

Ethnic Investing and the Value of Firms*

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Abstract

We study ethnic investing, using transaction level data from Kenya’s stock exchange (NSE) and CEO/board turnover. We first show that a given investor invests more in a given firm when the firm is run by coethnics, and earns lower risk-adjusted returns on such investments. Theory predicts that, other things equal, neglect of a subset of investment objects—such as the taste- or psychology-driven ethnic investing we uncover—will lower aggregate value creation. We find that compensating supply-side responses and arbitrage are limited. Our estimates imply that Kenya’s publicly listed firms could have been worth USD 32.4 billion (281 percent) more if investors ignored management’s ethnicity.

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1 Introduction

Individuals, regions, and nations tend to invest much more in others to which they are linked through ethnic ties.¹ This may be due to information asymmetries arising, for example, from easier communication or screening among coethnics, in which case investors will earn higher returns on coethnic investments (Lang, 1986; Cornell & Welch, 1996; Fisman, 2003; Fisman *et al.*, 2017). Alternatively, investors may have a taste for investing in coethnics, in which case they will earn lower returns on coethnic investments (Becker, 1957; Hjort, 2014; Fisman *et al.*, 2018).

Individual investors' differential returns on coethnic investments thus help identify the underlying source of investor biases. The *aggregate* economic consequences of coethnic investing—of interest to economists at least since the seminal work of Banerjee & Munshi (2004)—do not follow directly from the sign and size of such differential returns, however. How coethnic investing affects the average value of a firm, for example, depends also on the extent of both supply-side responses (Becker, 1957)—such as preferred use of CEOs from large ethnic groups—and, in the case of taste-based coethnic investing, arbitrage from unbiased investors (Shleifer & Vishny, 1997).

In this paper we study the extent, nature, and aggregate economic consequences of coethnic investing in Kenya. To do so, we use complete transaction level data from the Nairobi Securities Exchange (NSE) from 2005 through 2011. Exploiting an unusual feature of the context we study—some firms “change ethnicity” during our data period as a consequence of management turnover—we first show that a *given Kenyan investor* invests considerably more *in a given firm* when its CEO and/or board is of the same ethnicity as the investor, and earns lower risk-adjusted returns as a result. Taking advantage of the complete market nature of the NSE, we show that supply-side responses and arbitrage do not offset the impact on firms' market valuation of the misallocation of demand arising from the average investor's preference for coethnic firms. Our estimates imply that coethnic investing lowers the combined value of publicly listed Kenyan firms by about USD 32 billion.

The Kenyan stock exchange is an ideal setting to study coethnic investing for several reasons. First, ethnic divisions permeate Kenyan society (Ndegwa, 1997; Barkan, 2004; Hjort, 2014). Second, some investment objects—in our context, large firms—in effect change ethnicity across time in Kenya, and we observe the ethnicity and investment behavior of tens of thousands of individual investors. This means that we can identify how coethnicity affects investment *within investor-investment object pairs*, which has not been possible to do in existing research (see also Bertrand & Mullainathan, 2004). Third,

¹See, among many others, Saxenian (1999); Fafchamps (2000); Rauch (2001); Banerjee & Munshi (2004); Guiso *et al.* (2009); Hjort (2014); Burgess *et al.* (2015); Beach & Jones (2017); Fisman *et al.* (2017); Burchardi *et al.* (2017); Fisman *et al.* (2018).

since we study “atomistic” investors whose returns are fully observed, we can distinguish returns- increasing and decreasing sources of discrimination with confidence. Finally, observing all firms and all investors in the market allows us to capture aggregate phenomena that are difficult to get at in partial samples (Becker, 1957; Arrow, 1973; Shleifer & Summers, 1990), in particular the ultimately impact of coethnic investing on stock prices market-wide. Stocks market are broadly considered among the most efficient ways to allocate capital, and around 45 developing countries have established exchanges during the last 30 years.

We start our analysis by documenting a positive and large coethnicity effect in investment decisions. To do so, we first regress measures of an investor’s investments in a given firm on measures of the firm’s CEO and/or board belonging to the same ethnicity as the investor in the month in question, controlling for month, investor, and firm (or, alternatively, investor-firm) fixed effects. We show that the particular parallel trends assumption required to interpret the estimate causally appears to hold.² To investigate *why* investors invest more in coethnic firms, we show that the risk-adjusted return on such investments is on average lower. This suggests that coethnic investing in Kenya is primarily explained by investor preferences.³

In the final part of the paper, we show that the identified excess demand for coethnic firms markedly influences firms’ market valuation.⁴ Theory suggests that, relative to counterfactual, ethnicity-blind investing, preference-driven coethnic investing will lower the average value of firms, unless supply-side responses or arbitrage fully “compensate” for the implied excess total demand for firms led by managers from large ethnic groups (Becker, 1957; Merton, 1987; Shleifer & Vishny, 1997).⁵ To test this prediction, we take advantage of the fact that (i) we observe *all* investors and *all* firms, and (ii) the size of firms’ coethnic investor base varies over time.

We show that, when the number or portfolio wealth of investors that are active in the stock market and that belong to the same ethnic group as a given Kenyan firm’s CEO

²That is, the times when firms switch to management of another ethnicity are not times when investment from “pre-coethnics”/“post-coethnics” relative to investment from other investors are trending up/down, relative to other investors.

³Investor psychological biases may also contribute to the form of coethnic investing we identify, but this paper’s focus is on the economic consequences of coethnic investing for firms rather than for investors. Whether coethnic investing is of a form that increases or decreases investors’ returns is important because the two imply different economic consequences for firms (as a whole). However, psychology- and taste-based coethnic investing both predict lower financial returns for investors. Note also that the same motivation that leads investors to *allocate* a higher share of their investments to coethnics may also affect the *total amount* invested (see Hjort, 2014; Burchardi *et al.*, 2017). If so, a preference for coethnic investment objects could potentially have a positive effect on total value creation by shifting funds from alternative uses into investment, in addition to a negative effect resulting from preference-driven (mis)allocation across investment objects.

⁴Since public firms’ decisions—about investment, debt versus equity, mergers and acquisitions, compensation, etc—depend on their market capitalization (Baker *et al.*, 2003), distortions in market capitalizations likely in turn constrain real economic growth.

⁵A priori, it could also be that stock prices are driven by “fundamentals”, investors earning a given return on a given investment simply because of its timing.

changes, the price-to-book value of the firm changes in the same direction as the size of the “coethnic (potential) investor base”. Similarly, when a firm’s coethnic (potential) investor base increases because a change in CEO ethnicity resulting from management turnover that changes the firm’s coethnic investor base from one ethnic group to another, the firm’s price-to-book value increases. In contrast, when the firm’s coethnic investor base decreases because of a change in CEO ethnicity, the firm’s price-to-book value decreases.⁶ Such changes in firms’ “ethnicity” do not have detectable impact on *other* firms stock market valuations, however, perhaps because each firm is small relative to the market as a whole. A back-of-the-envelope calculation suggests that the total value of the firms listed on Kenya’s stock exchange would be about USD 32.4 billion higher today if investors did not engage in coethnic investing.

This paper contributes to three distinct but related areas of the literature on the existence; nature; and economic consequences of discriminatory investing. Economists have long been interested in the possibility of market-wide economic costs of discrimination (Becker, 1957; Arrow, 1973; Phelps, 1972; Banerjee & Munshi, 2004),⁷ but empirical estimates have, with the exception of Charles & Guryan (2008) and Hsieh *et al.* (2018)’s analyses of U.S. labor markets, remained elusive.⁸ The primary reason is that responses that mediate the impact on market-wide growth—such as induced differential changes in the supply of investment objects of different ethnicities and arbitrage by unbiased investors—are difficult to account for in partial samples. This paper to our knowledge provides the first estimate of how homophily investing affects total value creation. This is made possible by the fact that we analyze a complete market, in which some firms “change ethnicity” over time, and wherein a specific form of discrimination yielding predictions for how value creation should—in the absence of fully compensating market responses—be affected is identified at the micro (investor \times firm) level.⁹ We document the extent to which

⁶These findings also hold when we control for the factors that should capture price-to-book valuations in the absence of a “cliente effect” per finance theory (Merton, 1987), instead of holding the investment object (here the firm) itself constant by including its fixed effect as is more common in the discrimination literature.

⁷This area of research began with the famous debate between Becker (1957) and Arrow (1973) over taste-based versus statistical models of discrimination (see also Phelps (1972)). The seminal work of Banerjee & Munshi (2004) emphasized the possible impact on firm growth if access to capital differs across ethnic groups.

⁸Charles & Guryan (2008) show support for the predictions of Becker (1957)’s taste-based model of discrimination in data on U.S. wages and racial attitudes. They then use the model to predict how much higher black workers’ wages would be if the “marginal discriminator” among employers was less discriminatory. Hsieh *et al.* (2018) back out the change in discrimination and related frictions that must have occurred in the U.S. from 1960 to 2010 to explain the observed convergence in the occupational distribution and wages of blacks and women relative to white men, and filter the resulting estimates through a general equilibrium model to quantify the impact on GDP per person that such changes may explain.

⁹The direct mapping from the change in the size of a firm’s group of coethnic potential investors—arising either from management turnover or investors joining/leaving the NSE over time—that we exploit in our aggregate (firm) level analysis on the one hand, and the corresponding predictions for how such changes in investor groups should affect the value of a firm that come out of the specific form of discrimination we identify at the micro (investor \times firm) level on the other hand, is important. Existing studies have restricted attention to how the ethnicity (or related characteristics) of an investment object correlate with the value of, or returns to investing in, the object. Banerjee & Munshi (2004) document a relationship between the community group to which a knitted garment firm in Tirupur, India belongs and how much

coethnic investing misallocates demand and thereby lowers the average value of a large Kenyan firm.

Our primary contribution to the body of work quantifying the micro level relationship between ethnic ties and investment (see references in footnote 1) is to identify the causal effect of coethnicity *holding the identity of the investor-investment object pair constant*. Existing studies estimate a different causal effect. They do so by comparing a given investor when s/he is quasi-randomly assigned to a coethnic versus a non-coethnic investment opportunity (Hjort, 2014; Fisman *et al.*, 2017, 2018) or vice versa (Burgess *et al.*, 2015; Burcharde *et al.*, 2017). Such an approach cannot separate the effect of correlated, unobserved match characteristics from that of coethnicity itself, a caveat that complicates interpretation. Studying changes in coethnicity within investor-investment object pairs arguably does so.¹⁰ In addition, we analyze a type of market—stock markets—and a type of firm—large firms—on which evidence from developing countries is almost entirely absent (see also Yenkey, 2015; Anagol & Kim, 2012; Anagol *et al.*, forthcoming, 2018), despite both generally being considered essential to economic growth (Rajan & Zingales, 1998; Levine, 2005; Larrain, 2010).

Loury (1998); Altonji & Blank (1999); List & Rasul (2011); Charles & Guryan (2013) survey the literature that, building on the seminal work of Becker (1957), Arrow (1972), and Phelps (1972), attempts to pin down what motivates discriminatory behavior—and explain in detail why it is very difficult to do so.¹¹ Our contribution to this line of research is made possible by studying a context where investors are “atomistic” and returns—above and beyond taste-based and psychological rewards—are therefore purely financial (and fully observed). We show that, in such a context, a classical information asymmetry story in which investments in coethnic investment objects reap higher returns is not the primary explanation underlying coethnic investing.¹² Preference-based coethnic in-

capital the firm has. Rauch & Trindade (2002) and Banerjee & Pande (2007) show related evidence on international trade and politics respectively. In finance, Hong & Kacperczyk (2009) show that “sin stocks” are less held by institutional investors subject to norms and display higher returns than otherwise comparable stocks.

¹⁰Unobserved match characteristics between CEOs and boards on the one hand and investors on the other that are correlated with coethnicity are—even among the retail investors that make up the large majority of our sample—a possibility, but much less of a concern than the match characteristics between investors and investment objects themselves that existing studies may in part capture. One reason for this is that managers’ have limited influence on even more basic measures of firm performance *relative to firms themselves* (Bertrand & Schoar, 2003).

¹¹See, among others, Altonji & Pierret (2001); Knowles *et al.* (2001); Bertrand & Mullainathan (2004); Charles & Guryan (2008); Bandiera *et al.* (2009); Shayo & Zussman (2011); Hedegaard & Tyran (2017); Bohren *et al.* (forthcoming). There is also a set of studies that specifically investigate why individuals in developing countries often discriminate against non-coethnics (see e.g. Greif, 1993; Habyarimana *et al.*, 2007; Eifert *et al.*, 2010; Hjort, 2014; Burgess *et al.*, 2015; Berge *et al.*, 2016; Fisman *et al.*, 2017, 2018).

¹²In most existing studies, using the fundamental difference between the predicted consequences of information asymmetry- versus preference-driven discriminatory investing to tell apart motivations has not been possible because returns are rarely observed. We follow a handful of existing studies of real markets and workplaces in doing so (Cohen *et al.*, 2008; Hjort, 2014; Fisman *et al.*, 2017, 2018). However, in settings where investors are not atomistic relative to the investment objects, the researcher may not observe all relevant dimensions of the return on investment. For example, it may be that upstream “suppliers” in a production line who send more intermediate inputs to downstream coethnics than non-coethnics lower their own pay—as in Hjort (2014)—but are rewarded socially outside of the workplace for

vesting of the form we uncover may help explain why investors across the world invest much more in firms with which they share a geographical location, language, or culture, and—related—why capital flows to poor countries are much lower than the abnormally high associated returns would suggest (Banerjee & Duflo, 2005; McKenzie *et al.*, 2008). The widespread phenomenon of homophily investing—or “home bias”—is extensively documented in existing research (French & Poterba, 1991; Coval & Moskowitz, 1999; Huberman, 2001; Seasholes & Zhu, 2010; Hvide & Døskeland, 2011), but poorly understood.

2 Background and Data

Ethnic rivalries have characterized Kenyan political and economic affairs since independence (for more background, see e.g. Ndegwa, 1997; Barkan, 2004; Dupas & Robinson, 2012; Hjort, 2014; Berge *et al.*, 2016; Jakiela & Ozier, 2017), but the Nairobi Securities Exchange (NSE) was effectively inaccessible to ordinary Kenyans until the 2000s. By the early 2000s, more firms wanted to be listed on the NSE, and more Kenyans could afford to invest in stocks. The Privatization Act of 2005 lowered entry barriers to retail investing by digitizing the trading system and by requiring firms to make a higher proportion of newly issued shares accessible to domestic, small-scale investors via smaller lots. Especially in the first few years after 2005 the number of investors on the NSE grew rapidly—by several hundred thousand a year, from a base of around 140,000 (Yenkey, 2015).

Detailed information on the data we use is in the Online Appendix; we now provide an overview. The version of the NSE’s Transactions Registry we have access to reports the firm’s ticker id, the number of shares traded, the price, the seller’s (masked) id, the buyer’s (masked) id, and the date for all trades that occurred on the NSE between January 1, 2005 (when the NSE’s trading system “went digital”) through December 31, 2011. The version of the NSE’s Investor Registry we have access to reports the investor’s (masked) id, account creation year, and—crucially—last name. In addition, the names of listed firms’ CEO and board-members are publicly available. Information on firms’ book value, outstanding shares, etc, come from their financial statements.

As seen in Panel A of Table 1, the investors in our data are 40 years old on average, and about three quarters are male. Half joined the NSE before or during the stock exchange’s first year of digital operation, before 2006. Panel B shows that 41 of the 47 firms that are observed on the NSE during our data period were listed before 2006. The firms cover a range of sectors, with 24 percent in “Commercial and Services”, 31 percent in “Finance and Investment”, and 36 percent “Industrial”. The firms are large, with an average total market capitalization of around USD 200 million in 2006 and USD 240 million in 2010. In

doing so. This paper’s results are essentially unchanged when we exclude the largest investors, who could conceivably influence (coethnic) managers’ behavior. This is expected as we do not weight investors by their size.

Panel C we see that most investors increase their holdings during our data period and earn relatively high returns—about 14 percent per year annualized—on their investments. The investor belongs to the same ethnicity as the CEO in 25 percent of investor \times firm \times month observations.¹³

We probabilistically assign ethnicities to investors, CEOs, and board-members using their last names. The starting point is name \times ethnicity match probability information recorded by [Yenkey \(2015\)](#). The author hired eight Kenyan research assistants (RAs), each of whom reported if s/he was highly confident that a given name could belong to a given ethnicity or not.¹⁴ There is overlap in the names used by some ethnicities so that the RAs could assign a given name to multiple ethnicities. Using the RAs' reports, we construct four measures of an investor's ethnic proximity to a CEO and to a board respectively. The first CEO measure, CoethnicCEO_{ijt} , is an indicator variable equal to one if investor i and the CEO running firm j in month t are relatively likely to belong to the same ethnicity and relatively unlikely to belong to two different ethnicities. The second CEO measure, $\text{CEOCOethnicityIndex}_{ijt}$, is a 0 (minimum proximity) to 1 (maximum proximity) measure of the expected ethnic proximity between the investor's and the CEO's name, given each person's expected probability of belonging to each ethnicity.¹⁵ One board measure, $\text{BoardCoethnicityIndex}_{ijt}$, is equal to the proportion of board-members that are coethnic, where coethnicity is measured as for the CoethnicCEO_{ijt} . The other board measure, $\text{CoethnicBoard}_{ijt}$, is a 0/1 variable, and essentially repeats the construction of CoethnicCEO_{ijt} twice, first between individual board-members and the CEO, then for the board as a whole vis-a-vis the CEO. More detailed information on the construction of our four measures of coethnicity is in the Online Appendix.¹⁶

3 Ethnic Investing in Kenya

To estimate how investor-firm coethnicity causally affects investment, we take advantage of two features of the context we study. First, we observe which particular investors belong to the same ethnicity as a given firm's management at a given point in time. Second,

¹³Coethnicity is here measured as $\text{CoethnicCEO}_{ijt}=1$. This measure is described in the next paragraph.

¹⁴The ethnicities the RAs were asked about, and that we observe, are Anglo, Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Somali, South Asian, and Swahili.

¹⁵Specifically, the index is equal to 1 minus [Lieberman \(1969\)](#)'s index of population diversity.

¹⁶All four of our measures of investor-firm coethnicity give similar results. $\text{CEOCOethnicityIndex}_{ijt}$ is "assumptions-free" and follows directly from the raw data; we show in the Online Appendix that our results are generally robust to an alternative way to construct the measures of ethnicity itself from the name \times ethnicity match probability data that enter into the construction of CoethnicCEO_{ijt} , $\text{BoardCoethnicityIndex}_{ijt}$, and $\text{CoethnicBoard}_{ijt}$. $\text{CoethnicBoard}_{ijt}$ is a strict measure of investor-board coethnicity in the sense that, to set $\text{CoethnicBoard}_{ijt} = 1$ in month t , we require, first, each individual board-members to be either a likely coethnic or a likely non-coethnic of the CEO, and second, for the board as a whole to be relatively likely to belong to the same ethnicity as the CEO and relatively unlikely to belong to another ethnicity.

when CEOs and board-members are replaced by others of another ethnicity, the coethnicity status of a *given investor-firm pair* changes.

We first run:

$$\text{Investment}_{ijt} = \alpha + \beta \text{CoethnicFirm}_{ijt} + \gamma_i + \delta_j + \psi_{c(jt)} + \theta_t + \varepsilon_{ijt} \quad (1)$$

where Investment_{ijt} is the value of the investment investor i holds in firm j in month t , normalized by the total value of all her investments, or firm j 's "portfolio weight" in i 's portfolio.¹⁷ In addition to month fixed effects θ_t , we also include investor, firm, and CEO ethnicity fixed effects γ_i , δ_j , and $\psi_{c(jt)}$ so that our results are not driven by differences across investors, firms, or the various ethnic groups present in our data.¹⁸ We assess whether a given investor holds a bigger investment in a given firm in a given month when the firm is of the same ethnicity as the investor versus when it is not. As discussed in Section 2, we show results for four definitions of $\text{CoethnicFirm}_{ijt}$, two measuring investor-CEO coethnicity and two measuring investor-board coethnicity. We cluster the error term ε_{ijt} at the investor level.

The portfolio weight specification of the outcome variable Investment_{ijt} follows standard practice in the investor behavior literature, whose focus is generally on cross-sectional relationships (see e.g. Cohen *et al.*, 2008; Hvide & Døskeland, 2011). However, our focus is on how coethnicity affects investment—and ultimately firms themselves—and $\text{CoethnicFirm}_{ijt}$ varies across time within a given investor-firm pair. It is reasonable to expect an investor's *stock* of investments in a given firm to respond only gradually after a firm "becomes co-ethnic" (or becomes non-coethnic), but her investment *flows* should respond more rapidly if she is in fact influenced by the firm's ethnicity. We thus exploit the full granularity of the NSE transactions data to construct the outcome variable $\text{OrderImbalance}_{ijt}$ —the value of shares in firm j purchased by investor i in month t minus the value of shares in the firm sold by the same investor in the same month, divided by the sum of purchases and sales by i in j at t (see e.g. Chordia *et al.*, 2002).¹⁹ We run:

$$\text{OrderImbalance}_{ijt} = \alpha + \beta \text{CoethnicFirm}_{ijt} + \gamma_i + \delta_j + \psi_{c(jt)} + \theta_t + \varepsilon_{ijt} \quad (2)$$

¹⁷We do not observe shares that an investor had bought before the NSE "went digital" in 2005 and did not trade thereafter. To construct a measure of an investor's portfolio, we thus assume that all investors have zero holdings at the beginning of 2006. We thereafter simply add any observed purchases to investor i 's inferred holdings, and subtract any observed sales from her inferred holdings. Our results are very similar if we instead focus only on investors who opened their NSE account in 2006 or later, in which case we observe investors' full portfolio at every point in time. The fact that we do not observe pre-2005 holdings is not relevant for the "flow" measure of coethnic investing, $\text{OrderImbalance}_{ijt}$, we use below.

¹⁸Including firm fixed effects also means that our analysis controls for differences in average market capitalization across firms.

¹⁹Normalizing net purchases by volume traded is standard. Doing so controls for potential liquidity differences across observations (see e.g. Chordia *et al.*, 2002).

As seen in the top panel of Table 2, the share of an investor’s investments that is held in a given firm at a given point in time is 3.7 percent higher if the firm is managed by a co-ethnic CEO ($\text{CoethnicCEO}_{ijt} = 1$).²⁰ Similarly, the fraction of her investments an investor holds in a given firm is 6.4 percent greater when she has maximum ethnic proximity to the firm’s CEO ($\text{CEOCOethnicityIndex}_{ijt} = 1$) than when she has minimum ethnic proximity to the firm’s CEO ($\text{CEOCOethnicityIndex}_{ijt} = 0$). Columns 3 and 4 show that the share of an investor’s investments that is held in a given firm at a given point in time is 4.2 percent higher if the firm is managed by a coethnic board ($\text{CoethnicBoard}_{ijt} = 1$), and 31 percent greater when she has maximum ethnic proximity to the firm’s board ($\text{BoardCoethnicityIndex}_{ijt} = 1$) than when she has minimum ethnic proximity to the firm’s board ($\text{BoardCoethnicityIndex}_{ijt} = 0$).²¹

Columns 1 and 2 of the bottom panel of Table 2 show that a given investor’s normalized net investment in a given firm in a given month—investor i ’s $\text{OrderImbalance}_{ijt}$ for firm j in month t —is 3.7 percent greater if the firm is managed by a coethnic CEO in the month in question; 8.1 percent greater with maximum relative to minimum ethnic proximity to the CEO; 14 percent greater if the firm is managed by a coethnic board in the month in question; and 80 percent greater with maximum relative to minimum ethnic proximity to the board.

An important qualification to our coethnicity-based interpretation of our findings thus far—and to our knowledge to those of essentially all existing studies of ethnic discrimination in real markets and workplaces—is that we cannot rule out based on the results in Table 2 themselves that it is other correlated, unobserved match characteristics rather than coethnicity itself that increases an investor’s investment in a firm.²² To zero in on a purely coethnicity-based interpretation of the estimated match effect, we replace γ_i and δ_j with an investor-firm fixed effect, and thus identify how coethnicity affects investment *within investor-investment object pairs*. Rather than also taking advantage of the fact some investors belong to the same ethnicity as a given firm’s management at a given point in time and others do not, we then exclusively rely on CEO/board turnover for identifica-

²⁰ All stock market transactions have both a seller and a buyer. This raises the natural question of who is, on average, on the other side of the market in transactions that increase the portfolio weight of coethnic firms for a given buyer (or seller). An important part of the answer is that “ethnic concentration”—the proportion of equity held by coethnic investors—increases during our data period, implying that many such transaction partners are simply non-coethnics of the relevant CEO or board. Another contributor is that the period we study is one in which many small investors joined the stock market, buying equity from larger investors. This contributes to the estimates in Table 2 as we do not weight investors by their size.

²¹ There are several potential reasons why board coethnicity may have a greater effect on investment than CEO coethnicity. It could for example be that changes in which ethnic group dominates a board are less frequent than changes in the identity of the CEO and hence provide a more deeply rooted measure of a firm’s true identity in the eyes of investors.

²² The only study we know of that directly investigates the extent to which a range of *observed*, correlated match effects explain an estimated match-based discrimination effect attributed to coethnicity (or, more precisely, co-religiosity) is Lavy *et al.* (2018). They do so by controlling for various observed match characteristics. Such an approach is conceptually similar to that of audit studies in which the worker attributes listed on a CV are held fixed while the name on the CV is experimentally varied (see e.g. Bertrand & Mullainathan, 2004).

tion. Such an approach will isolate the pure coethnicity effect as long as firms that switch from being managed by a CEO/board of ethnicity A to being managed by a CEO/board of ethnicity B in a given month are on trends in investment from investors of ethnicity A and B that, relative to the trend in investment from investors of other ethnicities, are parallel to those of other firms. We begin by providing direct evidence in support of this assumption of parallel trends.

In Figure 1 we restrict attention to points in time around when a given firm “changes ethnicity” by replacing a CEO belonging to one ethnicity with one belonging to another ethnicity. We plot the flow of investment from “pre-coethnics” (investors of the same ethnicity as the outgoing CEO), “post-coethnics” (investors of the same ethnicity as the incoming CEO), and others, in the four months before and the four months after such CEO switches. We see that, in the month when the new CEO takes over, investment from post-coethnics rises dramatically relative to investment from pre-coethnics and others. In the subsequent months, the flow of investment from post-coethnics returns to the pre-coethnic/others trend, but remains at a higher level. This implies that the portfolio share of the firm for post-coethnics relative to others further rises in the months after the CEO switch. Finally, and most importantly, we see no indication of concerning non-parallel pre-trends in Figure 1. In the months *before* the CEO ethnicity switch, the trend in investment from all three groups is roughly flat, with signs of slightly greater investment from both pre-coethnics and post-coethnics in month $t - 1$ relative to $t - 2$, but if anything more so for pre-coethnics than post-coethnics. These patterns in the raw data provide strong support for a causal, coethnicity-based interpretation of the results from a version of the regressions in (1) and (2) that include an investor-firm fixed effect.

We show those results in Table 3. We lose some power when restricting the analysis to investor-firm pairs that change coethnicity status during our data period because most firms do not switch CEO ethnicity. However, the estimated coefficient on $\text{CoethnicFirm}_{ijt}$ falls only by about 50 percent when measured as $\text{CoethnicCEO}_{ijt} = 1$. When investor-CEO coethnicity is measured through $\text{CEOCOethnicityIndex}_{ijt}$, the estimated coefficient doubles relative to that in Table 2. The two investor-board coethnicity measures both increase in magnitude and remain highly statistically significant when we restrict attention to changes in coethnicity within investor-investment object pairs.

In this section we showed that Kenyan investors invest considerably more in a given firm when the firm is run by coethnics. We also showed that the coethnicity effect holds even within investor-firm pairs and arises only after (before) a firm “becomes” coethnic (non-coethnic), pointing towards a causal interpretation. In the next section we investigate *why* coethnicity causes investors to invest more in a firm.

4 Understanding Ethnic Investing

As discussed in the introduction, ethnic investing may broadly speaking be due to *information asymmetries* or *investor preferences*. The primary distinction between the two is that information asymmetries imply a *higher* return on coethnic investments, while taste-based discrimination implies a *lower* (or equal) return on coethnic investments. We thus run the following regression:

$$\text{RiskAdjReturns}_{bijt} = \alpha + \beta \text{CoethnicFirm}_{ijt} + \gamma_i + \delta_j + \psi_{c(jt)} + \theta_t + \varepsilon_{bijt} \quad (3)$$

where $\text{RiskAdjReturns}_{bijt}$ is the risk-adjusted return on investment b made by investor i in firm j in month t —that is, returns divided by risk—and the other variables are as defined above. Our measures of returns and risk are straightforward and follow the finance literature (see e.g. [Cohen et al. , 2008](#)); details are in the Online Appendix.²³ Within a given jt pair, $\text{RiskAdjReturns}_{bijt}$ varies across investors because different investors invest in the firm on different days within the month and because different investors sell their stocks at different times.

As seen in the first column of Table 4, a given investor’s risk-adjusted returns on her investment in a given firm in a given month are 11 percent lower if the investment is made when the firm is run by a coethnic CEO. In the second column we see that the investor’s returns are 31 percent lower if her investments are made when she has maximum ethnic proximity to the firm’s CEO rather than when she has minimum ethnic proximity to the CEO. Similarly, the investor’s risk-adjusted returns on investments made when the firm’s board is generally of the same ethnicity as the investor are 45-62 percent lower.²⁴

Our results in this section indicate that engaging in coethnic investing lowers the return Kenyan investors achieve at a given level of risk-taking. We conclude that their behavior appears to be driven by a taste for or a psychological bias towards coethnic firms.

²³An assumption on which of i ’s purchases of equity in j a given sale corresponds to is necessary. We follow standard practice in the literature by assuming first-in, first-out. Risk is simply the standard deviation of returns across months. In Table 4, we show results when clustering the standards errors at the investor level as in Section 3. In the Online Appendix we also show results when risk-adjusted returns to investing in a given firm are instead allowed to correlate over time, by clustering at the firm level. In Online Appendix Table B3 we also show how coethnic investing affects risk and returns respectively. Our results are primarily driven by differences in the raw returns on coethnic and non-coethnic investments.

²⁴We lack power to estimate how risk-adjusted returns differ on investments made when the firm is run by a board with a greater versus a lower $\text{BoardCoethnicityIndex}_{ijt}$ with precision, but the estimate in column 4 also points towards considerably lower returns on the former.

5 The Consequences of Ethnic Investing

5.1 Ethnic investing and the value of a firm: theoretical background

Preference-based coethnic investing of the form we documented in sections 3 and 4, in which investors “neglect” non-coethnic firms and thereby earn lower returns for a given level of risk, may have adverse *aggregate* economic consequences. In particular, if each group of investors exclusively or primarily invests in firms of a specific type, this will tend to lower the average value of a firm. The reason is that investors as a whole could earn higher returns by investing in firms with a smaller investor base. This “clienteles” prediction, first emphasized by Merton (1987)²⁵, holds only as long as supply-side and arbitrage responses to coethnic investing are limited, however.

To see this, suppose there are two groups of otherwise identical groups of firms, Blue and Green firms, and that Blue is the bigger of the two ethnic groups in the country. The results in sections 3 and 4 suggest that the demand curve for Blue firm stocks lies to the right of that for Green firm stocks. If in addition there are initially not many more Blue than Green firms, “suppliers” of stocks—existing owners of different firms’ stocks and firms themselves—may require a higher price to sell Blue stocks than Green stocks. Both of these forces imply that the price of otherwise similar Blue firm stocks will be higher than that of Green firm stocks.

We might expect three types of responses to such an out-of-equilibrium situation. First, Blue firms and owners of their stocks who do not have a taste for coethnicity may increase the supply of such stocks, shifting the supply curve out. Similarly, investors who do not have a taste for coethnicity may shift demand from Blue to Green firms in response to the price wedge. Both of these forces will tend to reduce the price wedge between Blue and Green firms.

Second, over time investors—especially in a rapidly growing economy like Kenya’s—will tend to join the stock market, increasing overall demand. If the composition of those joining the stock market is similar to the population as a whole we can expect the shift in demand for Blue stocks to exceed that for Green stocks because of coethnic investing, further increasing the relative price of Blue firms. Of course, it may also be that Green investors join the stock market to a greater extent than Blue investors if they can earn a higher return while investing in coethnic stocks.

Finally, it may be that firms want to exploit a lower cost of capital that comes with being Blue. We should see an increase in the valuation of a Green firm that changes its CEO to become Blue as demand for the firm’s stocks has increased. Existing Blue firms may now face downward pressure on prices from the demand and/or the supply-side of the

²⁵The comparative static analysis in Merton (1987) is cross-sectional in the sense of assuming that the market portfolio and aggregates of the economy do not vary with changes in the relative size of investor groups, but the intuition underlying the predictions we discuss below is straightforward and holds more broadly.

market. It is reasonable to assume, however, that—unless a large number of or especially large firms choose to “become Blue”—the price of other Blue firms would remain above that of Green firms. If not, the taste for coethnicity and higher returns would both attract investors to (existing) Blue firms. We thus expect the price wedge between Blue and Green firms to persist despite potential demand displacement across individual firms.

In sum, as this discussion makes clear, under preference-based coethnic investing we expect demand and supply forces to distort the relative price of firms with large and small coethnic investor bases relative to an ethnicity-blind investing scenario, as long as “compensating” supply-side and arbitrage responses are limited. This will tend to lower the average price of a firm.

5.2 Ethnic investing and the value of a firm: empirics

In Kenya, the size of firms’ coethnic investor bases vary over time. In combination with the fact that we observe all investors and all firms on the country’s stock market, this means that we can estimate how demand affects stock prices in a way that to our knowledge has not been possible in the existing literature.

To test how coethnic investing affects the price-to-book value of a firm, we first run regressions of the following simple form:

$$\text{PriceToBook}_{jt} = \alpha + \beta \text{InvestorBase}_{jt} + \delta_j + \theta_t + \varepsilon_{jt} \quad (4)$$

We include firm fixed effects δ_j , month fixed effects θ_t , and cluster the error term ε_{jt} at the firm level. The regressor of interest is the size of the firm’s coethnic investor base, the estimated sign on which should be significantly positive if, as we predict, coethnic investing of the form identified in sections 3 and 4 distorts firms’ stock market valuations. We measure InvestorBase_{jt} , the size of firm j ’s coethnic investor base at time t , simply as the proportion of all investors that are active—that is, that trade—at that time who belong to the same ethnicity as the firm, or, alternatively, the proportion of the NSE’s total value invested at time t that is invested by such investors.

In Panel A of Table 5, we show results from running (4) on the sample of firms whose ethnicity remains constant during our data period—that is, firms who do not change their CEO from someone belonging to one ethnicity to someone else belonging to a different ethnicity during our data period. In this sample, variation in InvestorBase_{jt} thus arises from investors joining and leaving the stock market and active versus passive status. We see that, when a firm listed on the NSE has a bigger coethnic investor base, its price-to-book value is significantly higher. The estimates imply, for example, that we would expect the price-to-book value of a firm that is led by a CEO from an ethnic group that has the same proportional number of investors as the group with the biggest investor base

observed in our data to be 88 percent greater than an otherwise identical firm led by a CEO from an ethnic group with an investor base of the same size as the smallest one in our data.²⁶

In Panel B of Table 5 we take a different approach and code changes in a firm’s investor base exclusively as 0/1 up-or-down events resulting from CEO (ethnicity) turnover. We run the following regression:

$$\begin{aligned} \text{PriceToBook}_{jt} = & \alpha + \beta \text{I}(\text{Firm switched CEO} \rightarrow \Delta \text{Investor base size})_j \times \text{post-switch}_{jt} \\ & + \gamma \text{I}(\text{Other firm of post-CEO switch ethnicity}_{-j})_j \times \text{post-switch}_{-jt} \quad (5) \\ & + \omega \text{I}(\text{Other firm of pre-CEO switch ethnicity}_{-j})_j \times \text{post-switch}_{-jt} \\ & + \delta_j + \theta_t + \varepsilon_{jt} \end{aligned}$$

$\text{I}(\text{Firm switched CEO} \rightarrow \Delta \text{Investor base size})_j$ is an indicator for firm j changing its CEO from one ethnicity to another at some point during our data period, and post-switch_{jt} an indicator that turns on in the month firm j “changed ethnicity” (and stays on thereafter). $\text{I}(\text{Other firm of post-CEO switch ethnicity}_{-j})_j$ is an indicator for firm j belonging to the same ethnicity, after the switch, as another firm $-j$ that changes its CEO from one ethnicity to another at some point during our data period, and post-switch_{-jt} a “post” indicator for such a switch. $\text{I}(\text{Other firm of pre-CEO switch ethnicity}_{-j})_j$ is defined analogously to $\text{I}(\text{Other firm of post-CEO switch ethnicity}_{-j})_j$.²⁷ We include firm and month fixed effects as in the rest of our analysis, and cluster the error term ε_{jt} at the firm level.

The results in column 1 of Panel B of Table 5, where variation in firms’ coethnic investor base comes from the supply (firm) side of the market, show that a firm changing its ethnicity from one with a smaller to one with a bigger investor base sees a significant and large increase in its price-to-book value, and vice versa in column 2. This supports the evidence from Panel A, where variation in investor base comes from the demand (investor) side of the market.²⁸ We find no evidence of “displacement effects” on the value of *other* firms of individual firms changing their ethnicity due to CEO turnover and thereby increasing or decreasing the number of firms that belong to the same ethnicity as the other firms in question.

The fact that we see a significant change of the expected sign in the valuation *both* of

²⁶This calculation uses the Investor base size proportions from December 2010.

²⁷The omitted group thus consists of firms that do not themselves “change ethnicity” during our data period, and that also do not belong to an ethnicity that sees other firms “joining” or “leaving” the set of firms that share ethnicity with the firm in question during our data period.

²⁸In Appendix Table B4, we replace the firm fixed effect δ_j with the particular expected predictors of firms’ valuation that come out of Merton (1987)’s version of “cliente” theory, some of which are time-varying. (The Controls_{jt} are the firm’s beta, i.e., its CommonFactorExposure_j, and the firm’s size. We take CommonFactorExposure_j to be constant across time for each firm. We measure firm size as j ’s market capitalization in month t .) With such an approach, the estimated coefficient on the investor base regressors remain positive and large in magnitude in both panels of the table, and statistically significant in Panel B. The estimates in Panel A of Appendix Table B4 are not statistically significant.

firms whose relative investor base size changes because investors join and leave active investing on the NSE *and* those that “change ethnicity” because of CEO turnover and therefore see the size of their investor base change points towards a causal interpretation of the relationship we have established between coethnic investing and the value of large Kenyan firms as a whole. In itself Table 5 does not rule out other interpretations. It is important to note, however, that the aggregate patterns in Table 5 are—as discussed in Sub-section 5.1—exactly what theory predicts we should see under the form of causally identified “neglect” of non-coethnic firms we established in sections 3 and 4.

5.3 The cost of ethnic investing

We can now estimate the overall cost of coethnic investing. Consider a counterfactual scenario in which all investors can potentially invest in all firms. As pointed out by Merton (1987), a situation in which each firm’s “clientele” is made up of all investors in the market corresponds to a state of the world in which investors do not have a taste for or bias towards certain firms. The estimated coefficient on a firm’s investor base in regression (4) is $\hat{\beta}$. $(1 - \text{InvestorBase}_{jt}) \times \hat{\beta}$ is thus the difference between the firm’s price-to-book value under the counterfactual no-coethnic investing scenario and the observed state of the world. This implies that the decrease in the expected value of a firm due to coethnic investing is $(1 - \text{InvestorBase}_{jt}) \times \hat{\beta} \times \text{BookValue}_{jt} \times \text{TotalShares}_{jt}$.²⁹ Computing this number for the last period observed in our data (December 2010), we estimate that a listed Kenyan firm would be worth USD 720 million more if Kenyan investors did not engage in coethnic investing. Under such a scenario the total value of all firms listed on the NSE would be around USD 32.4 billion—more than 280 percent—greater.

6 Conclusion

Ethnic investing—excess investing in coethnic investment objects—is common worldwide, but why do investors restrict their investments in this way, and what are the consequences? In this paper we first use transaction level data from Kenya’s stock exchange (NSE) and CEO/board turnover to document the surprising extent of ethnic investing *within investor-investment object pairs*—investors invest more in a given firm when the firm is run by managers of the same ethnicity as the investor—despite coethnic investments earning lower risk-adjusted returns, pointing towards a taste-based or psychological explanation. Taking advantage of the complete market nature of a stock exchange and variation over time in firms’ coethnic investor bases, we then show that supply-side responses and arbitrage do not offset the impact of coethnic investing on firms’ market valuation.

²⁹OTHER COUNTERFACTUALS THAN THE MERTON ONE TBA

Our estimates imply that coethnic investing lowers the combined value of publicly listed Kenyan firms by about USD 32.4 billion.

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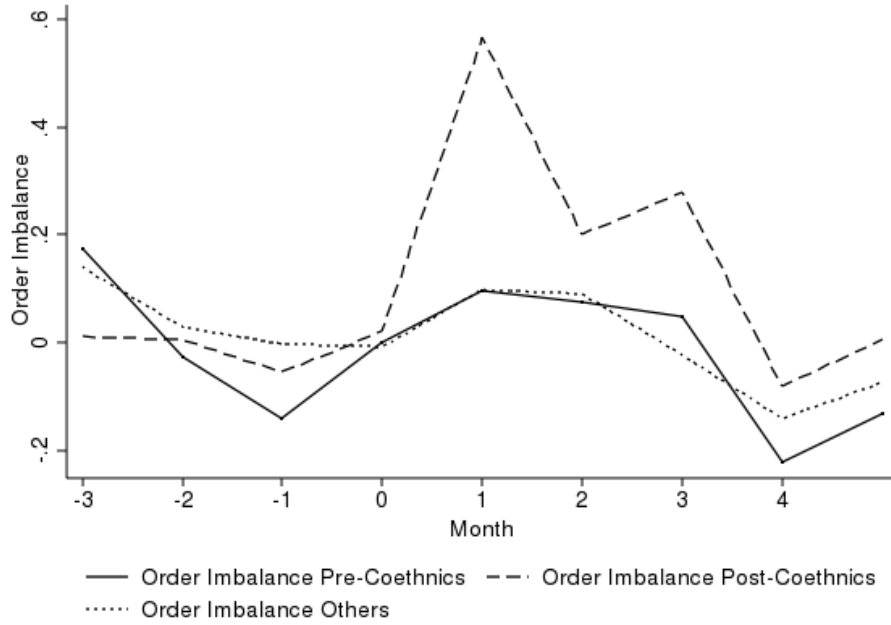
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Figures

FIGURE 1: INVESTMENT BY PRE-COETHNICS, POST-COETHNICS, AND OTHERS WHEN A FIRM “CHANGES ETHNICITY” DUE TO CEO TURNOVER



The average monthly order imbalance for pre-coethnics, post-coethnics, and others. The sample uses only those firm where the ethnicity of the CEO changes at least once. The change occurs at month 1.

Tables

TABLE 1: SUMMARY STATISTICS

Variable	Mean	Std. Dev.
Panel A: Investor level		
N = 54915		
Male	.732	.443
Female	.234	.424
Age (as of 2006)	39.9	13.6
Average portofolio value (USD 000's)	195.477	5720.952
Panel B: Firm level		
N = 47		
Listed by 2006	.872	.337
Agricultural	.089	.288
Commercial and Services	.244	.435
Finance and Investment	.311	.468
Industrial and Allied	.356	.484
Market cap. 2006 (USD 000's)	204976	343985
Market cap. 2010 (USD 000's)	245300	444318
Panel C: Investor \times firm \times month level		
N = 658188		
Investment	.547	.405
Order Imbalance	.069	.985
CoethnicCEO	.271	.445
CoethnicBoard	.406	.491
CEOCOethnicityIndex	.184	.294
BoardCoethnicityIndex	.152	.168
Risk-adjusted Returns	-.065	4.77

The dataset spans January 2006-December 2010. The data consists of all investors observed over the period that have made at least 5 trades (buying or selling) in a given year, as well as 47 firms that were listed on the NSE during some part of the period. These firms include ACCS, BAMB, BAT, BBK, CABL, CMC, DTK, EABL, EQTY, EVRD, HFCK, ICDC, JUB, KCB, KEGN, KENO, KNRE, KPLC, KQ, MSC, NBK, NIC, NMG, OCH, PORT, REA, SCAN, SCBK, SCOM, SGL, TOTL, TPSE, ARM, SASN, FIRE, PAFR, UNGA, BERG, CFC, UCHM, COOP, CandG, MASH, KUKZ, BOC, UTK, CARB. The trades have been aggregated to the investor-firm-month level. For any given investor and firm, only those months where a trade has been made are included. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE 2: INVESTOR-FIRM COETHNICITY AND INVESTMENT

	(1)	(2)	(3)	(4)
	Investment	Investment	Investment	Investment
CoethnicCEO	0.0103*** (0.00305)			
CEOCOethnicityIndex		0.0118*** (0.00348)		
CoethnicBoard			0.0205*** (0.00347)	
BoardCoethnicityIndex				0.0481*** (0.00797)
Mean of Dep. Var.	0.276	0.184	0.493	0.154
R2	0.399	0.393	0.431	0.390
N	276481	404755	190074	435219
	(1)	(2)	(3)	(4)
	OI	OI	OI	OI
CoethnicCEO	0.0102** (0.00458)			
CEOCOethnicityIndex		0.0149*** (0.00523)		
CoethnicBoard			0.0673*** (0.00620)	
BoardCoethnicityIndex				0.121*** (0.0143)
Mean of Dep. Var.	0.273	0.184	0.484	0.152
R2	0.330	0.324	0.343	0.317
N	413250	609687	284243	655953
Investor FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
CEO Ethnicity FE	Yes	Yes	Yes	Yes

The specification is estimated with a fixed-effects model on investor-firm-month-level data. The sample consists of all months in which a trade is made by any investor in any firms stock. Panel A shows the outcome investment, which is the proportion of the investor's portfolio that is held in the share. Panel B shows order imbalance, which measures how much the investor net buys or sells a particular firm's stock, as a proportion of the investor's total traded stock of the same stock during the same month. All specifications in both panels include pair, month, and CEO ethnicity fixed effects. Standard errors are clustered at the investor level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE 3: INVESTOR-FIRM COETHNICITY AND INVESTMENT WITHIN INVESTOR-FIRM PAIRS

	(1)	(2)	(3)	(4)
	Investment	Investment	Investment	Investment
CoethnicCEO	0.00528 (0.0172)			
CEOCOethnicityIndex		0.0201 (0.0190)		
CoethnicBoard			0.0629*** (0.00804)	
BoardCoethnicityIndex				0.237*** (0.0293)
Mean of Dep. Var.	0.271	0.181	0.490	0.154
R2	0.606	0.606	0.629	0.606
N	206926	299603	136823	320300
	(1)	(2)	(3)	(4)
	OI	OI	OI	OI
CoethnicCEO	0.0202 (0.0371)			
CEOCOethnicityIndex		0.0418 (0.0405)		
CoethnicBoard			0.161*** (0.0184)	
BoardCoethnicityIndex				0.685*** (0.0624)
Mean of Dep. Var.	0.279	0.186	0.498	0.155
R2	0.444	0.445	0.465	0.440
N	309572	454472	203839	486878
Pair FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
CEO Ethnicity FE	Yes	Yes	Yes	Yes

The specification is estimated with a fixed-effects model on pair-month-level data. Pair is defined as a unique investor-firm grouping. The sample consists of all months in which a trade is made by any investor in any firms stock. Panel A shows the outcome investment, which is the proportion of the investors' portfolio that is held in the share. Panel B shows order imbalance, which measures how much the investor net buys or sells a particular firm's stock, as a proportion of the investor's total traded stock of the same stock during the same month. All specifications in both panels include pair, month, and CEO ethnicity fixed effects. Standard errors are clustered at the investor level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE 4: INVESTOR-FIRM COETHNICITY AND RETURNS

	(1) Risk-adjusted Returns	(2) Risk-adjusted Returns	(3) Risk-adjusted Returns	(4) Risk-adjusted Returns
CoethnicCEO	-0.0576** (0.0279)			
CEOCOethnicityIndex		-0.0549* (0.0327)		
CoethnicBoard			-0.150*** (0.0369)	
BoardCoethnicityIndex				-0.0340 (0.0827)
Investor FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
CEO Ethnicity FE	Yes	Yes	Yes	Yes
Mean of Dep. Var.	0.541	0.180	0.331	-0.0554
R2	0.593	0.596	0.623	0.581
N	253064	372861	178449	400918

(1) The specifications are estimated with a fixed-effects model on investor-firm-month-transaction level data. Risk-adjusted returns is defined as the return on investment of the transaction divided by the risk or standard deviation of the monthly returns over the holding period. The sample consists of all transactions initiated during the period. The month indicates origination of the transaction. Any investor may have multiple transactions for a given firms stock in a given month, if there are different shares bought are sold in multiple different future months and thus may result in varying returns. The sample includes both transactions that were closed(sold in full) during the period, as well as those open at the end of the period. For those open at the end of the period, we assume the transactions were closed in the last month. All specifications use investor, firm, month of origination, and CEO ethnicity fixed effects. Standard errors are clustered at the investor level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE 5: AGGREGATE CONSEQUENCES OF COETHNIC INVESTING

	(1)	(2)
Investor base size	Log Price-to-book	Log Price-to-book
	1.605*	
	(0.880)	
Investor base value		1.386**
		(0.669)
Firm FE	Yes	Yes
Month FE	Yes	Yes
CEO ethnicity switch	No	No
Mean of Dep. Var.	0.853	0.853
R2	0.856	0.856
N	1828	1828
	CEO switch \rightarrow Investor base \uparrow	CEO switch \rightarrow Investor base \downarrow
	(1)	(2)
I(Firm switched CEO $\rightarrow \Delta$ Investor base size) \times post-switch	Log Price-to-book	Log Price-to-book
	0.568***	-0.242**
	(0.158)	(0.117)
I(Other firm of post-CEO switch ethnicity) \times post-switch	0.172	0.00967
	(0.155)	(0.0601)
I(Other firm of pre-CEO switch ethnicity) \times post-switch	-0.350	0.0362
	(0.259)	(0.0610)
Month FE	Yes	Yes
Firm FE	Yes	Yes
Mean of Dep. Var.	0.964	0.802
R2	0.794	0.831
N	1643	2319

(1) Top panel: The specifications are estimated on firm-month level data. The dataset spans January 2006-December 2010 and covers only those firms listed on the NSE where the ethnicity of the CEOs remained constant throughout the period. All specifications include firm and month fixed effects. Investor base size refers to the active investors in a given month of the same ethnicity as the firm CEO as a proportion of all investors active in the same month, and investor base value refers to the aggregate value traded by those coethnic investors in the month as a proportion of total value traded in the same month. Standard errors are clustered at the firm level.

(2) Bottom panel: The specifications are estimated on firm-month level data. All specifications include firm and month fixed effects. These estimates look at the effects of possible 'spillover' effects. First switched CEO is an indicator equal to 1 if the ethnicity of the firm CEOs change during the period. Investor base size has the same definition as in the top panel. Post switch is an indicator equal to one after the change in CEOs. Other firm of post-CEO switch ethnicity is an indicator for all firms with CEOs having the same ethnicity as that of the new CEO, and other firm of pre-CEO switch ethnicity is an indicator for all firms with CEOs having the same ethnicity of as that of the old CEO. The sample looks at a 12 month window around the switch, 6 months prior and 6 months following. Col (1) limits the sample to those firms in which the new CEO has a higher investor base size than the old CEO, and col (2) limits the sample to those firms in which the new CEO has a lower investor base size than the old CEO. Standard errors are clustered at the firm level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix

6.1 Data and outcome variables

6.1.1 Data

We use the following data sources. The NSE's Transactions Registry is recorded by the Central Depository and Settlement Corporation, Ltd. (CDSC), the "back office" that manages the clearing and settlement of NSE transactions. The CDSC also maintains a Registry of NSE Investor Accounts. They gave us access to a de-identified version that contains, in addition to a scrambled id, the investor's gender, residential location (typically a town or city), account creation year, account type (individual/institutional investor/broker), nationality (Kenya/East African Community (Burundi, Rwanda, South Sudan, Tanzania, and Uganda)/"foreign"), and last name. Information on firm characteristics (book value, outstanding shares, etc) comes from the firms' financial reports.

6.1.2 Outcome variables

What we term **Investment**, or holdings imbalance, ranges from 0 to 1. It measures, at the investor-firm-month level, the value of a particular investor's holdings of a particular stock, as a proportion of the value of the investor's total portfolio.

Order Imbalance ranges from -1 to 1. It measures, at the investor-firm-month level, how much the investor net buys or sells a particular firm's stock, as a proportion of the investor's total traded stock of the same stock during the same month (see e.g. [Chordia et al. , 2002](#)). Specifically,

$$\text{Order Imbalance} = \frac{(\text{Total value of stocks bought}) - (\text{Total value of stock sold})}{\text{Total volume traded within the month}}$$

The way we calculate **Returns** follows the finance literature (see e.g. [Cohen et al. , 2008](#)) and is explained in detail in Section 4. For buys that were not subsequently sold before the end of our data period, the 31st of December 2010, we compute returns at that point in time.

6.1.3 Other variables

Beta refers to a firm's beta with respect to the Nairobi Stock Exchange's index returns.

Firm size (one of the [Merton \(1987\)](#) "value controls" in Appendix Table XXX) refers to a firm's market capitalization relative to the total market capitalization within the sample during a particular month.

6.2 Coding ethnicity and coethnicity

6.2.1 Ethnicity

We probabilistically assign ethnicities to investors, CEOs, and board-members using their last names. As described in Section 2, the starting point is name \times ethnicity match probability information recorded by Yenkey (2015). The author hired eight Kenyan research assistants (RAs). For each last name, each RA was asked to assign a 1 to any ethnicity that the RA felt 75 percent confident that the name was likely to belong to, and a 0 otherwise. There is overlap in the names used by some ethnicities so that the RAs could assign a given name to multiple ethnicities.³⁰ We start by taking the average of the 1's and 0's across all RAs for each name to arrive at a single number for each name n and ethnicity e , p_{en} .

From this information we need to construct a measure of whether an individual investor is likely to be of the same ethnic group as a given CEO and board. We say that ethnicity e is name n 's *Likely Ethnicity* if $p_{en} \geq 0.4$ and p_{en} is ≤ 0.3 for all other ethnicities.³¹ If this is not true for any ethnicity, n does not have a Likely Ethnicity.

6.2.2 Coethnicity

As described in Section 2, the first CEO measure, CoethnicCEO_{ijt} , is an indicator variable equal to 1 if investor i and the CEO running firm j in month t share a Likely Ethnicity, and 0 if not. CoethnicCEO_{ijt} is missing if either the investor or the CEO does not have a Likely Ethnicity.

The second CEO coethnicity measure, $\text{CEOCOethnicityIndex}_{ijt}$, is a 0 (minimum proximity) to 1 (maximum proximity) measure of the expected ethnic proximity between the investor's and the CEO's name, given each person's expected probability of belonging to each ethnicity. Specifically, the index is equal to 1 minus Lieberman (1969)'s index of population diversity, or in other words, the inner product of the investor and the CEOs' p_{en} 's. In this case no cut-off choices are necessary, we can make use of the full sample, and we avoid restricting attention to the most likely ethnicity for the investor and the CEO.

One board measure, $\text{BoardCoethnicityIndex}_{ijt}$, is equal to the proportion of board-members that are coethnic, where coethnicity is measured as for the CoethnicCEO_{ijt} .

The other board measure, $\text{CoethnicBoard}_{ijt}$, is a 0/1 variable, and essentially repeats the construction of CoethnicCEO_{ijt} twice, first between individual board-members and

³⁰RAs were asked to do so for the following ethnicities: Anglo, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, South Asian, Swahili.

³¹These cut-offs were chosen with the goal of minimizing both type 1 and type 2 errors. We also wish to make use of a high proportion of the sample of investors; for this reason the 0.4 threshold is relatively low and the 0.3 threshold relatively high, given disagreement among the RAs, who were regular Kenyans and not name experts, and considerable overlap in the names used by some Kenyan ethnic groups. In sub-section B1 of this appendix we show that our results are qualitatively very similar if we vary the thresholds.

the CEO, then for the board as a whole vis-a-vis the CEO. So this measure is stricter in the sense that, to set $\text{CoethnicBoard}_{ijt} = 1$ in month t , we require, first, each individual board-members to be either a likely coethnic or a likely non-coethnic of the CEO (that is, to be relatively likely to belong to the same ethnicity and relatively unlikely to belong to a different ethnicity than the CEO, or vice versa), and second, for the board as a whole—given the expected individual board-member/CEO co-ethnicity/non-coethnicity statuses—to be relatively likely to belong to the same ethnicity as the CEO and relatively unlikely to belong to another ethnicity. More detailed information on the construction of our four measures of coethnicity is in the Online Appendix.³²

6.3 Robustness checks

In Appendix Table B1 we show that our results from Section 3 of the paper are qualitatively very similar if we vary the thresholds used to define investors' and managers' ethnicities.

In Appendix Table B2 we show that we lose power to estimate the impact of coethnic investing on risk-adjusted returns (as in Section 4) with precision if we cluster standard errors at the firm rather than the investor level (while, by construction, the point estimates remain unchanged). This is most likely simply because many individual investors invest in only a few different firms. More importantly, the conclusion that coethnic investing is likely driven by taste or psychology rather than information asymmetries would follow even if risk-adjusted returns were only slightly lower—or even the same—on coethnic investments.

In Appendix Table B3 we show that the lower risk-adjusted returns on coethnic investments we document in Table 4 are primarily driven by lower raw returns. When $\text{CoethnicFirm}_{ijt}$ is measured as CoethnicCEO_{ijt} or $\text{CEOCOethnicityIndex}_{ijt}$, the variability in returns on—that is, the risk of—coethnic investments is additionally higher than that on non-coethnic investments.

³²In the Online Appendix we also show that our results are robust to an alternative way to construct measures of ethnicity itself from the name×ethnicity match probability data.

Appendix Tables

TABLE B1: INVESTOR-FIRM COETHNICITY AND INVESTMENT: ALTERNATIVE ETHNICITY CODING

	(1)	(2)	(3)	(4)
	Investment	Investment	Investment	Investment
CoethnicCEO	0.0105*** (0.00353)			
CEOCOethnicityIndex		0.0128*** (0.00347)		
CoethnicBoard			0.00285 (0.00564)	
BoardCoethnicityIndex				0.0185** (0.00941)
Mean of Dep. Var.	0.255	0.184	0.317	0.0717
R2	0.396	0.393	0.446	0.389
N	186146	404755	69295	435219
	(1)	(2)	(3)	(4)
	OI	OI	OI	OI
CoethnicCEO	0.00403 (0.00560)			
CEOCOethnicityIndex		0.0197*** (0.00522)		
CoethnicBoard			-0.0106 (0.00975)	
BoardCoethnicityIndex				0.0212 (0.0158)
Mean of Dep. Var.	0.253	0.184	0.326	0.0709
R2	0.332	0.324	0.396	0.316
N	277845	609687	111108	655953
Investor FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
CEO Ethnicity FE	Yes	Yes	Yes	Yes

The specification is estimated with a fixed-effects model on investor-firm-month-level data. The sample consists of all months in which a trade is made by any investor in any firms stock. The coethnicity variables are defined differently than in table 1 from the main tables. The cutoffs, both to define individual and board level ethnicity are a high of 0.3 and low of 0.2, compared to 0.4 and 0.3, respectively in the main analysis. Panel A shows the outcome investment, which is the proportion of the investors' portfolio that is held in the share. Panel B shows order imbalance, which measures how much the investor net buys or sells a particular firm's stock, as a proportion of the investor's total traded stock of the same stock during the same month. All specifications in both panels include pair, month, and CEO ethnicity fixed effects. Standard errors are calculated at the investor level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE B2: INVESTOR-FIRM COETHNICITY AND RETURNS: ALTERNATIVE STANDARD ERRORS

	(1) Risk-adjusted Returns	(2) Risk-adjusted Returns	(3) Risk-adjusted Returns	(4) Risk-adjusted Returns
CoethnicCEO	-0.0576 (0.0344)			
CEOCOethnicityIndex		-0.0549 (0.0489)		
CoethnicBoard			-0.150 (0.154)	
BoardCoethnicityIndex				-0.0340 (0.319)
Investor FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Clustering	Firm	Firm	Firm	Firm
CEO Ethnicity FE	Yes	Yes	Yes	Yes
Mean of Dep. Var.	0.541	0.180	0.331	-0.0554
R2	0.593	0.596	0.623	0.581
N	253064	372861	178449	400918

(1) The specification is estimated with a fixed-effects model on investor-firm-month-transaction level data. The sample consists of all transactions initiated during the period. The month indicates origination of the transaction. Any investor may have multiple transactions for a given firms stock in a given month, if there are different shares bought are sold in multiple different future months and thus may result in varying returns. The sample includes both transactions that were closed(sold in full) during the period, as well as those open at the end of the period. For those open at the end of the period, we assume the transactions were closed in the last month. All specifications use investor, firm, month of origination, and CEO ethnicity fixed effects. Standard errors are clustered at the firm level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE B3: INVESTOR-FIRM COETHNICITY, RISK, AND RETURNS

	(1) Returns	(2) Returns	(3) Returns	(4) Returns
CoethnicCEO	-0.00981*** (0.00360)			
CEOCOethnicityIndex		-0.0138*** (0.00406)		
CoethnicBoard			-0.00551 (0.00486)	
BoardCoethnicityIndex				0.00932 (0.0104)
Mean of Dep. Var.	0.00508	-0.0245	-0.0175	-0.0505
R2	0.579	0.577	0.602	0.564
N	260587	383361	182054	413217
	(1) Risk	(2) Risk	(3) Risk	(4) Risk
CoethnicCEO	0.0225** (0.00912)			
CEOCOethnicityIndex		0.0306*** (0.0113)		
CoethnicBoard			-0.0401*** (0.00959)	
BoardCoethnicityIndex				0.128*** (0.0207)
Mean of Dep. Var.	0.300	0.263	0.354	0.246
R2	0.666	0.659	0.674	0.657
N	252365	372495	176413	400914
Investor FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
CEO Ethnicity FE	Yes	Yes	Yes	Yes

(1) The specifications in both panels are estimated with a fixed-effects model on investor-firm-month-transaction level data. Panel A shows the risk unadjusted returns, or the return on investment, and panel B shows the risk or standard deviation of the monthly returns over the holding period. The sample consists of all transactions initiated during the period. The month indicates origination of the transaction. Any investor may have multiple transactions for a given firm's stock in a given month, if there are different shares bought or sold in multiple different future months and thus may result in varying returns. The sample includes both transactions that were closed (sold in full) during the period, as well as those open at the end of the period. For those open at the end of the period, we assume the transactions were closed in the last month. All specifications use investor, firm, month of origination, and CEO ethnicity fixed effects. Standard errors are clustered at the investor level. The dataset spans January 2006-December 2010. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE B4: AGGREGATE CONSEQUENCES OF COETHNIC INVESTING: ALTERNATIVE CONTROLS

	(1)	(2)
	Log Price-to-book	Log Price-to-book
Investor base size	1.065 (1.153)	
Investor base value		0.713 (1.038)
Value Controls	Yes	Yes
Month FE	Yes	Yes
CEO ethnicity switch	No	No
Mean of Dep. Var.	0.953	0.953
R2	0.520	0.520
N	1408	1408
	CEO switch → Investor base ↑ (1)	CEO switch → Investor base ↓ (2)
I[Firm switched CEO → Δ Investor base size] × post-switch	Log Price-to-book 0.324*** (0.100)	Log Price-to-book -0.153* (0.0874)
I[Other firm of post-CEO switch ethnicity] × post-switch	0.0263 (0.0883)	(0.0603)
		0.00683
I[Other firm of pre-CEO switch ethnicity] × post-switch	-0.160 (0.223)	0.0159 (0.0538)
Value Controls	Yes	Yes
Month FE	Yes	Yes
Mean of Dep. Var.	1.049	0.897
R2	0.898	0.893
N	1371	1795

(1) Top panel: The specifications are estimated on firm-month level data. The dataset spans January 2006-December 2010 and covers only those firms listed on the NSE where the ethnicity of the CEOs remained constant throughout the period. All specifications include month fixed effects and controls for the market capitalization of the firm relative to the entire market, the return on equity(roe) in the prior 12 month period, and the 1 and 2 year forward roe. Investor base size refers to the active investors in a given month of the same ethnicity as the firm CEO as a proportion of all investors active in the same month, and investor base value refers to the aggregate value traded by those coethnic investors in the month as a proportion of total value traded in the same month. Standard errors are clustered at the firm level.

(2) Bottom panel: The specifications are estimated on firm-month level data. All specifications include month fixed effects and controls for the market capitalization of the firm relative to the entire market, the return on equity(roe) in the prior 12 month period, and the 1 and 2 year forward roe. These estimates look at the effects of possible 'spillover' effects. First switched CEO is an indicator equal to 1 if the ethnicity of the firm CEOs change during the period. Investor base size has the same definition as in the top panel. Post switch is an indicator equal to one after the change in CEOs. Other firm of post-CEO switch ethnicity is an indicator for all firms with CEOs having the same ethnicity as that of the new CEO, and other firm of pre-CEO switch ethnicity is an indicator for all firms with CEOs having the same ethnicity of as that of the old CEO. The sample looks at a 12 month window around the switch, 6 months prior and 6 months following. Col (1) limits the sample to those firms in which the new CEO has a higher investor base size than the old CEO, and col (2) limits the sample to those firms in which the new CEO has a lower investor base size than the old CEO. Standard errors are clustered at the firm level. $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$