An Economic View of Corporate Social Impact

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Abstract

The growing discussions of impact investing and stakeholder capitalism have increased interest in measuring companies' social impact. We conceptualize corporate social impact as the welfare loss that would be caused by a firm's exit. To illustrate, we quantify the social impacts of 75 firms in 12 industries using a new survey measuring consumer and worker substitution patterns combined with models of product and labor markets. We find that consumer surplus is the primary component of social impact (dwarfing profits, worker surplus, and externalities), suggesting that impact investors should focus more on firms selling differentiated and popular products to low-income consumers.

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There is growing focus on companies' social impact, in addition to their profitability. Many mutual funds and institutional investors have corporate social responsibility requirements for inclusion in their portfolios. One-third of U.S. assets under management—$17 trillion in total—consider environmental, social, and governance issues, an amount that has doubled since 2015 (SIF Foundation 2020). The Business Roundtable (2019), a group of CEOs, now says that their companies' objectives extend beyond generating shareholder value to include multiple stakeholders and "promoting an economy that serves all Americans." A group of academics and business stakeholders commissioned by the The British Academy (2018) similarly argues that profits "is not the corporate purpose," and that in some cases, "corporate purposes should include public purposes that relate to the firm's wider contribution to public interests and societal goals." Alongside this is an active academic debate about what companies should maximize,[1] why investors and firms embrace social goals,[2] the market returns and equilibrium implications of impact investing,[3] and how impact investors should allocate capital.[4]

A key challenge in this discussion is uncertainty and disagreement about how to actually measure a company's social impact.[5] There are third-party rating systems that score companies on dimensions of social impact—product quality, worker treatment, environmental performance, etc.—and then combine these measures to generate a company's overall score. However, most systems do not have a theoretically grounded economic definition of what they want to measure or an objective way to combine across dimensions to calculate the overall score.[6] Perhaps as a result, there is substantial disagreement between different third-party ratings of the same companies (Chatterji et al. 2015; Berg, Koelbel, and Rigobon 2022; Christensen, Serafeim, and Sikochi 2022).

[1] See, for example, Friedman (1970), Stout (2012), Magill, Quinzii, and Rochet (2015), Hart and Zingales (2017a, 2017b), Mayer (2018), Edmans (2021), and Fama (2021).

[2] See, for example, Besley and Ghatak (2005), Heal (2005), Bénabou and Tirole (2010), Hong, Kubik, and Scheinkman (2012), Kitzmueller and Shimshack (2012), Riedl and Smeets (2017), Hong et al. (2019), Morgan and Tumlinson (2019), and Cheng, Hong, and Shue (2020).

[3] See, for example, Heinkel, Kraus, and Zechner (2001), Hong and Kacperczyk (2009), Margolis, Elfenbein, and Walsh (2009), Chava (2014), Bialkowski and Starks (2016), Broccardo, Hart, and Zingales (2020), Barber, Morse, and Yasuda (2021), Pástor, Stambaugh, and Taylor (2020), Pedersen, Fitzgibbons, and Pomorski (2021), and Bolton and Kacperczyk (2021).

[4] See, for example, Brest and Born (2013), Brest, Gilson, and Wolfson (2016), Chowdhry, Davies, and Waters (2019), Landier and Lovo (2020), Green and Roth (2020), Oehmke and Opp (2020), Hong, Wang, and Yang (2021), and Roth (2021).

[5] For example, The Economist magazine (2019) writes that "the scoring systems sometimes measure the wrong things and rely on patchy, out-of-date figures."

[6] Existing corporate impact rating systems include Just Capital (https://justcapital.com/rankings/), Refinitiv (https://www.refinitiv.com/en/financial-data/indices/esg-index), and MSCI (https://www.msci.com/esg-ratings). As an example, Just Capital polls a representative sample of Americans to quantify the weights that they place on five different issues—workers, customers, communities, environment, and shareholders—and then scores all Russell 1000 companies on these issues using data from SEC filings, media reports, pollution inventories, and other sources. The "product impact-weighted accounts" framework (Serafeim, Trinh, and Zochowski 2020) takes an important step forward by quantifying firms' social impact in dollar units. Key differences between their approach and ours include that (i) we begin from an economic model that delivers a specific notion of social welfare; (ii) they use accounting techniques to estimate consumer surplus and costs, while we use demand estimation; and (iii) they do not quantify contributions to worker surplus.

Our paper begins from the observation that economics offers a set of useful frameworks for conceptualizing and quantifying the objects that many impact investors care about: consumer and worker surplus, externalities, social welfare, etc. We conceptualize a firm's social impact as the social welfare loss from the firm's exit in equilibrium. Using new survey data and standard approaches from industrial organization, public economics, and labor economics, we then quantify social impact for 75 large companies in the upstream oil industry and 11 differentiated product industries: automobiles, airlines, six consumer packaged goods (beer, cereal, cigarettes, soda, toothpaste, and yogurt), grocery retail, smartphones, and chain restaurants.

In our model, people with heterogeneous income-earning ability choose numeraire good consumption, what products to buy in each market, and what firm to work for. Some products (e.g., oil) impose consumption externalities, and some products (e.g., cigarettes and soda) also involve "internalities," meaning that consumers' choices do not maximize their own long-run utility. Firms' profits are redistributed unequally across people. Social welfare is the Pareto-weighted sum of utility across people.

We define a firm's *individual impact* as the social welfare loss from its exit if all competing firms remain in the market. However, many impact investors allocate assets at the industry level (for example, by excluding all cigarette or oil companies), and if consumers substitute easily across competing firms, a firm's individual impact could be small even if it is part of a highly impactful industry. We thus define a second metric, the *share of industry impact*, where we apportion the welfare loss from the entire industry's exit across firms using Shapley values. In our framework, firms and industries have larger social impact if (i) their consumers and workers are less willing to substitute away, (ii) they serve lower-income consumers or employ workers with low income-earning ability, and (iii) their products generate less negative externalities and internalities.

To illustrate how the framework can be usefully deployed, we then carry out a back-of-the-envelope quantification of corporate social impact for each of our 75 firms. We make five assumptions for empirical implementation: (i) the social marginal welfare weight applied to each person is inversely proportional to income, following a common rule of thumb in the optimal taxation literature (e.g., Saez 2002); (ii) utility is additively separable in components of consumption and labor supply; (iii) intermediate goods are produced in perfectly competitive markets with no externalities; (iv) each firm is only a small part of the labor market, so its exit does not affect wages offered by other firms; and (v) firms produce one representative product with exogenous characteristics and cost function. Assumptions (ii), (iii), and (iv) simplify the analysis substantially by allowing us to consider product markets and labor markets in independent partial equilibria, while assumption (v) simplifies our data collection and counterfactual simulations.

To measure consumers' and workers' income levels and willingness to substitute to competing firms, we fielded a new 3,500-person survey. For each of our 11 differentiated product markets, the survey elicited consumption frequency, brand last purchased, customer satisfaction, firm-level price response (whether people would still buy from the same firm if the price increased by 25 percent), and aggregate price response (the extent to which people would reduce consumption if the price of all products in the market doubled). The survey also asked a parallel question about labor supply response (whether people would find a new job if their employer had to cut salaries by 10 percent).

We model the 11 differentiated product markets using a standard framework from the industrial organization literature (e.g., Berry, Levinsohn, and Pakes 1995). We use the survey data to estimate a discrete choice demand system for each market, and we infer marginal costs and simulate counterfactual prices assuming that firms set prices to maximize profits in Nash equilibrium. We model oil as an undifferentiated product and assume that firms are price takers in the global market. For automobiles, airline travel, and oil, we include climate change externalities from carbon dioxide emissions valued at \$51 per ton, the U.S. government's social cost of carbon. For beer, cigarettes and soda, we include health cost externalities and internalities using estimates from the literature.

We model labor markets in the spirit of the differentiated firms framework from the labor economics literature (e.g., Card et al. 2018). Because we assume that each firm is only a small part of the labor market, we can estimate each firm's contribution to worker surplus by integrating under its residual labor supply function. Since our survey is not large enough to include many workers at each specific firm in our sample, we use regressions to predict labor supply response as a function of salary, education, occupation, employer size, and local labor market size, and we fit those predictions onto the distribution of workers at each firm, which we derive from census data.

Using these estimates, we quantify corporate social impact for the 75 firms across our 12 industries. There are four key results. First, our corporate social impact ratings are highly correlated with firm size: naturally, larger firms that serve more consumers and employ more workers have more social impact.

Second, consumer surplus is the most important component of corporate social impact, dwarfing profits, worker surplus, and externalities. Profits matter little because they overwhelmingly accrue to high-income people who have low social marginal welfare weights. Worker surplus is mechanically much smaller than consumer surplus because wages equal only about 10 percent of revenues for our average firm. The firm with by far the most social impact in our sample is Walmart's grocery business, which generates \$152 billion dollars per year of positive social impact by selling groceries to a large group of low- and middle-income Americans who report on our surveys that it would be relatively difficult for them to substitute to a competitor.

Third, at mainstream estimates of externalities and internalities, cigarette companies have *negative* corporate social impact: in our estimates, society would be better off if they exited. The firm with the most negative social impact in our sample is Philip Morris, which reduces social welfare by \$11 billion per year. Strikingly, airlines, auto companies, and oil companies still generate so much consumer surplus that this outweighs their negative climate change externalities, even in an alternative analysis with a $200 social cost of carbon.

Fourth, our estimates of corporate social impact are essentially unrelated to ratings from two prominent environmental, social, and governance rating systems. Part of this is presumably because of limitations in our ability to quantify all components of social impact in dollars, and part may be because existing ratings might be trying to measure something other than a firm's contribution to social welfare. But this lack of correlation also suggests that the current discussion of corporate social impact might benefit from additional economic foundation, and specifically that existing rating systems may not fully account for the large contribution of consumer surplus to social impact.

Our corporate social impact framework is directly useful for firms that want to measure their impact and for investors, workers, and consumers who want to associate their investments with high-impact firms. However, a firm's social impact is generally not the same as the additional social impact of investing in the firm (Brest and Born 2013). For example, investing in a high-social impact firm could in equilibrium displace other investors motivated only by profits, who might instead invest in other firms with low social impact (Green and Roth 2020). Bonnefon et al. (2022) find that most investors prefer to associate their investments with high-impact firms, with less regard for the additional impact of their investment. Corporate social impact estimates are still useful for impact-seeking investors because social impact is one key ingredient for optimal impact investing strategies in many models (e.g. Chowdhry, Davies, and Waters 2019; Green and Roth 2020; Oehmke and Opp 2020; Roth 2021).

Our analysis has at least three types of important limitations. First, one could debate our conceptualization of corporate social impact and the underlying welfarist moral philosophy. For example, our approach may not capture the full importance of diversity and inclusion or the costs and benefits of business practices such as political lobbying and good governance. Second, our static partial equilibrium assumptions are restrictive. For example, we ignore how a firm's exit would affect the pollution and worker surplus at its suppliers. Furthermore, we ignore how competitors might adjust product lines and production functions in a response to a firm's exit. If we considered a longer time horizon, a firm's social impact might be very small because competitors could adjust to make the same products and employ the same number of workers. Third, our empirical implementation uses survey responses instead of market behavior, requires strong functional form assumptions for marginal costs and the surplus provided to inframarginal consumers (Hausman 1996; Petrin 2002), and requires controversial assumptions about the magnitudes of externalities and internalities.

Notwithstanding these limitations, we hope that this paper can be a useful step forward in developing an economic framework to quantify corporate social impact. We think of this paper as a cousin to Hendren and Sprung-Keyser (2020): while they provide a unified welfare analysis of many U.S. government policies, we provide a unified welfare analysis of many large firms.

Sections I–V present the theoretical framework, data, product market estimates, and labor market estimates, respectively. Section VI presents our corporate social impact estimates, and Section VII concludes.

I Model

One of the most provocative parts of our analysis may be the initial question of how to conceptualize a company's social impact. What moral philosophy do we adopt? What notion of "impact" do we consider? This section lays out our formal economic model, adopting a welfarist framework that compares market equilibria with vs. without a firm.

I.A Setup

There are N people indexed by i with income-earning ability θ_i. There are many product markets (automobiles, airline travel, beer, etc.) indexed by m. Within each product market, a set of $\mathcal{J}_m$ products indexed by j are available at prices p_j on a set of $\mathcal{T}_m$ choice occasions indexed by t. The products are made by a set of firms $\mathcal{F}$ indexed by f, each of which makes products $\mathcal{J}_f$. There are many local labor markets indexed by l. Within each labor market is a set of firms offering wages $w_{fl}(\theta)$. $\boldsymbol{p}$ and $\boldsymbol{w}(\theta)$ are the vectors of prices and wages across all products and employers.

People choose numeraire good consumption, what product to buy in each market on each choice occasion, and the firm and local labor market where they work. y_{ijt} and y_{ifl} are binary indicators for buying j at time t and working at f in labor market l, and n is the quantity of numeraire consumption. $\boldsymbol{y} := \{y_{ift}, y_{ifl}\}$ is the vector of all choices. u_{ijt} and u_{ifl} are the utilities from buying j at t and working at f in l.

Each person i receives amount π_i of redistributed profits. Person i's income is thus $z_i = \pi_i + \sum_{fl} w_{fl}(\theta_i) y_{ifl}$, so the budget constraint is $n + \sum_m \sum_{t\in\mathcal{T}_m} \sum_{j\in\mathcal{J}_m} p_j y_{ijt} \leq z_i$. Φ is a negative externality, such as climate change or second-hand cigarette smoke.

We assume that people have quasilinear utility that is additively separable in consumption, labor, and the externality: $U_i = U_i\left(\sum_m \sum_{t\in\mathcal{T}_m} \sum_{j\in\mathcal{J}_m} u_{ijt} y_{ijt} + n + \sum_{fl} u_{ifl} y_{ifl} - \Phi\right)$, with $U_i' > 0$. Substituting in the budget constraint gives

$$U_i\left(\boldsymbol{y}; \boldsymbol{p}, \boldsymbol{w}(\theta_i)\right) = U_i\left(\sum_m \sum_{t\in\mathcal{T}_m} \sum_{j\in\mathcal{J}_m} (u_{ijt} - p_j) y_{ijt} + \pi_i + \sum_{fl} (u_{ifl} + w_{ifl}(\theta_i)) y_{ifl} - \Phi\right), \quad (1)$$

Standard economic models assume that people choose $\boldsymbol{y}$ to maximize equation (1). We relax the utility maximization assumption in two product markets where consumer choice is sometimes argued to be affected by behavioral biases: cigarettes (e.g., Gruber and Kőszegi 2001) and soda (e.g., Allcott, Lockwood, and Taubinsky 2019a, 2019b). In those markets, we assume that consumers misperceive u_{ijt} by amount γ_j. They thus maximize "perceived utility" $\tilde{U}_i$, which is the same as equation (1) except with $\tilde{u}_{ijt} \coloneqq u_{ijt} + \gamma_j$ in place of u_{ift}. Following Herrnstein et al. (1993) and the behavioral economics literature, we refer to γ_f as a negative "internality." We set $\gamma_f = 0$ for markets other than cigarettes and soda. Consumer choice is determined by

$$\boldsymbol{y}^* = \arg\max \tilde{U}_i \left(\boldsymbol{y}; \boldsymbol{p}, \boldsymbol{w}(\theta_i)\right). \tag{2}$$

Consumers ignore their contribution to profits π_i and externalities Φ when choosing.

Indirect utility is then $V_i\left(\boldsymbol{p}, \boldsymbol{w}(\theta_i)\right) = U_i\left(\boldsymbol{y}^*; \boldsymbol{p}, \boldsymbol{w}(\theta_i)\right)$. Aggregate consumption of product j in market m is $q_j(\boldsymbol{p}) = \sum_{t \in \mathcal{T}_m} \sum_i y^*_{ijt}$.

To close the model, we distribute profits and externalities to people. We define $C_j(q_j)$ as product j's total production cost. Firm f's profits are

$$\Pi_f(\boldsymbol{p}) = \sum_{j \in \mathcal{J}_f} \left[p_j q_j(\boldsymbol{p}) - C_j(q_j)\right]. \tag{3}$$

Profits may be distributed unequally across people, but the total profits equal the total amount redistributed: $\sum_f \Pi_f(\boldsymbol{p}) = \sum_i \pi_i$.

Consumption of product j imposes negative externality ϕ_j on other people. We assume that externalities are distributed equally across people, so the per-person externality is

$$\Phi = \frac{1}{N} \sum_m \sum_{j \in \mathcal{J}_m} q_j(\boldsymbol{p}) \phi_j. \tag{4}$$

Social welfare is the sum of utility, weighted by Pareto weights $\omega_i \geq 0$:

$$W(\boldsymbol{p}, \boldsymbol{w}) = \sum_i \omega_i V_i\left(\boldsymbol{p}, \boldsymbol{w}(\theta_i)\right). \tag{5}$$

I.B Corporate Social Impact

We define $\boldsymbol{p}^{\mathcal{X}}$ and $\boldsymbol{w}^{\mathcal{X}}$ as equilibrium prices and wage functions with some set of firms $\mathcal{X}$ in the market. The welfare loss from firm f's exit conditional on initial set of firms $\mathcal{X}_0$ is

$$\Delta W_f(\mathcal{X}) \coloneqq W\left(\boldsymbol{p}^{\mathcal{X}_0}, \boldsymbol{w}^{\mathcal{X}_0}\right) - W\left(\boldsymbol{p}^{\mathcal{X}_0 \setminus f}, \boldsymbol{w}^{\mathcal{X}_0 \setminus f}\right). \tag{6}$$

We consider two notions of corporate social impact. Firm f's *individual impact* is the welfare loss from a firm's exit if all other firms remain in the market:

$$\Delta W_f^{Individual} = \Delta W_f(\mathcal{F}). \tag{7}$$

Firm f's *share of industry impact* is the firm's Shapley value for the social welfare loss if all firms in the industry were to exit the market. To calculate this, we define $\mathcal{R}_m$ as the set of all orderings of firms in market m, we define $\mathcal{P}_f^R$ as the union of f with the set of firms that precede f in ordering R, and we define F_m as the number of firms in the market. The Shapley value is the average welfare loss from removing f over all permutations of other firms:

$$\Delta W_f^{Shapley} = \frac{1}{F_m!} \sum_{R_m} \Delta W_f \left(\mathcal{P}_f^R \right). \tag{8}$$

For a mathematical example of the distinction between individual impact and share of industry impact, consider a simple Bertrand oligopoly. There are two identical firms $f \in \{1, 2\}$ selling fully undifferentiated products with constant marginal cost, and total welfare is unaffected if one firm exits but drops by \$$X$ if both firms exit. Each firm's individual impact is $\Delta W_f^{Individual} = 0$. The set of orderings of the firms is $\mathcal{R}_m = \{(1, 2), (2, 1)\}$, and the Shapley value is $\Delta W_f^{Shapley} = \frac{1}{2}(X + 0) = \frac{1}{2}X$: the two identical firms have equal shares of the \$$X$ industry impact.

For an intuitive example, consider the cigarette industry. The industry as a whole might have very negative industry impact due to the externalities and internalities from smoking, but a single cigarette company (even one with large market share) might have *positive* individual impact if aggregate demand is fully inelastic, because a firm's exit reduces consumer surplus but does not reduce externalities and internalities.

The Shapley value is not the only way to allocate total industry impact to individual firms—for example, we could allocate based on share of sales. However, the Shapley value is the only map from total industry impact to shares of industry impact that satisfies four intuitive properties: linearity, null player, efficiency, and symmetry (Shapley 1953). Linearity means that the results are homogeneous of degree one, and null player means that a firm with $\Delta W_f(\mathcal{X}) = 0, \forall \mathcal{X}$ has zero Shapley value. Efficiency means that the Shapley values sum to the total industry impact. Symmetry means that firms that always contribute the same $\Delta W_f(\mathcal{X})$ have the same Shapley value. Allocating industry impact to firms based on share of sales would violate symmetry if firms that have the same sales generate different consumer surplus, for example because consumers are less willing to substitute away from certain firms.

I.C Assumptions for Empirical Implementation

Distributional preferences. Following the public economics literature, we define $g_i := \omega_i U_i'$ as the social marginal welfare weight: the social value of increasing person i's consumption by \$1. We define $a(z_i)$ as income after taxes and government transfers, as a function of pre-tax income z_i. We parameterize distributional preferences by ρ:

$$g_i = \kappa a(z_i)^{-\rho}. \tag{9}$$

We set $\kappa = N/\left[\sum_i a(z_i)^{-\rho}\right]$, so that the average welfare weight is $\bar{g}(z) = 1$. We calculate after-tax income $a(z)$ from pre-tax income z using the distributional national accounts data from Piketty, Saez, and Zucman (2020).

In our empirical implementation, we consider two cases. First, we consider $\rho = 0$, so all people are weighted equally: $g_i = 1, \forall z$. In this case, W is just total surplus. Second, we consider $\rho = 1$, so $g_i \propto 1/a(z_i)$, which approximately corresponds to log utility. In this case, we refer to consumer surplus, corporate social impact, and other objects as "weighted." While ρ is a normative parameter with no objectively correct value, Saez (2002), Piketty and Saez (2013), Allcott, Lockwood, and Taubinsky (2019a), and other optimal taxation papers use $\rho = 1$ as a benchmark, and Chetty (2006) shows that this is consistent with observed labor supply behavior in the U.S. See Appendix Figure A1 for the distributions of after-tax income and resulting social marginal welfare weights.

Partial equilibrium assumptions. We impose two additional assumptions that allow us to analyze product and labor markets in partial equilibrium. First, we assume that intermediate goods are produced in perfectly competitive markets with no externalities, so we can ignore general equilibrium effects up the supply chain. Second, we assume that each individual firm is a small share of the labor market, so its exit doesn't affect wages at other firms or the outside options of its employees. With these assumptions plus our additively separable quasilinear utility specification in equation (1), we can model product and labor markets separately. These assumptions eliminate considerations such as the labor and environmental practices of suppliers in developing countries. They also shut down equilibrium effects such as, for example, how Ford's exit would both make available more labor for GM and would increase GM's labor demand (because of the increase in demand for GM's products).

Representative product. We assume that each firm sells one representative product in one market. The representative product has initial price $p_f = 1$ (which will change endogenously in counterfactual scenarios), total cost function $C_f(q_f)$, externality ϕ_f, and internality γ_f. The representative product assumption simplifies our product market model relative to considering, for example, many specific airplane flight routes or restaurant locations. The short-run equilibrium framework—endogenous price but exogenous cost and characteristics—is crucial. In the very short run, a firm's sudden exit would cause large disruptions for its customers and employees. In the very long run, a firm's social impact might be very small because competitors could adjust to make the same products and employ the same number of workers.

As highlighted in the introduction, these are strong assumptions, but they are very useful in simplifying our illustrative quantifications in the rest of the paper. To estimate corporate social impact, we still need (i) the distribution of utilities u_{ift} and u_{ifl}, (ii) cost functions $C_f(q_f)$, (iii) externalities ϕ_f and internalities γ_f, and (iv) equilibrium assumptions to simulate counterfactual prices $\boldsymbol{p}$. The next three sections present the data and estimation strategies for those objects.

II Data

II.A Survey

In our model, a firm delivers more social impact if it would be more difficult for its consumers and workers to find substitute products and employers if the firm were to exit. That social impact is weighted more heavily if it accrues to people with higher social marginal welfare weights. Thus, the key goal of our survey is to measure consumer and worker substitution patterns and incomes.

Survey instrument. We fielded the survey in two rounds, July and November 2021, on Lucid and Cint, two standard online survey panels. The survey begins by looping through our 11 differentiated product markets: autos, airline travel, consumer packaged goods (cereal, cigarettes, carbonated soft drinks, beer, yogurt, and toothpaste), grocery retail, chain restaurants, and smartphones.[7] Using the auto market and the Chevrolet brand as an example, the survey questions are as follows.

> *Consumption*: Do you currently own or lease a vehicle?
>
> Yes | No
>
> *Brand*: What brand is your vehicle?
>
> Acura | Chevrolet | Ford | ...
>
> *Customer satisfaction*: Overall, how satisfied are you with [Chevrolet]?
>
> 0 (not at all satisfied) | ... | 10 (extremely satisfied)
>
> *Price response*: Imagine that the price of all [Chevrolet] vehicles and all other vehicles made by [General Motors] were **25%** higher. Would you still have chosen a [Chevrolet], or some other vehicle made by [General Motors], even at the higher price?
>
> Yes | No
>
> *Aggregate price response*: Now imagine that the price of all vehicles doubled. Would you still have a vehicle?
>
> Yes | No

The questions and response options varied somewhat by industry. In the block of auto market questions, the survey also asked people to report their vehicle's model name (for example, "Honda Civic" or "Ford Excursion") and whether they would still have bought that *model* if the price were 25 percent higher. For most industries, the *consumption* question was continuous, asking "How many dollars would you say you spent on [product] in an **average month** before the pandemic?"

[7] The survey is available from https://mit.co1.qualtrics.com/jfe/form/SV_4OrCsEDx2rnmWMu.

and the *brand* question was "What kind of [product] did you buy most recently?" The brand lists included all major brands in each market. For all industries other than autos and smartphones, *aggregate price response* was phrased more continuously, asking "how much less" people would buy if all prices doubled.

In the November survey round, we randomized the magnitude of the hypothetical price increase in the *price response* question: 90 percent of respondents were asked about a 25 percent price increase (as in the July survey round), while the remaining 10 percent were asked about 50 or 75 percent price increases. We use only the 25 percent group for the demand estimation described in Section IV.B; we use the 50 and 75 percent groups for an additional analysis described in Section IV.C.

After the product market questions, the survey asked questions about people's "primary employment," including whether they are currently employed more than 20 hours per week, their employer's size and industry, their occupation, and *worker satisfaction*: "Overall, how satisfied are you with your primary employer?" The survey then asked an analogue to the *price response* question:

> *Worker price response*: Imagine your primary employer faced major new competition and had to permanently cut everyone's salary by **10%**. Would you keep working there, even at the lower salary?
>
> Yes | No (I'd get a new job or stop working)

Data preparation and weights. To ensure high-quality data, the survey included two attention check questions and re-elicited monthly grocery and cereal spending at the end. We dropped any respondents who (i) failed either attention check; (ii) reported grocery or cereal spending that differed by more than 35 percent, if that difference was more than 10 percent of the sample average spending; (iii) reported unusually high or low spending in more than two product markets; or (iv) responded with more than 100 characters of text when asked their vehicle's model name. This screening dropped 23 percent of respondents, leaving 3,544 valid responses. Within the valid responses, we also winsorize spending in each product market at reasonable levels.

In all figures and tables, we weight the valid respondents for national representativeness on four household income bins, share male, share white, share age 45 and over, and share with a college degree. To avoid too much precision loss, we winsorize the weights at 1/3 and 3 times the sample average.

Descriptive statistics. Panel (a) of Table 1 presents demographics of the unweighted and weighted samples. The sample weights up-weight men, non-white people, non-college graduates, and higher-income people. Panel (b) presents descriptive statistics on our key survey questions. The *price response* mean indicates that 63 percent of people reported that they would still buy from the same firm if the price rose by 25 percent, the *aggregate price response* mean indicates that 57 percent of aggregate demand would be retained if all prices doubled, and the *worker price response* mean indicates that 55 percent of workers would still keep working at their primary employer even if the employer had to cut everyone's salary by 10 percent.

II.B Other Data

We define firms f at the level of the stock ticker (for publicly traded firms) or holding company (for private firms), using 2019 firm ownership. Only one firm, General Mills, operates in multiple product markets in our data. For simplicity, we report separate estimates by market: "General Mills" in the cereal market and "Yoplait" in the yogurt market.

We collect total 2019 revenues for each firm in the 11 differentiated product markets. Airline revenues are from the U.S. Department of Transportation (2021) DB1B dataset, auto revenues are from data we purchased from Wards, consumer packaged goods revenues are from NielsenIQ Homescan and Statista Consumer Market Outlook, grocery revenues are from Winsight (2019), restaurant revenues are from Technomic (2021), and smartphone revenues are from Statista and Statcounter (2021). Note that by attributing all retail revenues to the original manufacturers in the auto and consumer packaged goods markets, we attribute the consumer surplus from distribution and retail to the manufacturers.

For the labor market estimation, we define a local labor market as a county. We collect the employment count by occupation and county from the 2010–2019 American Community Surveys (ACS). We collect employment counts by firm and county from InfoUSA, and we rescale those counts to represent only the employment corresponding to the product market we study.[8]

III Descriptive Results

Before presenting the formal models, we present descriptive survey results that build confidence in the data and provide intuition for our eventual corporate social impact estimates.

Figure 1 presents the aggregate price elasticity of demand for each differentiated product industry in the survey, calculated from the *aggregate price response* question as (-1)×ln(share who would still buy if the price of all products doubled) / ln(2). Toothpaste, groceries, and smartphones have the most inelastic demand, airlines and restaurants have the most elastic demand, and all other industries are clustered around an aggregate elasticity of 1. Industries toward the left will tend to

[8]For example, Apple sells more than just smartphones, but we want to consider only the employment that corresponds to Apple's smartphone business. To do this, define N_f^* and R_f^* as employment and revenue from Compustat, define R_f^p as revenue in the U.S. product market we study, and define N_f^{IU} as U.S. employment count from InfoUSA. The employee count that corresponds to the product market we study is $R_f^p \cdot N_f^*/R_f^*$, so we multiply all InfoUSA establishment-level employment counts by $\left(R_f^p \cdot N_f^*/R_f^*\right)/N_f^{IU}$. This approach assumes that all workers are in the United States.

have larger differences between individual impact and share of industry impact, because inelastic aggregate demand implies large industry impact.

Figure 2 presents the two statistics that are key to a firm's social impact in our model. Each point on the scatterplot is a firm, and each industry has a different marker style. The x-axis has the average income of the firm's consumers. Firms toward the left generate more welfare-weighted consumer surplus, and thus more weighted corporate social impact, because their consumers have lower income and thus higher social marginal welfare weights. The y-axis has the firm's own-price elasticity, calculated from the *price response* question as (-1)$\times$ln(share of consumers who would still buy from the firm after a 25 percent price increase) / ln(1.25). Firms toward the bottom generate more consumer surplus, and thus more social impact, because consumers can't easily substitute away from their products. Appendix Tables A1 and A2 present the statistics from Figures 1 and 2 in tabular form.

We label all auto companies and the firms with outlying own-price elasticity or customer income. The firms with the highest customer income at the right of the figure include BMW and Mercedes, Alaska Airlines, Amazon groceries (Whole Foods and Amazon Fresh), Chobani yogurt, and Starbucks coffee. The firms with the lowest customer income at the left include Kia, Google and LG smartphones, Lorillard cigarettes, Walmart, Winco (a discount grocer), and Yoplait yogurt. The firms with most elastic demand at the top of the figure include Hyundai, Frontier and Spirit Airlines, and several other auto companies. The firms with the most inelastic demand at the bottom include BMW, Winco, ALDI (another discount grocer), Apple and Google smartphones, and Glaxo toothpaste (the Sensodyne brand).

Discussion and validation. A natural concern with our approach to estimating firm-level price responses is that it relies on hypothetical stated preference survey questions instead of market behavior. We initially considered more traditional demand estimation with market data and price instruments, but we decided on the survey approach for two reasons. First, there are not plausible instruments for firm-level or market-level prices in some of the markets that we wanted to cover. Second, the surveys allow us to take a consistent approach across markets, and it is easy to envision how one could extend such surveys to cover many more markets.

The survey and its role in the estimation strategy described below were inspired by the auto market survey in Berry, Levinsohn, and Pakes (2004). The survey asked people to report the car they would have bought if their current car was not available; the responses are used to identify the distribution of random coefficients. Our approach is comparable, except that our price response question may be more cognitively challenging than their second choice question.

We check and validate the survey responses in three ways. First, we compare firms' market shares and average customer income in the survey data to external sources—the National Household Transportation Survey (for autos), the DB1B data (for airlines), and Nielsen (for consumer packaged goods). The firm-level correlations are 0.85 for market shares and 0.96 for income. Second, we show that as expected, *price response* is correlated with *customer satisfaction*, and *worker price response* is correlated with *worker satisfaction*. See Appendix B for figures illustrating these correlations.

Third, we compare the product demand and labor supply elasticities implied by our survey responses to outside estimates. The automobile model-level price elasticity is 3.76, which is in the range of estimates reported in Berry, Levinsohn, and Pakes (1995), and the aggregate elasticity of auto demand is 0.92, which is close to the value of 1.0 suggested in Berry, Levinsohn, and Pakes (2004). The soda aggregate elasticity (1.02) lines up well with empirical estimates using market data (Allcott, Lockwood, and Taubinsky 2019b). The cigarette aggregate elasticity (1.04) is higher than early estimates reported in Chaloupka and Warner (2000) and Gallet and List (2003), but some recent estimates are closer (Cotti et al. 2020; Allcott and Rafkin 2021). The labor supply arc elasticity (4.6) is higher than estimates of the wage elasticity of separation surveyed in Manning (2011); Card et al. (2018) write that 4 is a "reasonable near-competitive benchmark." Labor supply may have been unusually elastic given the tight labor market at the time of the survey in summer and fall 2021, and we will show that our qualitative conclusions change little if we assume more inelastic labor supply.

IV Product Market Estimation

In this section, we specify equilibrium assumptions and functional forms for utility in order to estimate counterfactual prices, consumer surplus, profits, and externalities.

IV.A Differentiated Product Markets: Supply and Demand System

Our differentiated product market model and estimation follow a standard approach in the industrial organization literature (e.g. Berry, Levinsohn, and Pakes 1995). We assume that firms in our differentiated product markets set prices to maximize profits Π_f in a static Nash-Bertrand equilibrium with constant marginal costs C'_f.[9] Firm $f's$ first-order condition for the price of its representative product is

$$p_f - C'_f = \frac{q_f}{-\partial q_f(\boldsymbol{p})/\partial p_f}. \tag{10}$$

We assume that any fixed costs are sunk, so they cannot be recovered when a firm exits. This assumption causes us to attribute higher social impact to firms with high-fixed cost production technologies.

The demand system is a standard random coefficient logit model. We separate consumers into groups with household income above vs. below \$60,000 per year, indexed $z \in \{A, B\}$ with population shares μ_z, and we define A_i and B_i as indicators for household income above and below

[9]This assumes that common ownership does not influence pricing, consistent with the results of Backus, Conlon, and Sinkinson (2021).

\$60,000. To estimate the model, we specialize to the case of additively separable utility:

$$\tilde{u}_{ift} = \left(\underbrace{\xi_f}_{\substack{\text{unobserved}\\ \text{characteristic}}} + \underbrace{\gamma_f}_{\text{internality}} + \underbrace{A_i \zeta_f}_{\substack{\text{income-firm}\\ \text{effect}}} + \underbrace{\sigma_f \nu_{if}}_{\text{firm RC}} + \underbrace{\sigma_n \nu_{in}}_{\text{inside good RC}} + \underbrace{\epsilon_{ift}}_{\substack{\text{extreme value}\\ \text{utility shock}}} \right) / \eta. \tag{11}$$

The income-firm effect ζ_f controls differences in preferences for firm f for higher- vs. lower-income consumers. The standard deviation σ_f of firm-specific random coefficients controls the demand elasticity (and thus consumer surplus) by firm. The standard deviation σ_n of the inside good random coefficient controls the aggregate price elasticity. We let $\boldsymbol{\nu}_i := \{\nu_{if}, \nu_{in}\}$ denote the vector of random coefficients, and we assume that ν_{if} and ν_{in} take independent standard normal distributions. To use the logit model, we assume that the taste shock ϵ_{ift} is distributed type 1 extreme value. η is a scaling factor that maintains ϵ_{ift} at the type 1 extreme value variance ($\pi^2/6$), while maintaining $\tilde{u}_{ift}$ in units of dollars.

As usual in a logit model, we define "representative utility" as the net benefit from a product minus the extreme value utility shock, in units of the extreme value shock, conditional on a realization of random coefficients $\boldsymbol{\nu}_i$. Income group z's representative utility for firm f's product is

$$V_{zf}(p_f, \boldsymbol{\nu}_i) = \eta(-p_f + u_{ift}) - \epsilon_{ift} = -\eta p_f + \xi_f + \gamma_f + A_i \zeta_f + \sigma_f \nu_{if} + \sigma_n \nu_{in}. \tag{12}$$

We index the outside option (not buying any product in the market) as $f = 0$, and we normalize $V_{z0} = 0$.

Income group z's choice probability (over the distribution of $\boldsymbol{\nu}_i$) takes the usual logit form:

$$P_{zf}(\boldsymbol{p}) = \mathbb{E}_{\boldsymbol{\nu}} \left[\frac{e^{V_{zf}(p_f, \boldsymbol{\nu}_i)}}{1 + \sum_{k \in \mathcal{F}_m} e^{V_{zk}(p_k, \boldsymbol{\nu}_i)}} \right], \tag{13}$$

where k also indexes firms and $\mathcal{F}_m$ is the set of firms in market m. Aggregating across income groups, firm f's choice probability is $P_f(\boldsymbol{p}) = \sum_z \mu_z P_{zf}(\boldsymbol{p})$, and firm f's total quantity sold is $q_f(\boldsymbol{p}) = NT_m P_f(\boldsymbol{p})$.

Using the usual Small and Rosen (1981) log-sum formula, income group z's perceived consumer surplus per choice occasion in market m is

$$\widetilde{CS}_{zm}(\boldsymbol{p}) := \mathbb{E}_{\boldsymbol{\nu}} \left[\frac{1}{\eta} \ln \left(1 + \sum_{f \in \mathcal{F}_m} e^{V_{zf}(p_f, \boldsymbol{\nu}_i)} \right) \right] + K, \tag{14}$$

where K is a constant. Perceived consumer surplus differs from (actual) consumer surplus due to internalities γ_f. Accounting for internalities using the formula in Allcott (2013), the consumer surplus loss from firm f's exit conditional on a set of firms $\mathcal{X}_0$ initially in the market is

$$\Delta CS_f(\mathcal{X}_0) = N \sum_z \mu_z g(z) \cdot T_m \left[\widetilde{CS}_{zm}(\boldsymbol{p}^{\mathcal{X}_0}) - \widetilde{CS}_{zm}(\boldsymbol{p}^{\mathcal{X}_0 \setminus f}) - \sum_f \gamma_f \left(P_{zf}(\boldsymbol{p}^{\mathcal{X}_0}) - P_{zf}(\boldsymbol{p}^{\mathcal{X}_0 \setminus f}) \right) \right]. \tag{15}$$

IV.B Differentiated Product Markets: Estimation Strategy and Counterfactuals

Our estimation strategy for differentiated product markets broadly follows Berry, Levinsohn, and Pakes (2004), except that the price response parameter η is identified using microdata. We use survey data to identify ζ_f, η, σ_f, and σ_n, setting the residuals $\delta_f := \xi_f + \gamma_f$ to match aggregate market shares. We then assume that firms maximize profits in Nash-Bertrand equilibrium and infer each firm's marginal cost from its first-order condition.

The estimation includes all firms in the survey data that had at least 25 respondents as customers. All other firms in the product market are combined into an "other" firm $f = o$, which we assume always has $p_o = C'_o = 1$. We estimate the "other" firm's ζ_{Ao} and δ_o but fix its σ_o to the average σ_f of the non-"other" firms.

We define s_f as firm f's observed revenue share. In each market, we set the number of choice occasions equal to twice industry revenues, so the outside option share is initially $s_0 = 0.5$.

Define $\boldsymbol{p}^0$ as baseline prices, $\boldsymbol{p}'_f$ as the price vector after firm f increases prices by 25 percent, and $\boldsymbol{p}'$ as the price vector after all prices double. F_{if} is an indicator for whether respondent i bought from firm f. H_{if} is an indicator for whether respondent i bought from firm f and would still buy from f at higher price $\boldsymbol{p}'_f$ (from the *price response* survey question), while $O_i \in [0, 1]$ is the share of inside good consumption that respondent i would maintain if all prices doubled (from the *aggregate price response* question).

We approximate income group z's choice probability $P_{zf}(\boldsymbol{p})$ by simulation over random coefficients. Firm f's overall choice probability is $P_f(\boldsymbol{p}) = \sum_z \mu_z P_{zf}(\boldsymbol{p})$. ω_i is respondent i's nationally representative sample weight. $\chi_{im} \in \{1, 0\}$ is an indicator for whether respondent i consumes an inside good in market m.

We can now specify the moments in our method of simulated moments estimator. The "income-firm moments" are informative about ζ_f by matching the difference in share of purchases by high- vs. low-income consumers:

$$g_f^{inc} = \left(\frac{\mu_A P_{Af}(\boldsymbol{p}^0) - \mu_B P_{Bf}(\boldsymbol{p}^0)}{1 - P_0(\boldsymbol{p}^0)} \right) - \left(\frac{\sum_i \omega_i \chi_{im} A_i F_{if} - \sum_i \omega_i \chi_{im} B_i F_{if}}{\sum_i \omega_i \chi_{im}} \right). \tag{16}$$

The "substitution moments" are informative about the scaling factor η and firm random coefficient standard deviations σ_f by matching the predicted and actual responses to a 25 percent price increase:

$$g_f^{sub} = \frac{P_f(\boldsymbol{p}'_f)}{P_f(\boldsymbol{p}^0)} - \frac{\sum_i \omega_i \chi_{im} H_{if}}{\sum_i \omega_i \chi_{im} F_{if}}. \tag{17}$$

The "outside moments" are informative about the inside good standard deviation σ_n by matching predicted and actual response of the inside goods' market share to a doubling of all prices:

$$g^{out} = \frac{1 - P_0(\boldsymbol{p}')}{1 - P_0(\boldsymbol{p}^0)} - \frac{\sum_i \omega_i \chi_{im} O_i}{\sum_i \omega_i \chi_{im}}. \tag{18}$$

We fix $\sigma_f = 0$ for one firm in each market, after which we have the same number of moments $\{g_{zf}^{inc}, g_f^{sub}, g^{out}\}$ as free parameters $\{\eta, \zeta_f, \sigma_f, \sigma_n\}$. We use a method of simulated moments (MSM) estimation procedure analogous to Berry, Levinsohn, and Pakes (1995, 2004). In every iteration of the MSM estimation routine, we use the Berry (1994) contraction mapping to find the values of $\delta_f := \xi_f + \gamma_f$ that match simulated and actual aggregate market shares.

After estimating the demand parameters, we back out marginal costs C'_f by plugging baseline price vector $\boldsymbol{p}^0 = \mathbf{1}$, baseline quantities, and the simulated demand response $\partial q_f \left(\boldsymbol{p}^0\right) / \partial p_f$ into the Nash-Bertrand first-order condition from equation (10).

After backing out marginal costs, we can simulate counterfactual Nash-Bertrand equilibrium prices $\boldsymbol{p}^{\mathcal{X}}$ for any configuration of firms $\mathcal{X}$. To find the counterfactual prices, we iterate to a fixed point following Conlon and Gortmaker (2020) and Morrow and Skerlos (2011).

IV.C Differentiated Product Markets: Estimation Results

Tables 2 and 3 present the full set of parameter estimates. Although there is not a one-to-one correspondence because all parameters are jointly identified, firms with more inelastic demand in the survey data tend to have larger σ_f, and firms with a larger share of higher-income consumers in the survey data tend to have higher ζ_f. Using the auto industry as an example, BMW has a relatively low share of purchases by consumers with household income below \$60,000 and a high share of purchases retained after a 25 percent price increase, and it correspondingly has relatively large estimated ζ_f and σ_f. Kia and Hyundai have relatively high shares of purchases by consumers with household income below \$60,000 and low shares of purchases retained after a 25 percent price increase, and they correspondingly have relatively low estimated ζ_f and σ_f.

Dividing by η normalizes the parameters into dollar units. Again using the auto industry as an example, we have $\eta \approx 5.2$. Relative to lower-income consumers, consumers with household income above \$60,000 are willing to pay $\zeta_{BMW}/\eta \approx 1.95/5.2 \approx \$0.38$ more per dollar of representative product from BMW. Those higher-income consumers are willing to pay $-\zeta_{Kia}/\eta \approx 5.67/5.2 \approx \$1.09$ *less* per dollar of representative product from Kia. Relative to Hyundai, whose σ_f is fixed to zero, the standard deviation of consumers' idiosyncratic preferences is an additional $\sigma_{BMW}/\eta \approx 11.47/5.2 \approx \$2.21$ per dollar of representative product for BMW, but only $\sigma_{Kia}/\eta \approx 2.00/5.2 \approx \$0.38$ for Kia.

One natural concern when calculating consumer surplus is that while the estimation moments match the modeled and survey-based price responses to 25 a percent price increase, the shape of inframarginal demand at higher prices (and thus the magnitude of consumer surplus) depends on functional form assumptions for ϵ and σ (Hausman 1996). However, we find that the shape of the modeled demand function is roughly consistent with the raw survey data from the subset of respondents where we randomized higher hypothetical price increases of 50 and 75 percent; see Appendix Figure A8.

The distributions of simulated counterfactual prices after exit are generally close to 1 (see Appendix Figure A11), implying that in our model, a firm's exit does not materially increase competitors' market power.

IV.D Oil Market

There are two important differences between oil and our differentiated product markets. First, there is limited product differentiation. Second, it would be especially unrealistic to assume that the marginal costs of oil production are constant and can be inferred from a static Nash-Bertrand equilibrium.

We thus take a different approach in the oil market. We first simulate the removal of firm f from the global oil market and compute the resulting changes in global consumer surplus, profits, and externalities. To make these estimates consistent with the differentiated product industries, which are specific to the U.S., we then assign 20 percent of the global quantities to the United States, corresponding to the country's share of global oil consumption. We evaluate the largest seven publicly traded oil companies, or "supermajors": BP, Chevron, ConocoPhillips, Eni, Exxon, Shell, and Total. Given the substantial production of state-owned companies such as SinoPec, PetroChina, and Saudi Aramco, the supermajors still account for a relatively small share of global oil supply.

To model the global oil market, we assume that oil is an undifferentiated product sold at price p, and that all consumers and firms are price takers. Global oil demand is $D(p) = \sum_i \sum_{t \in \mathcal{T}_m} \mathbf{1}\left[u_{it} > p\right]$, where $\mathbf{1}\left[\cdot\right]$ is the indicator function. Firm f's equilibrium supply $q_f(p)$ is such that $C'_f\left(q_f(p)\right) = p$, and global oil supply with set of firms $\mathcal{X}$ in the market is $S(p; \mathcal{X}) = \sum_{f \in \mathcal{X}} q_f(p)$.

We construct the *inframarginal* portions of the cost functions $C_f(q_f)$ for our seven firms using data from Rystad on oil production and operating expenses for all oil fields in the world in 2018, following Asker, Collard-Wexler, and De Loecker (2019). Appendix Figure A9 presents the marginal cost curves.

We define p^0 and q^0 as 2018 price and global quantity: \$72 per barrel of Brent crude and 77 million barrels per day of crude oil. We assume that a competitive fringe of other firms produces the remaining oil. We assume that extramarginal aggregate supply is linear with slope such that the supply elasticity at (p^0, q^0) equals 0.10, the estimate from Caldara, Cavallo, and Iacoviello (2019). We assume that aggregate demand $D(p)$ is globally linear with slope such that the elasticity at (p^0, q^0) equals -0.14, the estimate from Caldara, Cavallo, and Iacoviello (2019).

Under those assumptions, we can calculate the market-clearing price $p^{\mathcal{X}}$ with any set of firms $\mathcal{X}$ in the market:

$$D\left(p^{\mathcal{X}}\right) = S(p^{\mathcal{X}}; \mathcal{F}). \tag{19}$$

The global consumer surplus loss from firm f's exit conditional on a set of firms $\mathcal{X}_0$ initially in the market is the triangle under the linear demand curve:

$$\Delta CS_f(\mathcal{X}_0) = \frac{1}{2}\left(D\left(p^{\mathcal{X}_0 \setminus f}\right) + D\left(p^{\mathcal{X}_0}\right)\right) \times \left(p^{\mathcal{X}_0 \setminus f} - p^{\mathcal{X}_0}\right). \tag{20}$$

We calculate each firm's global profits by inserting $p^{\mathcal{X}}$ into equation (3), and we calculate global externalities by inserting $q_f\left(p^{\mathcal{X}}\right)$ into equation (4).

To construct weighted consumer surplus within the U.S., we take 20 percent of global consumer surplus and allocate that across incomes using the U.S. distribution of gasoline consumption by income, as implied by vehicle miles traveled and fuel economy in the 2017 National Household Travel Survey. Higher-income people consume more gasoline (see Appendix Figure A10), so the welfare weight on consumer surplus is less than one, specifically 0.66.

IV.E Profits

Define $r_i = \{1, 2, ..., 100\}$ as the income percentile of person i, and define z_r as the mean pretax income of taxpayers in percentile r. We assume that profits are distributed such that people at income percentile r receive share $\lambda(r)$ of profits, so

$$\pi_i = \Pi\lambda(r_i). \tag{21}$$

We calculate $\lambda(r)$ using data on C-corporation ownership at each income percentile in the distributional national accounts data from Piketty, Saez, and Zucman (2020); see Appendix Figure A11. When social marginal welfare weights $g(z)$ are set with curvature $\rho = 1$, the welfare weight applied to corporate profits is then $\sum_{r=1}^{100} g(a(z_r)) \cdot \lambda(r) \approx 0.12$. If $\rho = 0$, meaning that transfers to all income groups receive the same welfare weight, or if corporate profits were distributed equally among all people, this weight would equal one. The weight is much less than one because the highest-income people receive most of corporate profits and have low social marginal welfare weights.

IV.F Externalities and Internalities

For airlines, autos, and oil, we include climate change externalities valued at a \$51 social cost of carbon, the U.S. government's value for 2021 (Interagency Working Group 2021). For each auto firm, we calculate the lifetime carbon emissions for its average vehicle sold, discounted at three percent per year. For each airline, we calculate the carbon emissions from its average flight.

For beer, we assume that the average externality from alcohol consumption is \$33.60 per liter of pure alcohol in 2019 dollars, following Herrnstadt, Parry, and Siikamaki (2015). This estimate includes factors such as health system cost externalities and injury risks to others from drunk driving. We assume a five percent alcohol content and an average price of \$1 per 12-ounce container. We are not aware of existing quantitative estimates of internalities associated with beer consumption.

For cigarettes, we assume the externality is \$0.64 per pack, following DeCicca, Kenkel, and Lovenheim (2020), and the internality is $(1-\beta)\times H^c = (1-0.67)\times \$44.40 \approx \$14.65$ per pack, where the present focus parameter β is from Chaloupka, Levy, and White (2019) and the health cost of smoking H^c is from Gruber and Kőszegi (2001). For soda, we assume a health system cost externality of 0.85 cents per ounce and an internality from self-control problems and imperfect information of 0.93 cents per ounce, following Allcott, Lockwood, and Taubinsky (2019a).

Table 4 presents the resulting average ϕ_f and γ_f by industry per dollar of retail sales. In most industries, externalities and internalities are relatively small, but the beer externality and especially the cigarette internality are very large: \$0.61 and \$2.77 per dollar of sales. In all markets, we assume for simplicity that the outside option involves zero internality or externality.

V Labor Market Estimation

V.A Supply and Demand System

In this section, we estimate the worker surplus loss from firm f's exit. We leverage a key simplifying assumption introduced in Section I: each firm is only a small part of the labor market, so its exit doesn't affect other firms' wage offers. Under that assumption, a firm's contribution to worker surplus is simply the area above its current employees' labor supply function. We estimate that area using the *worker price response* survey question assuming that the firm's residual labor supply is globally linear. See Appendix Figure A12 for a simple graphical illustration of the calculation.

Specifically, we define w_{i0} and u_{i0} as the wage and utility at worker i's outside option: their next-best employment after current firm and local labor market choice fl. We assume that current workers' surplus from working at fl instead of their outside options (as a percent of current earnings) is distributed uniformly with dispersion that depends on observable characteristics $\boldsymbol{x}_{ifl}$:

$$\frac{(u_{ifl}+w_{ifl})-(u_{i0}+w_{i0})}{w_{ifl}} = \frac{\epsilon_{ifl}}{\boldsymbol{\alpha}\boldsymbol{x}_{ifl}}, \tag{22}$$

with $\epsilon_{ifl} \sim U(0,1)$ and ϵ independent of $\boldsymbol{x}$.

Expected worker surplus (over the distribution of ϵ) is

$$\mathbb{E}_\epsilon \left[WS_{ifl}\right] = \int_0^1 \frac{w_{ifl}\epsilon}{\boldsymbol{\alpha x}_{ifl}} d\epsilon = \frac{w_{ifl}}{2\boldsymbol{\alpha x}_{ifl}}. \tag{23}$$

The change in worker surplus from firm f's exit is the sum of equation (23) over all workers in all local labor markets $\mathcal{L}_f$ where firm f has establishments:

$$\Delta WS_f = \sum_{l \in \mathcal{L}_f} \sum_{i \in fl} \frac{w_{ifl}}{2\boldsymbol{\alpha x}_{ifl}}. \tag{24}$$

V.B Estimation Strategy

For the 1,302 survey respondents who reported being employed but not self-employed, the survey elicited whether they would leave their current employer if the employer had to permanently cut salaries by 10 percent. We define the response as $L_i \in \{1, 0\}$. In the model, L_i is

$$L_i = \mathbf{1}\left[u_{ifl} + 0.9w_{ifl} \leq u_{i0} + w_{i0}\right] \tag{25}$$

$$= \mathbf{1}\left[\epsilon_{ifl} \leq (0.1\boldsymbol{\alpha})\boldsymbol{x}_{ifl}\right] \tag{26}$$

Since $\epsilon_{ifl} \sim U[0,1]$, we can estimate $(0.1\boldsymbol{\alpha})$ using the following linear probability model:

$$\Pr\left(L_i = 1\right) = (0.1\boldsymbol{\alpha})\boldsymbol{x}_{ifl}. \tag{27}$$

We define $\boldsymbol{x}_{ifl}$ to include observable factors that might predict workers' labor supply responses: annual earnings w_{ifl} from the primary employer, education (a college graduate indicator), occupation (a vector of major occupation indicators defined in the U.S. census), and the natural log of the employer's total employment in the county, all of which we collected in our survey, as well as the natural log of labor market size (the employment count in i's occupation in local labor market l, from the ACS) and a constant.

V.C Estimation Results

Table 5 presents the estimates of $(0.1\boldsymbol{\alpha})$. Column 1 includes only earnings and education, column 2 adds the occupation indicators, and column 3 includes the firm's local employment count and labor market size. The estimates in column 3 suggest that in response to a 10 percent salary cut, workers earning \$10,000 more are 2.0 percentage points less likely to leave, workers with a college degree are 7.8 percentage points less likely to leave, and workers at firms that employ one percent more people in the county are 2.5 percentage points more likely to leave.

For intuition on how we compute worker surplus under our linear labor supply assumption, consider the case where $\boldsymbol{x}_{ifl}$ includes just a constant. In that case, $\boldsymbol{\alpha}$ is the arc elasticity of labor supply faced by the average firm. About 46 percent of workers would leave their current employer after a 10 percent salary cut, so if $\boldsymbol{x}_{ifl}$ is a constant, $(0.1\boldsymbol{\alpha}) \approx 0.46$ and thus $\boldsymbol{\alpha} \approx 4.6$. The average annual earnings from the primary employer reported on the survey are about \$67,900, so using equation (23), the expected worker surplus per worker is $\mathbb{E}_{\epsilon}\left[WS_{ifl}\right] \approx \frac{\$67{,}900}{2\times(4.6)\times 1} \approx \$7{,}380$.

We use the estimates of $\boldsymbol{\alpha}$ from column 3 of Table 5 to predict the worker surplus across all of firm f's workers. To simulate the distribution of $\boldsymbol{x}_{ifl}$ at each firm, we assume that all firms in an industry have the same distribution of worker earnings, education, and occupations in all counties where they operate; we compute those industry-level nationwide distributions from the ACS. The InfoUSA data give each firm's county-level employment counts, and the ACS data give the local labor market size for each county and occupation. We use equation (23) to compute the worker surplus for each $\boldsymbol{x}_{ifl}$ in those simulated distributions, winsorizing at $\hat{\boldsymbol{\alpha}}\boldsymbol{x}_{ifl} \geq 1$, which corresponds to an assumption that people will not work for zero pay, regardless of their ϵ. We then use equation (24) to sum across counties to firm f's total worker surplus.

VI Corporate Social Impact Estimates

VI.A Examples: Autos and Cigarettes

As an initial illustration, Figure 3 presents the components of individual impact for each firm in the automobile and cigarette industries. Within each firm, the left bar presents unweighted estimates (i.e., equal social marginal welfare weights across income levels), while the right bar presents weighted estimates (i.e., social marginal welfare weights with curvature $\rho = 1$). The bars that extend below the y-axis reflect welfare reductions (e.g., negative externalities and reductions in competitors' profits). Corporate social impact (plotted as diamonds) is the sum of all positive and negative bars.

Both panels illustrate two results that hold across all industries and will be discussed further below. First, the largest firms (in the auto industry, Fiat Chrysler, Ford, GM, Honda, and Toyota) have the most social impact. Second, consumer surplus is by far the largest component of weighted corporate social impact.

The auto industry results in Panel (a) flow directly from the descriptive survey results described in Section III. BMW has the most inelastic demand in the survey data, and it correspondingly has a relatively high ratio of consumer surplus to profits and competitors' profits. BMW also has the highest average customer income in the survey data, and its consumer surplus thus decreases in the weighted compared to unweighted calculation. By contrast, Kia has the lowest average customer income in the survey data, and its consumer surplus increases by a relatively large proportion in the weighted estimates.

The cigarette results in Panel (b) are different for one key reason: the \$2.77 internality per dollar of revenue, as described in Section IV.F. While cigarettes deliver positive *perceived* consumer surplus, the *actual* (internality-adjusted) consumer surplus is negative in our model. Cigarette companies thus have negative social impact: in our model, social welfare would be higher if they ceased to exist.

VI.B Key Drivers of Corporate Social Impact

In our estimates, there are three key drivers of corporate social impact.

The first key driver is size: unsurprisingly, larger firms have more impact. Figure 4 plots weighted individual impact against revenue, using a log scale to accommodate the diversity of firm sizes. The figure includes all industries other than cigarettes, which is a large outlier due to the large internality. The R^2 of this relationship is 0.85. Some of this high correlation may be due to limitations in our ability to quantify all channels of social impact, but much of this strong correlation might remain even with more extensive quantification.

For many of the remaining results, we adjust for size by considering the *ratio* of corporate social impact to revenue. The key driver of size-adjusted impact is product differentiation, as measured by the residual demand elasticity. Figure 5 presents weighted impact/revenue against the own-price elasticity from the survey data, for all differentiated product firms excluding cigarette companies. The figure shows that there is meaningful variation in weighted impact/revenue, ranging from about 0.2 to 0.8, and much of this variation is explained by the own-price elasticity from the survey data.

Much of the remaining variation in weighted impact/revenue is explained by a third key driver: the share of consumers that are lower-income and thus receive higher welfare weights. To illustrate this, Appendix Figures A13 and A14 present versions of Figures 4 and 5 with unweighted corporate social impact; the relationships are much tighter.

Our covariates predict little heterogeneity across firms in surplus per worker. Thus, a firm's worker surplus in our model is largely determined by its employee count; see Appendix Figure A15.

These results imply a simple but powerful takeaway: with the exception of cigarette companies, the most socially impactful firms are large firms that sell highly differentiated products that benefit lower-income consumers.

VI.C Average Corporate Social Impact by Industry

Figure 6 presents the components of social impact per dollar of revenues, at the industry level. Within each industry, the first and second bars presents unweighted and weighted individual impacts, summed across firms and then divided by the sum of revenues. The third bar presents the analogous sum of shares of unweighted industry impact calculated using Shapley values from equation (8), divided by the sum of revenues. Because the Shapley values sum to total industry impact, this third bar is equivalent to total industry impact per dollar of revenues.

There are three key results. First, consumer surplus is by far the most important component of corporate social impact. Profits are small for two reasons: (i) firms' profits are mostly offset by the reduction that the firm causes in its competitors' profits, and (ii) profits shrink markedly in the weighted estimates, as they are multiplied by a welfare weight of 0.12 calculated in Section IV.E. Worker surplus is small because for the average firm in our sample, the wage bill is only about 10 percent of revenues. (Capital costs, intermediate goods, and profits account for the rest.) Thus, even if worker surplus per dollar of wages were equal to consumer surplus per dollar of revenues, consumer surplus would still dwarf worker surplus. Finally, externalities are relatively small (except perhaps in the beer industry) given the standard parameter values described in Section IV.F, even when considering share of industry impact.

Second, shares of industry impact are generally several times larger than individual impacts. Consumer surplus is larger because the cost of an entire industry's exit is much larger than the cost of one firm's exit. For example, when BMW exits, its customers can switch to another firm, but if all auto companies exit, people need to find entirely different forms of transportation. This is especially true in the industries with the most inelastic aggregate demand from Figure 1 (toothpaste, groceries, and smartphones), where survey responses indicate that it would be especially difficult for consumers to substitute away. Negative externalities also increase when we consider share of industry impact, but this is not large enough to outweigh the consumer surplus increase.

Third, oil is different than our differentiated product industries. Because global oil supply and demand are so inelastic, when any oil company exits, the price rises substantially, generating a large transfer from consumers to the remaining firms as well as a moderate reduction in externalities. As a result, even though oil is an undifferentiated product, oil companies generate large consumer surplus in our model by keeping prices low. Weighted corporate social impact is significantly larger than unweighted impact because competitors' profits receive a low welfare weight.

VI.D Highest- and Lowest-Impact Firms

Appendix Table A3 presents the components of corporate social impact for all firms in our sample. As a summary, Table 6 presents the top 10 most and least impactful firms as measured by weighted individual impact and weighted individual impact per dollar of revenue.

The left side of Panel (a) shows that by far, the most impactful firm in our sample is Walmart. This is a natural implication of the key drivers discussed above: Walmart is large, its convenience and low prices mean that many of its customers would still shop there even if prices increased, and it disproportionately serves middle- and lower-income consumers with higher social marginal welfare weights. The rest of the top 10 is primarily comprised of large companies in the auto, grocery, and smartphone industries. The right side of Panel (a) shows that the most harmful firm in our sample is Philip Morris. The rest of the bottom 10 is primarily comprised of other cigarette companies, due to their large negative internalities, and small companies with small but positive impacts.

The left side of Panel (b) shows that by far, the most impactful firms in our sample per dollar of revenue are the large oil companies. As discussed above, due to the tightness of the global oil market, oil companies deliver tremendous value to consumers by keeping prices low, and this value outweighs climate change externalities valued at a $51 social cost of carbon. The right side of Panel (b) shows that cigarette companies are again the most harmful companies per dollar of revenues. Lorillard jumps into the bottom slot because it has more lower-income consumers, so its consumer harms receive more weight. The rest of the bottom 10 is auto companies and airlines, who have positive impact but whose customers report that they can easily substitute to competitors.

VI.E Robustness

Figure 7 presents robustness checks with alternative parameter values. Each of the six panels presents components of corporate social impact for the average firm in the industry listed at the top of the panel. The left three panels show that estimates in the airline, auto, and oil industries change little even when we assume a $200 social cost of carbon, which is much larger than most estimates. Thus, at least at the time horizon assumed by our model, these industries deliver so much value to consumers that it far outweighs the environmental harms. This underscores the importance of the time horizon of our counterfactuals: at a longer time horizon, oil substitutes would develop and lessen the effect of an oil company's exit.

The fourth panel shows that cutting the assumed cigarette internality in half could make the weighted individual impact of cigarette companies slightly positive. The fifth panel shows that doubling the soda internality would have limited effect. Finally, the sixth panel shows that consumer surplus still dramatically outweighs worker surplus, even assuming more inelastic labor supply.

VI.F Comparison to Existing Metrics

Figure 8 compares our weighted individual impact metric per dollar of revenue to two prominent rating systems: CSRHub and Just Capital. The figure shows that these existing ratings have little relationship to our economically grounded measure of corporate social impact.[10] Part of this could be because existing rating systems may intend to measure something different than a firm's contribution to social welfare, and part is presumably because of limitations in our ability to quantify that contribution. However, many existing systems do try to quantify the value that firms provide to consumers and other stakeholders, so this lack of correlation could also imply that they are doing so in a way that does not line up with economic principles.

If we assume that other systems effectively incorporate our measure of weighted individual

[10] Appendix Figure A16 presents a parallel figure that does not normalize corporate social impact by revenue.

impact plus other factors that we are unable to measure, we can back out how large those other factors might be. For example, Walmart and Starbucks receive very similar ratings from Just Capital. In our estimation, Walmart generates 0.57 dollars of social impact per dollar of revenue ($160 billion per year), while Starbucks generates only 0.42 dollars of social impact per dollar of revenue ($22 billion per year), primarily because Walmart's consumers have much lower incomes (and Walmart is much larger). Thus, Starbucks must make many billions of dollars worth of annual social contributions that we have not measured in order for Starbucks to be correctly rated as highly as Walmart.

The two cigarette companies at the left of the figure are particularly striking examples of the differences between systems. While the internality assumptions described in Section IV.F are very uncertain, in our model these assumptions imply that cigarette companies reduce social welfare by billions of dollars each year. By contrast, the existing rating systems give fairly average scores to these cigarette companies, comparable to a typical restaurant chain or toothpaste maker. In January 2022, Just Capital changed its ratings to require that cigarette companies rate in the bottom quartile of companies (Just Capital 2022, page 52). This keeps their ratings closer to ours, but does so in a way that is not driven by any economic quantification of harms.

VII Conclusion

The growing discussions of impact investing and stakeholder capitalism have generated interest in measuring companies' social impact, not just their profits. In this paper, we have laid out an economically grounded definition of corporate social impact and have quantified the social impact of 75 large companies in 12 industries across the U.S. economy. As we have described throughout the paper, there are many caveats and limitations related to the welfarist moral philosophy, our static partial equilibrium assumptions, and our empirical implementation. These limitations mean that there may be important factors of social impact that we have not measured and incorporated. Despite the many limitations, we hope that our work can be a useful step forward in developing a framework that flows in an internally consistent way from a welfarist moral value system to an empirical quantification.

A central takeaway from our analysis is that consumer surplus is the primary driver of corporate social impact. This suggests that impact investors should consider devoting more attention to firms that deliver especially large consumer surplus, especially for low-income people. This also connects to the long discussion, dating at least to Friedman (1970), of what firms should try to maximize. Our estimates suggest that the key to social impact is to do what many firms are already trying to do as they maximize profits: make more differentiated products that more consumers want to buy.

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Table 1: **Survey Demographics and Descriptive Statistics**

(a) **Demographics of Unweighted and Weighted Samples**

	(1) Unweighted sample	(2) Weighted sample	(3) U.S. adults
Male	0.40	0.49	0.49
White	0.80	0.73	0.72
College	0.51	0.43	0.42
Age over 45	0.54	0.54	0.54
Income 0 to $39,999	0.42	0.31	0.31
Income $40,000 to $59,999	0.18	0.16	0.15
Income $60,000 to $99,999	0.24	0.23	0.23
Income $100,000 or more	0.16	0.30	0.31

(b) **Descriptive Statistics**

	Mean	Std. dev.	Minimum	Maximum
Customer satisfaction	8.51	1.72	1	10
Price response	0.63	0.48	0	1
Aggregate price response	0.57	0.39	0	1
Worker satisfaction	7.37	2.33	1	10
Worker price response	0.55	0.50	0	1

Notes: In Panel (a), Column 1 presents mean demographics from our survey respondents, column 2 presents the weighted mean demographics from our survey respondents, and column 3 presents average demographics of American adults using data from the 2019 American Community Survey. The sample weights are initially calculated to weight the survey respondents to be nationally representative, normalized to have a mean of 1, and then winsorized at $[1/3, 3]$ to reduce precision loss. Statistics in Panel (b) are sample-weighted.

Table 2: **Product Market Parameter Estimates by Firm**

			(1)	(2)	(3)
Industry	Firm	ζ	σ	δ ($:= \xi + \gamma$)	Marginal cost
Airline	Alaska	4.71	5	-6.38	0.71
	Allegiant	-2.42	7.72	-12.94	0.7
	American	4.06	1.39	0.38	0.74
	Delta	4.07	2.43	-0.3	0.72
	Frontier	3.57	0	-1.84	0.79
	JetBlue	3.23	7.55	-9.51	0.68
	Southwest	4.38	2.07	-0.66	0.73
	Spirit	3.04	1.91	-2.63	0.77
	United	3.32	1.48	0.45	0.74
	Other	1.05	3.28	-3.86	1
Auto	BMW	1.95	11.47	-21.7	0.69
	Fiat Chrysler	-1.69	1.71	2.72	0.76
	Ford	-1.52	3.17	1.53	0.74
	GM	-2.06	2.64	2.6	0.74
	Honda	0.55	3.46	-0.98	0.74
	Hyundai	-2.68	0	2.54	0.8
	Kia	-5.67	2	1.43	0.77
	Mazda	-0.86	2.03	-0.97	0.8
	Mercedes	4.03	4.52	-8.97	0.73
	Nissan	-2.32	1.06	2.85	0.78
	Subaru	-0.22	1.99	-0.14	0.78
	Toyota	-1.59	2.83	1.56	0.74
	Volkswagen	-0.24	5.13	-5.04	0.73
	Other	-1.66	3.23	-1.12	1
Beer	Anheuser-Busch	42.23	1.28	1.17	0.49
	Molson Coors	5.46	2.54	1.28	0.47
	Sazerac	0.72	0	-8.84	0.52
	Other	0.45	1.29	-41.87	1
Cereal	General Mills	1.59	15.09	6.6	0.9
	Kellogg	1.56	0	14.49	0.9
	Post	16.54	32.63	-59.75	0.9
	Quaker	3.68	31.71	-54.56	0.9
	Other	17.33	19.86	-30.52	1
Cigarette	Lorillard	-91.55	6.53	-1.88	0.75
	Philip Morris	-3.77	0	7.11	0.75
	R.J. Reynolds	-4.18	3.86	4.77	0.76
	Other	-148.79	3.46	3.53	1
Grocery	ALDI	0.29	1.49	-10.51	0.5
	Ahold	-0.32	3.37	-2.95	0.58
	Albertsons	-0.02	2.33	-0.76	0.62
	Amazon	-0.32	0	-3.37	0.59
	Costco	0.54	6.4	-2.16	0.56
	Kroger	1.8	3.55	-0.58	0.58
	Meijer	-1.26	3.34	-8.05	0.59
	Publix	0.59	2.81	-9.75	0.52
	Wakefern	0.21	3.24	-7.05	0.53
	Walmart	0.07	4.81	1.96	0.57
	Other	2.89	5.75	-0.66	1
Smartphone	Apple	0.63	0	1.4	0.4
	Google	-0.54	3.69	-5.1	0.44
	LG	-0.72	0.68	-0.35	0.53
	Lenovo	0.76	0.06	-4.47	0.56
	Samsung	0.29	1.39	0.44	0.45
	Other	-0.38	1.16	-4.66	1
Restaurant	Burger King	1.48	3.25	-1.33	0.54
	Chick-fil-A	0.78	5.01	-4.53	0.49
	Chipotle	-0.11	1.94	-8.61	0.48
	Domino's	0.63	0.62	-2.09	0.56
	Inspire Brands	-0.18	1.95	-0.59	0.56
	JAB	0.03	0.79	-9.52	0.44
	McDonald's	0.45	0	0.82	0.54
	Starbucks	-0.05	1.43	-0.1	0.57
	Subway	1.57	2.21	-1.81	0.54
	Wendy's	1.87	5.28	-0.76	0.6
	Yum! Brands	0.42	2.01	-0.6	0.53
	Other	-0.46	1.99	-4.32	1
Soda	Coca-Cola	0.06	0.85	0.58	0.43
	Dr Pepper 7 Up	-0.16	0	1.08	0.43
	Pepsi	0.07	1.04	0.44	0.42
	Other	-0.46	0.63	-0.84	1
Toothpaste	Church & Dwight	-1.34	2.04	0.38	0.47
	Colgate	-1.08	1.48	1.32	0.46
	Glaxo	-0.57	3.71	-1.41	0.42
	Procter & Gamble	-0.68	0	1.33	0.49
	Other	-0.03	1.81	-3.09	1
Yogurt	Chobani	0.69	0.27	-2.87	0.51
	Danone	0.33	0	0.54	0.49
	Yoplait	0.66	0.24	0.84	0.49
	Other	3.54	0.44	0.69	1

Notes: This table presents the demand parameter estimates for each firm in the differentiated product industries in our sample.

Table 3: **Industry-Level Product Market Parameter Estimates**

Industry	(1) η	(2) σ_n
Airline	4.92	6.31
Auto	5.19	7.89
Beer	2.51	3.69
Cereal	18.41	26.16
Cigarette	6.24	8.68
Grocery	3.01	6.74
Restaurant	2.54	2.66
Smartphone	2.26	4.59
Soda	2.06	2.46
Toothpaste	2.46	8.81
Yogurt	2.22	3.03

Notes: This table presents the industry-level parameter estimates for each differentiated product industry in our sample.

Table 4: **Average Externality and Internality per Dollar of Sales by Industry**

Industry	(1) Externality (/$ sales)	(2) Internality (/$ sales)
Airline	$0.07	–
Auto	$0.03	–
Beer	$0.61	–
Cigarette	$0.12	$2.77
Oil	$0.34	–
Soda	$0.19	$0.21

Notes: This table presents the averages across firms of externalities and internalities per dollar of sales, by industry. We assume that all other product markets have zero externalities and internalities.

Table 5: **Predictors of Worker Response to a 10 Percent Salary Reduction**

	(1)	(2)	(3)
Constant	0.613***	0.597***	0.448***
	(0.023)	(0.033)	(0.079)
Annual earnings ($10,000)	−0.019***	−0.018***	−0.020***
	(0.003)	(0.003)	(0.003)
College degree	−0.064**	−0.064**	−0.078**
	(0.030)	(0.032)	(0.032)
Occupation: service		0.067	0.077
		(0.050)	(0.050)
Occupation: sales and office		0.028	0.030
		(0.035)	(0.035)
Occupation: natural resources, construction, maintenance		−0.071	−0.036
		(0.051)	(0.053)
Occupation: production, transportation, material moving		0.014	0.017
		(0.053)	(0.054)
ln(firm's total employees in county)			0.025***
			(0.006)
ln(labor market size)			0.007
			(0.008)
Observations	1,302	1,302	1,302
R^2	0.048	0.052	0.064

Notes: This table provides estimates of equation (27), a regression of *worker price response* (whether respondents would leave their job if their primary employer had to permanently cut salaries by 10 percent) on individual, employer, and labor market covariates. The omitted occupation category is management, business, science, and arts. *Employees* is the employer's number of employees in the county. *Local labor demand* is the number of workers in the 2010–2019 American Community Surveys (ACS) who worked in the same county and occupation. Standard errors are in parentheses. *, **, ***: statistically significant with 10%, 5%, and 1% confidence, respectively.

Table 6: **Weighted Individual Corporate Social Impact: Top and Bottom 10 Firms**

(a) **Corporate Social Impact (billion $/year)**

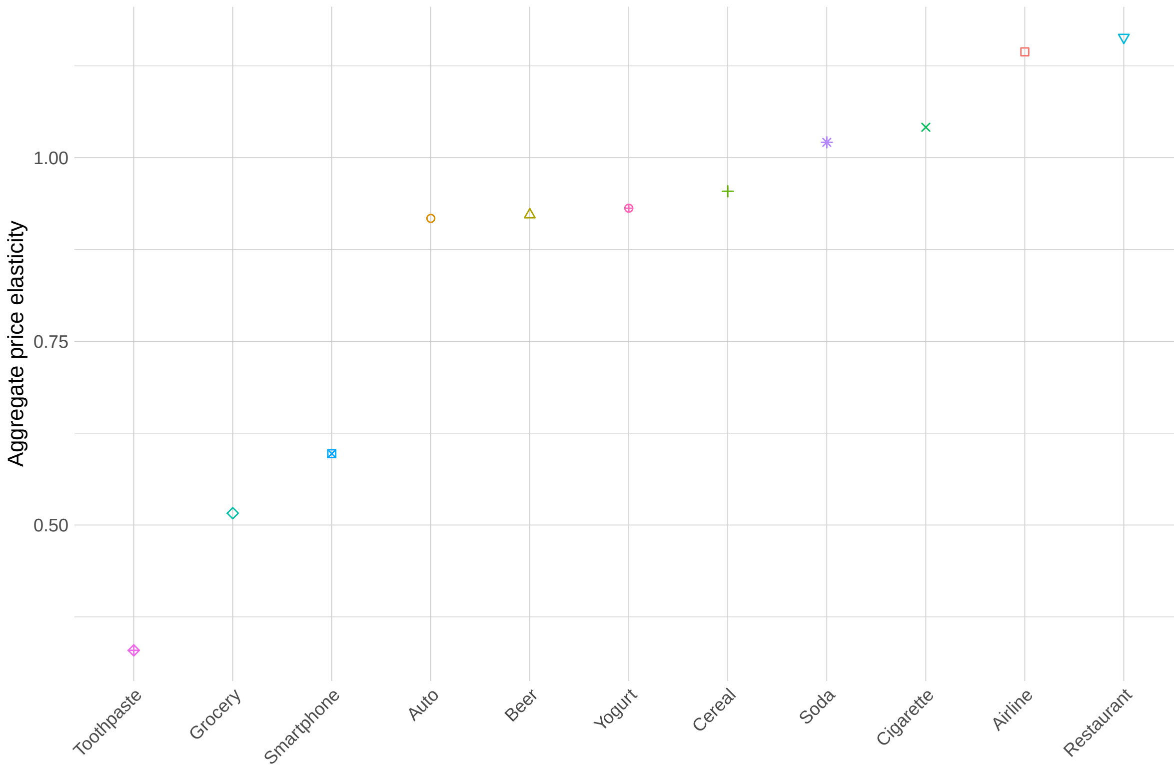
Rank	Firm	Industry	Impact	Rank	Firm	Industry	Impact
1	Walmart	Grocery	152.06	66	Glaxo	Toothpaste	0.43
2	Kroger	Grocery	60.98	67	Chobani	Yogurt	0.41
3	GM	Auto	41.47	68	Spirit	Airline	0.3
4	Costco	Grocery	39.44	69	Post	Cereal	0.23
5	Apple	Smartphone	35.2	70	Frontier	Airline	0.18
6	Molson Coors	Beer	34.15	71	Lenovo	Smartphone	0.09
7	Toyota	Auto	33.92	72	Quaker	Cereal	0.09
8	Ahold	Grocery	29.09	73	Lorillard	Cigarette	-5.05
9	Ford	Auto	28.99	74	R.J. Reynolds	Cigarette	-6.32
10	Anheuser-Busch	Beer	27.89	75	Philip Morris	Cigarette	-10.64

(b) **Corporate Social Impact/Revenue**

Rank	Firm	Industry	Impact/revenue	Rank	Firm	Industry	Impact/revenue
1	Conoco	Oil	2.09	66	American	Airline	0.26
2	Eni	Oil	2.09	67	Southwest	Airline	0.25
3	Total	Oil	2.09	68	Mazda	Auto	0.21
4	Shell	Oil	2.09	69	Subaru	Auto	0.2
5	Chevron	Oil	2.09	70	Mercedes	Auto	0.19
6	BP	Oil	2.09	71	Spirit	Airline	0.12
7	Exxon	Oil	2.08	72	Frontier	Airline	0.11
8	ALDI	Grocery	0.98	73	Philip Morris	Cigarette	-0.23
9	Google	Smartphone	0.83	74	R.J. Reynolds	Cigarette	-0.26
10	Glaxo	Toothpaste	0.81	75	Lorillard	Cigarette	-1.71

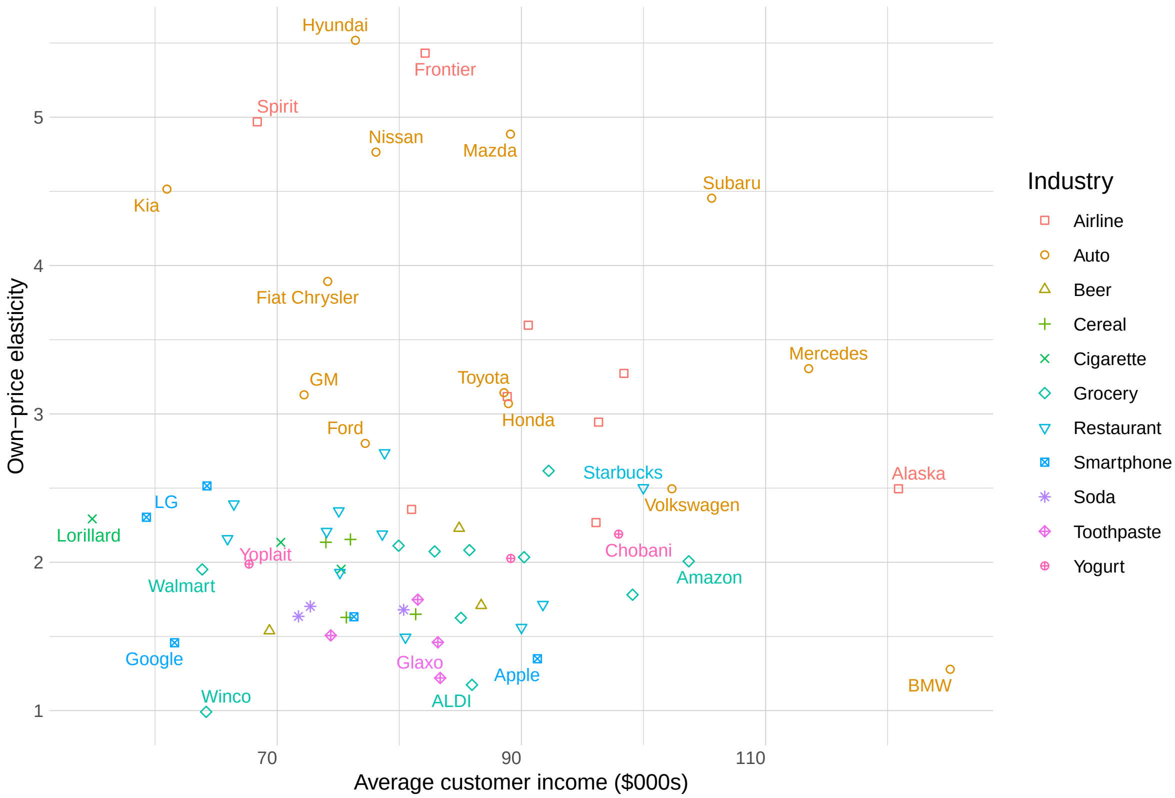
Notes: Panel (a) presents the top and bottom 10 firms for weighted individual corporate social impact. Panel (b) presents the top and bottom 10 firms for weighted individual corporate social impact per dollar of revenue.

Figure 1: **Aggregate Price Elasticity by Industry**



Notes: This figure presents the aggregate price elasticity for each of the differentiated product industries in our sample. Aggregate price elasticity is calculated from responses to the *aggregate price response* survey question: (-1)×ln(share who would still buy if the price of all products doubled) / ln(2).

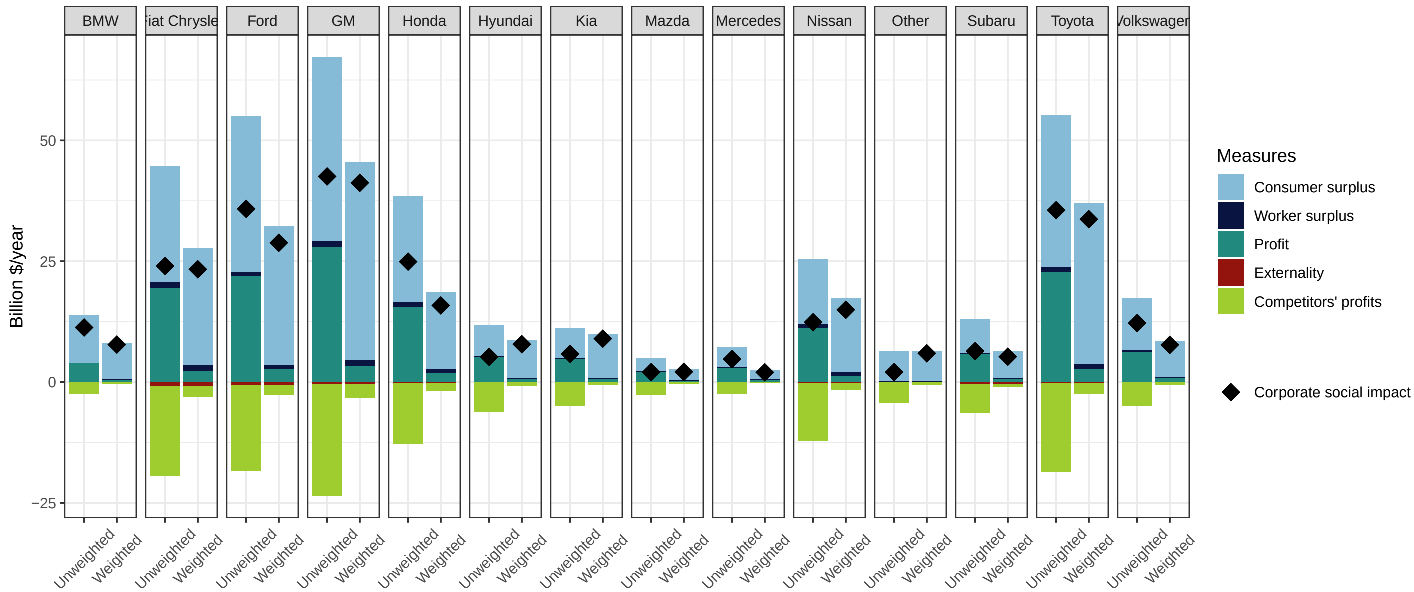
Figure 2: **Average Customer Income and Price Response by Firm**



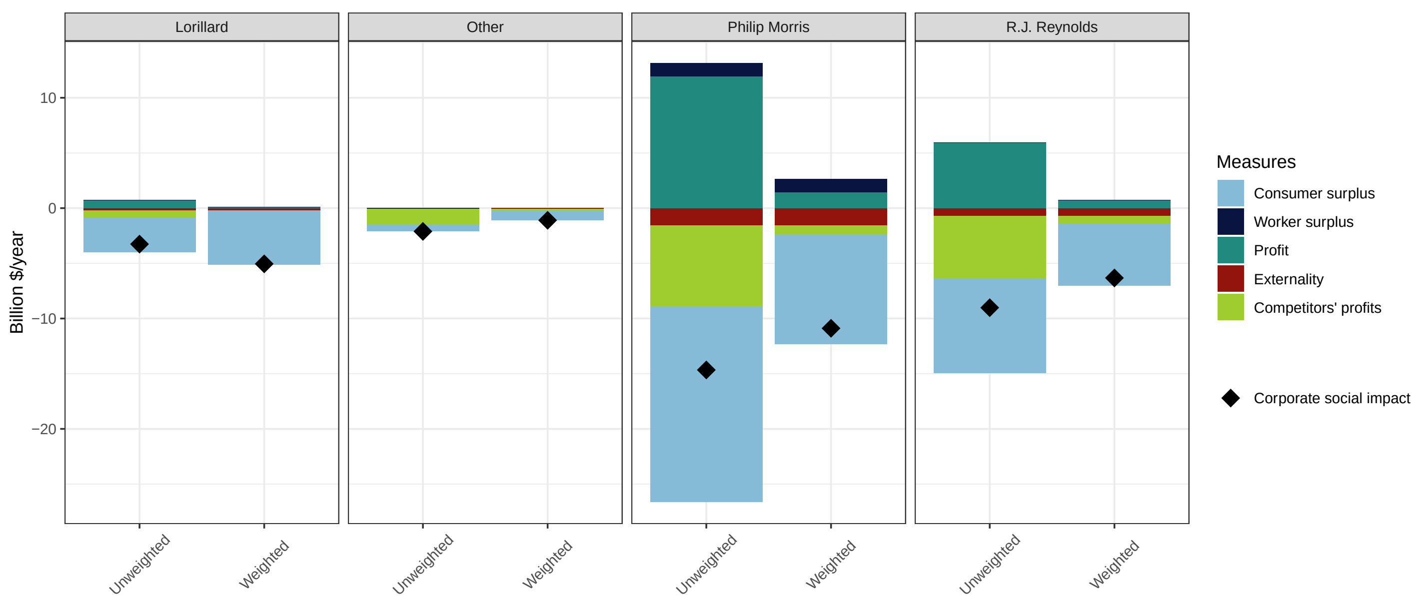
Notes: This figure presents average customer income against own-price elasticity for each firm in the differentiated product industries in our sample. Own-price elasticity is calculated from responses to the *price response* survey question: (-1)×ln(share who would still buy from the firm after a 25 percent price increase) / ln(1.25).

Figure 3: **Components of Social Impact by Firm**

(a) **Automobile Industry**

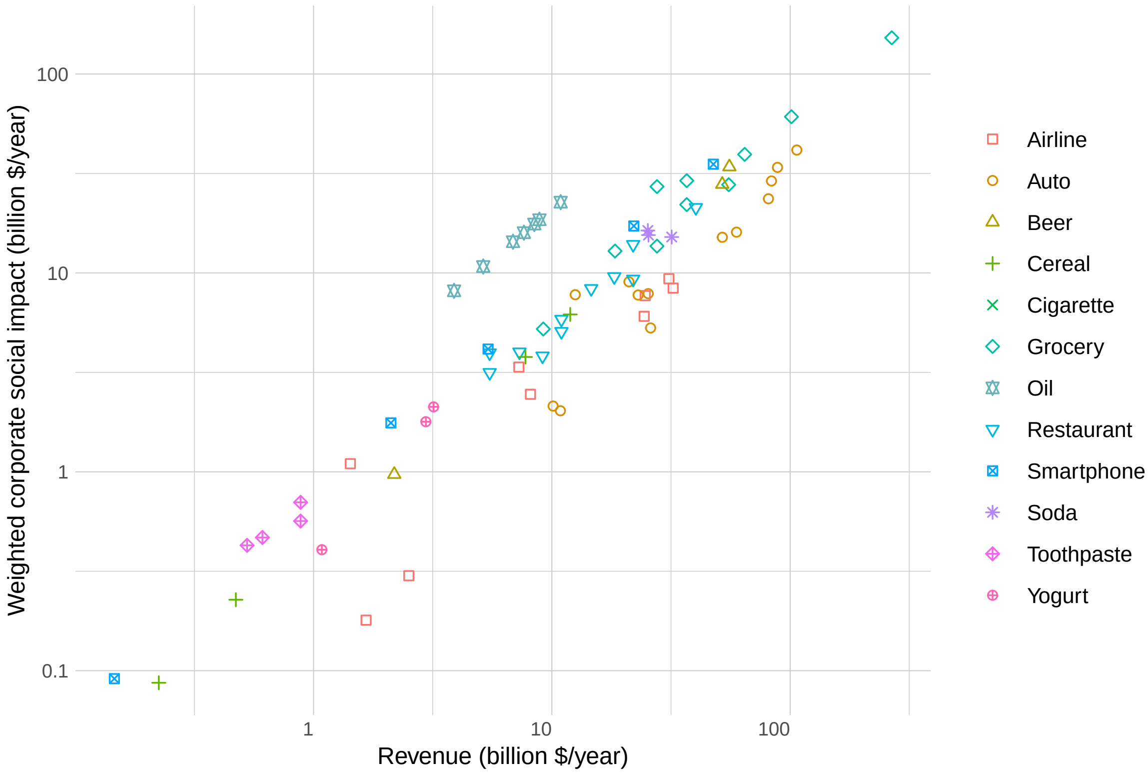


(b) **Cigarette Industry**



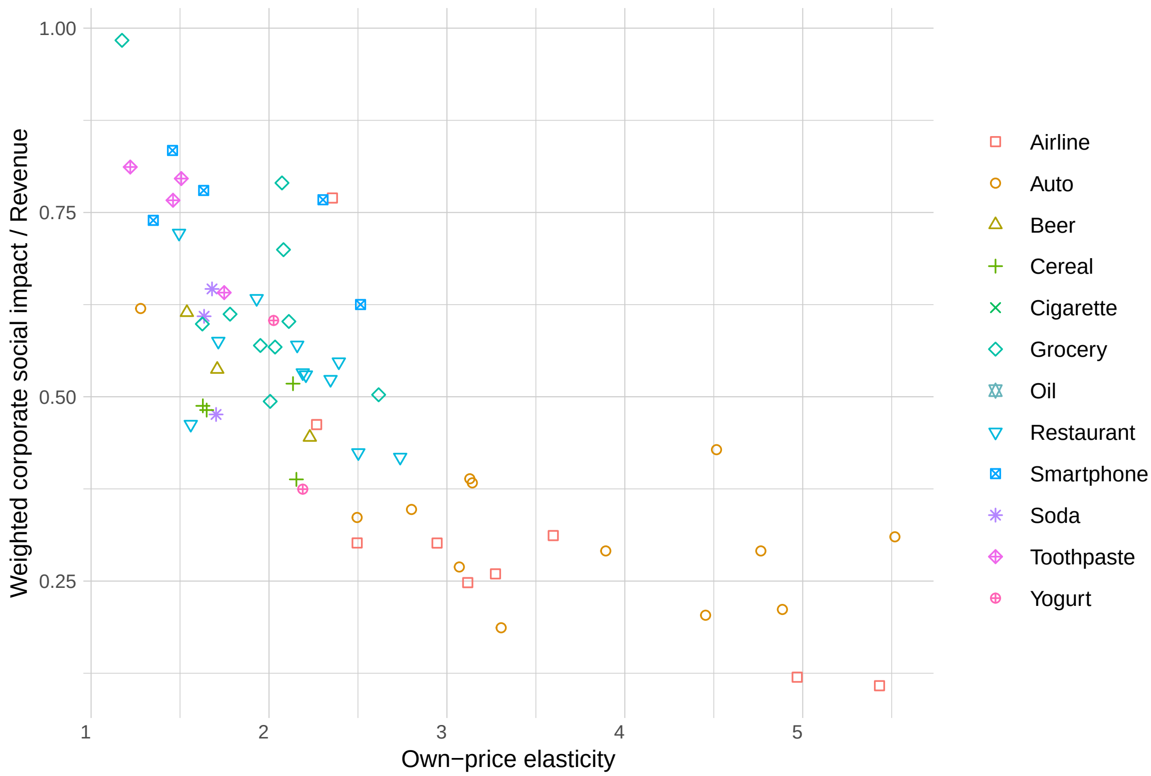
Notes: Panels (a) and (b) present the components of individual impact by firm in the automobile and cigarette industries. The first bar in each pair presents the firm's individual impact with equal social marginal welfare weights across income groups ($\rho = 0$). The second bar presents the firm's individual impact with a curvature of $\rho = 1$ on social marginal welfare weights, which approximately corresponds to log utility.

Figure 4: **Weighted Corporate Social Impact versus Revenue**



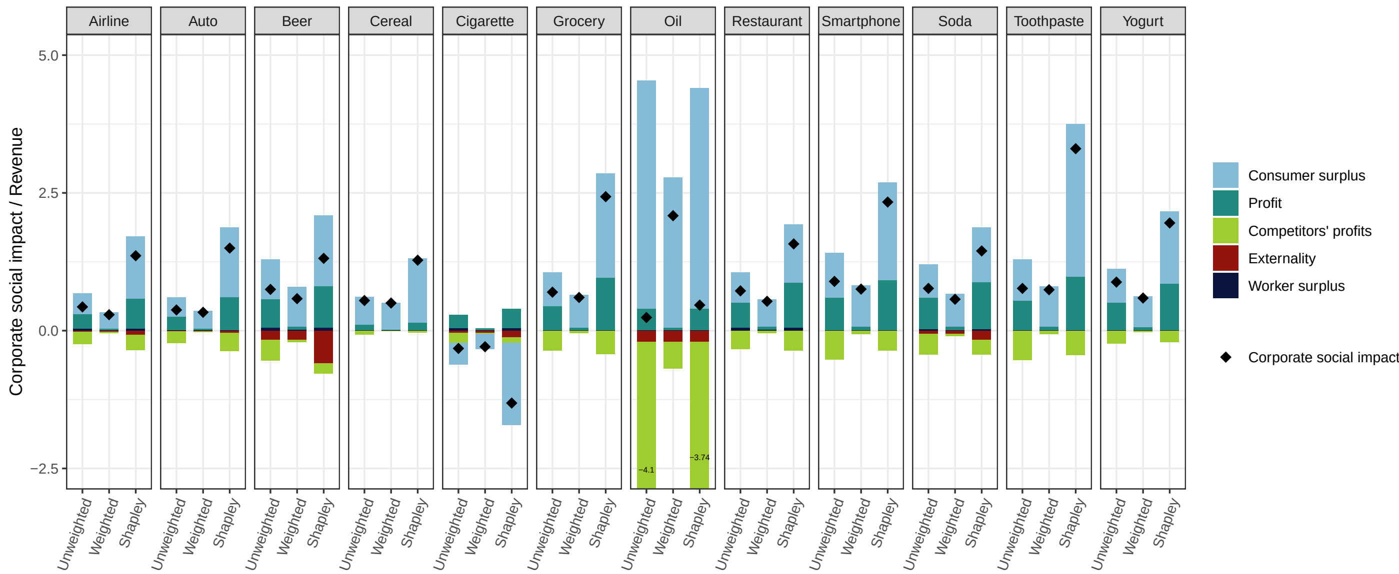
Notes: This figure presents weighted individual impact against revenue for each firm in our sample. This figure excludes cigarette companies, which are estimated to have negative social impact.

Figure 5: **Weighted Corporate Social Impact per Dollar of Revenue versus Own-Price Elasticity**



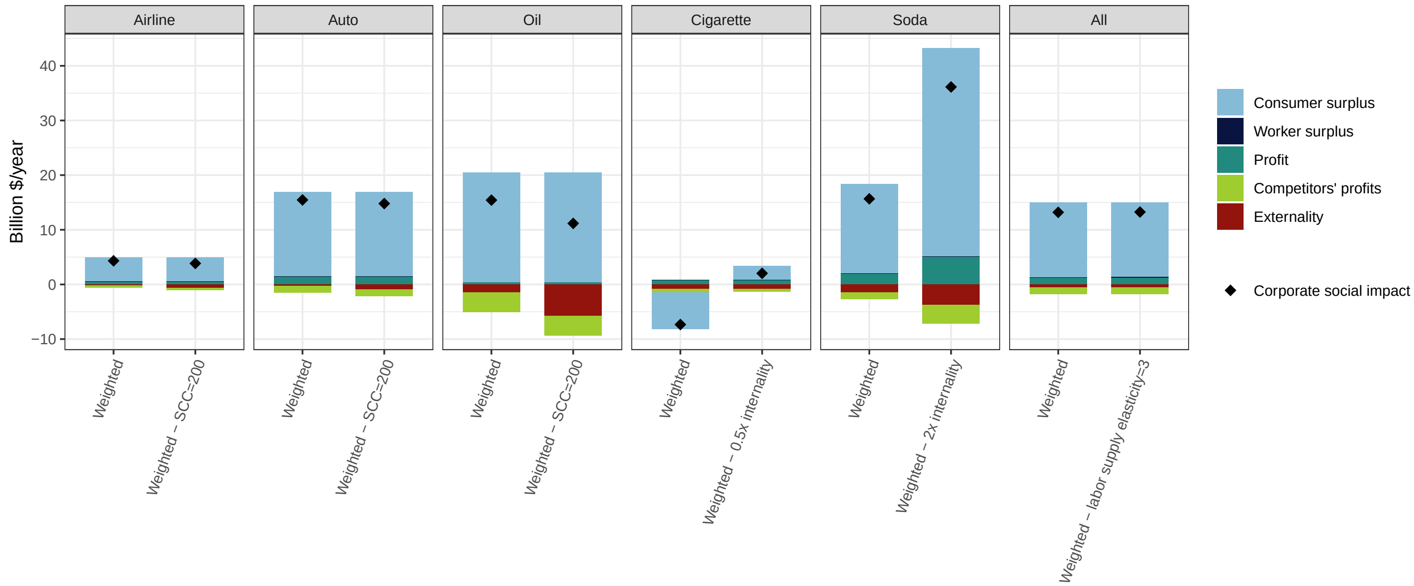
Notes: This figure presents weighted individual impact per dollar of revenue against own-price elasticity for each firm in the differentiated product industries in our sample. Own-price elasticity is calculated from responses to the *price response* survey question: (-1)×ln(share who would still buy from the firm after a 25 percent price increase) / ln(1.25). This figure excludes cigarette companies, which are estimated to have negative social impact.

Figure 6: **Corporate Social Impact per Dollar of Revenue by Industry**



Notes: This figure presents the components of corporate social impact per dollar of revenue, by industry. We sum each component across firms within an industry and divide by the sum of revenues within the industry. The first bar in each group presents components of individual impact, with equal social marginal welfare weights across income groups ($\rho = 0$). The second bar presents components of weighted individual impact, with a curvature of $\rho = 1$ on social marginal welfare weights). The third bar presents components of total industry impact, with equal social marginal welfare weights ($\rho = 0$).

Figure 7: **Robustness to Alternative Assumptions**



Notes: This figure presents the components of corporate social impact for the average firm in the industries listed at the top of each panel, under our primary assumptions (the left bar in each panel) and under alternative assumptions (the right bar).

Figure 8: **Weighted Corporate Social Impact versus Prior Metrics**

Notes: This figure presents our estimate of weighted individual impact per dollar of revenue against existing ratings from CSRHub (https://www.csrhub.com/csrhub/) and Just Capital (https://justcapital.com/rankings/), for all firms in our sample for which data are available.

Online Appendix

An Economic View of Corporate Social Impact

Hunt Allcott, Giovanni Montanari, Bora Ozaltun, and Brandon Tan

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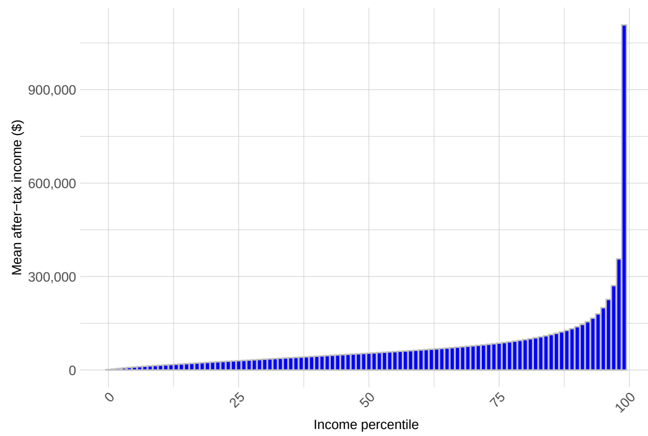
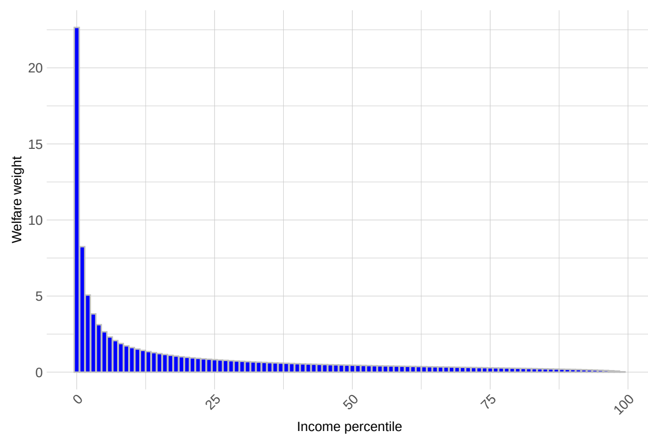
A Welfare Weights

Figure A1: **After-Tax Income and Welfare Weights by Income Percentile**

(a) **Mean Income After Tax and Transfers by Percentile**



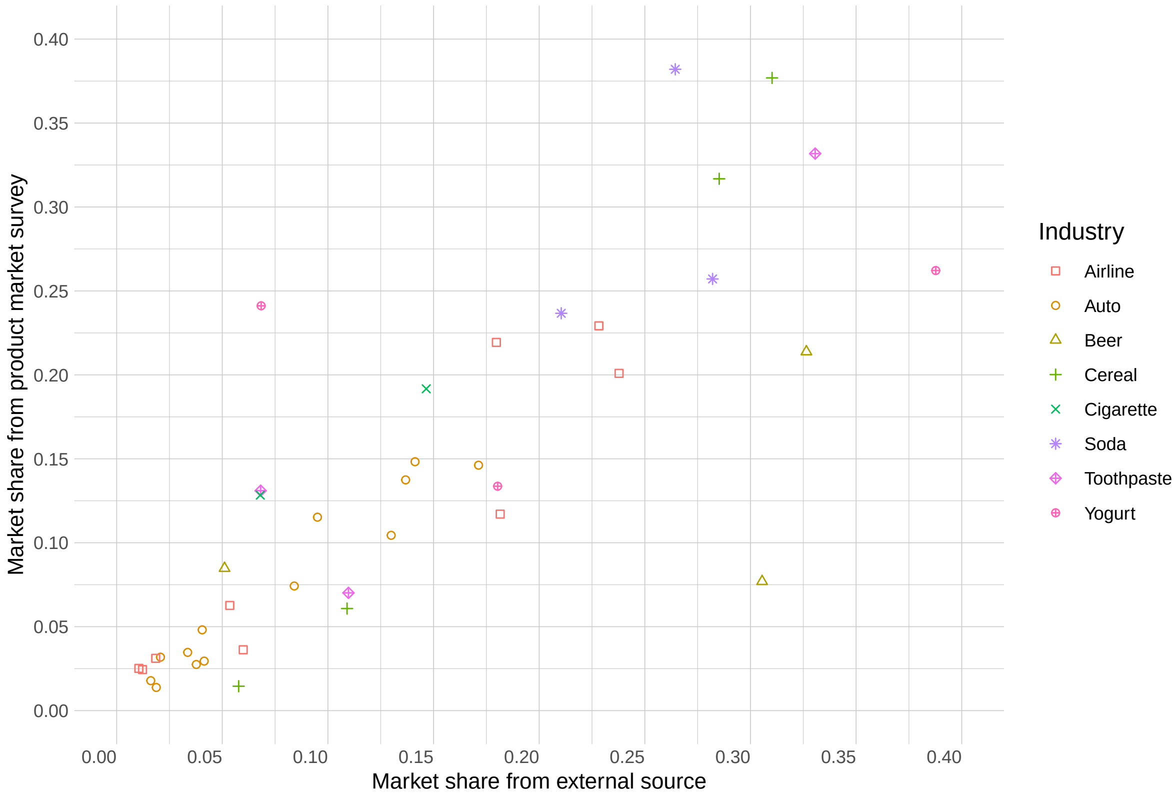
(b) **Welfare Weight by Income Percentile**



Notes: Panel (a) presents the mean income after taxes and government transfers by percentile, using the *poinc* variable from the Distributional National Accounts data (Piketty, Saez, and Zucman 2020). Panel (b) presents the resulting social marginal welfare weight by percentile, assuming that welfare weights are proportional to the inverse of income after taxes and government transfers.

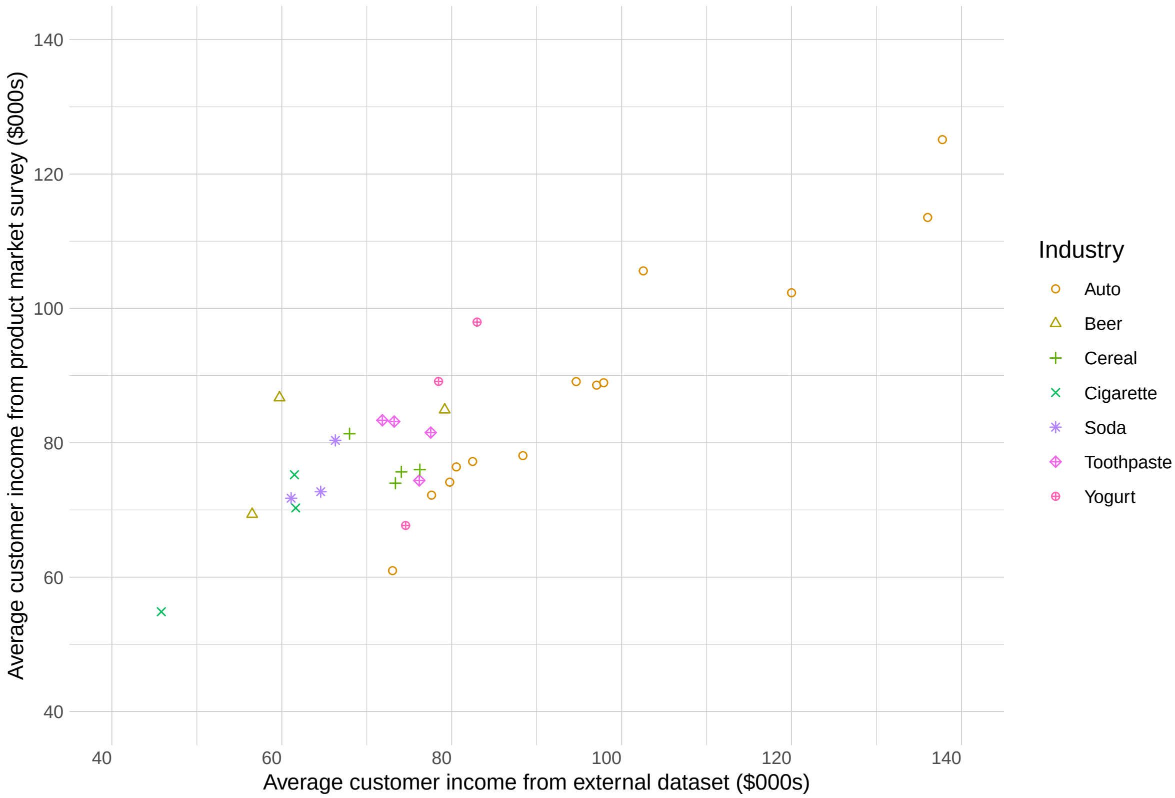
B Survey Appendix

Figure A2: **Survey vs. External Market Shares**



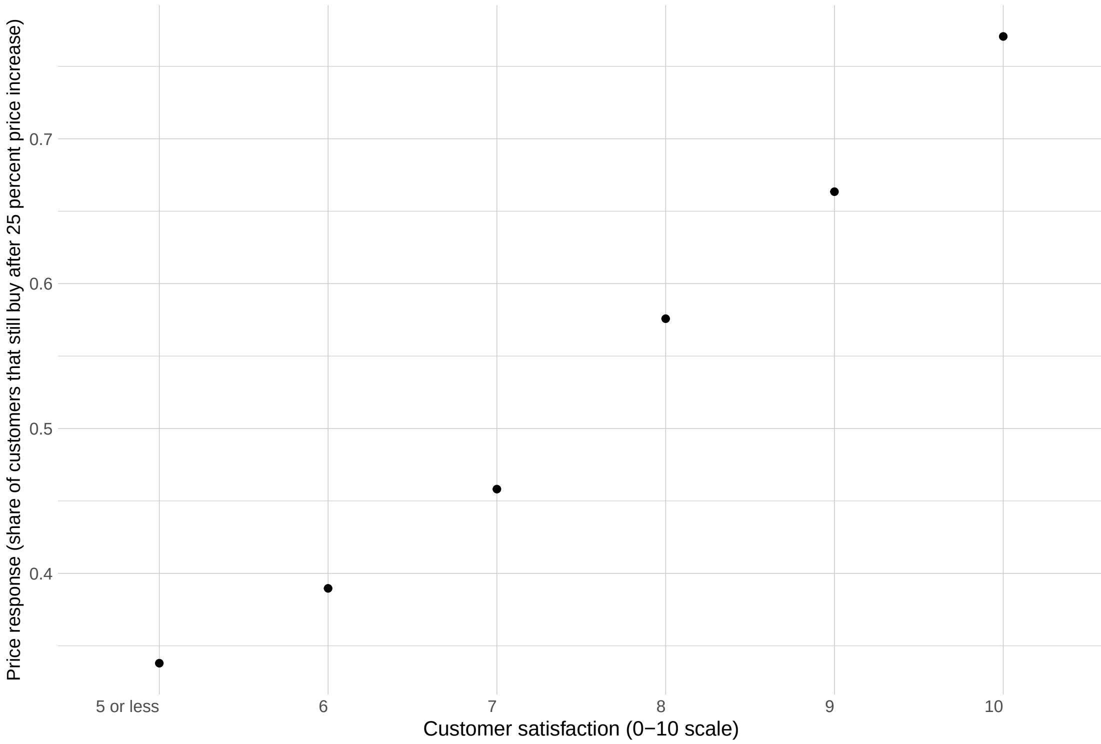
Notes: This figure presents market share from our survey against market share from an external source for firms in eight differentiated product industries in our sample. The external sources are the DB1B dataset (for airlines), Wards (for autos), and NielsenIQ (for beer, cereal, cigarettes, soda, toothpaste, and yogurt).

Figure A3: **Survey vs. External Customer Income**



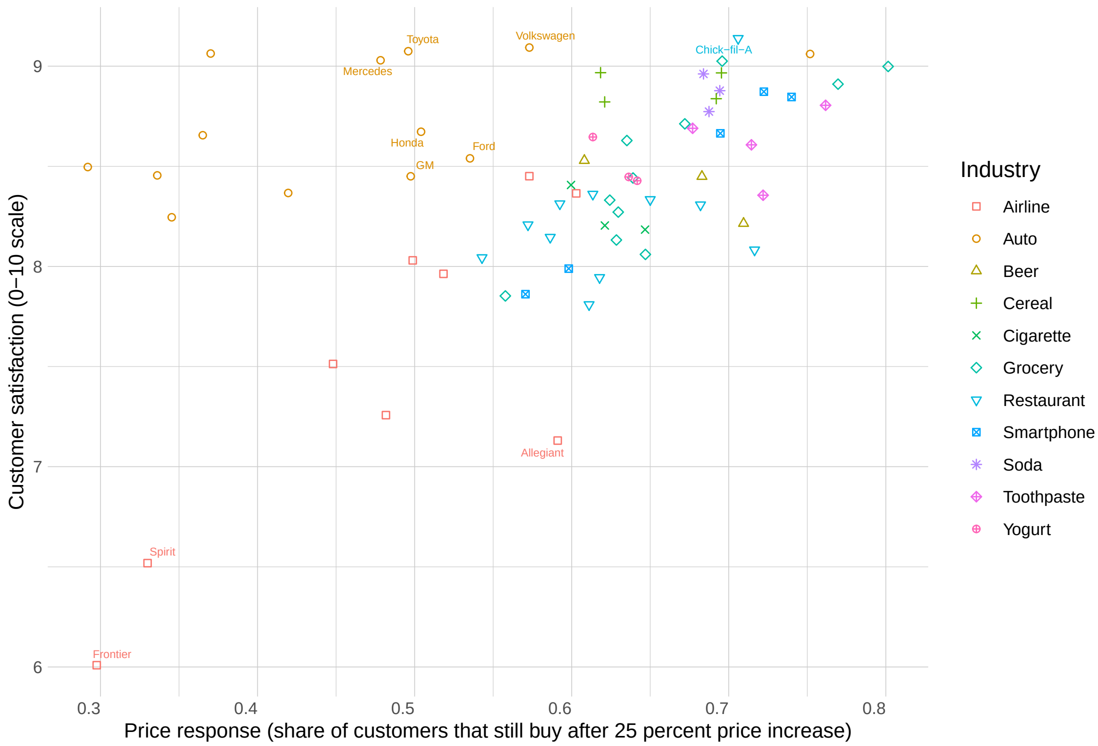
Notes: This figure presents average customer income from our survey against average income from an external source for firms in eight differentiated product industries in our sample. The external sources are the DB1B dataset (for airlines), Wards (for autos), and NielsenIQ (for beer, cereal, cigarettes, soda, toothpaste, and yogurt).

Figure A4: **Customer Satisfaction and Price Response**



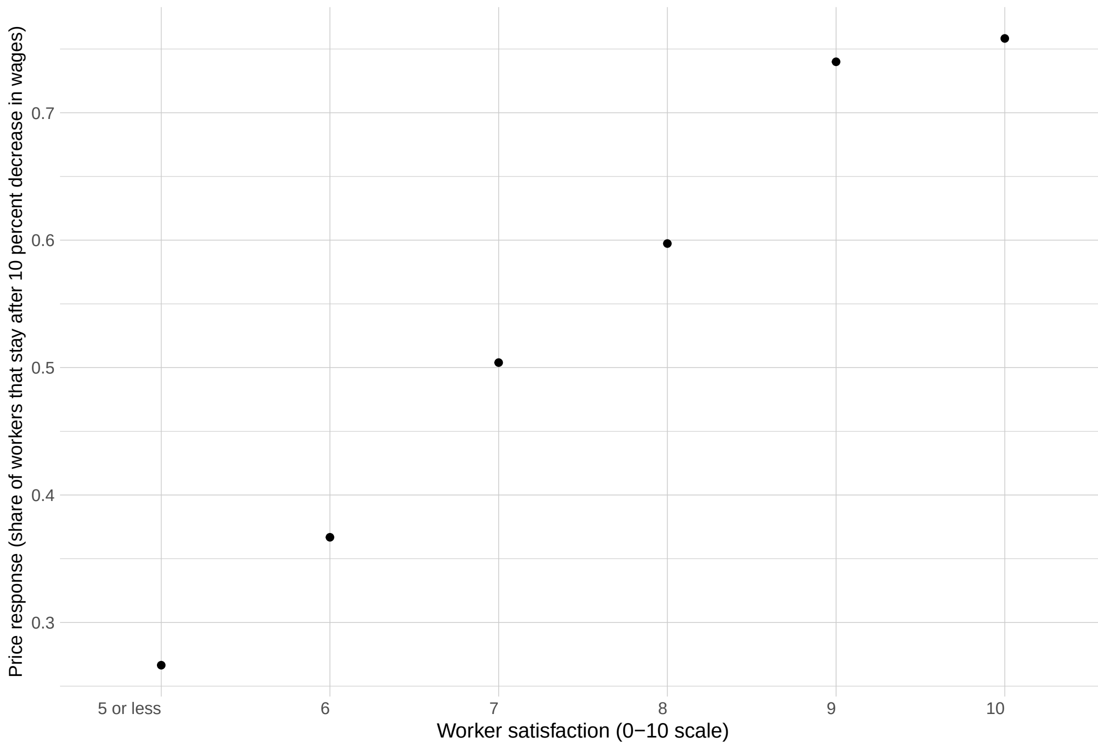
Notes: This figure presents the average *price response* (the share of customers that still buy from the same firm after a 25 percent price increase) for each value of *customer satisfaction*, using all responses in our survey.

Figure A5: **Customer Satisfaction and Price Response by Firm**



Notes: This figure presents *price response* (the share of customers that still buy from the same firm after a 25 percent price increase) vs. *customer satisfaction*, for all firms in our survey.

Figure A6: **Worker Satisfaction and Worker Price Response**



Notes: This figure presents the average *worker price response* (the share of workers that would stay at their current employer after a 10 percent salary decrease) for each value of *worker satisfaction*, using all responses in our survey.

C Product Market Estimation Appendix

C.A Survey Data and Counterfactual Prices in Differentiated Product Markets

Table A1: **Product Market Statistics by Firm**

Industry	Firm	(1) Market share	(2) Share of purchases by consumers with income < \$60,000	(3) Share of purchases retained after 25% price increase	(4) Own-price elasticity
Airline	Alaska	0.03	0.24	0.57	2.5
	Allegiant	0.01	0.4	0.59	2.36
	American	0.12	0.28	0.48	3.27
	Delta	0.11	0.31	0.52	2.94
	Frontier	0.01	0.42	0.3	5.43
	JetBlue	0.03	0.3	0.6	2.27
	Southwest	0.09	0.36	0.5	3.12
	Spirit	0.01	0.51	0.33	4.97
	United	0.09	0.38	0.45	3.6
	Other	0.01	0.48		
Auto	BMW	0.01	0.2	0.75	1.28
	Fiat Chrysler	0.07	0.44	0.42	3.89
	Ford	0.07	0.45	0.54	2.8
	GM	0.09	0.5	0.5	3.13
	Honda	0.05	0.37	0.5	3.07
	Hyundai	0.02	0.42	0.29	5.52
	Kia	0.02	0.59	0.37	4.52
	Mazda	0.01	0.32	0.34	4.89
	Mercedes	0.01	0.26	0.48	3.31
	Nissan	0.04	0.48	0.35	4.76
	Subaru	0.02	0.34	0.37	4.45
	Toyota	0.07	0.37	0.5	3.14
	Volkswagen	0.02	0.27	0.57	2.5
	Other	0.02	0.55		
Beer	Anheuser-Busch	0.22	0.43	0.68	1.71
	Molson Coors	0.23	0.55	0.71	1.54
	Sazerac	0.01	0.4	0.61	2.23
	Other	0.04	0.35		
Cereal	General Mills	0.18	0.48	0.7	1.63
	Kellogg	0.28	0.49	0.62	2.13
	Post	0.01	0.41	0.69	1.65
	Quaker	0.01	0.4	0.62	2.15
	Other	0.02	0.44		
Cigarette	Lorillard	0.02	0.63	0.6	2.29
	Philip Morris	0.3	0.52	0.65	1.95
	R.J. Reynolds	0.15	0.52	0.62	2.13
	Other	0.03	0.74		
Grocery	ALDI	0.02	0.41	0.77	1.17
	Ahold	0.02	0.46	0.63	2.07
	Albertsons	0.03	0.36	0.56	2.62
	Amazon	0.02	0.36	0.64	2.01
	Costco	0.04	0.3	0.67	1.78
	Kroger	0.06	0.43	0.62	2.11
	Meijer	0.01	0.36	0.64	2.03
	Publix	0.02	0.42	0.7	1.63
	Wakefern	0.01	0.45	0.63	2.08
	Walmart	0.17	0.56	0.65	1.95
	Other	0.09	0.48		
Smartphone	Apple	0.31	0.35	0.74	1.35
	Google	0.01	0.58	0.72	1.46
	LG	0.03	0.67	0.6	2.3
	Lenovo	0	0.54	0.57	2.51
	Samsung	0.14	0.47	0.69	1.63
	Other	0	0.71		
Restaurant	Burger King	0.04	0.52	0.62	2.16
	Chick-fil-A	0.03	0.38	0.71	1.56
	Chipotle	0.02	0.41	0.72	1.49
	Domino's	0.02	0.54	0.59	2.39
	Inspire Brands	0.05	0.5	0.59	2.35
	JAB	0.02	0.31	0.68	1.72
	McDonald's	0.12	0.51	0.61	2.21
	Starbucks	0.06	0.31	0.57	2.5
	Subway	0.03	0.44	0.61	2.19
	Wendy's	0.03	0.41	0.54	2.74
	Yum! Brands	0.06	0.51	0.65	1.93
	Other	0.01	0.43		
Soda	Coca-Cola	0.14	0.46	0.69	1.68
	Dr Pepper 7 Up	0.18	0.48	0.68	1.7
	Pepsi	0.15	0.49	0.69	1.64
	Other	0.03	0.53		
Toothpaste	Church & Dwight	0.1	0.41	0.72	1.46
	Colgate	0.15	0.49	0.71	1.51
	Glaxo	0.09	0.42	0.76	1.22
	Procter & Gamble	0.15	0.44	0.68	1.75
	Other	0.01	0.47		
Yogurt	Chobani	0.05	0.31	0.61	2.19
	Danone	0.14	0.37	0.64	2.03
	Yoplait	0.15	0.53	0.64	1.99
	Other	0.16	0.45		

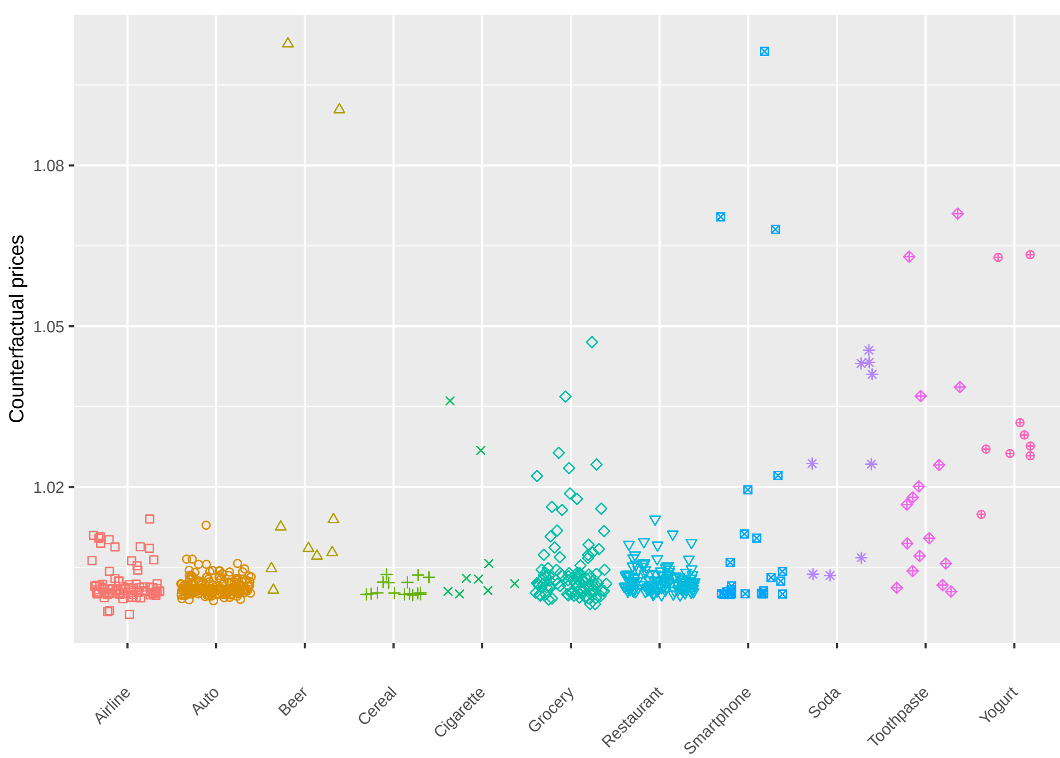
Notes: This table presents the statistics used for demand estimation for each firm in the differentiated product industries in our sample. Own-price elasticity is calculated from responses to the *price response* survey question: (-1)×ln(share who would still buy from the firm after a 25 percent price increase) / ln(1.25).

Table A2: **Industry-Level Product Market Statistics**

Industry	Aggregate price elasticity
Toothpaste	0.33
Grocery	0.52
Smartphone	0.60
Auto	0.92
Beer	0.92
Yogurt	0.93
Cereal	0.95
Soda	1.02
Cigarette	1.04
Airline	1.14
Restaurant	1.16

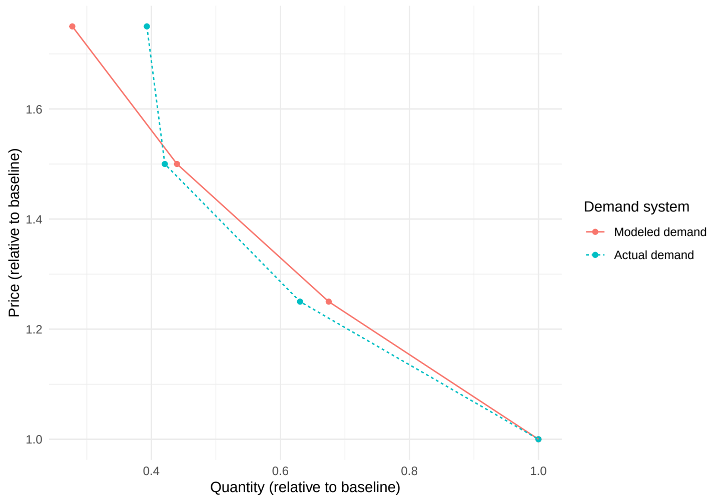
Notes: This table presents the industry-level aggregate price elasticity for each differentiated product industry in our sample. Aggregate price elasticity is calculated from responses to the *aggregate price response* survey question: (-1)×ln(share who would still buy if the price of all products doubled) / ln(2).

Figure A7: **Counterfactual Equilibrium Prices in Response to Individual Firm Exit**



Notes: This figure presents all counterfactual equilibrium prices in response to the exit of each individual firm in each differentiated product industry in our sample. Each firm is assumed to sell a representative good with baseline price of $1.

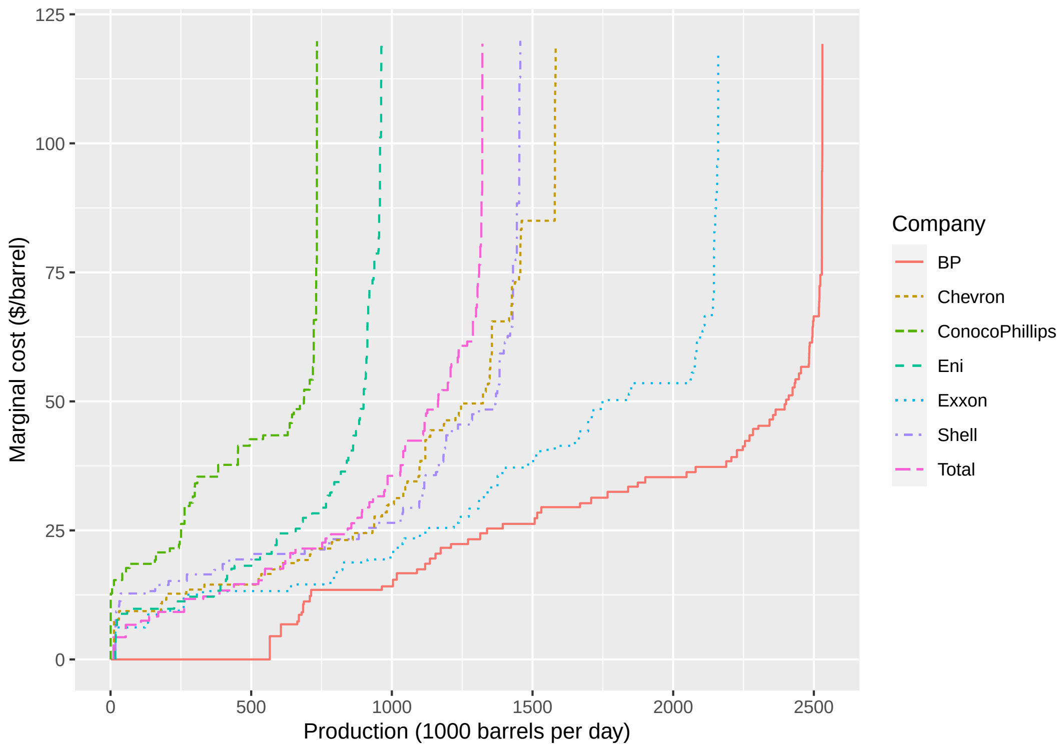
Figure A8: **Modeled Demand Function vs. Survey Data**



Notes: This figure compares the modeled demand function (given the functional form assumptions described in Section IV) to the "actual" demand function as self-reported in survey data, with randomly varied hypothetical price increases.

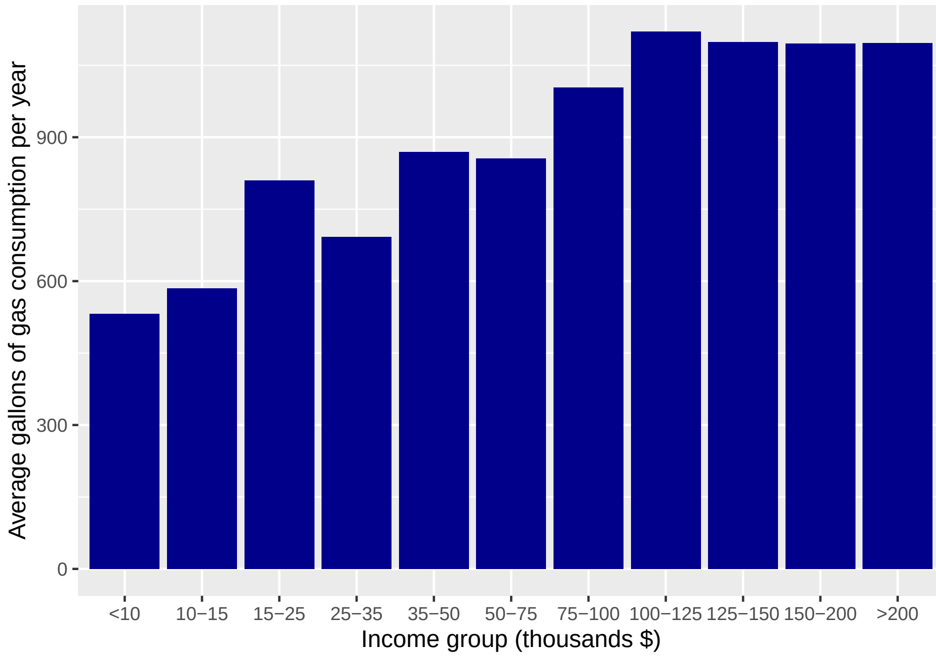
C.B Oil Market Appendix

Figure A9: **Marginal Cost Curves by Firm**



Notes: This figure presents the marginal cost curves for each oil company in our sample. These are calculated by aggregating over field-level marginal costs using data from Rystad.

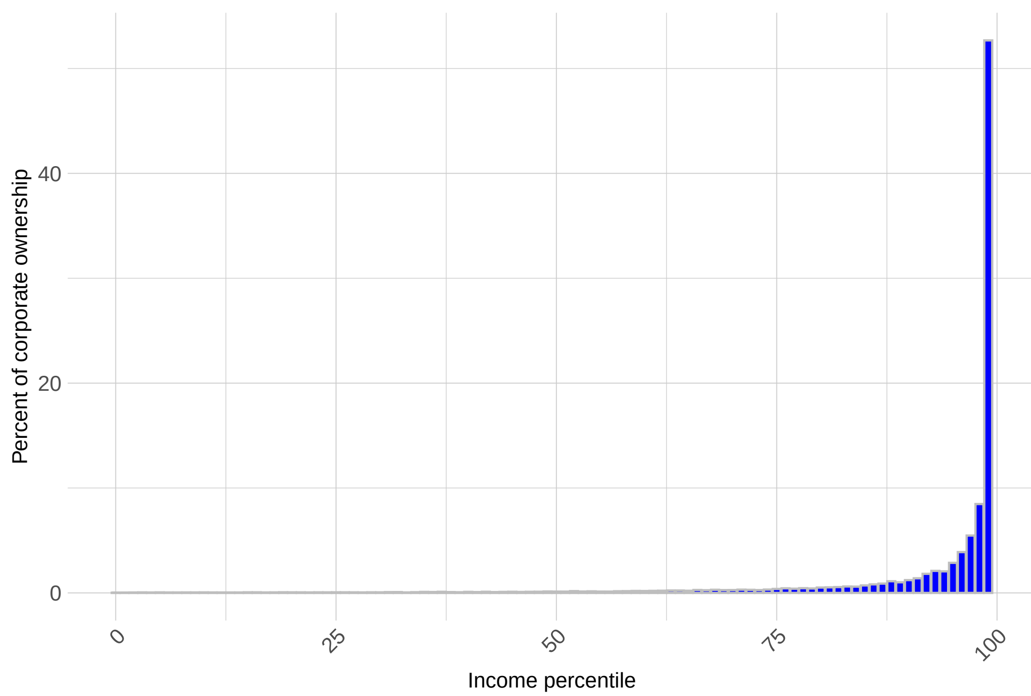
Figure A10: **Gasoline Consumption by Income**



Notes: This figure presents average gasoline consumption by income group, using microdata on vehicle miles traveled and fuel economy from the National Household Travel Survey.

C.C Profit Calculation

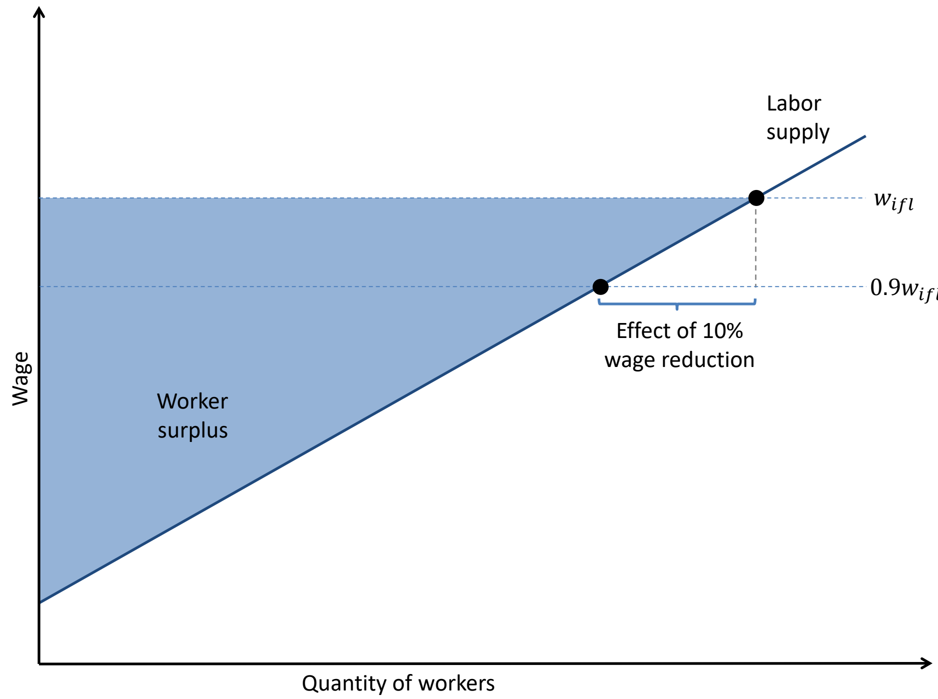
Figure A11: **Percent of C-corp Equity Owned by Income Percentile**



Notes: This figure presents the percent of C-corp equity owned by each income percentile, using the *fkequ_c* variable from the Distributional National Accounts data (Piketty, Saez, and Zucman 2020).

D Labor Market Estimation Appendix

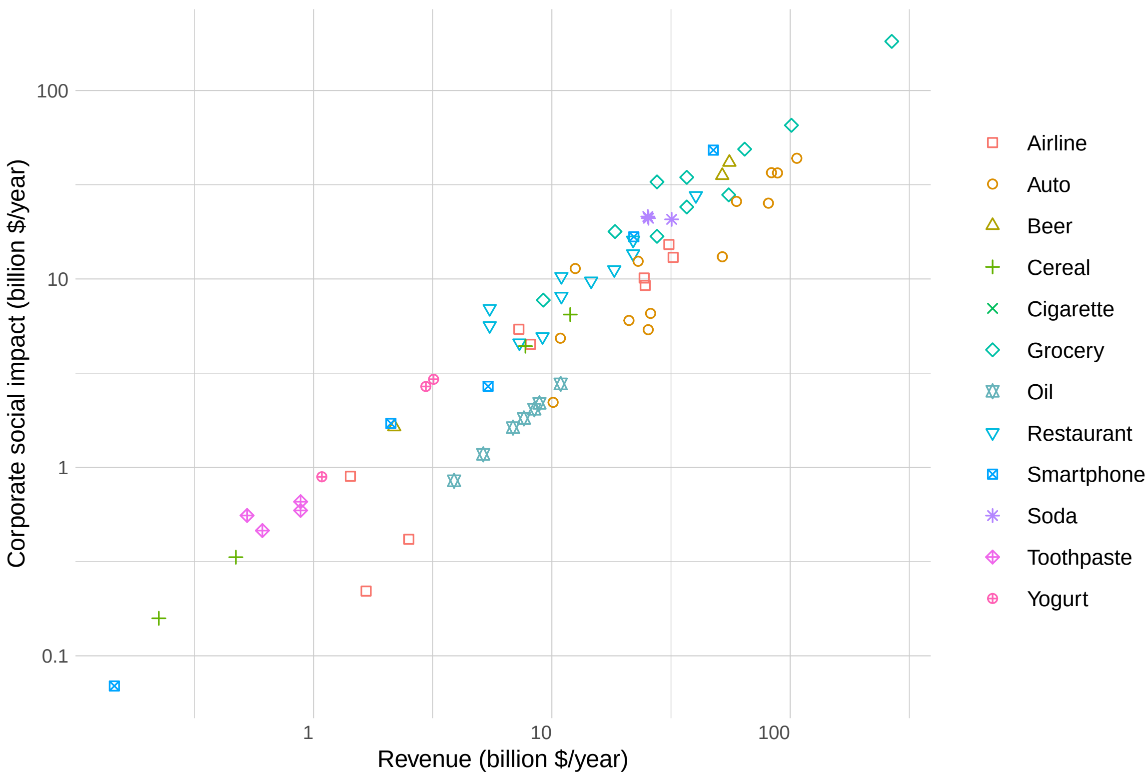
Figure A12: **Illustration of Worker Surplus Calculation**



Notes: This figure illustrates our strategy for estimating a firm's contribution to worker surplus. Since we assume that each firm is a "small" share of the labor market, a firm's worker surplus is the area above its current employees' labor supply function. We estimate that area using the *worker price response* survey question assuming that residual labor supply is linear.

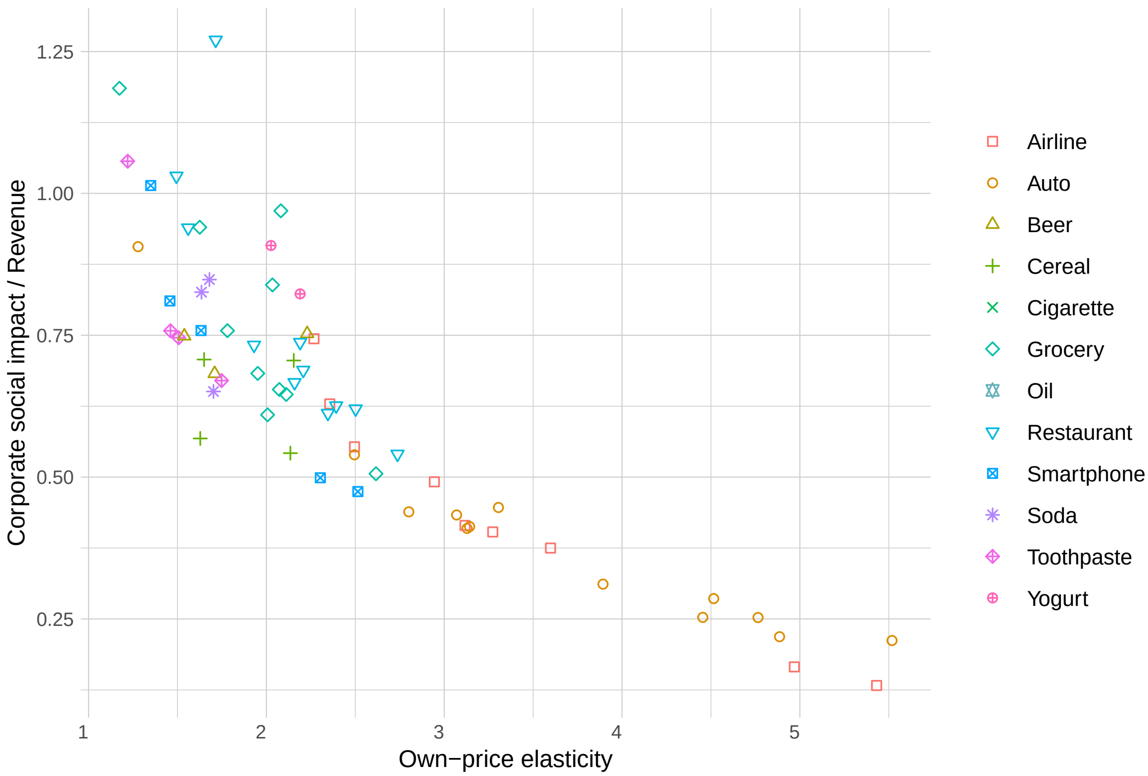
E Corporate Social Impact Results Appendix

Figure A13: **Unweighted Corporate Social Impact versus Revenue**



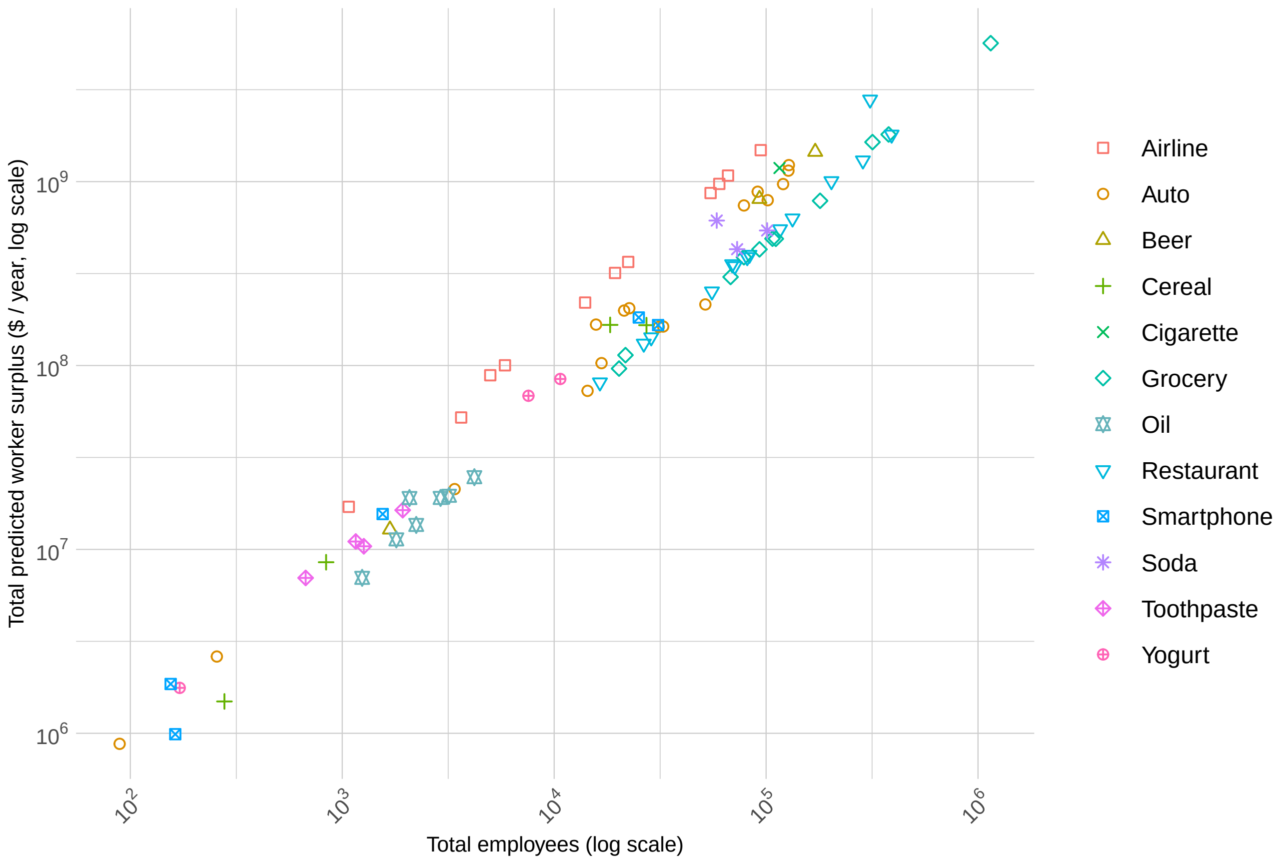
Notes: This figure presents unweighted individual impact against revenue for each firm in our sample. This figure excludes cigarette companies, which are estimated to have negative social impact.

Figure A14: **Unweighted Corporate Social Impact per Dollar of Revenue versus Own-Price Elasticity**



Notes: This figure presents unweighted individual impact per dollar of revenue against own-price elasticity for each firm in the differentiated product industries in our sample. Own-price elasticity is calculated from responses to the *price response* survey question: (-1)×ln(share who would still buy from the firm after a 25 percent price increase) / ln(1.25). This figure excludes cigarette companies, which are estimated to have negative social impact.

Figure A15: **Worker Surplus versus Employee Count**



Notes: This figure presents worker surplus against total employees for each firm in our sample.

Table A3: **Components of Individual Impact by Firm**

Industry	Firm	(1) Consumer surplus	(2) Profit	(3) Competitor profit	(4) Externality	(5) Worker surplus	(6) Corporate social impact	(7) Consumer surplus (weighted)	(8) Profit (weighted)	(9) Competitor profit (weighted)	(10) Worker surplus (weighted)	(11) Corporate social impact (weighted)	(12) Revenue
Airline	Alaska	3.9	2.33	-1.86	-0.24	0.37	4.5	2.58	0.28	-0.22	0.06	2.45	8.13
	Allegiant	0.73	0.43	-0.3	-0.02	0.05	0.9	1.09	0.05	-0.04	0.01	1.1	1.43
	American	10.74	8.41	-7.62	0.02	1.48	13.02	8.06	1.01	-0.92	0.22	8.39	32.29
	Delta	12.62	8.67	-7.16	0.14	0.97	15.24	8.88	1.04	-0.86	0.15	9.35	30.99
	Frontier	0.45	0.34	-0.46	-0.2	0.09	0.22	0.38	0.04	-0.06	0.01	0.18	1.66
	JetBlue	4.53	2.32	-1.44	-0.32	0.32	5.41	3.53	0.28	-0.17	0.05	3.36	7.27
	Southwest	8.83	6.59	-5.84	-0.54	1.08	10.12	6.33	0.79	-0.7	0.16	6.05	24.4
	Spirit	0.72	0.57	-0.65	-0.33	0.1	0.42	0.62	0.07	-0.08	0.02	0.3	2.51
	United	8.08	6.32	-6.04	0.02	0.87	9.24	7.5	0.76	-0.73	0.13	7.68	24.65
Auto	BMW	9.76	3.93	-2.41	0	0.07	11.36	7.57	0.47	-0.29	0.02	7.77	12.53
	Fiat Chrysler	24.12	19.37	-18.58	-0.88	1.23	25.25	24.12	2.33	-2.24	0.25	23.59	81.09
	Ford	32.12	22.04	-17.76	-0.55	0.79	36.64	28.84	2.65	-2.14	0.17	28.99	83.5
	GM	38.1	28.06	-23.2	-0.41	1.15	43.69	41.05	3.38	-2.79	0.25	41.47	106.67
	Honda	22.08	15.57	-12.43	-0.3	0.88	25.8	15.77	1.87	-1.5	0.18	16.03	59.55
	Hyundai	6.31	5.14	-6.28	0.04	0.16	5.38	7.92	0.62	-0.76	0.04	7.87	25.38
	Kia	6.02	4.85	-4.96	-0.09	0.2	6.02	9.08	0.58	-0.6	0.04	9.02	21.07
	Mazda	2.64	2.07	-2.57	-0.09	0.17	2.21	2.26	0.25	-0.31	0.03	2.14	10.12
	Mercedes	4.21	2.93	-2.46	0.07	0.1	4.85	1.87	0.35	-0.3	0.02	2.03	10.86
	Nissan	13.34	11.32	-11.99	-0.3	0.74	13.12	15.33	1.36	-1.44	0.16	15.11	51.93
	Subaru	7.13	5.77	-6.17	-0.32	0.16	6.56	5.62	0.69	-0.74	0.04	5.29	25.96
	Toyota	31.41	22.84	-18.51	-0.18	0.97	36.53	33.36	2.75	-2.23	0.21	33.92	88.49
	Volkswagen	10.87	6.22	-4.95	0.06	0.21	12.41	7.48	0.75	-0.6	0.05	7.74	23.02
Beer	Anheuser-Busch	35.72	26.37	-19.41	-8.72	1.45	35.41	35.45	3.17	-2.34	0.32	27.89	51.9
	Molson Coors	41.73	29.51	-21.41	-9.01	0.81	41.61	42.03	3.55	-2.58	0.16	34.15	55.59
	Sazerac	1.91	1.04	-1.16	-0.15	0	1.64	1.14	0.13	-0.14	0	0.97	2.18
Cereal	General Mills	4.07	0.78	-0.61	0	0.17	4.4	3.72	0.09	-0.07	0.04	3.78	7.75
	Kellogg	5.81	1.21	-0.7	0	0.17	6.47	6.08	0.15	-0.08	0.04	6.18	11.94
	Post	0.32	0.05	-0.04	0	0.01	0.33	0.22	0.01	0	0	0.23	0.47
	Quaker	0.16	0.02	-0.03	0	0	0.16	0.09	0	0	0	0.09	0.22
Cigarette	Lorillard	-3.1	0.73	-0.72	-0.17	0	-3.26	-4.88	0.09	-0.09	0	-5.05	2.94
	Philip Morris	-17.71	11.97	-7.38	-1.54	1.19	-13.47	-9.9	1.44	-0.89	0.24	-10.64	46.9
	R.J. Reynolds	-8.55	5.92	-5.72	-0.68	0	-9.02	-5.67	0.71	-0.69	0	-6.32	24.44
Grocery	Ahold	22.67	15.8	-14.86	0	0.49	24.1	28.85	1.9	-1.79	0.13	29.09	36.82
	Albertsons	29.8	20.88	-24.37	0	1.64	27.94	27.79	2.51	-2.93	0.4	27.77	55.23
	ALDI	28.67	13.85	-9.91	0	0.11	32.73	26.66	1.67	-1.19	0.03	27.16	27.62
	Amazon	16.69	11.36	-11.6	0	0.39	16.84	13.57	1.37	-1.4	0.1	13.64	27.62
	Costco	44.03	28.58	-24.26	0	0.49	48.85	38.79	3.44	-2.92	0.13	39.44	64.44
	Kroger	58.39	42.69	-37.5	0	1.8	65.38	59.89	5.14	-4.52	0.47	60.98	101.26
	Meijer	8.34	3.82	-4.87	0	0.43	7.72	5.24	0.46	-0.59	0.11	5.22	9.21
	Publix	29.31	17.66	-13.13	0	0.79	34.63	21.29	2.13	-1.58	0.21	22.05	36.82
	Wakefern	16.61	8.67	-7.74	0	0.3	17.85	12.69	1.04	-0.93	0.08	12.88	18.41
	Walmart	143.59	115.98	-82.97	0	5.66	182.26	146.64	13.96	-9.99	1.45	152.06	266.97
Oil	BP	36.72	3.52	-36.32	-1.75	0.01	2.19	24.2	0.42	-4.37	0	18.5	8.87
	Chevron	34.96	3.31	-34.59	-1.66	0.02	2.03	23.04	0.4	-4.16	0	17.61	8.44
	Conoco	16.15	1.53	-16.07	-0.77	0.01	0.85	10.64	0.18	-1.93	0	8.13	3.89
	Eni	21.39	2.03	-21.25	-1.02	0.02	1.17	14.09	0.24	-2.56	0	10.77	5.15
	Exxon	45.01	4.29	-44.4	-2.15	0.02	2.77	29.66	0.52	-5.35	0	22.69	10.89
	Shell	31.63	3.01	-31.33	-1.5	0.01	1.82	20.85	0.36	-3.77	0	15.93	7.63
	Total	28.48	2.71	-28.24	-1.35	0.02	1.63	18.77	0.33	-3.4	0.01	14.35	6.87
Restaurant	Burger King	7.7	6.72	-4.75	0	0.08	9.75	8.08	0.81	-0.57	0.02	8.34	14.62
	Chick-fil-A	7.5	5.56	-3.31	0	0.55	10.3	4.66	0.67	-0.4	0.14	5.07	10.97
	Chipotle	4	2.88	-1.61	0	0.39	5.65	3.7	0.35	-0.19	0.1	3.96	5.48
	Domino's	3.69	3.25	-2.5	0	0.13	4.57	3.88	0.39	-0.3	0.03	4	7.31
	Inspire Brands	9.15	8.14	-6.09	0	0	11.2	9.32	0.98	-0.73	0	9.57	18.28
	JAB	5.29	3.09	-1.82	0	0.4	6.97	2.9	0.37	-0.22	0.1	3.15	5.48
	McDonald's	20.49	18.4	-13.01	0	1.8	27.68	20.18	2.21	-1.57	0.47	21.3	40.22
	Starbucks	10.54	9.43	-7.67	0	1.3	13.61	8.75	1.14	-0.92	0.34	9.3	21.94
	Subway	5.88	5.04	-3.84	0	1.01	8.09	5.43	0.61	-0.46	0.26	5.84	10.97
	Wendy's	4.17	3.7	-3.28	0	0.35	4.94	3.68	0.45	-0.39	0.09	3.82	9.14
	Yum! Brands	12.07	10.38	-7.01	0	0.63	16.07	13.32	1.25	-0.84	0.17	13.89	21.94
Smartphone	Apple	40.11	29.81	-21.82	0	0.18	48.28	34.2	3.59	-2.63	0.04	35.2	47.62
	Google	1.62	1.19	-1.11	0	0.02	1.71	1.75	0.14	-0.13	0	1.76	2.11
	Lenovo	0.11	0.06	-0.11	0	0	0.07	0.1	0.01	-0.01	0	0.09	0.15
	LG	3.7	2.54	-3.54	0	0	2.69	4.26	0.31	-0.43	0	4.14	5.4
	Samsung	17.98	12.29	-13.69	0	0.17	16.74	17.35	1.48	-1.65	0.04	17.22	22.08
Soda	Coca-Cola	16.67	14.37	-10.11	-0.1	0.61	21.44	15.79	1.73	-1.22	0.13	16.34	25.28
	Dr Pepper 7 Up	17.33	18.15	-11.81	-3.39	0.43	20.72	17.67	2.19	-1.42	0.11	15.15	31.83
	Pepsi	16.57	14.75	-10.12	-0.73	0.54	21.01	15.54	1.78	-1.22	0.14	15.5	25.44
Toothpaste	Church & Dwight	0.45	0.32	-0.32	0	0.01	0.46	0.47	0.04	-0.04	0	0.47	0.61
	Colgate	0.65	0.47	-0.48	0	0.02	0.66	0.7	0.06	-0.06	0	0.7	0.88
	Glaxo	0.49	0.31	-0.25	0	0.01	0.56	0.42	0.04	-0.03	0	0.43	0.53
	Procter & Gamble	0.61	0.45	-0.48	0	0.01	0.59	0.57	0.05	-0.06	0	0.57	0.88
Yogurt	Chobani	0.69	0.53	-0.33	0	0	0.89	0.38	0.06	-0.04	0	0.41	1.08
	Danone	1.8	1.5	-0.69	0	0.08	2.69	1.67	0.18	-0.08	0.02	1.79	2.96
	Yoplait	1.92	1.63	-0.68	0	0.07	2.94	1.99	0.2	-0.08	0.01	2.12	3.19

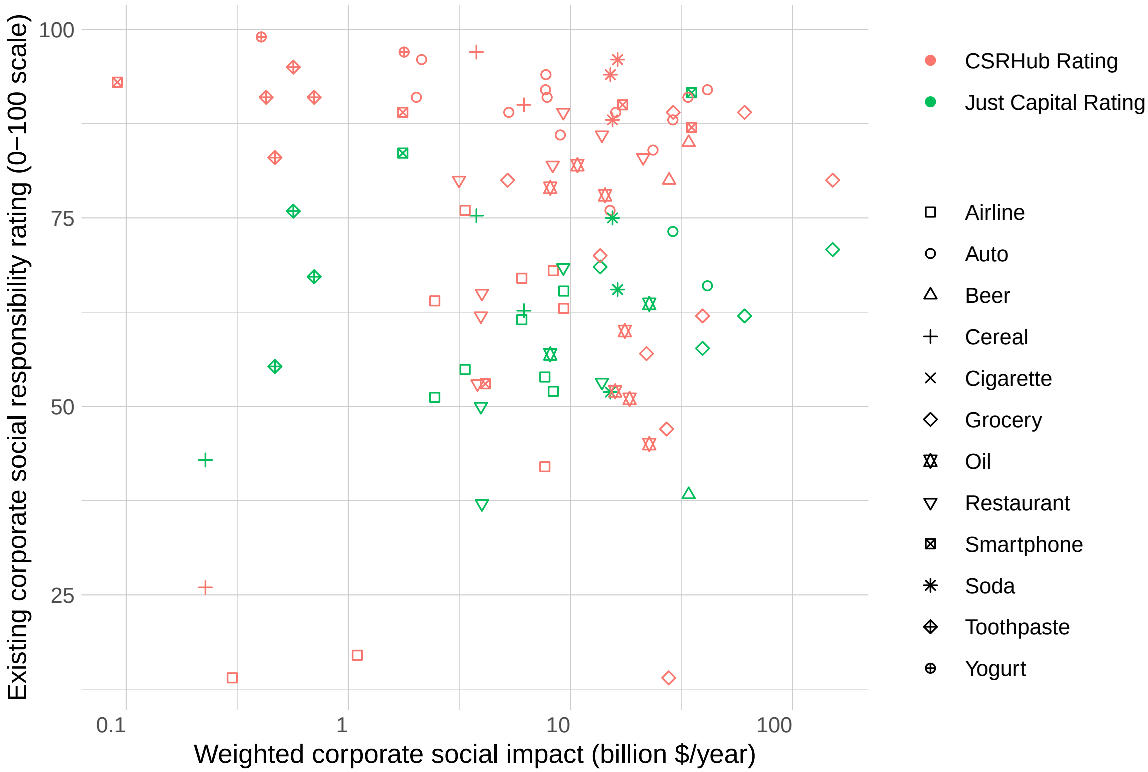
Notes: This table presents the components of individual impact for all firms in our sample. The "weighted" estimates impose a curvature of $\rho = 1$ on social marginal welfare weights, which approximately corresponds to log utility. All other estimates use equal social marginal welfare weights across income groups ($\rho = 0$).

Table A4: **Components of Share of Industry Impact by Firm**

Industry	Firm	(1) Consumer surplus	(2) Profit	(3) Competitor profit	(4) Externality	(5) Worker surplus	(6) Corporate social impact	(7) Consumer surplus (weighted)	(8) Profit (weighted)	(9) Competitor profit (weighted)	(10) Worker surplus (weighted)	(11) Corporate social impact (weighted)	(12) Revenue
Airline	Alaska	9.58	4.68	-2.01	-0.7	0.37	11.92	6.19	0.56	-0.24	0.06	5.87	8.13
	Allegiant	1.54	0.76	-0.18	-0.07	0.05	2.11	2.3	0.09	-0.02	0.01	2.31	1.43
	American	31.96	16.14	-8.66	-0.74	1.48	40.18	22.14	1.94	-1.04	0.22	22.52	32.29
	Delta	30.42	15.06	-7.83	-0.35	0.97	38.27	20.75	1.81	-0.94	0.15	21.42	30.99
	Frontier	9.48	3.47	-1.67	-2.43	0.09	8.94	6.29	0.42	-0.2	0.01	4.09	1.66
	JetBlue	7.81	3.72	-1.48	-0.56	0.32	9.82	5.66	0.45	-0.18	0.05	5.42	7.27
	Southwest	25.7	12.88	-6.89	-1.5	1.08	31.28	16.98	1.55	-0.83	0.16	16.36	24.4
	Spirit	7.91	3.59	-1.62	-2.22	0.1	7.75	5.64	0.43	-0.2	0.02	3.68	2.51
	United	26.38	13.39	-7.42	-0.67	0.87	32.55	20.21	1.61	-0.89	0.13	20.39	24.65
Auto	BMW	14.44	5.63	-2.26	-0.09	0.07	17.79	10.13	0.68	-0.27	0.02	10.46	12.53
	Fiat Chrysler	92.1	44.82	-27.75	-3.52	1.23	106.88	97.36	5.4	-3.34	0.25	96.16	81.09
	Ford	88.74	43.93	-22.9	-2.53	0.79	108.03	88.77	5.29	-2.76	0.17	88.94	83.5
	GM	105.09	52.71	-29.37	-2.41	1.15	127.16	112.52	6.35	-3.54	0.25	113.17	106.67
	Honda	66.65	32.17	-16.68	-1.56	0.88	81.46	52.25	3.87	-2.01	0.18	52.73	59.55
	Hyundai	60.08	23.64	-17.33	-1.12	0.16	65.44	71.57	2.85	-2.09	0.04	71.25	25.38
	Kia	40.76	18.01	-10.49	-1.17	0.2	47.31	58.1	2.17	-1.26	0.04	57.88	21.07
	Mazda	32.98	13.77	-6.99	-1.41	0.17	38.52	32.86	1.66	-0.84	0.03	32.3	10.12
	Mercedes	16.88	8.15	-3.74	-0.18	0.1	21.22	9.75	0.98	-0.45	0.02	10.12	10.86
	Nissan	77.87	35.91	-23.87	-2.36	0.74	88.3	88.38	4.32	-2.87	0.16	87.63	51.93
	Subaru	48.8	21.74	-12.58	-2.15	0.16	55.98	44	2.62	-1.51	0.04	42.99	25.96
	Toyota	89.09	45.7	-24.9	-1.71	0.97	109.15	90.28	5.5	-3	0.21	91.29	88.49
	Volkswagen	26.08	14.2	-4.06	-0.37	0.21	36.07	21.23	1.71	-0.49	0.05	22.13	23.02
Beer	Anheuser-Busch	69.54	37.38	-11.09	-29.95	1.45	67.34	65.73	4.5	-1.33	0.32	39.27	51.9
	Molson Coors	69.79	41.05	-11.18	-30.46	0.81	70.01	69.9	4.94	-1.35	0.16	43.2	55.59
	Sazerac	2.69	3.5	0.64	-3.7	0	3.13	0.36	0.42	0.08	0	-2.84	2.18
Cereal	General Mills	9.69	1.16	-0.35	0	0.17	10.67	9.58	0.14	-0.04	0.04	9.71	7.75
	Kellogg	12.58	1.41	-0.41	0	0.17	13.75	12.43	0.17	-0.05	0.04	12.59	11.94
	Post	0.99	0.11	0.04	0	0.01	1.14	0.58	0.01	0	0	0.6	0.47
	Quaker	0.59	0.08	0.04	0	0	0.71	0.51	0.01	0	0	0.52	0.22
Cigarette	Lorillard	-12.58	1.88	-0.51	-0.82	0	-12.03	-20.36	0.23	-0.06	0	-21.01	2.94
	Philip Morris	-57.57	14.35	-4.35	-4.34	1.19	-50.72	-48.33	1.73	-0.52	0.24	-51.22	46.9
	R.J. Reynolds	-40.84	10.27	-2.81	-3.22	0	-36.61	-34.86	1.24	-0.34	0	-37.18	24.44
Grocery	Ahold	86.29	44.8	-18.5	0	0.49	113.08	96.54	5.39	-2.23	0.13	99.83	36.82
	Albertsons	160.36	73.29	-35.98	0	1.64	199.32	153.04	8.82	-4.33	0.4	157.93	55.23
	ALDI	52.24	26.37	-7.63	0	0.11	71.1	45.02	3.17	-0.92	0.03	47.3	27.62
	Amazon	86.6	42.28	-19.31	0	0.39	109.97	75.2	5.09	-2.32	0.1	78.06	27.62
	Costco	125.45	65.43	-28.96	0	0.49	162.41	117.04	7.88	-3.49	0.13	121.56	64.44
	Kroger	191.19	98.29	-45.62	0	1.8	245.66	173.57	11.83	-5.49	0.47	180.38	101.26
	Meijer	27.82	15.2	-4.23	0	0.43	39.22	20.83	1.83	-0.51	0.11	22.26	9.21
	Publix	68.43	33.63	-10.15	0	0.79	92.7	44.92	4.05	-1.22	0.21	47.95	36.82
	Wakefern	45.65	23.31	-8.33	0	0.3	60.94	46.7	2.81	-1	0.08	48.58	18.41
	Walmart	378.47	187.66	-91.15	0	5.66	480.64	378.19	22.59	-10.97	1.45	391.25	266.97
Oil	BP	35.58	3.52	-33.22	-1.75	0.01	4.15	23.45	0.42	-4	0	18.13	8.87
	Chevron	33.86	3.31	-31.61	-1.66	0.02	3.92	22.31	0.4	-3.81	0	17.25	8.44
	Conoco	15.59	1.53	-14.56	-0.77	0.01	1.81	10.27	0.18	-1.75	0	7.94	3.89
	Eni	20.67	2.03	-19.29	-1.02	0.02	2.41	13.62	0.24	-2.32	0	10.53	5.15
	Exxon	43.67	4.29	-40.77	-2.15	0.02	5.06	28.78	0.52	-4.91	0	22.25	10.89
	Shell	30.62	3.01	-28.59	-1.5	0.01	3.55	20.18	0.36	-3.44	0	15.6	7.63
	Total	27.56	2.71	-25.73	-1.35	0.02	3.21	18.16	0.33	-3.1	0.01	14.04	6.87
Restaurant	Burger King	15.35	12.36	-5.24	0	0.08	22.55	15.26	1.49	-0.63	0.02	16.13	14.62
	Chick-fil-A	11.84	8.82	-3.27	0	0.55	17.94	8.44	1.06	-0.39	0.14	9.25	10.97
	Chipotle	6.77	4.31	-1.51	0	0.39	9.95	5.51	0.52	-0.18	0.1	5.95	5.48
	Domino's	8.36	6.79	-2.96	0	0.13	12.31	8.34	0.82	-0.36	0.03	8.84	7.31
	Inspire Brands	19.21	15.33	-6.89	0	0	27.65	19.03	1.85	-0.83	0	20.05	18.28
	JAB	4.6	4.24	-0.7	0	0.4	8.55	3.13	0.51	-0.08	0.1	3.66	5.48
	McDonald's	38.42	29.53	-12.77	0	1.8	56.97	36.64	3.56	-1.54	0.47	39.13	40.22
	Starbucks	23.48	18.32	-8.49	0	1.3	34.62	19.94	2.21	-1.02	0.34	21.47	21.94
	Subway	13.71	9.96	-5.32	0	1.01	19.36	12.13	1.2	-0.64	0.26	12.95	10.97
	Wendy's	12.42	9.33	-4.63	0	0.35	17.47	10.89	1.12	-0.56	0.09	11.54	9.14
	Yum! Brands	22.42	17.46	-7.31	0	0.63	33.2	23.21	2.1	-0.88	0.17	24.59	21.94
Smartphone	Apple	70.51	34.41	-14.65	0	0.18	90.46	63.22	4.14	-1.76	0.04	65.63	47.62
	Google	4.9	3.45	-0.77	0	0.02	7.6	5.31	0.42	-0.09	0	5.64	2.11
	Lenovo	3.81	1.7	-0.46	0	0	5.05	3.37	0.2	-0.06	0	3.52	0.15
	LG	19.41	9.1	-3.54	0	0	24.97	21.2	1.1	-0.43	0	21.87	5.4
	Samsung	39.14	21.85	-8.33	0	0.17	52.82	37.31	2.63	-1	0.04	38.98	22.08
Soda	Coca-Cola	27.32	22.29	-7.02	-2.66	0.61	40.55	25.73	2.68	-0.84	0.13	25.04	25.28
	Dr Pepper 7 Up	29.9	26.02	-8.56	-7.11	0.43	40.67	29.67	3.13	-1.03	0.11	24.77	31.83
	Pepsi	25.05	22.61	-6.56	-3.56	0.54	38.08	23.4	2.72	-0.79	0.14	21.9	25.44
Toothpaste	Church & Dwight	1.82	0.67	-0.26	0	0.01	2.24	1.96	0.08	-0.03	0	2.01	0.61
	Colgate	2.24	0.83	-0.36	0	0.02	2.72	2.36	0.1	-0.04	0	2.42	0.88
	Glaxo	1.5	0.58	-0.21	0	0.01	1.88	1.47	0.07	-0.03	0	1.52	0.53
	Procter & Gamble	2.47	0.75	-0.45	0	0.01	2.78	2.48	0.09	-0.05	0	2.52	0.88
Yogurt	Chobani	1.67	1.13	-0.28	0	0	2.53	0.85	0.14	-0.03	0	0.95	1.08
	Danone	3.77	2.45	-0.6	0	0.08	5.71	3.42	0.3	-0.07	0.02	3.66	2.96
	Yoplait	4.02	2.56	-0.61	0	0.07	6.03	3.94	0.31	-0.07	0.01	4.19	3.19

Notes: This table presents the components of individual impact for all firms in our sample. The "weighted" estimates impose a curvature of $\rho = 1$ on social marginal welfare weights, which approximately corresponds to log utility. All other estimates use equal social marginal welfare weights across income groups ($\rho = 0$).

Figure A16: **Weighted Corporate Social Impact versus Prior Metrics**



Notes: This figure presents our estimate of weighted individual impact against existing ratings from CSRHub (https://www.csrhub.com/csrhub/) and Just Capital (https://justcapital.com/rankings/), for all firms in our sample for which data are available.