

Evaluation of the Hass Avocado Board's Assessment Rate

Jiawei Guo

Kristin Kiesel

Stamatina Kotsakou

Richard J. Sexton⁺

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⁺ Jiawei Guo is a Ph.D. Student, Kristin Kiesel is an Associate Professor, Stamatina Kotsakou is a Ph.D. Candidate, and Richard J. Sexton is a Professor, all in the Department of Agricultural and Resource Economics at the University of California, Davis.

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1. Introduction

California avocado growers' longstanding program to fund advertising and promotion programs for their fruit was extended to include imports of fresh avocados through the Hass Avocado Promotion, Research, and Information Act enacted into law in 2000. This Act established the authorizing platform and timetable for the creation of the Hass Avocado Promotion, Research and Information Order (HAPRIO) that was approved in a referendum of producers and importers with 86.6 percent support on July 29, 2002. The Hass Avocado Board (HAB) was created at this time to administer the activities authorized under the HAPRIO.

Mandatory program assessments of 2.5 cents per pound on all fresh Hass avocados sold in the U.S. market commenced effective January 2, 2003. This assessment rate has remained unchanged over the entire 20 plus year life of the Order. The assessment is collected by first handlers for California production and by the U.S. Customs Service for imports and forwarded to the HAB. These funds are then allocated to programs and activities designed to increase the demand for Hass avocados in the U.S. market. The HAB uses 15% of the assessments to fund administration of the order and activities such as nutrition research, marketing, and information programs. The Board rebates 85% of domestic assessments to the California Avocado Commission (CAC) and 85% of assessments from each importing country to the certified country importer associations for their own promotion programs. At present, those associations include the Chilean Avocado Importers Association (CAIA), the Colombian Avocado Board (CAB), the Mexican Hass Avocado Importers Association (MHAIA) and its partner organization, Avocados from Mexico (AFM), and the Peruvian Avocado Commission (PAC).

The purpose of this study is to evaluate the HAB's longstanding 2.5 cents per pound assessment rate and consider whether an increase in the assessment rate would likely generate a

positive net return to California growers and to importers of fresh Hass avocados. The report consists of the following components: (i) a brief overview of the history of the industry and its growth since the creation of the HAB; (ii) evidence on how the assessment rate, although constant over time in nominal terms, has changed in real terms due to inflation and in relative terms, given the growth in fresh Hass avocado prices over time; (iii) evidence on the incidence of the assessment—i.e., the extent to which it is passed forward in the supply chain to consumers; (iv) quantitative evaluation of the impacts of promotions funded by the assessments based on the quinquennial evaluation studies of the HAB’s programs; and (v) discussion of the potential for further demand growth in the U.S. market through expanded promotions.

2. Growth in the Market for Fresh Hass Avocados in the United States¹

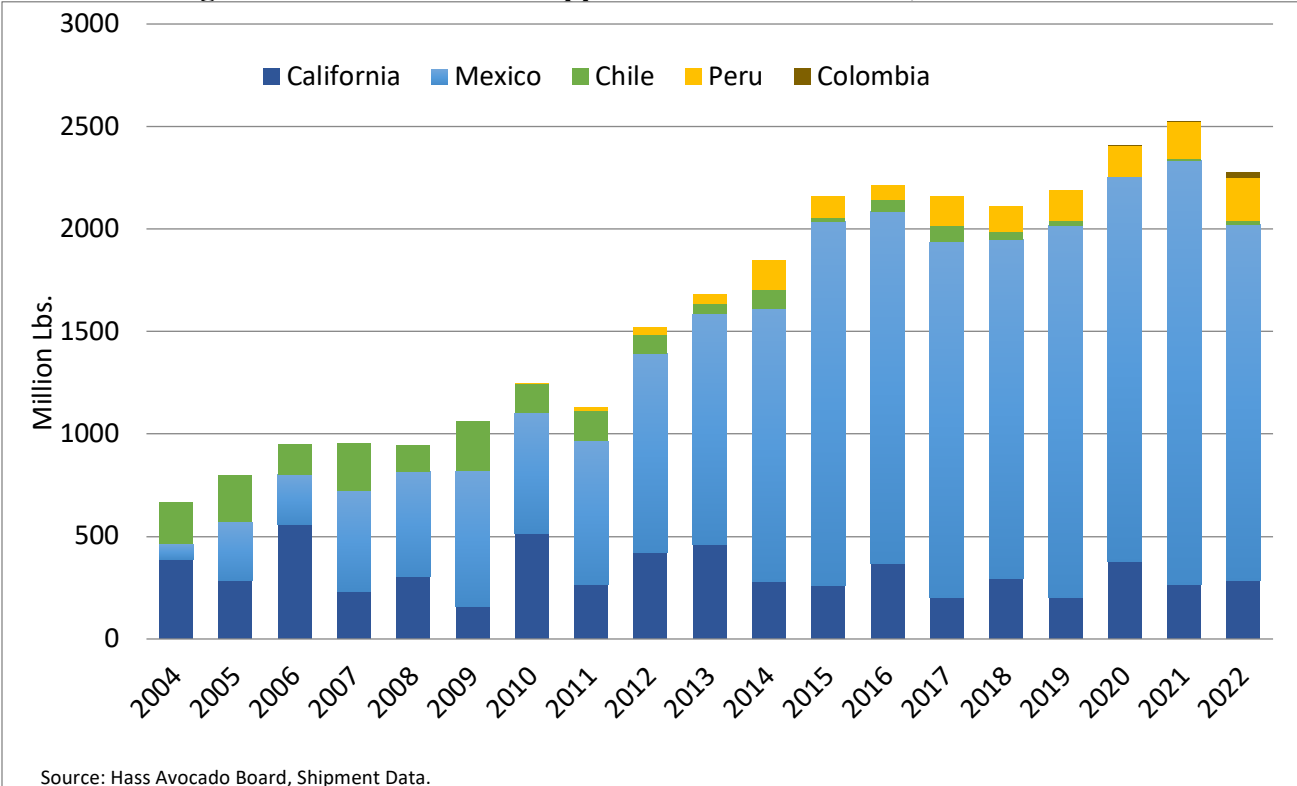
From 1970 – 89, fresh avocado consumption in the United States averaged 1.2 lbs. per capita. Nearly all production emanated from California and Florida, and imports accounted for only about one percent of total supplies during this period. The market share of imported fresh avocados began to expand rapidly in the 1990s, first due mainly to product entering from Chile and the Dominican Republic. Mexico gained access to portions of the U.S. market in 1997, and the share of the market comprised by imports expanded rapidly. Mexico gained access incrementally to increasing segments of the U.S. market, and in 2007 gained year-round access to all states.

Figure 1 shows the total supply of fresh avocados to the U.S. market from 2004 – 22 by country of origin. Total supplies expanded nearly fourfold over this period, and the composition of supplies also changed dramatically. Mexico’s share of the market grew to near 80%, with

¹ This section is adapted from the study “Five-Year Evaluation of The Hass Avocado Board’s Promotion Programs: 2018 – 2022,” conducted by the same authors.

declining shares coming from California and Chile. Peru has emerged recently as an important player in the market, and, with a 7.2% market share from 2018 – 22, became the third largest seller, following Mexico (79.4%) and California (12.4%).

Figure 1. Fresh Avocados Supplied to the U.S. Market, 2004 - 2022

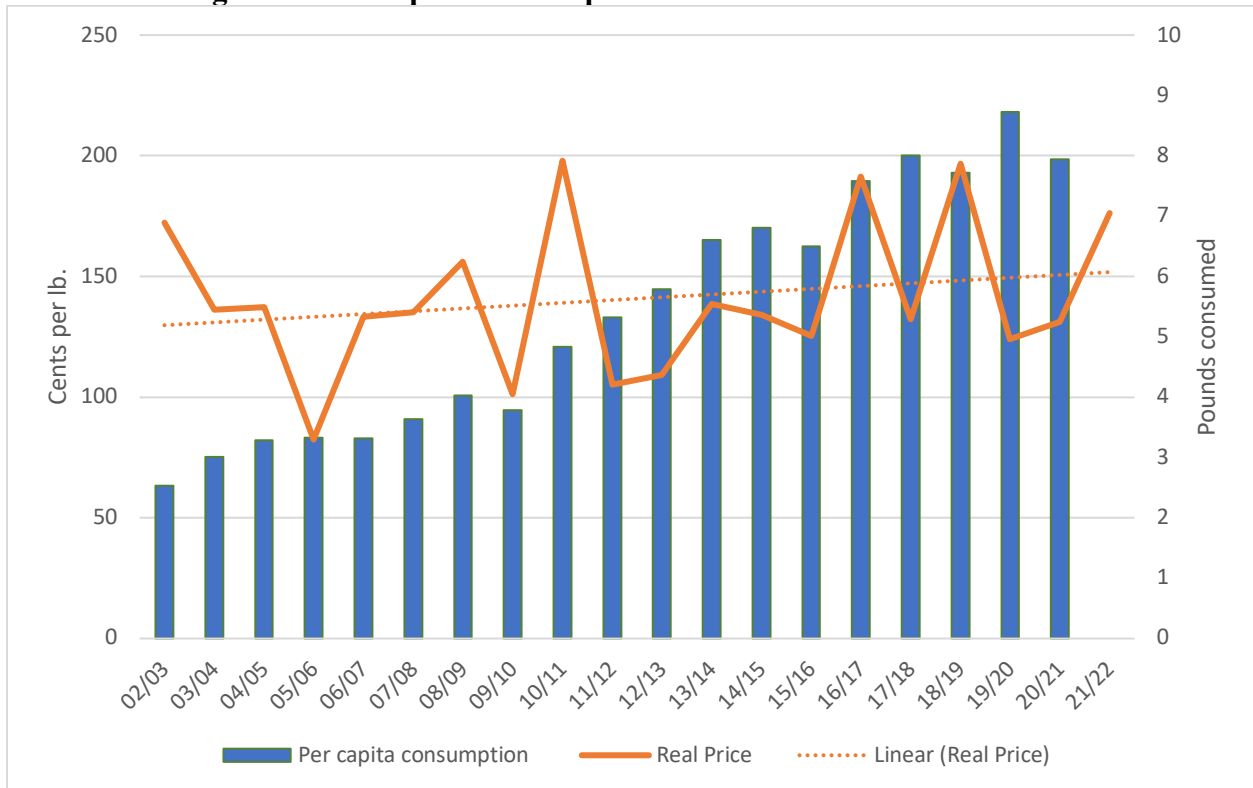


The dramatic growth in fresh avocado supply to the U.S. market would have cratered prices received by domestic producers and importers without significant expansion of demand occurring at the same time. Thus, a first measure of the effectiveness of the HAB’s promotion activities is the real prices attained by domestic producers and importers over time. Sales growth achieved while maintaining or increasing prices on an inflation-adjusted (real) basis reflects true growth in demand.

Our evidence gathered on movements in real prices over time is contained in figures 2 and 3. Figure 2 depicts annual per capita consumption of fresh avocados in the United States (blue

bars), along with the California producer price in real (2022) terms. The linear trend line shows that, despite considerable year-to-year volatility, real grower prices per pound have increased on average over the life of the HAB at a rate of 1.16 cents per year.

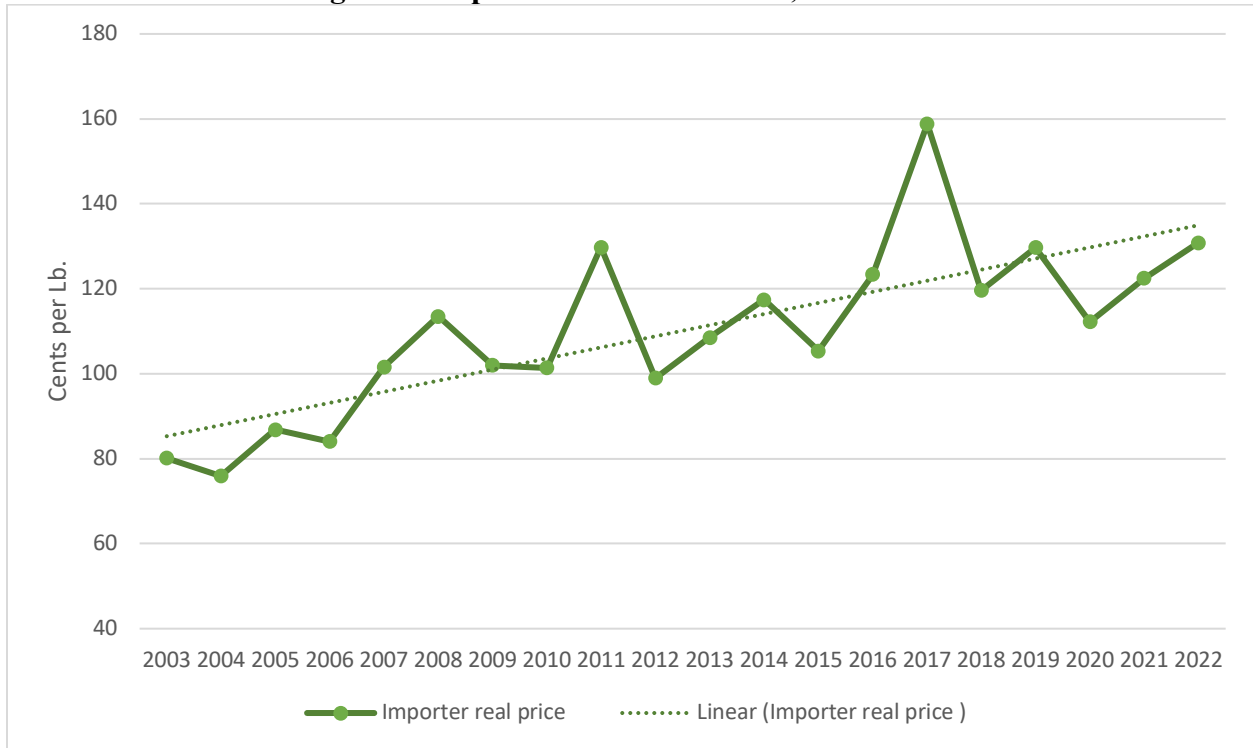
Figure 2. Per Capita Consumption and California Producer Price



Source: Per capita consumption data from USDA; price data from California Avocado Commission; price deflated by U.S. Consumer Price Index (2022=100), Bureau of Labor Statistics.

Figure 3 depicts the average real (2022 base) price received by importers of fresh avocados at the U.S. ports of entry from 2003 – 2022. The trend line shows a real price that is increasing on average over the life of the HAB at a rate of 2.61 cents per year. Our analysis indicates that the industry has succeeded in expanding demand significantly, and that demand more than kept pace with the growth in supplies to the market.

Figure 3. Importer Price and Trend, 2003 - 2022



Source: USDA, Economic Research Service, Trade History; price deflated by U.S. Consumer Price Index (2022=100), Bureau of Labor Statistics.

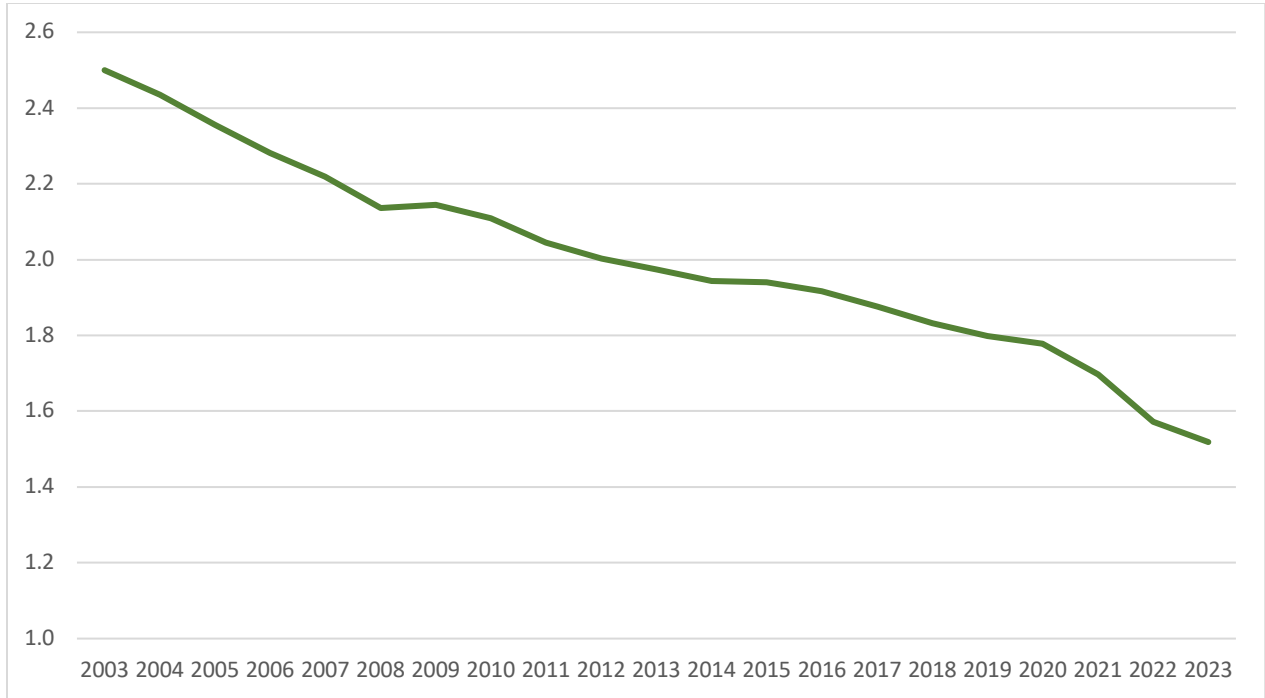
3. Decline of HAB Assessment Rate in Real and Percent Terms

The inflation rate over the life of the HAB, as measured by the Consumer Price Index (CPI), has been about 65%, meaning that a dollar of assessment income collected in 2023 is worth only about 60 cents compared to that same dollar in 2003. Figure 4 illustrates this point by depicting the assessment rate in real terms, with the CPI base set at 100 in 2003, HAB’s inaugural year. We show that the assessment rate has declined continuously over time in real terms, reflecting annual rates of inflation. As of 2023, the real assessment rate (in 2003 dollars) was only 1.52 cents or 60.7% of its value in 2003.

Some commodity boards with federal authorization (e.g., the Cotton Board, Pork Board, United Sorghum Board, and United Soybean Board) set assessment rates in terms of a percentage of the commodity’s value at, say, the farm level. Such assessments are known as *ad valorem* (i.e.,

according to the value). Thus, as the value of a commodity rises and falls over time, so too does the assessment revenue.

Figure 4. Deflated (Real) Assessment Rate (cents/lb)

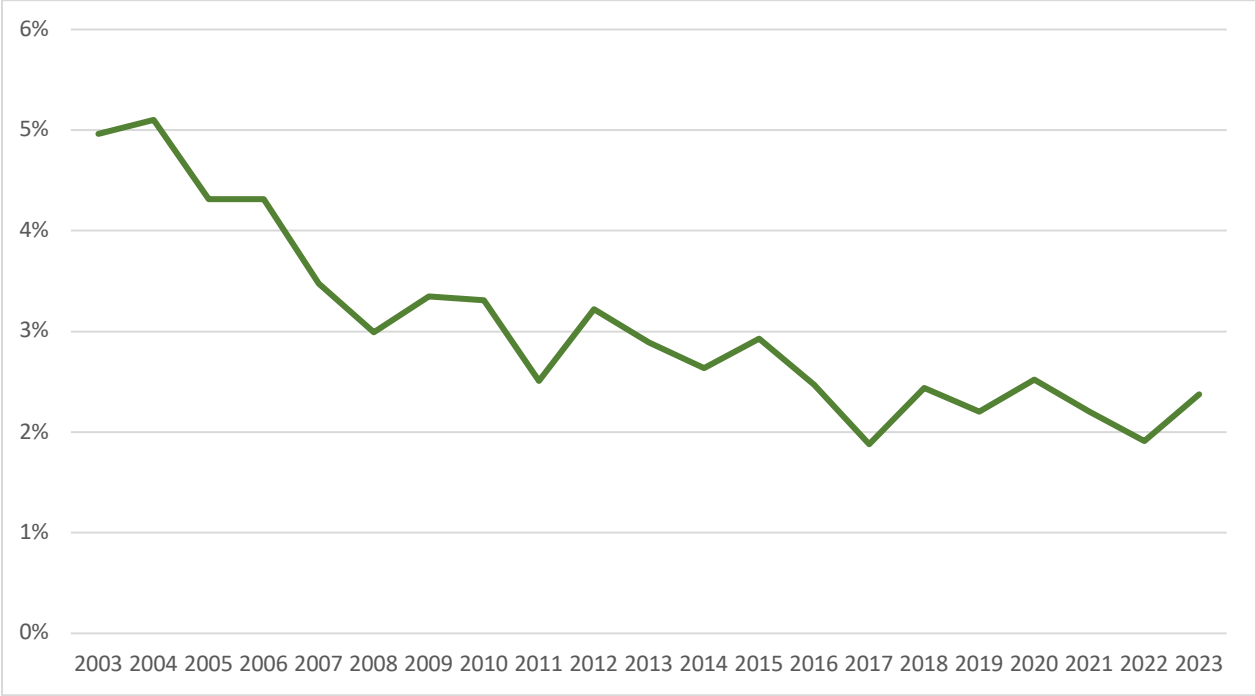


Even though the HAB assessment is on a per-pound basis, we also consider it as a percentage of the price of fresh Hass avocados per pound as shown in figure 5. This figure is constructed by simply dividing the 2.5 cent per pound assessment by the import price per pound for each year over the life of the HAB.² The figure shows that in HAB's early years the assessment rate, if converted to a percentage basis, was about 5% of the product value per pound. The implied percent rate has fallen rapidly since then because the product value has increased while the assessment rate has stayed constant. In recent years the assessment rate has generally been in the range of 2.0 – 2.5% of the import value, although it dipped below 2.0% in both 2016-17 and 2021-

² We use the import price for purposes of making this comparison, given that a significant majority of fresh Hass avocados are imported, but using the California grower price instead would tell a very similar story because the import and domestic price are highly correlated.

22 due to high import prices. In sum, as a percentage of the crop value, the assessment rate has fallen from about 5% at the naissance of the HAB to near 2% today.

Figure 5. Assessment Rate/Importer Price (Percentage)



4. Shifting of the Assessment and Its Incidence for Producers and Consumers

It is a fact of basic economics that a tax or assessment imposed at one stage of a supply chain may be passed forward in the supply chain in whole or part based upon market processes. With specific reference to the HAB assessment, the idea is that the assessment raises the marginal costs of domestic producers and importers by the amount collected (\$0.025 per pound). Some portion of this cost increase will be reflected in an increase in the price of the final product and, hence, be borne by consumers.

Assuming competitive market conditions in the Hass avocado industry, the share that is passed forward is based upon the price elasticity of supply, ϵ_S , of producers and importers relative to the price elasticity of demand, ϵ_D , for consumers. The specific formula for the share of an

increase in the assessment rate, ΔA , borne by consumers in the form of a higher price, ΔP , is: $\frac{\Delta P}{\Delta A} = \frac{\varepsilon_S}{\varepsilon_S - \varepsilon_D}$. For example, if $\varepsilon_D = -1.0$ and $\varepsilon_S = 1.0$, the formula indicates that half of any increase in the assessment would be passed forward to consumers in the form of a higher retail price.

In our evaluation of the HAB's promotion programs (Guo et al. 2024) we estimated the retail price elasticity of demand to be $\varepsilon_D = -0.77$ for our preferred double log model.³ This means that a 10% increase in the retail price of Hass avocados is expected to reduce retail sales by about 7.7%. Our evaluation of the promotion programs did not seek to estimate ε_S . We noted that supply becomes more elastic the longer the time period considered. As a perennial crop, the world supply of Hass avocados at any point in time is relatively fixed, with producers only able to effectuate minor changes in supply within a given crop year based on the application of variable inputs such as fertilizers. However, within a relatively short time marketers can reallocate supplies to some extent from one market to another, meaning that the elasticity of supply to a given market, such as the United States, is more elastic than the overall world supply.

Our evaluation report considered three values for ε_S , namely 0.5, 1.0, and 2.0, with 1.0 representing our preferred estimate, and 0.5 representing a short-term response to price and 2.0 representing a longer-term response. Table 1 indicates the share of any increase in the assessment rate that will be passed forward to consumers in the form of a higher retail price, given our econometric estimate of the price elasticity of demand and the three values for the price elasticity of supply of Hass avocados to the U.S. market. Based upon our preferred estimate of ε_S , about 56% of a change in the assessment rate will be passed forward to consumers. Over a longer time horizon, as supply to the U.S. market becomes more elastic, an even larger share will be passed

³ The alternative linear model yielded a similar estimate of the retail price elasticity of demand: $\varepsilon_D = -0.73$.

forward, e.g., 72% when $\epsilon_S = 2.0$.⁴ The remainder of the change in assessment will be absorbed by domestic producers and importers, distributors, or retailers.

Table 1: Share of Assessment Borne by Retail Consumers

Price elasticity of supply	$\epsilon_S = 0.5$	$\epsilon_S = 1.0$	$\epsilon_S = 2.0$
Share of assessment rate borne by consumers	0.39	0.56	0.72

Note: Calculations assume $\epsilon_D = -0.77$.

Our analysis of HAS avocado sales did not distinguish between avocados produced domestically or imported from Mexico, Peru, Chile, and Colombia. The estimates reported here represent an aggregated and average pass-through or price change.

5. Effectiveness of Promotions Conducted Under the HAB's Auspices

So far we have shown that the industry has succeeded in expanding demand for fresh Hass avocados in the United States and that real prices for domestic growers and importers have risen over the life of the HAB. We have also shown that in real terms or as a percentage of product value, the assessment rate has declined significantly over the HAB's life. In considering whether expansion of the assessment rate would benefit importers and domestic producers, the key factor is whether the assessment-funded promotions have, at the margin, been effective in the sense of yielding benefits to domestic producers and importers in the form of incremental profits in excess of the 2.5 cents per pound cost.

Mandated evaluation studies that have been conducted every five years over the life of the HAB can be used to answer this fundamental question. To date, four such studies have been

⁴ Worth noting is that increases in prices for Hass avocados from a share of any increase in the assessment rate being passed forward to consumers will result in reduced sales. However, the impact on retail prices and sales of a small increase in the assessment rate will be very minor. For example, suppose the assessment rate is raised by \$0.01 (one cent) per pound. Assuming 2.2 avocados per pound and 56% pass through yields a per avocado price change of $(\$0.01/2.2) \times 0.56 = \0.0025 , i.e., only about $\frac{1}{4}$ of one cent, causing an almost imperceptible impact on retail sales.

completed, all by agricultural economists affiliated with the Department of Agricultural and Resource Economics at UC Davis. The methodologies employed by these studies have changed over time, reflecting mainly the availability of more and better data on fresh Hass avocado sales and prices in the United States. All of the studies have, however, found that the promotions yielded a substantial net benefit to the industry in terms of incremental profits, derived through a combination of higher crop prices and greater sales, that substantially exceeded the incremental costs incurred in terms of the 2.5 cents per pound assessment.

The most recent study covered the years 2018 – 22 and was conducted by the same authors as this report. Depending upon the model specification, we found producer/importer benefit-cost ratios that ranged from 1.85 – 3.34 with our preferred estimate of 2.47. This means that the incremental dollar expended to promote fresh Hass avocado consumption in the United States during this period yielded grower/importer returns of at least \$1.85 and as much as \$3.34 (with \$2.47 representing the preferred estimate). Importantly, these estimates were closely comparable to what was generated for the prior five-year review for the 2013 – 17 period by Ambrozek, Saitone, and Sexton, who presented benefit-cost ratios in the range of 1.6 – 3.6, depending upon model specification.

6. Opportunities for Further Hass Avocado Demand Growth in the U.S. Market

We concluded from the 2018 – 22 HAB promotion evaluation study that the fresh Hass avocado market in the United States retains considerable opportunity for future demand growth. Despite the rapid market growth achieved over the life of the HAB, we detect significant regional disparities in per capita consumption that exist today, a persistent seasonality in consumption, and considerable variation in consumption across key demographic groups.

For instance, our evaluation showed that per capita consumption of fresh Hass avocados in the Great Lakes, Plains, Midsouth, and Northeast regions is half or less of the per capita consumption in the West (table 2). These four regions jointly comprise over half of the U.S. population, and moving consumption in these regions to even the mean level of per capita consumption per month of 0.48 avocados would result in a 12.2% growth in the total U.S. demand.

Table 2. Summary Statistics for U.S. Regions: 2018 - 22

Market	Mean	Mean [SD]	Mean [SD]	Mean [SD]
	Population (millions)	Per capita avocados sold	Ave. sales price (cents)	Per capita retail sales value (cents/month)
California	39.43	0.63 [0.11]	130 [16]	81.64 [15.56]
Great Lakes	47.52	0.33 [0.06]	118 [16]	39.46 [7.89]
Midsouth	40.21	0.38 [0.08]	119 [13]	45.44 [9.11]
Northeast	57.03	0.38 [0.08]	133 [14]	49.74 [10.35]
Plains	21.72	0.37 [0.07]	113 [17]	42.08 [8.32]
South Central	40.89	0.59 [0.12]	92 [16]	53.91 [10.34]
Southeast	45.24	0.45 [0.09]	111 [16]	49.36 [9.88]
West	36.82	0.75 [0.14]	113 [16]	84.31 [16.03]
Total United States	328.86	0.48 [0.09]	116 [15]	55.30 [10.48]

Note: Values in square brackets are standard deviations.

A similar point can be made regarding the rather extreme seasonality present in Hass avocado demand in the United States documented in our five-year evaluation. Consumption is high during the spring and summer months relative to fall and winter. The peak months are May, reflecting both Cinco de Mayo and Mother’s Day celebrations, followed by July. Hass avocado consumption is lowest in November. The difference in May vs. November retail per capita consumption is 0.186 Hass avocados, implying that per capita consumption is 39% higher in May than in November. Expanding Hass avocado use in the United States during the winter months and holidays such as Thanksgiving and end-of-year celebrations represents another avenue to expand

demand moving forward.

Although we did not focus on the demographic factors driving Hass avocado consumption in our evaluation study, it is well known that the Latino/Hispanic population tends to be heavy consumers of avocados. This segment of the U.S. population is by far the fastest growing, increasing by roughly 1,000,000 people per year in the prior decade. The 2020 Census revealed that the Latino/Hispanic population grew 23% during this decade, while the rest of the population grew only 4.3%. Thus, serving the growing Latino/Hispanic population provides the industry with further growth opportunities, as does the potential to increase Hass avocado consumption among demographic groups that are not presently heavy users.

Finally, the most recent evaluation report discussed HAB's efforts to broaden its research and promotion efforts to explicitly include sustainability as an additional priority. We view these expenditures and continuous investments in the promotion of health, environmental, and societal benefits of avocado consumption as not only essential to ensuring that perceptions of existing heavy consumers remain positive, but also as a way to reach new demographics, including younger audiences.

We note these opportunities not in the sense of attempting to guide the promotions conducted under the Board's auspices but only to suggest that we believe considerable growth potential remains in the U.S. market for Hass avocados. We, thus, believe that an increase of the assessment rate to enable the Hass avocado promotions to be maintained in real terms or even expanded holds considerable potential to increase prices, sales, and profits to domestic producers and importers.

References

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Guo, J., K. Kiesel, S. Kotsakou, and R.J. Sexton (2024). “Five-Year Evaluation of The Hass Avocado Board’s Promotion Programs: 2018 – 2022.” Report submitted to the Hass Avocado Board, January 2024.