. Such politicized offer terms in IPOs are a common incentivization strategy used to stimulate public share ownership in developing countries (for a more in-depth reviews of its global use, see Jones et al., 1999; Boutchkova & Megginson, 2000). The state quickly followed the passage of the Privatization Act with an aggressive schedule of new listings on the NSE, with five state-owned firms and two private firms listing in the three years following passage of the Act.

The dramatic rise in the number of domestic investors in Kenya makes it a compelling case study for investor recruitment. Figure 1 shows cumulative and daily counts of new shareholders at the NSE in the seven IPOs that followed passage of the Privatization Act. Grey bars mark the subscription periods of each IPO, periods of between 10 and 30 days when investors subscribe for shares in the IPO. More than 98% of all newly recruited investors entered the NSE via subscription to one of these seven IPOs. The differential subscription rates to the seven IPOs that followed strongly suggest that attributes of each IPO are highly relevant in the recruitment of new investors.

[Figure 1 about here]

The rise in numbers of Kenyan shareholders, however, was not the result of the practice spreading of into new areas of the country. Instead, investors were recruited in a pattern suggesting a

more localized contagion process. Figure 2 shows two maps, marking the towns of residence of the 140,000 Kenyan investors who owned shares prior to the passage of the Privatization Act in 2005 and those of the 1.2 million investors as of December 2008. The number of investors in each town is represented by dots of increasing size. Numerous Kenyan policy makers contacted during this study unanimously predicted that shareholding was initially practiced in the capital city of Nairobi and then diffused outward into increasingly remote parts of the country. Figure 2 shows this assumption to be false, showing that early adopters of shareholding (those in the market before 2006) were already spread across the country initially and that participation increased following the Privatization Act around the towns where it was already practiced. The 900% growth rate in individual participation in the NSE was accompanied by a 48% increase in the number of unique towns in which investors are registered, with new towns that entered the investing population during this time located geographically close to towns where existing investors already resided.

[Figure 2 about here]

Finally, it is also useful to understand that the new population of Kenyan investors is generally representative of the general population financially at risk of buying shares. Figure 3 compares the value of initial investments made by the 140,000 investors who were already in the market by late 2005 with the 1.2 million newly recruited investors. More than half of newly recruited Kenyan investors invest less than US\$50 initially, just over two weeks' income at double the poverty rate. This wide but shallow pool of investors reflects the fact that per capita income in Kenya in 2006 was just below the international poverty line of US\$2 per day (Kenya NBS, 2007: 11, 89). We cannot know the motives of each investor (e.g. long- versus short-term orientations), nor can we know their actual household income. But Figure 3 strongly suggests that the investor mobilization campaign successfully recruited a population of investors that generally mirrors the wealth distribution in the country as a whole.

[Figure 3 about here]

Several elements of Kenya's institutional environment suggest it is an unlikely setting for such an explosion in retail investing. Kenya suffers poor quality formal institutions, including weak property

rights and high levels of corruption. The World Bank's 2009 Investor Protection Index ranks the Kenyan state as one of the weaker protectors of investors' property rights, ranking 81<sup>st</sup> internationally. In their daily activities, average Kenyans have an even worse experience with various rent-seeking bureaucracies. Ranked 150<sup>th</sup> worldwide in Transparency International's 2007 Bribery Perception Index, 87% of the Kenyans reported paying bribes for basic government services. Such weak institutional regimes have been argued to reduce investments and economic development (e.g. La Porta et al., 1997). Kenya's formal financial institutions are poorly developed. At the start of the boom in retail investing in 2006, less than 25% of the total population had prior experience with any formal sector financial product such as a bank account, line of consumer credit, insurance policy or pension fund (FSD-Kenya, 2006).

Informal social institutions in Kenya are also a possible source of friction for stimulating collective participation in Kenya's emerging stock exchange. Of particular interest in this area is the degree of ethnic heterogeneity, as Kenya is home to 42 distinct ethno-linguistic tribe groups and a history of troubled relations between many of them. High levels of ethnic diversity can be related to inter-ethnic tensions (Rydgren et al. 2013) and negatively affects economic growth (Easterly and Levine 1997) because rival groups fail to reach political agreement about the provision of public goods required for development such as infrastructure projects and education spending (Alesina and La Ferrara, 2005). This tension between tribal groups in Kenya is broadly demonstrated in the 2005 Afrobarometer survey, which asked the question "How much do you trust Kenyans from other ethnic groups?" More than 70 per cent of all respondents answered "Not at all" or "Just a little." The highest level of reported trust ("A lot") was the least common response in every province, at less than seven per cent of all respondents.

## **PERFORMANCE EXPERIENCES OF (DIS)SIMILAR OTHERS**

Paradoxically, the deleterious effects of low incomes and high levels of corruption that retards financial market participation (La Porta et al., 1997) could be outweighed by willingness to engage in new, potentially risky behaviors in order to achieve higher levels of material wellbeing (Rogers, 2003; Greve, 1998). Exemplifying this, a new Kenyan investor standing outside the NSE recalled in an

unstructured interview, “I am just a small fish, but there is money to be made in shares so I must take the risks.” Strang and Macy (2001) put it succinctly: “success is particularly contagious,” a point demonstrated in studies of how airline hijackings resulting in delivered ransoms increase the rate of future hijackings (Holden, 1986) and increased numbers of strikes among French coal miners following earlier strikes that achieved workers’ goals (Connell and Cohn, 1995). In this light, contagion is understood to be a rational process, whereby potential adopters engage in social learning by monitoring the experiences of previous adopters (see Strang and Soule 1998 for review). Potential adopters may theorize that the experiences of culturally similar others are more relevant to them (Strang & Meyer, 1993; Lamont & Fournier, 1992), but this does not preclude influence of experiences of dissimilar others, particularly in settings where information is freely available and actors competitively monitor each other’s actions (Burt, 1987). Profits experienced by existing investors therefore constitute the “contagious” information that must come into contact with and be interpreted as relevant to potential investors (Strang and Tuma, 1993; Strang & Meyer, 1993). To be clear, this paper focuses on the differing effects of profits earned by socially similar versus dissimilar prior adopters, controlling for the number of each groups’ previous adopters. I focus on performance experiences rather than previous adoption because profits earned on stock purchases are an easily measurable outcome, and combined with a diverse and distrustful social setting this provides a rich case study of social segmentation versus integration in a nascent market.

## **LEARNING FROM (DIS)SIMILAR OTHERS**

### **Segmentation via similarity**

Research across subfields has shown that influence is strongest when potential adopters of a practice come into contact with socially similar previous adopters. This outcome can occur either because a potential adopter is more likely to hear about the benefits of the new practice or because those benefits are seen as more relevant when they convey the experiences of socially similar others. Podolny (2001) introduced the idea that social structure functions both as pipe and prism, where increasingly connected actors have larger conduits through which information can travel (i.e. pipes) or the patterns of connections

help the influence of information encountered (i.e. prisms). Podolny cites as an example of the former the spread of corporate policies via the pipes provided by interlocking Boards of Directors (Davis, 1991; Haunschild, 1993). An example of the prism perspective is Zuckerman's (1999, 2000) work on firm valuation, where firms that conform to institutionalized cognitive categories held by that industry's analysts garner greater coverage and therefore higher valuations and easier access to capital. Conditional on two actors being close enough to interact, social similarity influence actors' behaviors either by further increasing the chances of contact between actors or shaping the relevance of information encountered.

The ability of social structure to increasingly convey information or determine its relevance is evident in research in several related subfields. Social movement scholars studying recruitment into high risk political activism have shown that propinquity successfully combines with social similarity. Gould (1991) finds that participation in the 1871 Paris Commune is best predicted by the combination of contact created through co-enlistment into the Paris National Guard and shared social identity with a particular Parisian neighborhood. Similar patterns of recruitment are found for the 1964 Freedom Summer movement (McAdam, 1986; McAdam and Paulson, 1993) and female participation in the Salvadoran Guerilla Army (Viterna, 2006). Other social movement scholars show that group-level culture serves as a key framing for appropriate action (Snow & Benford, 1992). Network theorists find similar patterns with respect to inter-personal tie formation, where physically proximate and socially similar alters are found to form stronger relationships with each other than socially dissimilar alters in the same interaction space (Reagans, 2011; Zeng & Xie, 2008). Symbolic interactionists similarly argue that culture defines the symbolic boundaries of a group by defining who is meaningful and who is not across activities including economic action (Lamont & Small, 2008). Specific to the ethnic groups studied here, Brewer (1981) argues that ethnocentrism results in greater hostility to out-group beliefs and practices which then form the necessary conditions for sustaining inter-group competition and conflict. In each of these settings, the combination of propinquity and similarity results in increased segmentation, in the form of movement mobilization, relationship formation, diffusion of new practices, or attention of market actors.

Integrating works from several literatures, physical proximity and social similarity should enhance the effect of prior performance information of socially similar others either because potential adopters are more likely to encounter the information or because available information is seen as more relevant because it comes from a homophilous source. The analysis presented here is unable to definitively disentangle which of these mechanisms is at work, but the outcome of interest, investor recruitment, is not dependent on either one holding. Diffusion can occur either because cohesive ties are more likely to exist between socially similar prior and potential adopters (Reagans, 2011) or because potential adopters are similarly connected to third parties that transmit the contagion to each other and therefore are at a greater risk of encountering information broadly available in the environment (Mizruchi, 1992; Burt 1987). In this analysis, I focus on the object of the information, defined as the ethnic group membership of the people whose performance experience is being communicated, rather than the pathway through which this information is carried to the potential adopter. In this way, is possible to assume any number of inter-personal pathways through which information may travel.

Where performance is clearly measurable, experiences of prior adopters should strongly influence the decisions of potential adopters, especially the experiences of socially similar prior adopters:

**Hypothesis 1:** Previous profits earned by coethnic investors will be more influential than those earned by non-coethnics in the recruitment of new investors.

### **Fostering integration**

The segmentation predicted in Hypothesis 1 is potentially deleterious to construction of a national market. If potential investors are more influenced by the past performances of members of their own social group, it means that information about the potential benefits of share ownership is either conveyed to socially similar others or the information encountered is considered relevant when it describes a socially similar source. Evidence of these detrimental effects of segmentation has been demonstrated in ethnically fractionalized settings where support is lower for public infrastructure projects capable of contributing to economic growth settings (Alesina and La Ferrara, 2005; Easterly & Levine, 1997), and where market functionality is non-trivially determined by symmetric availability of information (Akerlof,

1970). Thus, it is important to understand possible moderators of the dominant pattern, such that information becomes influential across social boundaries. As a first step in doing so, I consider how attributes of the settings in which investors are situated (Feld, 1981) alter the relative influence of prior performances of socially similar and dissimilar others. Settings have previously been studied in their role of breaking the trend of locally cohesive ties between organizations (Sorenson and Stuart, 2008; Ingram and Torfason, 2010). I adapt this concept to better understand how attributes of locations may increase the susceptibility to contagious material information about the experiences of dissimilar others.

I first consider the moderating effect of local diversity, as represented by a town's own level of ethnic diversity and its ethnic composition relative to the surrounding area. Despite their insular image, geographically clustered ethnic groups may attenuate the segmentation predicted in Hypothesis 1 when this clustering results either in a homogeneous town or a town being a regional minority. Earlier work on contact theory predicts higher levels of inter-ethnic conflict in heterogeneous areas lacking substantive interaction (Allport, 1954; for reviews see Moody, 2001; Rydgren et al., 2013). Patterns of low inter-ethnic trust in Kenya presented above suggest that the substantive local interaction necessary to facilitate trust and reduce conflict is generally lacking. Inter-ethnic conflict is more likely when social heterogeneity triggers threats to group membership and identity (Pettigrew 1957; Olzak, 1992). A similar pattern is found in friendship formation, with researchers finding that homophilous traits and shared group membership are increasingly prioritized by residents of diverse settings, such that diversity in a given settings triggers homogeneity in interactions because individuals' identities are threatened in diverse settings (Moody, 2001).

In areas where there are clear majority and minority groups, inter-group threat is also reduced because stability in the status order results from the inability of the minority group to challenge that the majority group (Moody, 2001), a similar argument that Fligstein (1996) makes about inter-firm competition during market formation. In a more ethnically homogeneous town, ethnic identity should be less stimulated due to the lack of a viable mass of out-group challengers. Similarly, towns that are increasingly ethnic minorities in their areas would be less likely to be perceived as antagonistic to the

majority ethnic groups (Blalock, 1967; Smith, 1981) while at the same time be exposed to increasingly available material information sourced by ethnic outsiders (Wimmer, 2013: 145). Therefore:

**Hypothesis 2:** The influence of coethnics' previous profits relative to non-coethnics' will be reduced in more ethnically homogeneous towns.

**Hypothesis 3:** The influence of coethnics' previous profits relative to non-coethnics' will be reduced in towns that are more in the ethnic minority in their region.

If the baseline expectation is for potential investors to be more influenced in their decision making by the experiences of socially similar others, then a logical next question is whether or not a nascent market will grow out of that trend. The size of the local investing population should attenuate the segmenting effect of social similarity because it independently increases the availability of easily understandable information about past performance. Organizational theorists have paid increasing attention to the inefficiencies that can result from entrenchment in existing social connections. Overly committed to existing contacts, actors lose the ability to develop new contacts better suited to new challenges (Gargiulo & Benassi, 1999). Sorenson and Waguespack (2006) find that the higher performance outcomes attributed to longer term partnerships can be the result of over commitment of resources and poor terms of trade that arise in long standing relationships, but the durability of the relationship prohibits an objective accounting that would discover these biases. In these cases, alternatives are knowable but one's ability to act on new opportunities is constrained by social pressures to remain in existing patterns of relations or cognitive biases that cloud judgments of the benefits of change. However, Sorenson & Waguespack identify a key scope condition for these inefficiencies to persist: measures of the performance of the current practice or arrangement must be uncertain. Without uncertainty in the evaluation of performance outcomes, the explanation for continuing in the underperforming relationship is continued access to the positive affect it provides outside of its economic dimension (Lawler, 1992; Zajonc, 1968).

But performance of previous stock purchases is unambiguous. In situations where performance is unambiguous, performance information is plentiful, and groups are competitively aware of their relative

positions, the constraints of existing patterns of social relations should be reduced. That is, decision making should become more attentive to *content* of information rather than source as information is increasingly available in a competitive environment. Burt (1987) demonstrated the point that adoption of new practices can arise from disconnected actors receiving information from shared third parties.

Assuming competition between the ethnic groups in Kenya, we can predict that they will adopt practices that help their material position *Vis a Vis* other groups. Spence (1973) argued that the signals broadcast by economic actors will be devalued over time if they are inconsistent with the reality of the object they are meant to measure. Simply put, when more sources of easily interpretable information are available, it should be increasingly difficult to sustain biased evaluations of that information:

**Hypothesis 4:** The influence of coethnics' profits relative to non-coethnics' will be reduced in towns with larger investing populations.

The final attribute of the town-level context in which potential investors adjudicate performance outcomes considered is wealth. This is a particularly important question to address in understanding investor recruitment in developing countries, as states often incentivize share ownership for lower income segments (Jones et al., 1999; Boutchkova and Megginson, 2000). As demonstrated in Figure 3, such policies were in effect in Kenya. Earlier research suggests that these policies should be successful in recruiting non-wealthy segments of developing country populations. Higher participation rates among lower income groups have been found in high-risk aspirational financial practices, such as national lotteries (King, 1985; Beckert & Lutter, 2009). Similarly, underperformance relative to aspirations is associated with willing to adopt risky strategies (Greve, 1998). Similar to prior work on over commitment to existing social connections discussed in hypothesis 4, many of these studies measure adoption of practices whose expected benefits are difficult to measure, an attribute not shared by prior share ownership. Low-income communities should therefore be less likely to discount material information from dissimilar sources:

**Hypothesis 5:** The influence of coethnics' profits relative to non-coethnics' will be reduced in towns with lower levels of wealth.

These hypotheses set the baseline expectation that profits earned by socially similar existing investors will be more influential in the recruitment of new investors than those of dissimilar existing investors. I then argue that this segmenting influence will vary according to structural and socio-demographic attributes of investors' locales. The goal is to address mechanisms of both segmentation and integration, and thus identify the sources and potential remedies of bias in nascent market construction.

## **DATA AND METHODS**

Access to several unique databases allows me to measure the location and timing of first share purchases for Kenyan investors as well as the ethnic composition of the communities in which they live. The location and time of first share purchase for Kenya's approximately 1.2 million new investors in the Nairobi Securities Exchange is obtained from the databases of the Central Depository and Settlement Corporation, Ltd. (CDSC), a legally separate back office organization responsible for creating and maintaining all electronic investor accounts and managing clearing and settlement of all share transactions including IPO subscriptions.<sup>1</sup> Since the NSE migrated to an electronic platform in November 2004 all transactions have been executed via the CDSC system.

Before purchasing shares, each investor has to open an account with the CDSC, similar to opening a bank account. Investor location is measured by the town of residence in the mailing address provided, which I matched to the list of 1,595 municipalities (i.e. cities, towns, and villages) used by the Kenyan National Bureau of Statistics (KNBS) in the decennial census. About 18 per cent of all CDSC accounts contained incorrect or missing town names, the result of mistakes made by investors filling out the registration form or CDSC clerks entering the information into their databases. To recapture these observations, I created a crowdsourcing method for correcting missing or mistaken town names. During registration, investors are asked for a complete mailing address including postal codes. For each town name that did not match the list from the KNBS, I compared the provided postal code with the postal

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<sup>1</sup> More information can be found at <http://www.cdsckenya.com>.

codes of accounts whose town name did match the KNBC list. I then replaced the missing or incorrect town name with the town name most frequently associated with the same postal code. This routine identified town of registration for all but 60,000 of the missing or incorrect observations. Because the CDSC does not mail account statements and clerks are rushed to process large volumes of registrations during brief IPO subscription periods, it is likely that postal codes are given priority for entry into the database and unclear town names are discarded.

To insure that each account represents a unique investor entering the market, I cleaned the CDSC data of duplicate accounts held by existing investors. I did so by comparing the personal names, national ID card or passport numbers<sup>2</sup>, registered phone numbers, and mailing addresses of each account in the registration database. If any two or more accounts made use of the same phone number, combination of name and mailing address, or national ID card number, I included only the first opened account in the analysis. This routine identified approximately 90,000 accounts likely opened by existing investors. To protect the confidentiality of CDSC account holders, this routine was performed in the CDSC offices in Nairobi, and I took possession of a dataset containing only account number and town of registration.

### **Dependent Variable**

While the CDSC data precisely measure timing of market entry and performance experiences of prior investments, they do not allow explicit measurement of social contact between existing and potential investors. Without inter-personal contact information, I instead generate measures of new investor recruitment at the town level because I can measure town-level similarities (described below). If information can move from prior to potential adopters through shared third parties (Mizruchi, 1992; Burt, 1987) and it is more likely to move within ethnic groups than between them, either because inter-personal

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<sup>2</sup> In an effort to limit the practice of opening multiple accounts, regulations stipulate that investors must use either their passport or national ID number to open an account. However, some investors attempted to circumvent this regulation. In one case, an investor opened 27 accounts using the same name, phone number, and mailing address by adding each letter of the alphabet to the end of his national id number to subsequent registrations.

ties are more plentiful or because information about coethnics is more influential, then measuring investor recruitment at the town level is unproblematic.

The dependent variable in all models is a town-level count of investors whose first ownership of shares occurs as a result of subscribing for shares in one of the seven IPOs following the 2005 Privatization Act or purchasing shares in the first 30 days of trading. More than 98% of all new investors enter the market by one of these paths (c.f. Figure 1). The subscription period for each IPO varies in duration from 10 to 30 days, during which time all investors place a subscription order with an intermediary (a stock brokerage or licensed agent thereof) and pay for all subscribed shares in advance. IPO shares are offered at a fixed price, and the regulator prohibits book building for domestic investors in Kenyan IPOs. In the event of an oversubscription, which occurs in all but the last of these IPOs, each investor receives a pro rata allocation proportional to the level of oversubscription and is later refunded the balance of her initial payment. I include early purchases in the secondary market because unstructured interviews with market officials and investors indicated that a minority of investors avoided the refund process in oversubscribed IPOs by purchasing in the early secondary market.

### **Modeling strategy**

Negative binomial models estimate the effects of prior profits earned on IPO investments in geographically proximate towns on the town-level count of new investors in the seven IPOs following the passage of the 2005 Privatization Act. In addition to explanatory and control variables described below, a random effect is estimated for each of 533 towns, and fixed effect controls are included for each IPO period and each town's tribal composition. Variations in formal sector participation across ethnolinguistic groups are an issue in contentious Kenyan politics. It is outside the scope of this paper to analyze these differences, and accordingly I do not report those coefficients.

As mentioned above, there are 1,595 cities, towns, and villages recognized by the Kenyan Census. The theoretical arguments view towns as settings where actors access and adjudicate information. For the quantitative analysis, towns are operationalized as the legally recognized administrative

municipalities where investors are registered, which is a subset of all administrative municipalities in Kenya. KNBS data indicate that all 1,062 towns without registered investors are small villages with fewer than 200 residents, and half of them are less than seven kilometers from a town with a registered investor (mean of 11 kilometers). It is unknowable whether this pattern reflects the true residential location of all investors or if residents of small villages tend to use a mailing address in a nearby town, perhaps due to the availability of a postal facility. If the former is true, then the data directly measure the location of each investor. If the latter is true, then registered location is a valid proxy for investor location assuming that town of registration proxies for a focal point of social and economic life for the investor.

### **Independent variables**

*Profits of proximate coethnic and non-coethnic peers.* Hypothesis 1 predicts that prior performance of investments by coethnic peers will be more influential in new investor recruitment than profits earned by non-coethnics. Given the short time window in which all IPOs occur and the within-IPO changes in share price at the time of each subsequent IPO, I calculate town-level prior performance of all previous IPOs. Figure 4 shows the indexed share prices for the first six IPOs, with grey bars indicating the subscription period for each subsequent IPO. Town-level profits are calculated as the sum of individual profits for all investors registered in a town using the total number of shares purchased in all previous IPOs and their share prices at the end of trading the day before the subscription period for the next IPO. Any investor who sold shares prior to the start of the next IPO is assigned the selling price when calculating profit.

[Figure 4 about here]

Separate measures of profits earned by coethnic and non-coethnic peers are based on the similarity of ethnic populations between the 533 towns of registration reported by Kenyan investors. Ethnic similarity between town populations is measured by the language used by respondents to the 2005 Kenya Integrated Household Budget Survey (KIHBS), a national survey of 13,128 households conducted by the KNBS. Survey administrators record the language used by respondents to complete the survey from the twelve most common tribal dialects as well as English and Swahili. The national averages

obtained from this survey data are very comparable to reported tribal populations in the 2000 Kenyan Population Census. An exception is the over use of Swahili, one of two national languages in Kenya and not indicative of ethnicity outside of Kenya’s coastal Muslim population. Swahili is used by 29% of all KIHBS survey respondents, including almost 60 per cent of residents of the capital city of Nairobi. Two explanations likely account for the overrepresentation of Swahili. First, Swahili is the “melting pot” language common to Kenya’s capital, and respondents were either not given the option to use another language or the survey administrator was unable to speak the tribal language of the respondent and therefore used Swahili by default. Second and similarly, members of local ethnic minorities may have needed to use Swahili to complete the survey if the KIHBS survey administrators trained in the region’s dominant tribal language was unable to speak the minority’s language. This pattern is most common in Kenya’s agricultural areas known to draw internal migrants in search of agricultural opportunities, although overall internal migration in Kenya is rare (Oucho 2007).

Ethnic similarity between towns is calculated using Lieberman’s (1969) similarity index:

$$Ethnic\ Similarity = \sum (p_{ik} * p_{jk}) \quad (1)$$

where there are  $K = 14$  possible ethno-linguistic groups in each town and  $p_{ik}$  represents the proportion of town  $i$  speaking language  $k$  and  $p_{jk}$  represents  $k$ ’s proportional population in town  $j$ . Equation 1 produces a single continuous measure, taking values 0-1, of social similarity between all pairs of towns that proxies for the probability of that any two randomly chosen residents belong to the same ethnic tribal group.

Consider an example from three villages in Kenya’s Kericho district<sup>3</sup>, a tea-producing area in the highlands west of the Rift Valley traditionally but not exclusively populated by the Kalenjin tribe. Kiptere, Kabianga, and Ainomoi each have fewer than 500 residents and are within 20 kilometers of each other. All residents of Kiptere responded to the 2005 KIHBS survey using the Kalenjin tribal language, while 70 per cent of residents of Kabianga and less than 40 per cent of residents Ainomoi did so. All other respondents used Swahili. The ethnic similarity between Kiptere and Kabianga is thus estimated to be 0.7,

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<sup>3</sup> There are 68 districts in Kenya, comparable to counties in the U.S. They are the next smallest administrative unit below provinces.

while the similarity between Kiptere and Ainomoi is less than 0.4. The precise ethnic composition of Kabianga and Ainomoi are unknown, as significant portions of the residents of both villages are recorded as Swahili, a national language. For our purposes here, it is enough to know the aggregated differences.

It is important to note that this measure of tribal distance assumes equal distance between all tribes. It is possible that members of more antagonistic tribes may reside close to each other, but that rivalry may be obfuscated by the language measure used to calculate tribal distance that would show rivals as “Swahili” rather than their actual tribe. Hence, I have constructed a conservative measure of the presence of coethnics, counting members of different but closely related ethnic groups as ethnic outsiders.

Physical distance between all towns is computed as the geodesic distance between town center points, obtained from a digitized mapping of the 1,595 KNBS-recognized communities publicly available from the GIS research group at the International Livestock Research Institute.<sup>4</sup>

Beyond measuring physical distance, it is important to account for the degree to which peer influence is localized. That is, how far does information travel in the Kenyan context? I treat this as an empirical question and employ a weighting scheme that allows the data to indicate the degree to which influence degrades over geographic distance. Following earlier work in social network analysis (Burt, 1987; Burt and Carlton, 1989; Bothner, 2003), all peer towns are assigned weights according to their proportional geographic distance from ego, with weights of all peer towns summing to unity:

$$w_{ij} = \frac{[\max(d_{ik}) - d_{ij}]^v}{\sum [\max(d_{ik}) - d_{ij}]^v} \quad (2)$$

where  $K$  is the set of all 533 towns with registered investors,  $\max(d_{ik})$  is the maximum distance from town  $i$  to any other town in the sample and  $d_{ij}$  is the distance from town  $i$  to a particular peer  $j$ .  $v$  is a user-defined term that weights each peer proportional to their proximity relative to all other peers. Increasing values for  $v$  greater than one signify that ego is increasingly influenced by closer peer towns. For example,  $v = 0$  defines that all peers are weighted equally regardless of distance from the focal town,

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<sup>4</sup> See <http://www.ilri.org/GIS> for more information.

$\nu = 1$  assigns weights according to their linear increase in distance from the focal town such that a town five kilometers away is assigned double the weight as a town 10 kilometers away. Values of  $\nu$  increasing from 1 specify non-linear decreases in weights as geographic distance increases. Models are estimated using a range of values of  $\nu$ , with  $\nu=10$  providing the best statistical fit. Figure 5 graphically depicts this best fitting geographic weighting using simulated data and demonstrates that influence is concentrated within a rather limited geographic area, with falling to about half at 30 kilometers and approximately one-tenth at 100 kilometers. Effects of coethnic and non-coethnic peers are sensitive to alternative values of the  $\nu$  parameter such that coefficients for both peers' profits are insignificant at values of  $\nu$  less than 7, indicating that peer influence is highly geographically concentrated in this setting.

[Figure 5 about here]

Estimates of the profits earned by coethnic and non-coethnic peers to a focal town are calculated by multiplying each of  $J=532$  peer town's cumulative past IPO profits with its ethnic similarity to the focal town and then weighting by geographic proximity:

$$CoethnicPeer\pi_{it} = \ln[\sum(\pi_{j(t)} * p_{ij}) * w_{ij}] \quad (3)$$

$$Non - coethnicPeer\pi_{it} = \ln[\sum(Total\pi_{jt} - Coethnic\pi_{jt}) * w_{ij}] \quad (4)$$

Logged values of gains and losses are calculated used the absolute value of the profit, with losses reset to their negative value.

*Moderators of segmentation.* Hypotheses 2 and 3 argue that the influence of coethnic peers relative to non-coethnics will decrease in ethnically homogeneous towns and towns whose ethnic populations are in the regional minority. The homogeneity of each town's ethnic population is measured as a Herfindahl Index of the sum of squared proportions of each town's population using a particular language to respond to the 2005 KIHBS:

$$EthnicHomogeneity = \sum(p_{ik})^2 \quad (5)$$

where there are  $K = 14$  available languages in each town  $i$ . The Herfindahl index was originally developed to measure industry concentrations of firms in a locality, but has also been used to measure the social homogeneity in a given area, such as religious groups (Land et al., 1991; Ellison et al. 1997).

To determine the extent to which a town is more of an ethnic minority in its region, I adapt the Lieberson measure of qualitative similarity used in equation (1) above to measure the town's ethnic dissimilarity from the proportional populations of each tribal group in the district where it is located:

$$\text{Ethnic Minority in region} = 1 - \sum (p_{ik} * p_{dk}) \quad (6)$$

The only differences from equation (1) above are that  $p_{dk}$  represents the proportions of each tribe  $k$  in each district  $d$ , and difference is measured as one minus the similarity measure.

Hypothesis 4 predicts that the influence of coethnic peers will attenuate as market participation increases. The size of the investing population in each town is measured as the logged *number of investors in the town* at the start of each IPO.

Hypothesis 5 predicts that towns with higher levels of wealth will be less influenced by coethnic peers relative to non-coethnics. Town-level wealth is measured as the proportion of *high, medium, and low SES* households in each community, measured by KIHBS survey administrators' observations of the conditions of the respondent's dwelling. Dwellings with a dirt floor are coded as low SES, those with an improved roof and floor as well as piped water and flush toilet are coded as high SES, and all others are coded as medium SES. These individual observations are aggregated into town-level percentages. In all models, medium SES category is the reference group.

*Controls.* Beyond the prior experiences of socially (dis)similar peers, other attributes should be related to stock market participation. Financial literacy is measured as the percentage of each town that reports prior *use of formal financial products*, including use of a bank account, formal line of credit, credit or debit card, insurance policy, or pension fund. These measures are constructed from individual responses to the

2006 FinAccess Survey (n=4,418), a nationally representative survey conducted by Financial Sector Deepening-Kenya that tracks formal financial sector participation.

I control for *listing firm presence* in each town's district with a dummy variable taking a value of one if the firm conducts business in that district. Information about firm locations of manufacturing or distribution facilities or sales of its products was collected from each listing firm's IPO prospectus. Each town's *ethnic similarity to listing firm* is measured as the Lieberson measure used in equation (1) above, calculated using the town's ethnic population and the ethnic group membership of the firm's CEO at the time of listing. Lieberson similarity between the town and all the members of the firm's Board of Directors was also measured but did not change results in any models.

Firms listing on the NSE also vary considerably in their use of advertising campaigns to recruit investors during IPOs. The logged value of town-level *IPO advertising exposure* is measured by a Nairobi-based market research firm that tracked all radio advertisements in each IPO. Radio advertising is the most reliable measure of exposure to IPO advertising, as radio is the most widespread form of media consumed in Kenya and accounts for approximately 80 per cent of IPO advertising budgets reported in the prospectuses. An estimated retail price of all advertisements broadcast in all towns in all IPOs firms in the four months prior to listing are available for each of Kenya's 42 radio stations based on the time of day, duration, and other features of each advertisement. Geographic footprints of radio stations are well defined, allowing for the creation of measures of the level of radio advertising each Kenyan town is exposed to in each IPO. Finally, proprietary survey data on listenership of each radio station in each district is used to weight the exposure of advertisements on each radio station.

The size of the town's *at risk population* in each IPO period is calculated as the natural log of the town's total population minus the portion in the low SES group described above minus the number of existing investors, with town population estimates obtained from the KNBS. Geographic remoteness is controlled for by with a measure of each town's *distance to the nearest major city* in hundreds of kilometers using the same measure of geodesic distance described above.

Characteristics of listing firms may account for a large proportion of investor demand, and previous research has demonstrated that privatizations are especially linked to higher rates of new investor recruitment in emerging markets (Boutchkova & Megginson 2000; Lieberman & Kirkness, 1988). All models include a fixed effect dummy for each IPO to capture unobserved IPO-level variance in investor recruitment, capturing the attractiveness of each firm as well as the rate of return earned by all previous investors. Share ownership may also differ across fixed effects for the proportion of each ethnic group in each town capture any cultural differences in willingness to participate between ethnic groups.

### **Measurement of town-level characteristics**

The above town-level characteristics are estimated from the individual responses to the two nationally representative surveys mentioned above: the 2005 KIHBS survey and the 2006 FinAccess Survey. The 2006 FinAccess survey was conducted using the same KNBS sampling frame as the 2005 KIHBS.<sup>5</sup> Town-level measures are calculated by estimating averages for each sub-location, the smallest administrative unit in the KNBS sampling framework. I create probability sampling weights for individual respondents by dividing the number of surveys conducted in each sub-location by the number of residents living in that sub-location. The KNBS sampling frame designates sub-locations to contain an average of about 10,000 residents, so that more populated urban areas contain multiple sub-locations while sparsely populated rural areas may contain multiple smaller villages. For the eight Kenyan cities containing multiple sub-locations, I calculate city-level aggregates by averaging across all sub-locations. For smaller towns and villages located in just one sub-location, I assigned the sub-location average to all towns within its geographic boundaries. Geographic boundaries of each sub-location and the towns and villages contained in them were obtained from the digital map referenced above.

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<sup>5</sup> See <http://statistics.knbs.or.ke/nada/index.php/catalog/8/sampling> for more information on the KNBS sampling framework.

## RESULTS

Descriptive statistics and correlations for all variables used in the analysis are presented in Table 1. Table 2 reports estimates of the number of new investors recruited in each town in each IPO. Model 1 estimates town-level new investor recruitment using only the control variables. Model 2 includes the effect of the number of existing investors and the profits attributed to coethnic peers; model 3 includes the same measures for non-ethnic peers. Most control variables are insignificant in most models. In models without random estimates for towns, firm presence in the town's district, geographic proximity to a city, and exposure to IPO advertising campaigns are positive and significant. Within each town the number of prior adopters and its quadratic term are statistically significant. Without a way to tease out within-town social dynamics, I focus on the effects of coethnic versus non-coethnic peers.

[Tables 1 and 2 about here]

Hypothesis 1 predicted that the prior performance experiences of socially similar peers would be more influential in recruiting new investors than the experiences of socially dissimilar peers, as measured by ethnic composition of each town. Results in models 2 and 3 strongly support this argument. A one unit increase in profits earned by coethnic peers is estimated to produce 38 per cent more new investors in a given town. Models 2 and 3 do not suggest that potential investors mimic their coethnic or non-coethnic peers in geographically proximate towns, suggesting that social learning from geographically proximate peers is the norm. The three villages mentioned above- Kiptere, Kabianga, and Ainomoi in Kericho district- illustrate examples of these results. Kiptere is the home to the most investors, 196 in total. Consistent with the predicted influence of geographic proximity and social similarity, Kabianga recruited a total of 92 investors, as it was the most ethnically similar town to Kiptere. Ainomoi was much less similar ethnically (and about 12 kilometers farther away from Kiptere), and recruited only three investors.

Models 4 through 7 test the extent to which this pattern of coethnic influence varies by proximity to one of Kenya's seven major cities, home to almost 70 per cent of all investor. A 50 kilometer radius was chosen for this test because that is the estimated radius where peer weights drop to less than half of their value relative to immediately proximate peers (see Figure 5). Since the measure of contagious

information begins with the accumulated profits earned within a town, Kenya's major cities are expected to be key broadcast centers for the signal of the potential benefits of share ownership, hence it is important to explicitly model the effects of each source of this signal, coethnics and non-coethnics, within the range of geographic influence stipulated by the data. Results of models 4 and 5 suggest that coethnic populations within Kenya's major cities are particularly strong broadcasters of information about past experience. Within a 50 kilometer radius to her major cities, the influence of coethnic past profits grows to 47 per cent greater than those of non-coethnics. This result is meaningful to understanding patterns of investor recruitment in this context, as just over 80 per cent of all investors are registered in a town within 50 kilometers of a major city. Models 6 and 7 estimate these effects on a more restrictive subsample, using only towns within 50 kilometers of a major city but excluding towns within this radius to Nairobi. As mentioned above, ethnic group membership in the capital city over represents the Swahili language and therefore provides a less accurate measure of ethnic similarity to other towns. In this subsample, the effect of non-coethnic peers ceases to be statistically significant and the coefficient size for coethnic peer profits is approximately double that of model 4. Across all models, the predicted segmenting effect of coethnic peer influence is clearly demonstrated. These models also suggest that the estimation of the effect of ethnic similarity used here is conservative, as the relative effects of coethnic peers are stronger in settings where its measurement is known to be more precise.

Table 3 presents estimates of new investor recruitment resulting from geographically proximate coethnic and non-coethnic peers across the hypothesized attributes of local settings. Hypotheses 2 and 3 predict that the influence of coethnic peers relative to non-coethnic peers will decline in more ethnically homogeneous towns and towns that are ethnic minorities in their regions. Results of models 8 through 11 support both of these hypotheses. Model 8 suggests that coethnic peers profits are insignificant in their effect on ethnically homogeneous towns; model 9 suggests the same although with a low magnitude effect: non-coethnics are less influential in more ethnically homogeneous towns, although a small portion of the influence of these socially dissimilar peers remains even for a completely homogeneous town. Ethnically homogeneous towns are less influenced by performance experiences of all proximate peers,

coethnic and non-coethnic alike, but this decline is strongest for coethnic peers. This is an important comparison to make, since the average Kenyan town is measured to be 86% homogenous, and 54% of all towns in the sample are measured as completely homogeneous. Estimates reported in models 10 and 11 support hypothesis 3. Model 10 suggests that the influence of coethnic peers remains constant across towns varying in their ethnic minority position relative to their district, while the influence of non-coethnic peers grows across towns that are increasingly in the ethnic minority. Empirically, only about 20 per cent of all Kenyan towns are measured to have ethnic differences of greater than 0.5 from their surrounding district. Comparing the coefficients in models 10 and 11 suggests that coethnics are increasingly influential in towns as their ethnic differences with their district fall farther below this 0.5 level. Stated differently, minority status is associated with lower influence of coethnics, but in absolute terms coethnics remain more influential until the town is at least 50 per cent different from its surrounding district.

[Table 3 about here]

Hypothesis 4 predicts that the segmenting influence of coethnic peers would attenuate relative to non-coethnic peers as the size of the local investing population increases. Because potential investors can easily assess prior performance of existing investors, it is expected that a greater number of potential sources of this information should reduce the bias associated with attending primarily to members of the same social group. Results of models 12 and 13 fail to support this prediction. Interaction terms of both sources of peer profits are equivalent, suggesting stability in the relative influence of coethnic and non-coethnic peer profits as the size of the local investing population grows. The baseline coefficient for coethnic peer profits drops to about nine per cent more influential than that of non-coethnic peer profits. These results suggest that Kenyan towns do not “outgrow” the biased influence of coethnic peers, with the influence of these socially similar peers remaining relatively stable as market participation grows.

Hypothesis 5 predicts that the influence of coethnic peers relative to non-coethnic peers will be lower in lower wealth towns. This hypothesis is tested in models 14 – 17 with interactions of peer group profits and levels of low and high SES households in the town. Lower levels of wealth are observed in

towns with lower levels of high SES households and higher proportions of low SES households. Results suggest mixed interpretations of the interaction of local wealth with the relative influence of coethnic and non-coethnic peers. Towns with no high SES households are estimated to be more influenced by coethnic peers by virtue of the insignificant baseline coefficient for non-coethnic peer profits, thus failing to support hypothesis 5. As the portion of high SES households in a town grows, results in models 14 and 15 suggest convergence of the influence of these two peer groups, such that completely high SES towns are about equally influenced by both groups. This pattern suggests the opposite of the prediction made in hypothesis 5, as towns with higher levels of wealth are less influenced by coethnic peers rather than more. Working from the opposite direction, towns with no low SES households are about 25 per cent more influenced by coethnic peers, but the relative influence of coethnic to non-coethnic peers falls as the portion of low SES households grows. When the measure of town-level low SES households reaches 50 per cent, the influence of both groups is about equal. The distribution of investors across high and low income towns suggests that the results of models 14 and 15 are more informative. Approximately 67 per cent of all investors are registered to towns where half of all dwellings are coded as high SES; in contrast, only about eight per cent of all investors are registered in towns where more than half of households are coded as low SES. Models 16 and 17 suggest an attenuation of coethnic influence in towns with higher portions of low SES households, but the empirical rarity of investors being located in such towns suggests this is a dubious conclusion to draw. In contrast, the rising influence of coethnic peer profits in towns with fewer high SES households suggests a stronger argument that lower wealth does not attenuate the influence of socially similar peers.

As a final robustness check, I reran all models interacting attributes of the local setting with proximate coethnic and non-coethnic peer profits on the subsample restricting the population to towns within 50 kilometers of a major city. The relative effects of coethnic and non-coethnic peer experiences are unchanged, with the exception that the effect of non-coethnic peers is found to be even stronger in towns home to a regional ethnic minority. That is, restricting the sample to the towns home to more than

80 per cent of all investors suggests no change in any of the above results except it points to an even stronger integrative effect of minority settings as predicted in hypothesis 3.

## **DISCUSSION AND CONCLUSION**

Diversity leads to socially segmented clusters because it reduces contact and integration between members of disparate groups (Blau, 1977; Lau & Murnighan, 2005). Identities that arise within group boundaries create and reinforce commitments to segmented clusters by restricting the set of worthy interaction partners and discounting information coming from members of other groups (Lamont & Fournier, 1992). This segmentation is productive for tasks that benefit from the cohesion fostered by shared identity, such as recruitment into social movements (e.g. Gould 1991; McAdam 1986), faster diffusion of new practices (Hedstrom, 1994; Ouchi, 1981), and the formation of stronger inter-personal relationships (Reagans, 2011). However, segmentation is antithetical to market function because it either restricts the available pathways through which information necessary for informed decision making might flow or it reduces the legitimacy of information received when it pertains to the experiences of socially dissimilar others.

I find strong evidence of social segmentation between ethno-linguistic tribal groups in the recruitment of new investors into Kenya's nascent capital market. In the full sample of all Kenyan towns, profits earned by geographically proximate coethnic peers are 38 per cent more influential than those of non-coethnics. Within 50 kilometers of Kenya's major cities where the majority of investors are registered, experiences of coethnics are even more influential relative to non-coethnics. These results are based on conservative tests that code only the proportions of peer towns belonging to the same ethnic group as coethnics, such that the social distance to different but sympathetic tribal groups is likely overestimated. Additionally, the measure of ethnic populations employed, language used by survey respondents, is known to underrepresent ethnic tribal groups in the capital city of Nairobi, thus inhibiting estimation of their potential influence on coethnics in nearby towns and villages. When models are run without towns within the 50 kilometer radius of influence of Nairobi, the effect of coethnics almost

doubles. If local perceptions of social distance were knowable and a more accurate measure of the capitol's cities' ethnic populations was obtainable, it is likely that my results would be stronger.

The paper began by predicting segmented influence based on ethnic group, but a key contribution is the identification of mechanisms capable of stimulating integration, such that potential investors would be more likely to be influenced by non-coethnic peers' experiences. Earlier research suggested three mechanisms that should foster integration across social groups. First, local ethnic homogeneity should increase the influence of non-coethnics because inter-group identity is strongest and conflict is most likely when diverse populations mix. Second, integration should follow growth in the size of the investing population because prior performance of IPO investments is unambiguous to interpret and the bias induced by social similarity functions in environments of uncertain outcomes and limited information sources. Third, lower levels of wealth should also stimulate integration since lower income actors are less able to discriminate against clear information about the potential gains of a new practice. Not all of these predictions were supported, but the results do suggest ways of thinking about where actors are more likely to come in contact with or consider influential information about socially dissimilar others. Patterns of integration were found in towns with more wealthy households, ethnically homogeneous towns, and towns comprised of ethnic groups in the minority in their region. Of these, ethnic minority towns are by far the rarest, making this result theoretically compelling for theorists but of less use to practitioners actively working to construct markets. However, ethnically homogeneous towns are plentiful in Kenya, comprising just over half the total number of towns with registered investors. Additionally, more than 65 per cent of all investors live in towns where at least half of the residents live in high SES dwellings. These two empirical patterns suggest significant mechanisms capable of attenuating social segregation and increasing integration in this nascent market: information about performance experiences of socially dissimilar others is more available and/or more influential in these settings where many investors reside. In contrast, and a cause of concern for market makers, is that increasing segmentation is associated with growth in the size of the local investing population. Rather than growing its way out of patterns of

segmentation in information access or influence, Kenya's nascent capital market seems to buttress against influence from dissimilar others as the market grows.

The generalizability of the evidence presented here is an important consideration. Kenya is a novel research setting for studying theoretical mechanisms drawn from organization theory, social network analysis, and social movement theory. This novelty can contribute back to these literatures so long as the mechanisms employed are generalizable across contexts. I chose mechanisms likely to moderate social segmentation that are commonly found across locales and scalable to macro and micro settings. Local diversity, market size, and resources in the form of wealth are common features suggested by earlier work that should attenuate the influence of prior performances of socially similar and dissimilar peers. Ethnic diversity, for example, has been shown to be influential for support for economic development investments in both urban areas of developed countries as well as small villages in developing countries (Alesina & La Ferrara, 2005). The patterns of segmentation and integration between ethno-linguistic tribes of Kenya could just as easily be studied by focusing on political parties in 19<sup>th</sup> century England (Carruthers 1999) or communication patterns between rival criminal organizations (Gambetta 2009).

My findings expand the scope of recent research studying how to break dominant patterns of social organization that focus on increasingly clustered, homophilous relations. Sorenson and Stuart (2008) observed that the majority of organization and social network theories predicted increasingly localized, clustered patterns of relations even though empirically we observe a large number of distant ties. These authors argued for the role of settings in which relations form (Feld, 1981) as a key predictor of the receptivity of actors to interactions with distant, unknown others, finding that industry popularity, size of investment syndicate and density of relations within a syndicate are all associated with greater probability of formation of ties between firms separated by larger geographic and industry distances. Other researchers have since adopted this perspective, investigating how local context can help determine the desirability of bilateral ties between intergovernmental organizations (Ingram & Torfason, 2010). Casciaro and Lobo (2008) make a sympathetic argument that inter-personal context in the form of

affective perceptions between contacts predicts evaluations of competence. Without denying the foundational effects of homophily and propinquity, these are examples of a growing literature that seeks to better understand how, where, and why actors choose to integrate with diverse others rather than increasingly organized into homogeneous, local clusters. This paper has contributed a novel study of how the tensions between segmentation and integration play out in the process of market construction, a novel setting for applying theory from organizations, networks, and social movements.

This paper also contributes to the sociological understanding of markets by incorporating theoretical inputs from organizational, contagion, and social movement research into the study of new market construction. Several economic sociologists have conducted rich case studies of market construction, attending primarily to the role played by cultural and technological infrastructure in facilitating the institutional changes necessary to support markets for new products. Examples include the creation of medial markets for egg and sperm donors (Almeling, 2011) and how participation in the first stock markets in London, New York, and Paris were legitimized (Preda, 2009). Guseva (2008) and Rona-Tas and Guseva (2013) provide rich accounts of the institutional changes that took place in post-communist states that made possible the rise of the credit card market. My paper expands on these works by incorporating organization, network, and social movement theories into a study of how individual actors shared and process information about the potential benefits of participation in a newly available market. There is clearly room for numerous expansions and re-combinations of theoretical perspectives to study how markets are constructed.

To be clear, I haven't shown an actual performance outcome as a result of this segmentation, but understanding patterns of market construction has been shown to be productive in explaining longer term performance. Two seemingly separate examples demonstrate how findings can diverge according to context. First, Weber et al. (2009) show that stock exchanges established in developing countries as a result of peer country adoption and emulation of prestigious actors experience higher levels of subsequent market development due to higher levels of commitment to the newly formed institution. Second, Rao et al. (2001) show a different effect of adoption on subsequent efficacy when adoption is caused by

following peers in the more traditional setting. These authors find that stock analysts that initiate coverage of NASDAQ firms due to increased peer coverage are also likely to abandon coverage because they discover that the firms are a poor fit in their portfolio. These papers are examples of how scholars are tracing the mechanisms of social influence on adoption of some practice, including creation of new market institutions, to subsequent performance or development experiences. While I have shown that diversity of participation in the Kenyan market is likely to be a function of the group membership of original participants, future work will need to investigate the effect of segmented recruitment on future actions, and in doing so provide a more complete contribution to the study of market segmentation. In particular, future work will need to investigate the trading patterns of these newly recruited investors to determine if they continue to make use of biased sources of material information when trading in the secondary market or if they increasingly make decisions based on information from dissimilar sources.

Future work should continue to push further into non-traditional settings. More than 30 years ago. Ouchi (1980) conjured the imagery of clans to study organizations, and much research has demonstrated that African tribes function very similarly to social groups in developed settings by serving as institutions central to trustworthy behavior and organization of economic exchange (Brewer, 1981; van Ufford & Zaal, 2004; Ensminger, 1996). But non-traditional settings such as developing countries embed these mechanisms in environments of weak formal institutions, severe resource and opportunity constraints, and impoverished understandings of formal sector financial practices. Each of these conditions is to varying degrees represented in less advantaged areas of developed countries, suggesting that scholars interested in the role of organizations in economic development in both the global north and south will find productive research sites. The literatures in organization theory, economic sociology of markets, and studies of network contagion processes could productively expand the scope of their research by including more non-traditional research settings that provide unique opportunities to test known mechanisms in new settings and discover new mechanisms affecting a wider range of actors, individual and corporate.

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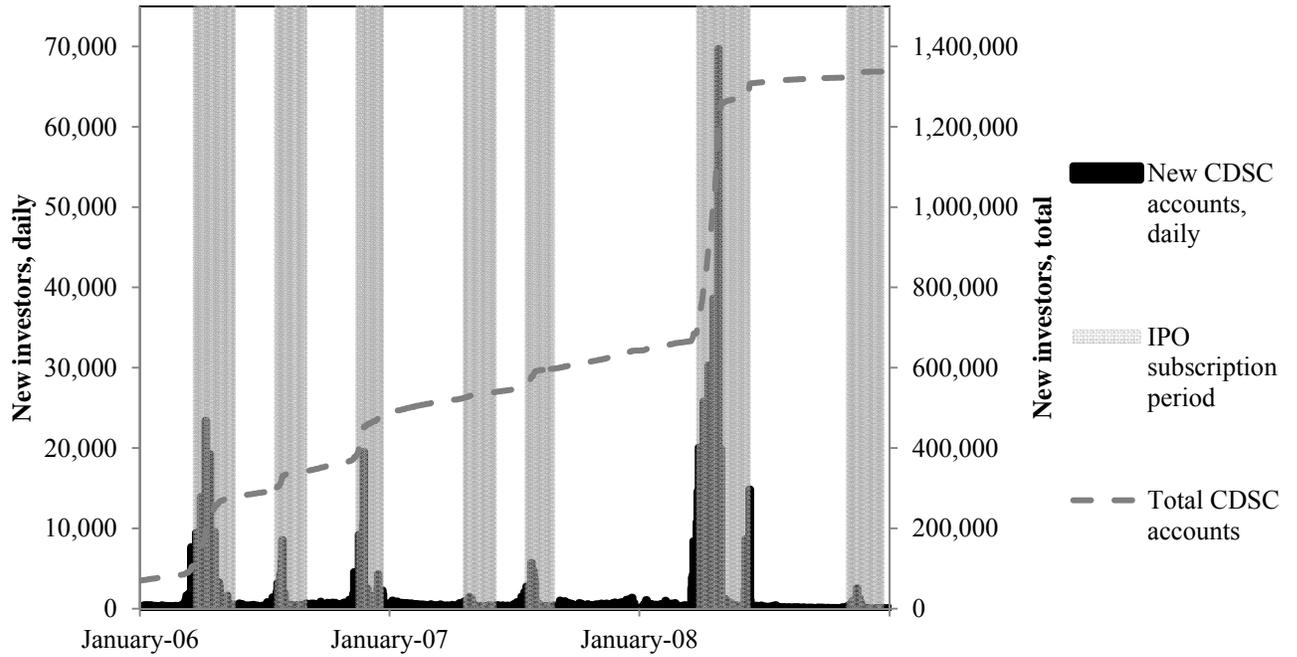
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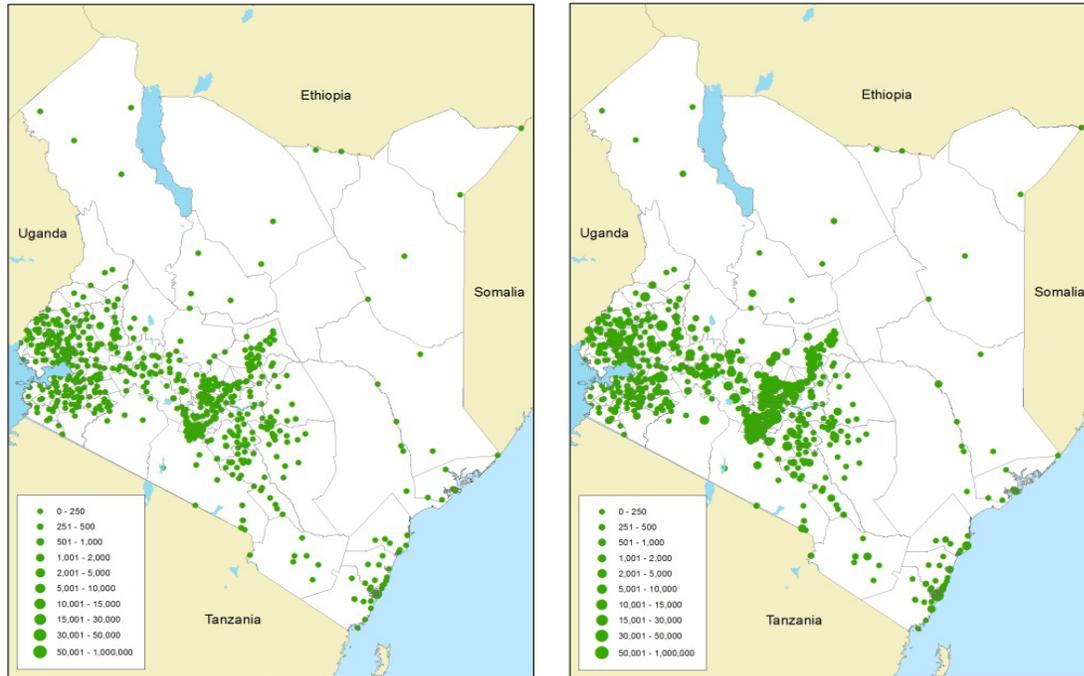
**Figure 1: New and total investors recruited, daily**



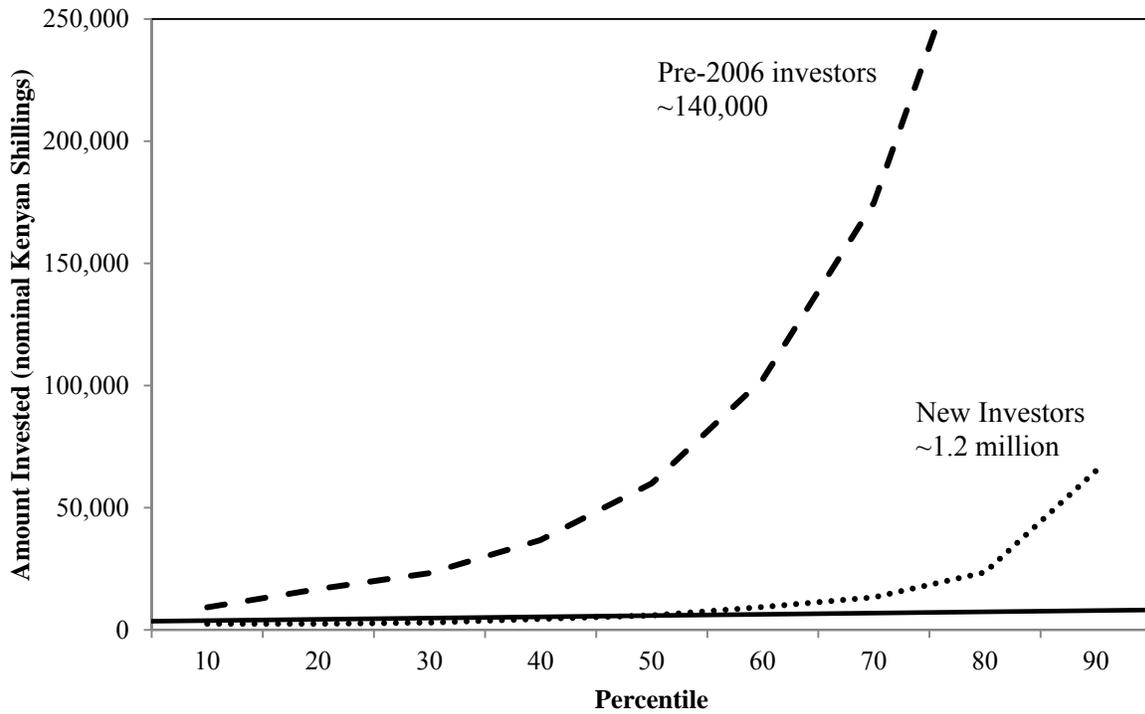
**Figure 2: Geographic distribution of Kenyan shareholders before and after recruitment wave**

Dec. 2005: 366 towns; 140,000 investors

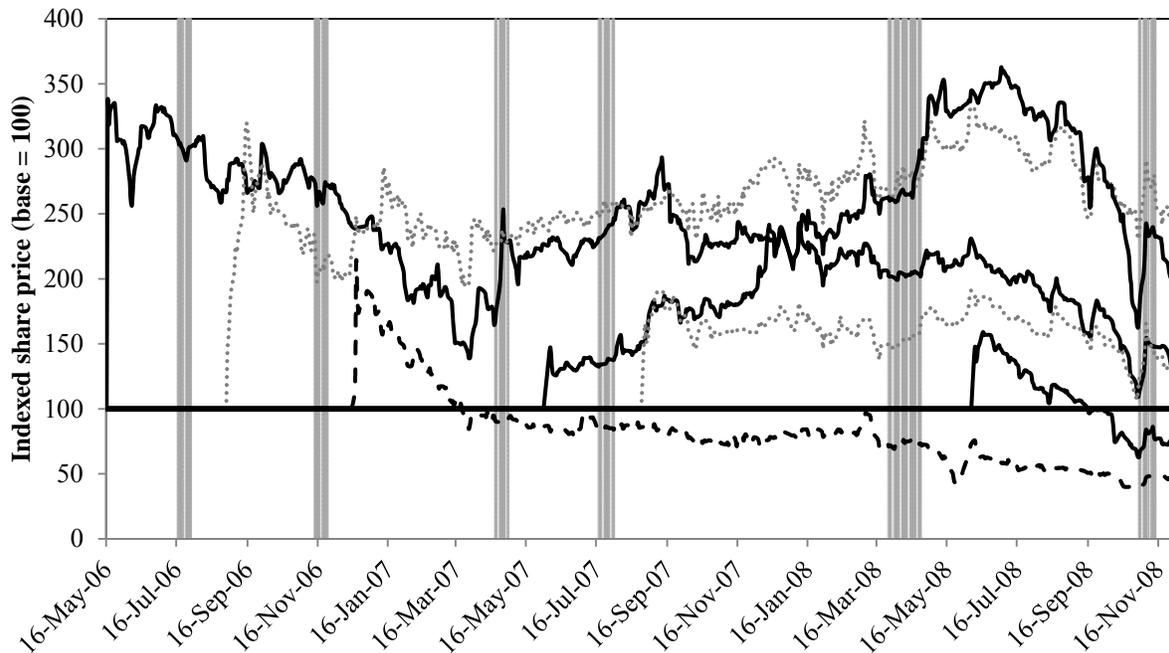
Dec. 2008: 542 towns; 1.4M investors



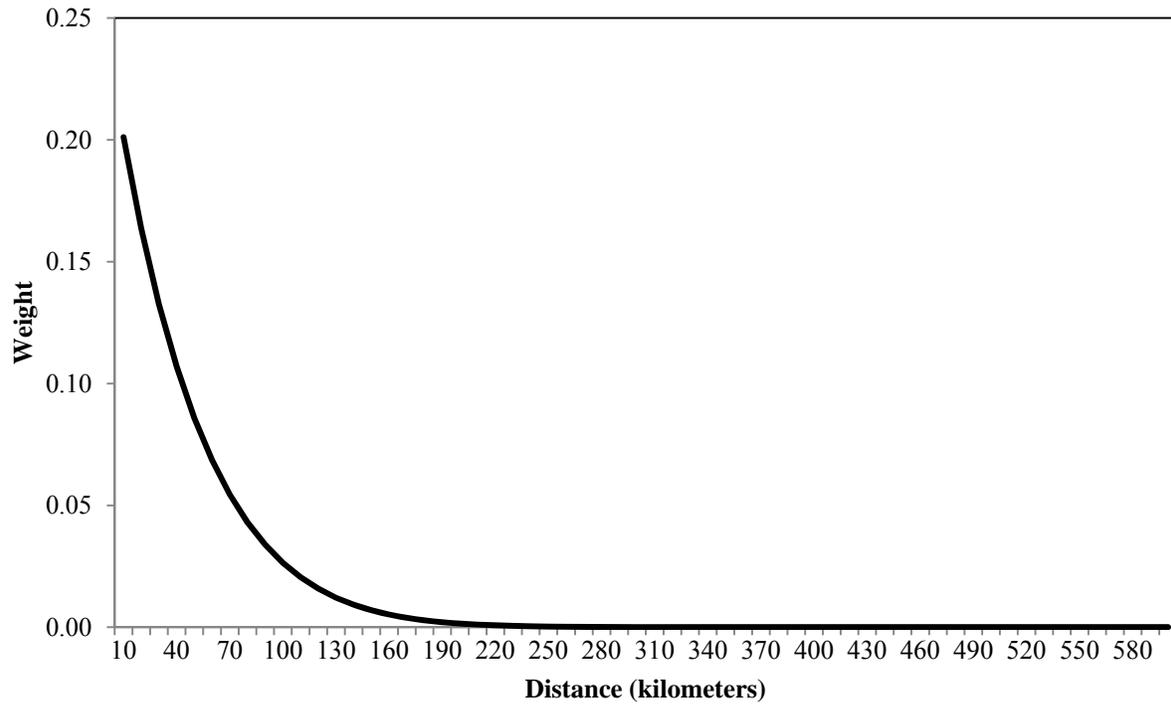
**Figure 3: Value of initial investment by previous and new investors, by percentile**



**Figure 4: Share price performance at the start of the next IPO**



**Figure 5: Simulated Values of Geographic Weighting Scheme, ( $v=10$ )**



**Table 1: Summary statistics and correlation matrix**

Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8
1 New investors	212.93	4,711.68	0	255,466								
2 Coethnic investing peers (ln)	4.44	1.50	0	7.75	0.03							
3 Coethnic peers' profit (ln)	13.01	6.40	-15.61	18.14	0.02	-0.07						
4 Non-coethnic investing peers (ln)	6.27	0.94	2.44	8.33	0.02	0.34	-0.18					
5 Non-coethnic peers' profit (ln)	13.34	9.47	-16.01	18.62	0.01	-0.22	0.54	-0.34				
6 No. existing investors in town (ln)	3.09	2.40	0	13.08	0.14	0.32	-0.11	0.22	-0.13			
7 Cumulative profits in town (ln)	9.12	7.94	-21.19	23.53	0.06	0.01	0.27	-0.16	0.34	0.52		
8 Distance to nearest major city (00's km)	0.69	0.66	0	6.37	-0.03	-0.23	-0.05	-0.21	-0.02	-0.13	-0.06	
9 Listing firm presence	0.45	0.50	0	1	0.05	0.27	-0.07	0.34	-0.14	0.17	-0.02	-0.08
10 Ethnic similarity to listing firm CEO	0.06	0.21	0	1	0.01	0.25	0.05	0.26	-0.28	0.11	-0.02	0.00
11 Use of formal financial products (%)	0.24	0.17	0	0.8	0.06	0.24	0.02	0.08	0.03	0.20	0.09	-0.32
12 Ethnic homogeneity	0.86	0.19	0.37	1	-0.06	-0.20	0.03	0.13	-0.04	-0.21	-0.14	0.20
13 Ethnic minority in district	0.24	0.24	0	1	0.03	0.10	-0.06	-0.20	0.05	0.13	0.09	-0.16
14 IPO advertising exposure (ln)	6.78	3.69	0	12.23	0.05	0.41	-0.18	0.46	-0.25	0.24	-0.10	-0.13
15 At risk population (ln)	4.82	2.83	0	14.60	0.12	0.18	0.05	-0.04	0.14	0.46	0.35	-0.07
16 SES high (%)	0.06	0.17	0	1	0.12	0.32	-0.01	0.11	-0.01	0.31	0.18	-0.18
17 SES low (%)	0.57	0.32	0	1	-0.06	-0.34	0.01	-0.13	0.01	-0.37	-0.20	0.24

	9	10	11	12	13	14	15	16
10 Ethnic similarity to listing firm CEO	-0.01							
11 Use of formal financial products	0.04	0.14						
12 Ethnic homogeneity	-0.02	0.05	-0.15					
13 Ethnic minority in district	0.01	-0.11	0.11	-0.61				
14 IPO advertising exposure (ln)	0.51	0.13	0.07	0.00	0.01			
15 At risk population (ln)	-0.01	0.00	0.24	-0.29	0.07	-0.02		
16 SES high (%)	0.10	0.07	0.32	-0.31	0.28	0.09	0.33	
17 SES low (%)	-0.06	-0.06	-0.36	0.27	-0.10	-0.07	-0.70	-0.49

**Table 2: Negative Binomial Estimates of New Investor Recruitment in Each Town in Each IPO**

				< 50km from major city		< 50km from major city, excluding Nairobi	
<i>Control variables</i>	1	2	3	4	5	6	7
Distance to nearest major city	-0.029 (0.038)	-0.000 (0.041)	0.003 (0.042)	0.252 (0.253)	0.154 (0.242)	0.027 (0.080)	0.090 (0.090)
Listing firm present	0.011 (0.039)	-0.003 (0.041)	0.028 (0.040)	-0.012 (0.069)	-0.001 (0.068)	-0.255*** (0.077)	-0.307*** (0.084)
Ethnic similarity to listing firm CEO	-0.066 (0.043)	-0.112* (0.045)	-0.041 (0.045)	-0.192** (0.069)	-0.100 (0.070)	-0.382* (0.159)	-0.181 (0.160)
Use of formal financial products	-0.196 (0.118)	-0.226 (0.123)	-0.258* (0.122)	-0.319 (0.202)	-0.409* (0.200)	0.056 (0.075)	0.035 (0.088)
Ethnic homogeneity	0.057 (0.114)	0.141 (0.122)	0.034 (0.117)	-0.139 (0.219)	-0.399 (0.210)	-0.287** (0.090)	-0.299*** (0.090)
Ethnic minority in district	0.127 (0.114)	0.164 (0.118)	0.138 (0.116)	-0.021 (0.238)	-0.079 (0.229)	0.008 (0.084)	-0.016 (0.087)
IPO advertising exposure (ln)	0.024* (0.011)	0.020 (0.011)	0.019 (0.011)	-0.006 (0.015)	0.007 (0.015)	0.063*** (0.015)	0.032* (0.014)
At risk population (ln)	0.007 (0.008)	0.014 (0.008)	0.002 (0.008)	-0.010 (0.013)	-0.037** (0.014)	-0.018* (0.009)	-0.029** (0.009)
SES high (%)	-0.147 (0.136)	-0.364* (0.152)	-0.189 (0.142)	-0.849** (0.265)	-0.432 (0.239)	-0.107 (0.093)	-0.146 (0.107)
SES low (%)	-0.107 (0.079)	-0.045 (0.082)	-0.138 (0.082)	0.093 (0.154)	-0.053 (0.147)	0.007 (0.063)	-0.052 (0.066)
Investors in town (ln)	1.235*** (0.022)	1.229*** (0.022)	1.234*** (0.022)	1.134*** (0.038)	1.142*** (0.039)	1.003*** (0.035)	0.967*** (0.036)
Investors in town, squared	-0.036*** (0.002)	-0.035*** (0.002)	-0.036*** (0.002)	-0.023*** (0.004)	-0.024*** (0.004)	-0.002 (0.003)	0.001 (0.003)
Town's profits (ln)	0.005* (0.002)	0.006** (0.002)	0.007*** (0.002)	0.003 (0.004)	0.004 (0.004)	-0.004 (0.003)	-0.001 (0.003)
IPO fixed effects	yes	yes	yes	yes	yes	yes	yes
Ethnic group fixed effects	yes	yes	yes	yes	yes	yes	yes
<i>Explanatory variables</i>							
No. coethnic investing peers (ln)		0.037 (0.055)		0.342*** (0.086)		-0.359*** (0.100)	
No. coethnic investing peers, squared (ln)		0.008 (0.005)		-0.004 (0.008)		0.030** (0.009)	
Coethnic peers' profit (ln)		0.011*** (0.003)		0.016*** (0.004)		0.026*** (0.004)	
No. non-coethnic investing peers (ln)			0.133 (0.074)		0.258* (0.107)		-0.435*** (0.090)
No. non-coethnic investing peers, squared (ln)			-0.007 (0.006)		-0.011 (0.008)		0.039*** (0.008)
Non-coethnic peers' profit (ln)			0.008*** (0.002)		0.011** (0.003)		-0.001 (0.004)
Constant	-4.227*** (0.177)	-4.588*** (0.234)	-4.767*** (0.307)	-4.550*** (0.377)	-4.335*** (0.465)	-3.232*** (0.286)	-2.149*** (0.353)
Log likelihood	-7,354	-7,337	-7,345	-3,545	-3560	-2,574	-2,595
Chi-squared	62,772	62,024	62,285	32,299	31,696	54,231	47,686
Deg. of Freedom	31	34	34	33	33	32	32
No. obs	3,198	3,198	3,198	1,392	1,392	1,110	1,110

Standard errors in parentheses

\* p&lt;0.05 \*\* p&lt;0.01 \*\*\* p&lt;0.001

**Table 3: Negative Binomial Estimates of New Investor Recruitment in Each Town in Each IPO According to Local Settings**

<i>Control variables</i>	8	9	10	11	12	13	14	15	16	17
Distance to nearest major city	-0.000 (0.041)	-0.005 (0.042)	-0.000 (0.041)	-0.004 (0.042)	-0.003 (0.040)	-0.007 (0.041)	0.000 (0.040)	-0.005 (0.041)	0.000 (0.041)	-0.000 (0.042)
Listing firm present	-0.005 (0.041)	0.043 (0.039)	-0.000 (0.041)	0.032 (0.039)	0.034 (0.040)	0.084* (0.039)	0.011 (0.041)	0.051 (0.039)	0.008 (0.041)	0.037 (0.040)
Ethnic similarity to listing firm CEO	-0.113* (0.045)	-0.053 (0.045)	-0.109* (0.045)	-0.065 (0.045)	-0.085 (0.045)	0.005 (0.044)	-0.102* (0.045)	-0.049 (0.045)	-0.110* (0.045)	-0.048 (0.045)
Use of formal financial products	-0.224 (0.123)	-0.258* (0.122)	-0.228 (0.123)	-0.260* (0.122)	-0.220 (0.122)	-0.293* (0.119)	-0.227 (0.122)	-0.250* (0.121)	-0.235 (0.123)	-0.287* (0.122)
Ethnic homogeneity	0.104 (0.166)	0.388* (0.162)	0.142 (0.122)	0.059 (0.116)	0.142 (0.121)	0.052 (0.114)	0.135 (0.121)	0.068 (0.115)	0.126 (0.122)	0.044 (0.117)
Ethnic minority in district	0.163 (0.118)	0.152 (0.116)	0.086 (0.148)	-0.132 (0.143)	0.182 (0.116)	0.159 (0.113)	0.175 (0.117)	0.154 (0.114)	0.162 (0.118)	0.149 (0.116)
IPO advertising exposure (ln)	0.021 (0.011)	0.019 (0.011)	0.021 (0.011)	0.019 (0.011)	0.020 (0.011)	0.019 (0.011)	0.021 (0.011)	0.019 (0.011)	0.020 (0.011)	0.019 (0.011)
At risk population (ln)	0.014 (0.008)	0.009 (0.008)	0.014 (0.008)	0.008 (0.008)	0.019* (0.008)	0.006 (0.008)	0.015 (0.008)	0.011 (0.008)	0.015 (0.008)	0.005 (0.008)
SES high (%)	-0.365* (0.152)	-0.196 (0.140)	-0.355* (0.152)	-0.196 (0.140)	-0.348* (0.150)	-0.151 (0.137)	-0.576** (0.178)	-0.507** (0.162)	-0.379* (0.152)	-0.169 (0.141)
SES low (%)	-0.047 (0.082)	-0.103 (0.082)	-0.042 (0.082)	-0.109 (0.082)	-0.019 (0.081)	-0.106 (0.081)	-0.038 (0.082)	-0.090 (0.081)	0.230 (0.129)	0.095 (0.113)
Investors in town (ln)	1.230*** (0.022)	1.232*** (0.022)	1.228*** (0.022)	1.233*** (0.022)	1.139*** (0.028)	1.130*** (0.026)	1.226*** (0.022)	1.230*** (0.022)	1.225*** (0.022)	1.231*** (0.022)
Investors in town, squared	-0.035*** (0.002)	-0.036*** (0.002)	-0.035*** (0.002)	-0.036*** (0.002)	-0.035*** (0.002)	-0.035*** (0.002)	-0.035*** (0.002)	-0.036*** (0.002)	-0.035*** (0.002)	-0.036*** (0.002)
Town's profits (ln)	0.006** (0.002)	0.007*** (0.002)	0.006** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.009*** (0.002)	0.007*** (0.002)	0.008*** (0.002)	0.007*** (0.002)	0.008*** (0.002)
IPO fixed effects	yes									
Ethnic group fixed effects	yes									
<i>Explanatory variables</i>										
No. coethnic investing peers (ln)	0.037 (0.055)		0.036 (0.055)		0.071 (0.055)		0.038 (0.054)		0.044 (0.055)	
No. coethnic investing peers, squared (ln)	0.008 (0.005)		0.008 (0.005)		0.006 (0.005)		0.008 (0.005)		0.008 (0.005)	
Coethnic peers' profit (ln)	0.009 (0.006)		0.009* (0.004)		-0.032*** (0.008)		0.006* (0.003)		0.015*** (0.003)	
No. non-coethnic investing peers (ln)		0.134 (0.074)		0.136 (0.073)		0.166* (0.073)		0.133 (0.073)		0.136 (0.074)
No. non-coethnic investing peers, squared (ln)		-0.007 (0.006)		-0.007 (0.006)		-0.009 (0.006)		-0.007 (0.006)		-0.007 (0.006)
Non-coethnic peers' profit (ln)		0.023*** (0.006)		0.002 (0.003)		-0.035*** (0.006)		0.002 (0.003)		0.012*** (0.003)
Coethnic peers' profit (ln) * Ethnic homogeneity	0.002 (0.007)									
Non-coethnic peers' profit (ln) * Ethnic homogeneity		-0.020** (0.007)								
Coethnic peers' profit (ln) * Ethnic minority in district			0.006 (0.006)							
Non-coethnic peers' profit (ln) * Ethnic minority in district				0.018** (0.005)						
Coethnic peers' profit (ln) * Investors in town (ln)					0.006*** (0.001)					
Non-coethnic peers' profit (ln) * Investors in town (ln)						0.006*** (0.001)				
Coethnic peers' profit (ln) * SES high							0.014* (0.006)			
Non-coethnic peers' profit (ln) * SES high								0.021*** (0.005)		
Coethnic peers' profit (ln) * SES low									-0.018** (0.007)	
Non-coethnic peers' profit (ln) * SES low										-0.013** (0.004)
Constant	-4.559*** (0.251)	-5.093*** (0.322)	-4.560*** (0.236)	-4.758*** (0.304)	-4.093*** (0.248)	-4.214*** (0.310)	-4.531*** (0.234)	-4.778*** (0.302)	-4.660*** (0.236)	-4.866*** (0.308)
Log likelihood	-7336	-7340	-7336	-7339	-7323	-7316	-7334	-7333	-7333	-7341
Chi-squared	61944	63358	62329	63483	63786	66229	62882	64412	62411	62734
Deg. of Freedom	35	35	35	35	35	35	35	35	35	35
No. obs	3198	3198	3198	3198	3198	3198	3198	3198	3198	3198

Standard errors in parentheses  
\* p<0.05 \*\* p<0.01 \*\*\* p<0.001