

New terrains of taste: Spatial analysis of price premiums for single origin coffees in Central America

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A B S T R A C T

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Coffee retailers often court discriminate consumers through the marketing of single origin coffees with distinct flavor attributes. The Cup of Excellence has become a key mechanism for locating and certifying single origin coffees. In this paper we use hedonic regression analysis to examine the price premiums for farmers generated by the origin attributes of 607 Cup of Excellence certified coffees from Central America. We find that while the greatest impact on the price premiums for a pound of coffee is the jury score awarded by coffee cuppers, several geographic factors, including the altitude of the farm, coffee farm size, country of origin and even sub-region of origin have significant effects on price premiums. While the price premiums conferred represent opportunities for farmers who have access to such markets, we argue that the appetite for single origin coffees may also contribute to uneven development.

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Introduction

Specialty coffee is big business globally. In the US, for example, coffee roasters and retailers have transformed the market for high quality coffee beverages into a \$12bn per year enterprise. Terroir, traditionally associated with wine, has become a key ingredient in the successful marketing of single origin coffees to consumers. As with wine, coffee roasters and retailers claim that single-origin coffees cultivated in unique micro-climates and under optimal soil conditions can yield distinct taste profiles that differentiate them from conventional coffee blends. Indeed, as Starbucks, one of the leading international coffee and coffee house chains with over 17,000 stores in over 50 countries, publicizes: “Geography is a flavor.”

The drive to find new terrains of taste through single origin coffees hinges upon locating and certifying coffee’s unique place-based qualities. In this paper we examine the effects of particular origin attributes on price premiums for the Cup of Excellence certified coffees so sought after by specialty coffee buyers and consumers. To do so we explore a database of 607 Cup of Excellence (CoE) certified coffees from Central American producers between 2003 and 2009. The prestigious CoE certification is earned only through participation in its annual country level tasting competition, recognized by industry professionals as having the most

stringent protocols for organoleptic coffee evaluation to identify, screen and approve “the best of the best.” The analysis evaluates premiums earned for particular origin attributes and attempts to unravel the geographical complexities of a quality certification regime that to date has been the mysterious domain of specialist tasters, roasters, buyers, and coffee producers.

Our research on the Cup of Excellence contributes to applied geography in the field of agro-food and development studies. Geographers have long engaged with the restructuring of agro-food systems, at the local and global scale. A recent special issue of Applied Geography has demonstrated the value of geographic analysis to local scale patterns of retail location, consumption and food network organization in the United States. Our work draws upon spatial data analysis to evaluate the geographic factors that contribute to variations in price premiums in a highly competitive coffee marketplace. The results of our work demonstrate that place matters in the valuation of coffee in global agro-food networks. However, as a strategy for promoting economic development the effects of this valuation are geographically uneven. This raises important questions for development practitioners and industry professionals who are actively promoting single origin coffees as a means for improving the livelihoods of farmers in coffee producing regions.

Terrains of taste: the allure of single origin coffees

Discriminate coffee retailers and consumers alike are enticed by coffees from a single origin. Single-origin gourmet coffees are

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spatial stories in a cup. Exceptional single-origin coffees foster a connection to far-away locations, places unknown to most people in any tangible sense but through a cup or label: “This is what the foothills around Mt. Kenya taste like.” (Ferguson, 2001). As with wine sellers, specialty coffee retailers frequently employ spatial narratives about where coffee comes from and how its particular origin affects flavor. Single-origin coffees are differentiated from other coffees by geographic indicators such as a specific production region, estate, cooperative or farm. In some cases, single origin coffees are qualified by information about a particular coffee varietal, grade, altitude or sustainability certification that provide additional layers of specificity associated with the unique characteristics of where the crop was cultivated and how it was produced and processed. Coffee importers, roasters, and retailers zealously locate and secure access to single-origin coffees to sell as premium product offerings. Due to their uniqueness and non-replicability, single origin coffees tend to fetch the highest price premiums in the coffee market.

Single origin coffees, unlike blends, are marketed to consumers as the “natural” expression of terroir. Starbucks, for example, claims that, “You can tell a lot about a coffee if you know where it’s from. Every bean has a distinctive flavor that comes from its land of origin. Just like with wine, it’s the *goût de terroir* – the taste of the place.” Starbucks sells single origin coffees at a premium price through its Starbucks Reserve line extolling these “exotic, rare and exquisite coffees” with “distinct flavors that enchant, amaze and captivate.” One Starbucks Reserve coffee is the Guatemala Antigua Santa Catalina “produced by Pedro Echevarria on his farm Las Nubes” which Starbucks describes in the following manner:

Antigua coffees are noted worldwide, but there are only a handful of farms on the skirt of the Acatenango volcano, benefitting from this amazing environment for growing coffee. The Santa Catalina Las Nubes farm is nestled on the slope of one of the three imposing volcanoes surrounding the Antigua growing region. Las Nubes means “clouds”—the farm, perched so high, is surrounded by a “cloud forest,” which protects the coffee trees from the hot tropical sun. This elegant coffee takes the classic Antigua flavors to the next level, with complex layers of praline and rich bittersweet chocolate, complemented by sweet tangerine-like acidity.

The level of geographical specificity and the connotations of place are arresting with their symbolic allusions to a “handful of farms,” “surrounded by cloud forest,” “nestled on the slope,” “at the skirt of a volcano,” “perched high,” and “protected from hot tropical sun,” all of which evoke notions of a coffee that is at the “next level” beyond “classic Antigua” flavors. Geography, Starbucks argues, plays a key role in differentiating coffee and coffee taste. Geographical difference “grounds” tastes such as “praline and rich bittersweet chocolate, complemented by sweet tangerine-like acidity” in a particular location that cannot be re-placed. The Santa Catalina Las Nubes farm single origin coffees produce perceptible flavors that cannot be replicated across space or time. Single origin coffees are unique, special, and therefore, valuable. Hundreds of importers, roasters and retailers alike offer single origin coffees and there is a demonstrated and growing retail market segment willing to pay premium prices for ever more precise, traceable and taste-able coffee qualities.

Quality economies: geographies of agro-food network restructuring

Over the past twenty-years the rise of niche food marketing has led to the re-organization of domestic and international commodity chains to address buyer-driven demands for quality,

product differentiation and traceability (Murdoch, Marsden, & Banks, 2000; Ponte & Gibbon, 2005). As Goodman and Watts (1997) have argued, the restructuring of agro-food networks parallels changes in industrial production and consumption more generally as commodity networks transition from mass production to flexible specialization common to post-Fordist commodity networks. Downstream actors within commodity networks, particularly retailers, have accumulated considerable power (and wealth) in this transition both in terms of creating new consumer tastes and markets as well as translating supply requirements into new divisions of labor, specialized production arrangements and commodity values. As numerous scholars have illustrated, the transition in agro-food networks toward quality control, product differentiation and traceability is explicitly geographical (Cook, 2008; Cook et al., 2006, 2011; Goodman & Watts, 1997; Marsden & Arce, 1995; Ponte & Gibbon, 2005; Watts, Ilbery, & Maye, 2005; Winter, 2003).

Food qualities, unlike the qualities of manufactured durable commodities, tend to be constrained by geographical differences in sites of production such as biophysical and environmental processes (soil, climate, etc.) and foods are particularly susceptible to issues of perishability associated with distance to final market (Freidberg, 2009). These natural barriers in agro-food networks represent a spatial friction that is unique to agricultural production that make geographical concerns paramount to ensuring profitability for all network actors. Geographic differences also lend many foods their unique value, either in the form of relative scarcity or abundance, or through innovations in overcoming natural barriers. Indeed, natural barriers to profitability in agro-food networks not only represent constraints but also new opportunities for market actors who can gain, maintain and control access to particular sites of food production, processing and retailing (Goodman & Watts, 1997). This power over food qualities may manifest itself through monopoly control over land or resources for food production, or through a strategic location within the broader network connecting sites of production to sites of consumption (Goodman & Watts, 1997; Mutersbaugh, 2005).

There has been a significant shift in agro-food network control over the past 30 years that give downstream actors such as processors, importers/exporters, transport companies and retailers such as supermarkets and fast food restaurants greater control over food qualities and the added value they generate (Goodman & Watts, 1997). Consequent to the shift toward greater control by downstream actors in agro-food networks, appealing to consumers with varied tastes and desires has also become paramount to profitability. Whereas a decade ago geographic anxieties over the origins of our food manifested in widespread distrust of food retailers, firms now use labels and advertisements to provide consumers substantive answers to the question: Where does my food come from? (Freidberg, 2004; Goodman, 2004; Guthman, 2004) Food scares, environmental pollution, health risks and ethical concerns about animal cruelty and labor rights have all put the geographies of food production back on the table (Freidberg, 2004). To create a more informed consumer public and to protect the reputation of market actors, we’ve witnessed the growth of first, second and third-party accountability, certification and labeling regimes designed to saturate the consumer’s world in geographic information (Goodman, 2010; Mutersbaugh & Lyon, 2010). However, while certifications and traceability has gained in importance to consumers and retailers in marketing, so has place, biophysical and environmental qualities.

In recent years, geographic differences in food quality has filtered back into the discourse on agro-food networks. The marketing of place-based attributes is used by firms to demonstrate sophistication, tell unique stories and win consumer loyalties. It is

also the grist of alternative food movements (Goodman, Dupuis, & Goodman, 2011). Farmer's markets, community supported agriculture, and slow food movements have all prioritized local food production and consumption and new food markets. And knowing where your food comes from is no longer enough. Taste is also important. Today, consumers, restaurants and retailers increasingly re-assert biophysical and environmental difference in the marketing of place-based food qualities (Trubek, 2008). In particular, the unique flavor attributes of foods produced in place or *terroir*, has re-emerged in recent years as the latest frontier in food marketing (Jacobsen, 2010; Trubek, 2008). Moving past its original appeal among wine producers, retailers and consumers, *terroir* and touting the natural origins of food flavor has gained in popularity as a food quality marketing technique. Claims about where food comes from is now also connected in some fashion to the aestheticization of biophysical conditions, artisanal labors, and the particular locational heritage associated with food production (Goodman et al., 2011). Paradoxically, returning to the first point made in our review, the newest frontier for the valuation of food quality in agro-food networks is precisely the immense geographic diversity of production conditions represented around the world.

Interest in place-based food qualities has resulted in the re-scaling of the terrain of agricultural production and marketing. *Terroir* has become central to this spatial restructuring of quality. The value of *terroir* (translated from French literally as a cultural or environmentally bounded region) represents an attention both to the effect of environmental factors on food quality as well as to a particular scale of agricultural production and marketing. Here value takes a particularly environmental and areal geographical form. Whether it be a subregion or even a single estate or even farm plot, attention to *terroir* divides the world into ever smaller areas for the purposes of ascribing value to both the uniqueness of the foods produced in that area but also to define its relative scarcity. The tremendous growth of geographic indications of origin and appellation based trademarks and certifications illustrates the value of these price premiums and the importance of maintaining control over product scarcity for the purpose of maintaining or increasing its value (Barham, 2003). In wine, standards, certification and trademarks of appellation have long served as an important barrier to entry that preserves and protects their premium value. In the coffee industry however, the concept of place-based quality attributes and efforts to control their value is a much more recent affair (Daviron & Ponte, 2005).

Terroir and coffee

In the past decade there has been an explosion of geographic information in the specialty coffee sector in the United States driven by roasters, retailers and consumers that source and serve what are called single origin coffees (Daviron & Ponte, 2005). According to gourmet coffee experts, the value of single origin coffees is derived from *terroir* or the "appropriate intersection of cultivar, microclimate, soil chemistry and husbandry" (Rhinehart, 2009). According to coffee specialists, peculiar properties of single origin coffees are produced "in nature" through biophysical processes on the farm (soil, climate, varietal) and preservationist labor practices such as varietal selection, orchard maintenance, harvesting, and milling that do not damage the inherent value of the coffee. The unique intrinsic value of single origin coffees must be preserved through on-farm and off-farm activities that process the harvested coffee fruit into a finished product that unlocks its gem-like qualities through roasting, grinding, and brewing a coffee beverage.

Unlike wine where appellation systems have been largely producer-driven, the market in single origin coffees has been

largely buyer-driven (Daviron & Ponte, 2005). By and large, place-based claims in coffee marketing continue to be driven by coffee roasters and retailers that are seeking to distinguish their coffees, and themselves, in the competitive coffee marketplace. However, appellation trademarks are used by some coffee marketing boards in producer countries to differentiate their product and to capture the value generated by their monopoly control over unique place-based qualities, but the examples are few and far between (Daviron & Ponte, 2005). Regional scale standards, certifications and trademarks for Hawaiian Kona, Jamaican Blue Mountain, or Ethiopian Oromia, Harrar and Yirgacheffe represent just some of the few examples. Marketing boards in these countries have sought to prohibit use of these regional place names without meeting particular production, product composition, or marketing requirements that preserve them as unique and non-replicable sources of coffee (Daviron & Ponte, 2005).

In other cases, regional reputations have developed over time with such growing areas such as Guatemala Antigua gaining international prominence without a clear place-based certification (Ferguson, 2001). Moreover, coffee marketing boards have also developed other strategies to create scarcity through product grading standards such as Kenya AA which selects only the highest value coffees from the country to meet the quality criteria. Other buyer-driven standards such as third-party fair trade, or organic certification, are also mechanisms for generating product differentiation and price premiums as they require strict standards, certifications and visible symbolic signs to convey information and differentiate coffee in a marketplace inundated with products of equivalently perceptible quality (Daviron & Ponte, 2005).

Given the buyer-driven nature of agro-food networks for single origin coffee and the still limited infrastructure for establishing appellation based certifications and markets, the location of distinctive coffees has tended to scale down to the estate or farm scale. With limited infrastructure, evolving reputations and high competition for distinctive single origin coffees, the gourmet and specialty coffee sector turns to a much more mobile set of explorers to stake their claims. To locate and certify the special qualities of single origin coffees market actors employ traveling organoleptic tasting experts, or "cuppers," who use olfactory and gustatory evaluation to judge coffee quality and assess the correlation between unique coffee flavors and their geographic origin. Cupping is a form of quality certification that simulates of the end consumer experience. Cupping approaches organoleptic evaluation through standardized procedures that aim for scientific objectivity in an otherwise subjective taste test (Lingle, 2001). Cuppers test coffees by inhaling the fragrance and aroma of freshly brewed coffee then slurping small amounts of coffee with a spoon to evaluate acidity, flavor, body and aftertaste. Historically, such tests of the material quality of coffee tended to focus on its negative attributes or defects in an effort to reduce bad tastes that turn consumers off. However in the past three decades cuppers have been increasingly employed by commodity network intermediaries to find positive attributes that will differentiate single origin coffees from the rest. In recent years, cuppers have played a key role in locating and certifying single origin coffees through their search for irreplaceable coffees from individual regions, estates or farms.

Making markets: cupping competitions and internet auctions

In the absence of established quality infrastructure to foster markets for single origin coffee produced by estates, farms and cooperatives, coffee firms, industry associations, marketing boards and international development agencies have sponsored the creation of international cupping competitions and internet auctions to facilitate the location, certification and sale of single origin coffees.

Searching for and certifying unique single coffees at the estate or farm scale can be costly, not only for large commercial retailers, but also for smaller scale roasters and retailers that bank their reputation and their high prices on delivering the taste of place to their discriminate consumer base. According to industry professionals, development specialists, and scholars alike, international internet auctions create new market opportunities for buyers and producers of single origin coffees. Through auctions, buyers get an opportunity to source coffees unavailable anywhere else. Industry professionals and development experts also claim that growers of high quality coffees stand to benefit from increased visibility associated with participation in competitions and auctions, creating a platform for them to differentiate their product from coffees on the conventional market, plagued by volatility associated with financial speculation, overproduction, and generic standards that fail to reward quality.

Cupping competitions and internet auctions have been highly regarded as a form of market-led development that can bring investment to coffee producing regions stressed by economic crisis (Varangis, Siegel, Giovanucci, & Lewin, 2003). Following years of low coffee prices triggered by the dissolution of international commodity agreements, Washington-consensus agencies such as the World Bank, InterAmerican Development Bank and USAID have touted and promoted the competitive transition of the Central American coffee sector using internet auctions, certifications and cupping competitions (IADB, USAID, & World Bank, 2002). For some producers of single origin coffees, the payoff for participation in these auctions can be very high. If farmers in particular places gain a reputation for producing exceptional single origin coffees, there is a strong possibility they will attract consistent buyers willing to pay premium prices for the taste of that place. For instance, one of the most exceptional single origin coffees is the Esmeralda Special harvested from a rare coffee varietal called “Geisha” from the Hacienda La Esmeralda in western Panama. In May 2007, at the Best of Panama specialty coffee auction the Esmeralda Special sold for US\$130.00 per pound. Don Holly, the director of roasting and quality control at Green Mountain Coffee Roasters has notoriously claimed that when he first tasted the Esmeralda Special in 2007 he saw “the face of God in a cup” (Jacobsen, 2010). Imparting an aroma of jasmine and tangerine with a flavor of bergamot, the Esmeralda Especial fetched a price of US\$170.00 per pound at auction in 2010 and continues to attract buyer interest in their farm and other farms in the region.

Cup of Excellence paying the price for the taste of place

The exceptional price premiums paid for coffees such as the Esmeralda Especial raise critical questions about the effects of cupping competitions and internet auctions for single origin coffees from Central America. What economic patterns are emerging more broadly from farmer participation in these new markets? What kinds of environmental conditions affect flavor profiles and what market factors contribute to higher or lower price premiums? What combinations of factors might lead a coffee cupper to see God in the cup or a firm to pay \$170.00 per pound for coffee? In what remains of this paper we explore these questions through the study of results from the prestigious Cup of Excellence in Central America. Nowhere is the appetite for single-origin coffees more evident than in the Cup of Excellence. Shining a spotlight into remote coffee producing regions to locate and certify distinctive single origin coffees, the CoE is “a strict competition that selects the very best coffee produced in [a] country for that particular year” and “winners are awarded the prestigious Cup of Excellence® [certification] and is sold to the highest bidder during an internet auction.”

The CoE is a critical market maker. While the CoE is often described as a sport-like competition and award ceremony, the CoE is also a third party certifier of single origin coffees. Unlike other third party coffee certifications that verify symbolic quality claims such as “shade-grown,” “organic,” or “fair trade,” the intrinsic qualities of single origin coffees is certified by a panel of national and international COE approved “cuppers” who conduct more than five rounds of blind evaluation on each coffee sample submitted from more than 2500 different coffee farms in Central America. Some 25–35 winning coffee entries are then selected and ranked from each country. The winning coffees and their detailed descriptions are then presented and auctioned off via the internet and can regularly fetch prices more than 4–5 times the prevailing market price, even outstripping Fair Trade/Organic premiums, the only price premium guarantee for small-scale producers (see Fig. 1).

To inform potential buyers CoE certified coffees are presented with standardized survey data on each coffee such as (1) location of the farm-of-origin, its altitude, the municipality, province, and country, (2) agricultural information such as farm size, area in production, coffee varietal, processing type, and certification such as organic or fair trade, and (3) coffee quality information based on the jury score (100 point scale) and descriptive flavor attributes (e.g. citrus, floral, bitter chocolate) (Table 1).

Price premiums in Cup of Excellence certified coffees from Central America

In our study of price premiums we used the detailed descriptions of Cup of Excellence certified coffees to understand the key origin attributes that generated the price premiums of 607 coffees in Central America. To identify the relative significance of specific origin attributes on price premiums in single origin coffee we carried out an ordinary least squares (OLS) regression analysis. Similar OLS regressions have been conducted on Cup of Excellence auction results by Donnet, Weatherspoon, & Moss, 2007 and Donnet, Weatherspoon, & Hoehn, 2008 to interpret hedonic price and buyer behavior in differentiated product markets. In our regression tests, the effects of farm size, area under production, the amount of coffee submitted, farm altitude, country of origin, region of origin, CoE jury score, coffee varietals, and the number of flavor descriptors on the price premium paid at auction.¹ Deconstructing the constituent characteristics of the certified coffee in this way and estimating the contribution of each variable to the price differentiation of the coffee enabled us to calculate the price premium earned from each of these peculiar properties. We performed regression analyses for the entire region of Central America as well as for Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. Only the aggregate results for Central America are shown here for brevity. The country-level regressions exhibit little variation from the regional analysis.

OLS Regression analysis provides a particularly useful way to estimate the extent to which each variable in the dataset contributes to price premiums in CoE certified coffees. Like the classical formulation of rent which explores the peculiar values generated where all other factors are held constant, or in the common parlance, where “all else is equal,” OLS regressions provide a strong illustration of rents. To facilitate interpretation and to assess the revealed contributory value of each of the place characteristics outlined above, regression analysis results are presented in

¹ Values specifying the country, region, cooperative, and varietals were coded as dummy variables and Honduras was used as the referent country. Because a farm can produce and blend several varietals together, a referent varietal was not required to avoid multicollinearity.

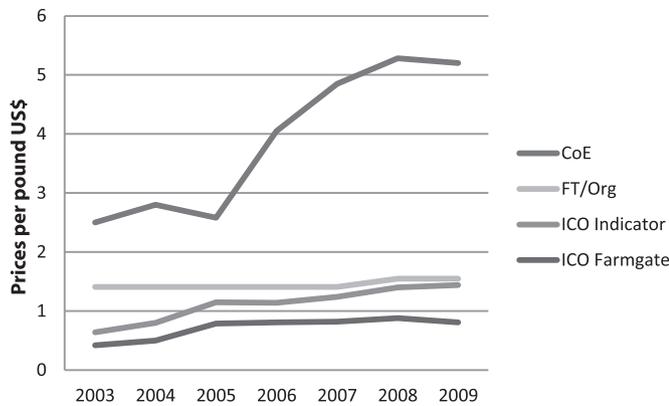


Fig. 1. Annual price comparisons between Cup of Excellence, fair trade/organic, ICO indicator prices for Mild Arabicas and ICO Farmgate prices in Central America.

graphical form in Fig. 2. In the display, the least significant variable of the regression analysis has been iteratively removed from each model until all remaining variables are significant at the $p = 0.1$ level. In the graphical representations the regression coefficients are denoted as the central marker for each variable and signify the marginal impact of each variable on the price per pound for which the coffee was sold at auction. For example, the quality score values in Fig. 1 indicate that a gain was made in the price of the coffee at auction as a result of an increase in the jury score of just one point. The horizontal lines to the side of each coefficient express the uncertainty in that marginal impact within the 95% confidence interval. The tick marks toward the ends of each of these lines indicate the 90% confidence interval. Variables that do not have a marker are not significant for that model and were removed. For example, the farm size does not have a significant impact on price per pound.

Fig. 2 displays the regression results for all the variables in the entire dataset. Model 1 uses just those variables specific to the farm and the tasting: farm size, coffee area, altitude, pounds produced, coffee quality score, number of descriptors, and the cooperative dummy variable. Model 2 adds dummy variables to indicate the categorical effect of the selection of any of the uncommon varieties Caturra, Catuai, Pacamara, in the coffee. Model 3 adds country-specific dummy variables to Model 2, using Honduras as the referent and Model 4 adds region-specific dummy variables to Model 2 (Table 2).

Findings and analysis

The regressions reveal the attributes which have the greatest influence on price premiums of Cup of Excellence certified coffees in Central America. We find the following results. First, the size of the area in production had a significant positive effect on price premiums for three of the four models. Based on the model, producers could expect roughly one additional dollar per pound for

each additional 100 ha in production. This premium, based upon the control of a larger area in production, may be generated through the benefit of screening larger volumes of coffee for the highest quality product. In other words, producers that own larger farms could be selective about what portion of their harvest they submitted for evaluation. Therefore, it could be extended that price premiums for single origin coffees could be enhanced by the control of larger areas and sufficient capital to invest in production. That this variable is not significant when the country variables are included suggests this practice may be most prevalent in Guatemala and Nicaragua, the two countries with the highest mean production area (92.21 ha and 35.07 ha respectively) and the two countries which are significant in the third model. To strengthen this claim, further research would be necessary on yield per hectare as well as general farm practices and investments on small and large farms.

Second, if all else is equal, the volume of pounds certified by Cup of Excellence has a significant negative impact of roughly fifty cents per 1000 pounds. This penalty can be explained in two ways. On the one hand, it could be explained by a simple economy of scale argument suggesting that buyers wish to pay less per pound to buy more pounds. On the other hand, it can also be explained by the law of devaluation: larger batches of single origin coffees are less scarce and therefore earn lower prices. The fact that Cup of Excellence certified coffees receive a price penalty because there might be too much of it (i.e. it is not scarce enough), indicates that the rule of diminishing returns and devaluation indeed holds. What is still unclear is the quantity at which single origin coffees are deemed scarce or begin to lose their highest potential value. Ultimately, for CoE producers, the negative price impact of total volume was offset by the fact that Cup of Excellence certified coffees all received a significant premium and therefore, even at a lower per pound price, the producer received a very high total sale price. However, when we look at the logic of devaluation it raises a series of critical questions about whether the production and marketing of single origin coffees represents a scalable development approach. In the search for scarcity, single origin coffees may undermine the value of all other coffees, effectively undercutting the majority of other producers by redefining the value of coffee on new terms.

Third, the varietal has a significant but small impact on the price of CoE certified coffees, as the higher adjusted R² value for the second model shows. However, each individual varietal alone does not show a particularly strong impact on Cup of Excellence certified coffees. Catuai tends to produce lower prices whereas Paca and Caturra tends to sell for higher prices. Curiously, given the emphasis on finding unique coffees such as the Esmeralda Special, coffees featuring less-common varieties (labeled “Other varietal” in the chart) do not, as a group, sell for different prices than the more common varieties. This may, however, mask impacts of individual unique varieties, some of which could sell for much more and others of which could sell for much less. Further research is necessary on the role of varietal selection in the production of high quality single origin coffees. It is still unclear to what degree varietal selection influences taste as labor, climate, soil composition,

Table 1
Statistical description of Cup of Excellence entries from Central America.

	Farm size (ha)	Coffee area (ha)	Volume (lbs)	Altitude (m)	Quality score	Number of descriptors	Price/lb (2003 US\$)	Total sale
Minimum	1.09	0.62	1311	600	80.25	0	\$1.22	\$3164
1st quartile	10.2	7	2098	1300	84.87	7	\$2.93	\$8124
Median	25	17	2581	1448	85.98	9	\$4.54	\$11,255
3rd quartile	70	40	3260	1550	88.65	14	\$6.79	\$16,588
Maximum	1332	445.5	18,195	2210	95.76	37	\$27.47	\$69,109
Mean	69.32	35.88	2859	1424	86.73	10.81	\$5.50	\$13,909

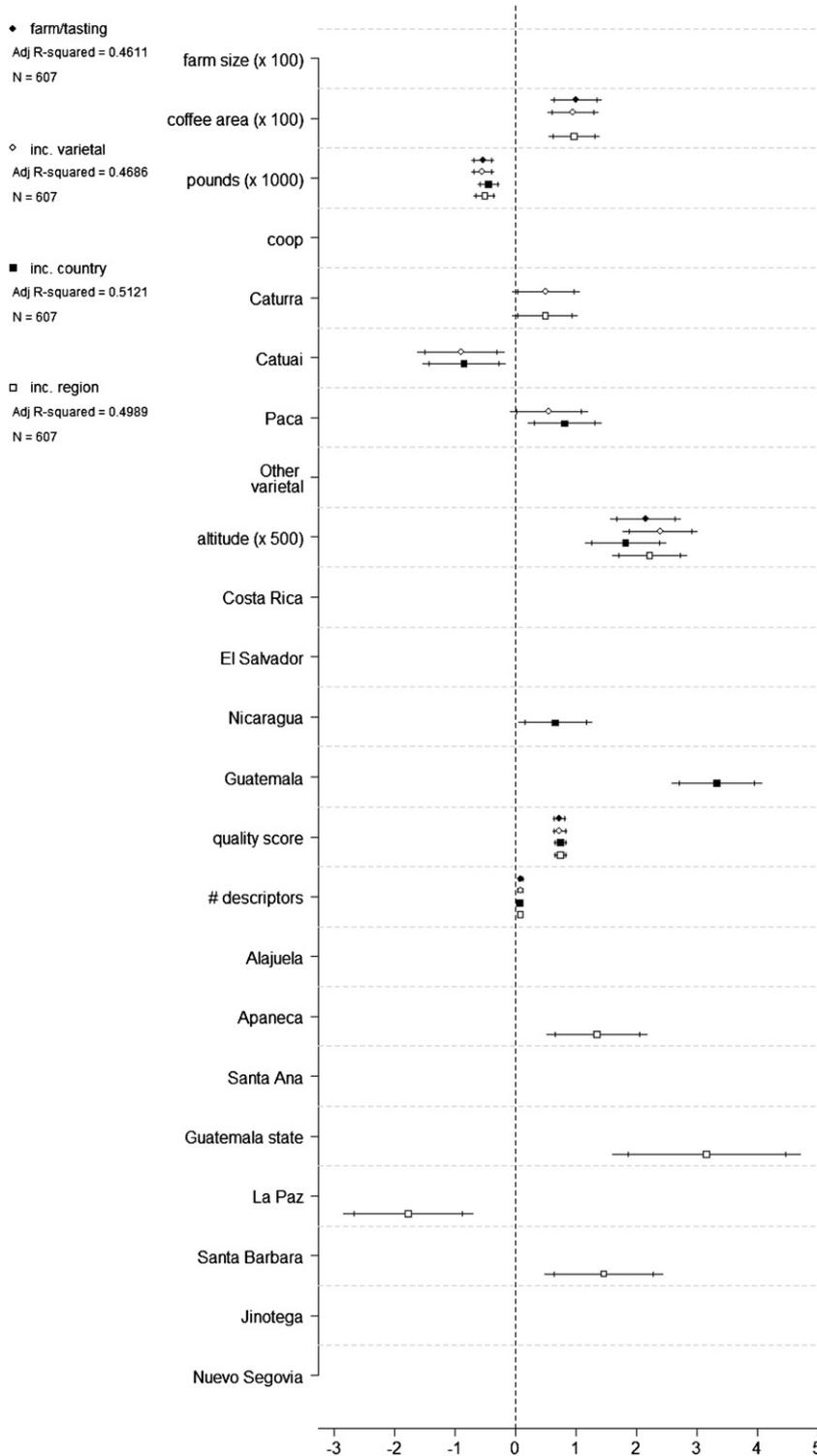


Fig. 2. Final regressions for Central America: marginal impact on price/lb (US\$).

and location are other dynamic factors that make it difficult to hold any one agricultural element constant. What is clear, however, is that varietals like the Geisha, have gained reputations for producing high quality single origin coffees. Whether these reputations are based on their symbolic value or their materially unique attributes they produce is a direction for future research.

Fourth, altitude contributes very significantly to the price of CoE certified coffee. If all else is equal, altitude adds a two dollar

premium per 500 m in altitude above sea-level. Altitude causes the fruit of coffee plants to mature much more slowly and thus creating a harder, denser bean (seed). Coffee experts claim that, among origin attributes, higher altitude is one of the most critical as coffees growing higher in elevation yield the best qualities. It is clear from these results that for farmers of single origin coffees greater control of higher elevation land is a pathway to obtain premium prices. The significance of altitude in relation to price premium perhaps best

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