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What explains profit inefficiency in the restaurant industry? Evidence from Sweden

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Abstract

This study investigates the drivers of profit inefficiency in the restaurant industry. Assuming that restaurants operate under monopolistic competition, we first present a characterization of the factors that explain restaurants' departure from the profit frontier, focusing on the role of business experience, number of outlets, service model, restaurant typology, and COVID-19 shock. Based on Stochastic Frontier Analysis, we estimate how these factors explain the differences in profit inefficiency across firms using a panel dataset of 4128 restaurants in Sweden in the period 2017–2021. We find that the average level of profit efficiency is low (46%). Inefficiency increases with years in operation and is significantly higher among limited-service restaurants and single-outlet firms. Interestingly, no significant difference in profit inefficiency is detected during the COVID-19 pandemic. Our findings provide valuable insights for profit efficiency management.

Keywords

COVID-19, limited-service restaurants, profit inefficiency, restaurant industry, stochastic frontier analysis

Introduction

Productivity is a key determinant of firm survivability (Türkcan and Erkus-Öztürk, 2020), with productive and cost inefficiencies being important predictors of firm closure (Mhlanga, 2018a;

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2018b). Efficient management practices increase market share and subsequent firm growth, particularly during recessions (Poretti and Heo, 2022). Most of the literature on firm inefficiency in the hospitality sector focuses on productive (Dapeng et al., 2020; Liu and Tsai, 2021) and cost inefficiency (Arbelo et al., 2017; Pérez-Rodriguez and Acosta-González, 2007). However, far less attention has been paid to profit inefficiency. Although there is a positive link between productivity and financial performance (Peng et al., 2021), profit inefficiency (i.e., the gap between firms' observed profit and the maximum level of profit achievable in the case of full efficiency) is more complex because it requires productive, cost, and output allocative efficiency in prices (Arbelo et al., 2018; Restrepo-Tobón and Kumbhakar, 2017).

Research on business performance has put forward the notion of "productivity types" among producers, by which performance exhibits important idiosyncratic elements associated with firm characteristics (e.g., Foster et al., 2008). This is particularly pertinent in differentiated product markets such as the hospitality industry operating under monopolistic competition, where observed differences in performance might relate to aspects such as the number of years in operation, number of service outlets, or product typology, among others. It yet remains unclear whether firms with more outlets or those with longer operational stories are able to extract maximum profits through economies of scale and learning by doing. Furthermore, demand shocks, such as those produced by COVID-19, are likely to influence profit inefficiency in the presence of output price rigidities and input adjustment costs.

This study examines sources of profit inefficiency in the restaurant industry. We adopt the Non-standard Profit Function (NSPF) approach first introduced by Humphrey and Pulley (1997) to characterize the role of firm typology, years in operation, and size on foregone rents. Specifically, we study the differences in profit inefficiency due to years in operation, between restaurants and other foodservice enterprises (such as caterings or canteens), between full- and limited-service restaurants, and between single- and multi-outlet firms. Although some studies have related restaurant size, location, and experience to productive (Alberca and Parte, 2018; Assaf et al., 2011; Mhlanga, 2018a) and cost inefficiency (Mhlanga, 2018b), little is known yet about their influence on profit inefficiency.

From a theoretical viewpoint, we assume that restaurants operate under a competitive monopoly structure with product differentiation, which allows them to exercise market power by setting prices à la Dixit and Stiglitz (1977). Profit inefficiencies arise as a mixture of productive, cost, and output price inefficiencies (Kumbhakar and Lovell, 2003). Unlike other approaches that relate profits to a set of covariates (Demydyuk et al., 2015; Mun and Jang, 2015, 2018), we rely on microeconomic theory to derive a profit function that allows for some variables to explain the gap between observed and potential profits (profit inefficiency) along the lines of Kumbhakar et al. (2015).

Empirically, we use Stochastic Frontier Analysis (hereafter SFA) to estimate departures from the profit frontier based on a panel dataset of 4128 restaurants in Sweden covering the period 2017–2021. This temporal frame is of particular interest because it allows us to evaluate the potential changes in inefficiency due to COVID-19. Restaurant demand has decreased substantially during the hardest phases of the pandemic (Wang et al., 2022; Yang et al., 2020), and large firms are, on average, more resilient to the shock (Song et al., 2021). Thus, the pandemic offers quasi-exogenous variation in market demand that might have induced productive and allocative inefficiencies that are worth investigating.

The empirical analysis is conducted for the Swedish restaurant industry, which holds significant importance in the country's economic development and job creation, particularly for those seeking entry into the labor market (Carlbäck et al., 2024). Designated as a primary industry by the state (BFUF, 2018), the Swedish restaurant sector boasted a substantial total turnover of 16.8 billion USD in 2019 (SCB, 2023). However, it has encountered prolonged challenges, initially grappling with issues of inefficiency and profitability, and has recently faced difficulties in staff recruitment and retention (BFUF, 2018; Carlbäck et al., 2024; UC, 2023). The sector witnessed a staggering staff turnover exceeding 25% (Carlbäck et al., 2024), contributing to an above-average bankruptcy rate compared with other industries (UC, 2023). The impact was further intensified during the pandemic, with the sector experiencing a bankruptcy rate surge of over 60% even in the post-pandemic period (UC, 2023). Evidence by Angelov and Waldenström (2023) points to an average decline of 6.1% in Swedish firms' sales that induced an economic recession. Despite its recognized importance, the sector has seen limited initiatives to address these evident efficiency gaps. This can be attributed, in part, to the scarcity of comprehensive scientific studies that focus on the Swedish restaurant industry.

The study is among the first that examines profit inefficiency in the restaurant industry, which is a relevant complement to the tourism sector (Sparks et al., 2003). The quality and variety of restaurants' culinary offerings have become an important factor in attracting international tourists (e.g., Castillo-Manzano et al., 2021; Kivela and Crotts, 2006). Scholars have primarily investigated whether franchising decreases earnings volatility (Koh et al., 2018), or the role of menu composition (Fang and Hsu, 2014) and menu calorie labels (Sussking et al., 2024) on restaurants' profits. However, relatively few studies have examined profit inefficiency in the foodservice sector. While a growing body of research has studied productive and cost inefficiencies for hospitality accommodations (Arbelo et al., 2017; Dapeng et al., 2020; Liu and Tsai, 2021; Pérez-Rodríguez and Acosta-González, 2007), evidence for the restaurant sector is comparatively scarcer.

The few studies on restaurant performance efficiency have evaluated sales, productive, and cost inefficiency (Alberca and Parte, 2018; Assaf et al., 2011; Giokas et al., 2015; Mhlanga, 2018a, 2018b). We contribute to this literature by examining the role of years in operation, number of outlets, service model, firm typology, and external demand shocks (COVID-19) in explaining differences in profit inefficiency across restaurants. Methodologically, while most of the related literature uses non-parametric Data Envelopment Analysis (DEA) approaches, we adopt SFA modelling. According to Rodgers and Assaf (2007), this method should be preferred in the foodservice industry because it accounts for measurement error. Moreover, the imposition of constant or variable returns to scale in most DEA studies can be restrictive in some instances (Angelini et al., 2024).[1]

Our results show that the wedge between observed and potential profits increases with the years in operation, but is smaller among multi-outlet firms. This suggests that recently opened restaurants with more sales outlets gain larger profits for the same output and input prices. Differences in profit inefficiency are also found based on restaurant typology: limited-service restaurants and canteen and catering of beverage serving firms earn profits below their frontier. In contrast, no differences in profit inefficiency are found due to COVID-19.

Literature review

The analysis of productive and cost inefficiency has a long tradition in the tourism and hospitality literature. For hotels, scholars have both investigated hotels' capacity to 'produce' the maximum number of overnight stays from a given set of inputs – technical efficiency – (e.g., Dapeng et al., 2020; Liu and Tsai, 2021) and their capacity to produce as much output as possible with the minimum cost – cost efficiency – (e.g., Arbelo et al., 2017; Pérez-Rodríguez and Acosta-González, 2007). This body of research typically finds moderate-to-high levels of productive and cost inefficiencies, which are attributed to differences in specialization, market competition, quality, and hotel characteristics, such as age or chain filiation.

In recent years, studies have begun to investigate the inefficiency of hospitality firms with respect to profits. This can be considered a measure of operational deficiencies and has relevant managerial implications. As discussed in Arbelo et al. (2018), profit inefficiency seems to be a highly relevant metric for business corporations, as it encompasses both productive, cost, and output price inefficiencies. Table 1 summarizes the few existing studies on this matter, which have primarily considered the hotel sector. This literature has documented that profit inefficiency negatively correlates with age and labor productivity (Arbelo et al., 2018, 2021) and that location is a crucial dimension for explaining differences in inefficiency across firms (Oliveira et al., 2013).

For the restaurant industry, existing studies have primarily examined operational inefficiency using sales (Alberca and Parte, 2018; Giokas et al., 2015; Reynolds and Thompson, 2007) and costs (Mhlanga, 2018a) as dependent variables. Table 2 provides an overview of this body of research. These studies generally find that restaurants operate with moderate-to-low levels of efficiency; according to Reynolds and Thompson (2007) less than 12% of the US restaurants operate at full efficiency, whereas for the case of Australian restaurants the average level of efficiency is around 46% (Assaf et al., 2011). This literature also documents that restaurants operate under increasing returns to scale (Assaf et al., 2011; Mhlanga, 2018a) and that efficiency positively correlates with restaurant size (Alberca and Parte, 2018; Sanjeev, 2007) and managerial experience (Assaf et al., 2011). In addition, restaurant typology has been found to be a relevant predictor of inefficiency. According to Mhlanga (2018a), chain restaurants are more cost-efficient than independent restaurants. Mhlanga (2018b) and Reynolds and Thompson (2007) report that full-service restaurants are more efficient than fast-food restaurants. Another relevant dimension is location: restaurants in cities and metropolitan areas attain higher levels of efficiency (Mhlanga, 2018b; Sanjeev, 2007).

However, evidence of restaurants' profit inefficiency is limited. As Table 2 shows, most studies consider sales rather than profits as the dependent variable. Although some scholars have examined the drivers of restaurant profitability (Demydyuk et al., 2015; Mun and Jang, 2015, 2018), to the best of our knowledge, no prior work has evaluated the wedge between observed and attainable maximum profits in this industry. This study aims to address this gap in literature.

In what follows, we first characterize the sources of profit inefficiency in the restaurant industry, and then offer novel empirical evidence for the Swedish case.

Theoretical framework

Profit maximization in competitive monopoly

In competitive markets, producers are assumed to be price takers. However, under product differentiation, competitive monopolistic market structures allow firms to exercise market power when choosing output prices (Dixit and Stiglitz, 1977). For instance, restaurants can charge different prices based on the quantity consumed (second-degree price discrimination) or differentiate prices among loyal customers by offering targeted discounts (third-degree price discrimination). Like other service industries, restaurants charge a markup over marginal costs, depending on consumers' price elasticity for the variety. Although in the long run we would expect firms to have zero profits, in the short run firms can obtain both positive and negative profits.

In line with a vast literature on profit inefficiency in banking (Humphrey and Pulley, 1997; Lozano-Vivas, 1997), we assume that in the short-run restaurants maximize profits (π) for given output quantities (y) and input prices (w) by choosing output prices (p) and input levels (x). The indirect profit function is thus given by:

Table 1. Overview of previous studies on profit inefficiency in the hotel industry, by chronological order.

Author	Data	Model	Dep. variable	Explanatory variables	Results
Oliveira et al. (2013)	28 four- and five-star hotel companies in Algarve (Portugal) in the period 2005-2007	SFA; revenue function	Total revenue	• Room price • Food price • Number of rooms • Number of employees • Capital expenditure (capex) • Other costs	• Mean inefficiency is 11.6%. • Inefficiency is explained by location and the availability of golf course
Arbelo-Pérez et al. (2017)	838 hotels in Spain in the period 2009-2013	SFA; Battese and Coelli (1995) model	Total operating costs and profits (EBIT)	• Operating revenue • Price of labour, materials, physical capital and other operating costs	• Cost and profit inefficiency decrease over time but increases with quality pProfit efficiency is equal to 50.3%
Yang et al. (2017)	377 urban hotels in Beijing (China) in the period 1994-2005	SFA; true fixed effects model	Value added (revenues-costs)	• Number of rooms • Number of employees	• The average efficiency is 76% • Star rating and product diversification increase efficiency
Arbelo et al. (2018)	231 hotels in Spain (four and five stars) in the period 2008-2012	SFA; Battese and Coelli (1995) model	Profits (EBIT)	• Operating revenue • Price of labour, food and drink and capital • Other operational expenses	• Profit efficiency improves with experience and labour productivity. • Resort hotels are more profit efficient than urban ones
Arbelo-Pérez et al. (2019)	102 hotels in the canary Islands in the period 2008-2014	SFA; Battese and Coelli (1995) model	Total operating costs and profits (EBIT)	• Net sales • Other revenue • Price of labor, materials, capital, and other operating costs	• Hotels offering all-inclusive packages are less efficient

(continued)

Table 1. (continued)

Author	Data	Model	Dep. variable	Explanatory variables	Results
Deng et al. (2019)	44 Spanish hotel chains (787 individual hotels) in the year 2014	SFA; Bayesian and classical estimation of a revenue function	Operating revenue	• Room and food prices • Number of establishments and rooms • Assets • Material and operating expenses • Employee expenses • Number of employees • Funds and financial expenses • Cash flow	• Beach hotels and those in the three star or lower category are more revenue efficient • Revenue efficiency is unrelated to size or the ownership of golf courses
Arbelo et al. (2021)	465 hotels in Spain in the period 2012-2017	SFA; Bayesian approach	Profits (EBIT)	• Net sales • Other revenue • Price of labor, materials, capital and other operating costs	• Profit efficiency increases with hotel age, size, and labour productivity, and decreases with the number of competitors

Note: SFA = stochastic frontier analysis; EBIT = earnings before interest and taxes.

Table 2. Overview of previous studies on performance inefficiency in the restaurant industry, by chronological order.

Author	Data	Model	Dep. variable	Explanatory variables	Main results
Sanjeev (2007)	68 hotels and restaurants in India for the period 2004-2005	Data envelopment analysis	• Operating income • Profit before depreciation, interest and tax	• Shareholders funds and long-term liabilities • Gross fixed assets • Current assets • Operating costs	• Average efficiency is 0.75 • Positive correlation between efficiency and firm size
Reynolds and Thompson (2007)	62 restaurants from a restaurant chain in the United States in 2001	Data envelopment analysis	• Sales	• Server wage • Seats • Years open • Server counts and hours • Competitors	• The average efficiency is 82% • Under 12% of the restaurants operate efficiently
Assaf et al. (2011)	105 restaurants in Australia in 2007	Data envelopment analysis bootstrap approach	• Total food sales • Total beverage sales	• Number of full-time equivalent employees • Food expenses • Beverage expenses • Number of seats	• The average level of efficiency is low (46%) • Most restaurants operate under increasing returns to scale • Managerial experience and restaurant size positively affect performance efficiency
Giokas et al. (2015)	21 food and beverage firms in Greece in the period 2012–2015	Data envelopment analysis	• Sales	• Total assets • Operating cost	• Inefficiency has decreased over time • Overall inefficiencies are mostly driven by technical inefficiency rather than scale inefficiency • Large restaurants are more efficient

(continued)

Table 2. (continued)

Author	Data	Model	Dep. variable	Explanatory variables	Main results
Alberca and Parte (2018)	Unbalanced panel of Spanish restaurants between 2011 and 2014	Meta-frontier data envelopment analysis + tobit	• Total sales	• Total assets • Staff costs • Cost of sales	• Large restaurants perform better • The probability of bankruptcy and leverage negatively impact firm efficiency
Mhlanga (2018a)	42 restaurants in South Africa in 2016	Stochastic cost frontier	• Total operating costs	• Price of labour • Price of food and beverage • Price of other materials • Total revenue	• Restaurants operate under increasing returns to scale • Chain restaurants are more efficient • Fast-food restaurants are more inefficient than fine dining ones
Mhlanga (2018b)	Unbalanced panel of 51 restaurants in South Africa in the period 2012–2016	Data envelopment analysis	• Total sales	• Number of full-time employees • Total covers	• Full-service restaurants are more efficient than fast-food and casual ones
Sveum and Sykuta (2019)	US restaurants in 2007	Data envelopment analysis + tobit	• Revenue	• Payroll • Age of the establishment • Number of seats	• Franchisee restaurants are more efficient among full-service establishments, but no effect is found among limited-service restaurants • Establishments in large chains perform worse

$$\begin{aligned} &Max\, \pi = py - w'x \\ &\text{Subject to} : g(p, y, w) = 0 \\ &y = f(x, q)\exp(-v) \end{aligned} \tag{1}$$

where p are output prices, y are output levels, x are input levels, w are input prices, $f(x, q)$ is the production function and v is productive inefficiency. The term $g(p, y, w)$ represents restaurant's pricing opportunity set for transforming x, y into output prices and reflects producers' assessment of consumers' willingness to pay for restaurant services under product differentiation and potential market power given y and w. It equals zero, implying that an equilibrium or feasibility condition in pricing is being met (Humphrey and Pulley, 1997). From the first order conditions for output prices and input levels, the indirect profit function is increasing in the output quantities, but nonincreasing in input prices as follows:

$$\pi\left(\underbrace{y}_{+}, \underbrace{w}_{-}\right)$$

However, producers may fail to maximize profits (i.e., foregone rents). This inefficiency mainly arises because of the excessive use of inputs associated with poor management (technical inefficiency). Some inputs might be quasi-fixed or exhibit rigidities in the short run, making it difficult for firms to adjust flexibly following demand shocks, resulting in overcapacity and technical inefficiencies. A second source of foregone rents could be inefficient pricing (output price inefficiency), defined as situations in which competitive monopolistic firms charge output prices below the optimal given market demand for the firms' variety. This inefficiency arises as a mixture of restaurants' inability to segment customers by willingness to pay, limited ability to price discriminate, or inability to communicate menu price variances in advance (Webb et al., 2023), among others.

According to Kumbhakar and Lovell (2003), firms are profit efficient if and only if they adopt a profit-maximizing combination of inputs and output prices (i.e., both technical and output price efficient). Accordingly, actual profits (π) can be decomposed into the product of a profit frontier component ($\pi(y, w)$) and an inefficiency component ($\exp(-u)$), as follows:

$$\pi = \pi(y, w) \times \exp(-u) \tag{2}$$

Equation (2) implies that profit efficiency (PE) is given by the ratio between actual profits and the profits that could be achieved under full efficiency:

$$PE = \frac{\pi}{\pi(y, w)} = \exp(-u) \tag{3}$$

The closer to unity, the greater the profit efficiency. If we take logs on both sides of (2), we get:

$$\ln(\pi) = \ln \pi(y, w) - u \tag{4}$$

According to equation (4), the log of profits is given by a deterministic function of output levels and input prices ($\ln \pi(y, w)$), plus a deviation attributed to a mixture of both productive and output price inefficiencies ($-u$). Restrepo-Tobón and Kumbhakar (2017) show that the NSPF can be seen as the difference between a nonstandard revenue function and a standard neoclassical cost function. A direct consequence is that the profit inefficiency measure (u) is a composite of both cost and revenue inefficiencies.

Drivers of profit inefficiency and research hypotheses

This section discusses the firm characteristics that we consider as explanatory of the differences in profit inefficiency.

Years in operation. Economic theory posits that firm learning and innovation is a function of experience: as a firm gains more years of experience, managers and workers accumulate knowledge and skills, leading to organizational learning, capital learning, and manual task learning (Bahk and Gort, 1993). In this vein, hospitality firms have been shown to better manage their resources and become more productively efficient as time passes through learning by doing (Arbelo et al., 2018, 2021), which in turn positively contributes to gaining larger profits through reductions in production and cost inefficiencies. Moreover, young firms (i.e. those that have recently opened) tend to charge lower prices than incumbents in differentiated product markets (Foster et al., 2008), and take more time to obtain the same levels of demand (Enz et al., 2014). This is because under quality uncertainty, it takes more time for new firms to form a customer base, so firms initially set low prices to capture quality-averse consumers. Over time, restaurant firms build relationship-specific capital with their customers and can charge higher prices for the same output. Another way to see this is that their demand curve becomes more inelastic over time due to greater market power, which increases their capacity to set higher mark-ups over their marginal costs. Accordingly, patterns of demand accumulation over time (Foster et al., 2016) might help firms gain larger profits for a given input use and output levels thanks to the building of a customer base. Accordingly, our first hypothesis is the following:

H1: Firm's years in operation reduce profit inefficiency

Number of outlets. When consumers face uncertainty about quality in differentiated markets, they are forced to incur information search costs. Advertising, word-of-mouth effects, and positive brand image help decrease quality uncertainty, thereby shifting and rotating demand curves through information channels (Johnson and Myatt, 2006). These marketing strategies generally correlate with firm size, because small restaurants might have little capacity to promote themselves, and some minimum-scale economies associated with dense coverage of a geographic area are needed for the cost of some marketing campaigns to pay off (e.g., Pratt et al., 2010). Moreover, large firms are more likely to develop product innovations (Porter, 1974), offer a wider variety of products (Hottman et al., 2016), and exert some monopsony power over upstream suppliers in the input market (Waterman, 1996). Most notably, firms with several selling outlets can better exploit economies of scale in production, selling, and management (Demydyuk et al., 2015; Mun and Jang, 2018). Accordingly, our second research hypothesis is:

H2: Multi-outlet firms are less profit inefficient

Service model. One distinctive feature of restaurants is the type of food service offered. Full-service (hereafter FS) restaurants (also known as wait-service or sit-down) typically provide a complete dining experience with a high level of service. In contrast, limited-service (hereafter LS) restaurants (also known as fast-food or quick-service restaurants) sell a differentiated variety of standardized partially pre-prepared products with minimal table services and that are usually available for takeaway (Lee et al., 2024). The latter firms tend to operate under franchise systems, which usually create monitoring problems that might result in productive inefficiencies (Krueger, 1991). Moreover, workers in LS restaurants have comparatively high turnover with little change in advancement through internal job ladders that produce dissatisfaction, lower effort, and additional productive inefficiencies (Mohsin and Lengler, 2015). In addition, the meal price in LS restaurants is usually cheaper than that in traditional restaurants (Brown, 1990), thereby lowering revenues for similar input use. We therefore postulate the following:

H3: Limited-service restaurants are more profit inefficient than traditional full-service restaurants

Firm typology. Another relevant distinction is between traditional FS or LS restaurants and other food service firms such as canteens, beverage serving, or catering firms. The former typically provides a wide variety of food products at fixed locations through direct customer interaction. Canteens provide a more restricted variety of meals to specific and more stable clientele (institutions). Their demand is generally more predictable, and their limited menu offerings reduce the complexity and costs of inventory and staffing. Food and beverage firms mainly sell drinks while also serving light food, which may yield more profit margins than restaurants, because they face lower food production costs. Catering firms provide food for events and parties. Although their demand is more irregular, profit margins may be larger owing to event-specific pricing and the absence of fixed costs. Therefore, our fourth hypothesis is as follows:

H4: Restaurants are more profit inefficient than other foodservice firms

COVID-19 as a demand shock. COVID-19 caused an unprecedented shock to the restaurant industry. Stay-at-home orders and increases in contagion rates have led to a substantial decline in restaurant demand (Yang et al., 2020). Wang et al. (2022) estimate that when new cases per 1000 people increased by 1%, restaurant visits dropped by 2.5% in the second half of 2020. This shock forced restaurants to cut down expenditures, adjust their input mix, and re-adapt their services towards simplified menus and off-premise dining offerings for survivability (Kim et al., 2021; Yost et al., 2021). Restaurants faced quasi-fixed expenses and limited revenue, which likely dampened profits relative to the potential. In addition, the different social distancing regulations implemented by governments to battle the spread of the virus not only reduced demand, but also plausibly increased production costs through the implementation of additional sanitation and prevention measures. Accordingly, we propose the following hypothesis:

H5: Profit inefficiency is higher during COVID-19 times

Data & methods

Dataset

The empirical analysis relies on a panel dataset comprising 4779 restaurants in Sweden tracked over a five-year period from 2017 to 2021 (23,895 observations). The dataset was sourced from UC (Upplysingscentralen), a Swedish credit rating agency that gathers information from all operational companies in Sweden utilizing their audited reports submitted to the authorities. Consequently, the dataset encompasses all food service firms conducting business in Sweden as limited companies.

All variables within the dataset are denoted in the Swedish Kronor (thousand SEK). The restaurant industry data obtained from UC are categorized into two primary groups: (1) traditional full-service (FS), and (2) limited-service (LS) restaurant firms. This is a standard classification for Swedish business landscapes. As mentioned above, LS restaurants are establishments offering quick and easily accessible services, where "take away" is commonplace. These include hamburger chains, food stalls, snack bars, and salad bars. On the contrary, FS restaurants encompass those with table service, comprising fine dining establishments, local restaurants, and pizzerias, among others.

Variable definition

- Dependent variable: Our measure of profits is the earnings before interest and taxes (hereafter EBIT), measured in thousand SEK.
- Output: Ideally, we would consider firms' physical output (i.e., volume of meals sold). However, since restaurant services and meal offers are diverse, physical outputs are not comparable across firms. Moreover, we do not avail such data. Therefore, as in Arbelo et al. (2018) and Mhlanga (2018a), we use revenue (sales) as the output indicator (expressed in monetary terms so that food quantities are weighted by their prices). Because firm-level prices are typically unobserved, most studies divide revenues using a common industry-level deflator. Because in our empirical analysis we will control for year dummies, we do not normalize revenue; these dummies will capture common general price inflation across periods.
- Input prices: we consider that restaurant services are produced using capital and labor inputs. We use the average wage cost (labor costs/number of workers) as the labor input price, as done by Alberca and Parte (2018) and Sveum and Sykuta (2019). For capital input, we follow Pérez-Rodríguez and Acosta-González (2007) and Arbelo et al. (2018, 2021) and compute it as the depreciation of fixed assets divided by fixed assets.
- Inefficiency shifters: we also have information on the number of years since registration (Experience) and the number of outlets the firm has in the country (Num. Outlets). Because the latter is heavily skewed and 93% of the sample has a single outlet, we define a dummy variable that takes a value of 1 if the firm has more than one outlet and 0 otherwise (Multi-outlet). We also define a binary indicator for whether the firm is a limited-service restaurant (LS) as opposed to a traditional full-service (FS) one. Similarly, we define a dummy for whether the firm belongs to group 56100 ("Restaurants and mobile food service activities") of the Swedish Standard Industrial Classification 2007 (Restaurant). This indicator aims to distinguish restaurants from other firms in the dataset offering food services such as canteens, catering, or beverage serving activities.[2] Importantly, not all limited-service restaurants belong to the 'restaurant' typology, and vice versa (see Table A1 in the Appendix). Finally, we define a dummy variable for COVID-19 period (COVID-19, years 2020 and 2021). This variable captures the effects of both infectious cases and different types of policy regulations implemented in those years on restaurant profit inefficiency.[3]

Descriptive statistics

After data cleaning and dropping observations with missing values for some of the variables of interest, the data for the analysis involves 18,308 restaurant-year observations pertaining to 4128 different firms. The panel is highly balanced, although some restaurants are observed only during one (0.97% of the total observations), two (2.22%), three (4.3%), and four (10.73%) periods. Table A2 in Online Appendix reports a cross-tabulation of the observations in the sample for each panel period per calendar year. The number of observations per calendar year is balanced, implying that we do not face a sample attrition problem during COVID-19 periods due to potential selection on profits.

Table 3 reports the summary statistics of the variables used in the empirical analysis. The average profit (EBIT) is 1058 thousand SEK, although there is a large dispersion across restaurants. Indeed, 22.4% of the sample earned negative profits during the study period. An auxiliary probit regression presented in Table 4 indicates that the probability of reporting negative profits increases with the number of years in operation and is significantly lower for LS restaurants and multi-outlet firms but decreases over time.

Table 3. Summary statistics (obs = 18,308).

Label	Definition	Mean (%)	SD	Min	Max
π	EBIT	1058.53	12,228.35	−70,852	715,240
y	Revenue	13,495.43	67,720.28	4	3,440,371
w	Staff unitary cost (average wages)	403.591	2466.82	1	332,158
r	Capital unitary cost	35,791.34	181,082.1	5.38	1.1e + 07
Experience	Years since registration	16.92	10.00	1	116
Num. Outlets	Number of outlets	1.14	1.84	1	98
Multi-outlet	= 1 if num. outlets>1	6.65			
LS	= 1 if LS restaurants, = 0 if FS restaurant	5.59			
Restaurant	= 1 if restaurant, = 0 if canteen, catering or food and beverage firm	90.49			
COVID-19	= 1 if COVID-19 period (2020 and 2021)	41.03			

The mean revenue is 13,495 thousand SEK, while the average wage and capital costs are 403.6 thousand SEK and 35,791.3 thousand SEK, respectively. Firms have been open for approximately 17 years and have 1.1 outlets on average. Indeed, the share of single-outlet firms is 93%. Approximately 5.6% of the sample are LS restaurants, while the remaining 94.4% are FS ones. Finally, most firms (90.5%) belong to the “Restaurants and mobile food service activities”.

Econometric modelling

Assuming a translogarithmic form for the profit frontier with neutral technical change and imposing the usual symmetry restrictions ($\vartheta_{kj} = \vartheta_{jk}$), the empirical counterpart of equation (4) becomes:

$$\ln \pi_{it} = \alpha + \beta \ln y_{it} + \lambda \frac{1}{2} \ln {y_{it}}^2 + \sum_{k=1}^{K} \gamma_k \ln w_{kit} + \sum_{k=1}^{K} \varphi_k \frac{1}{2} \ln {w_{kit}}^2 + \frac{1}{2} \sum_{k=1}^{K} \theta_k \ln w_{kit} \times \ln y_{it} + \frac{1}{2} \sum_{k=1}^{K} \sum_{j=1}^{J} \vartheta_{kj} \ln w_{kit} \times \ln w_{jit} + \tau_t + \delta_j + v_{it} - u_{it} \tag{5}$$

where $i = 1, \ldots, N$ indexes restaurants and $t = 1, \ldots, T$ periods, π_{it} are the profits, y_{it} is the output, w_{kit} is the price of input k, τ_t are year fixed effects, v_{it} is a zero-mean normally distributed random error term with variance σ_v^2 (noise), and u_{it} measures the difference of the log maximum profit and the log of the actual profit (profit inefficiency) and follows a truncated-normal distribution with variance σ_u^2. The inefficiency term is a function of a set of covariates Z_{it} (including a constant term) under the Battese and Coelli (1995) formulation as follows:

$$u_{it} = \kappa Z_{it} + \omega_{it} \tag{6}$$

where ω_{it} is defined by the truncation of a normal distribution with zero mean and variance σ_u^2 so that the point of truncation is $\omega_{it} \geq -\kappa Z_{it}$ (Battese and Coelli, 1995: 327).

The model in (5) does not consider firm-specific individual effects because some firms are only observed once, so their fixed effects would be weakly identified. Instead, we model frontier heterogeneity through a set of province fixed effects (δ_j) capturing the potential effects of market

Table 4. Coefficient estimates and average marginal effects from auxiliary probit regression on the probability of having negative profits.

Dependent variable: negative profits	(1) Coef. (SE)	(2) AME (SE)
Experience	0.004***	0.001***
	(0.001)	(0.000)
Multi-outlet	−0.388***	−0.114***
	(0.067)	(0.020)
Restaurant	−0.077*	−0.023*
	(0.045)	(0.013)
LS	−0.194***	−0.057***
	(0.069)	(0.020)
Year 2018	−0.352***	−0.116***
	(0.028)	(0.009)
Year 2019	−0.396***	−0.129***
	(0.030)	(0.010)
Year 2020	−0.447***	−0.143***
	(0.030)	(0.010)
Year 2021	−0.485***	−0.153***
	(0.031)	(0.010)
Constant	−0.390***	
	(0.051)	
Observations	18,308	18,308

Robust standard errors in parentheses. ***$p < .01$, **$p < .05$, *$p < .1$.

competence and demand across geographic areas that affect profits through price competition (Konishi, 2005) and product variety (Schiff, 2015). Nevertheless, we present the results considering firm fixed effects under a True Fixed Effects specification (Greene, 2005), restricting the sample to firms observed during the five periods (balanced panel) as a robustness check. In exchange for better control of unobserved heterogeneity, this approach may induce selection bias if the firms that exit the sample are those with negative profits.

The output and input price variables are normalized by their respective geometric means. As such, the first-order coefficients are interpreted as profit elasticities in the sample means. Unlike Arbelo-Pérez et al. (2017, 2018), we do not impose the profit function to be homogeneous of degree one in input prices. This is because under a competitive monopoly structure, halving input prices can more than double profits because output prices are generally set depending on the scale of the output and the price elasticity of demand (Restrepo-Tobón and Kumbhakar, 2017).

The parameters of the SFA model in (5) and (6) are jointly estimated by Maximum Likelihood, and standard errors are clustered at the firm level. One problem with the estimation of equation (5) is that $\ln \pi_{it}$ is not defined when the firm has negative profits. We follow Bos and Koetter (2011) and add a binary indicator to the right-hand side (Negative Profit Indicator, hereafter NPI), which takes a value of 1 for firms with positive profits and the absolute value of profits for restaurants with $\pi_{it} < 0$. Furthermore, the dependent variable is adjusted to take a value of 1 when profits are negative, and its corresponding value when $\pi_{it} > 0$ (Bos and Koetter, 2011). This approach has also been adopted by Arbelo et al. (2018) and Arbelo-Pérez et al. (2017) in the hotel industry.

To test our research hypotheses, the vector Z_{it} in equation (6) includes the following variables as inefficiency shifters: (i) years in operation as a measure of firm experience (Experience), (ii) a

Table 5. Coefficient estimates from Battese and Coelli (1995) model.

Dep. Variable: $\tilde{\pi}_{it}$	(1) Coeff. (SE)	(2) Coeff. (SE)
Ln y	0.728***	0.729***
	(0.014)	(0.014)
Ln w	−0.115***	−0.115***
	(0.030)	(0.030)
Ln r	−0.196***	−0.191***
	(0.011)	(0.011)
Ln y × Ln w	0.016	0.002
	(0.045)	(0.046)
Ln y × Ln r	−0.047**	−0.049**
	(0.020)	(0.020)
Ln w × Ln r	−0.098***	−0.095***
	(0.030)	(0.030)
$(\text{Ln y})^2$	0.217***	0.226***
	(0.021)	(0.021)
$(\text{Ln w})^2$	−0.013	−0.004
	(0.024)	(0.025)
$(\text{Ln r})^2$	−0.056***	−0.058***
	(0.009)	(0.009)
NPI	5.801***	5.804***
	(0.033)	(0.033)
Year 2018	0.012	0.012
	(0.015)	(0.015)
Year 2019	0.002	0.003
	(0.016)	(0.016)
Year 2020	0.019	0.025
	(0.017)	(0.019)
Year 2021	0.024	0.032
	(0.017)	(0.020)
Constant	−3.657***	−3.671***
	(0.102)	(0.102)
Province fixed effects	YES	YES
Mean inefficiency determinants	**Coeff. (SE)**	**Coeff. (SE)**
Experience		0.036***
		(0.013)
Multi-outlet		−2.316***
		(0.792)
Restaurant		−1.023**
		(0.482)
LS		1.243**
		(0.515)

(continued)

Table 5. (continued)

Mean inefficiency determinants	Coeff. (SE)	Coeff. (SE)
COVID-19		0.060
		(0.220)
Constant	−7.848***	−7.442***
	(2.167)	(2.001)
Variance of inefficiency	**Coeff. (SE)**	**Coeff. (SE)**
Constant	2.257***	2.246***
	(0.209)	(0.208)
Variance of noise	**Coeff. (SE)**	**Coeff. (SE)**
Constant	−1.492***	−1.489***
	(0.064)	(0.063)
σ_u	3.091***	3.073***
	(0.323)	(0.319)
σ_v	0.474***	0.474***
	(0.015)	(0.014)
$\lambda = \frac{\sigma_u}{\sigma_v}$	6.519***	6.472***
	(0.317)	(0.313)
Observations	18,308	18,308
Number of panel units	4128	4128

Note: Clustered standard errors at the restaurant level in parentheses. ***p < .01, **p < .05, *p < .1.

dummy for having more than one outlet (Multi-outlet), (iii) a dummy for whether it is a restaurant as opposed to canteens, catering, or beverage serving firms (Restaurant), (iv) a dummy for being a LS restaurant (LS), and (iv) a dummy for the pandemic period (*COVID-19*). Some preliminary descriptive analyses are presented in the Online Appendix, Figure A1.

Results

Main findings

Columns (1) and (2) in Table 5 present the estimation results of the Battese and Coelli (1995) model in equations (5) and (6) without and with inefficiency determinants. Consistent with microeconomic theory, profits are increasing in output levels and non-decreasing in input prices. In particular, the profit elasticity with respect to output is 0.729 for the sample means. The profit elasticities with respect to labor and capital unitary costs are −0.115 and −0.191, respectively. Thus, our results indicate that profits are more sensitive to percentage increases in capital costs than wages. The second-order coefficients and interaction terms are statistically significant. A Wald test rejects the null hypothesis that they are globally zero ($\chi^2(6) = 563.5$, p-value <.001), favoring the use of a translog specification over a Cobb-Douglas.

The year fixed effects are not statistically significant. We thus do not reject the null hypothesis that they are globally zero ($\chi^2(4) = 3.50$, p-value = .478), implying that the average profit levels remained constant over the study period, *ceteris paribus*. Similarly, none of the province fixed effects are individually significant (point estimates available upon request). We also find that the ratio of the variance of the inefficiency term to that of random noise ($\lambda = \frac{\sigma_u}{\sigma_v}$) is high and statistically significant ($\widehat{\lambda} = 6.47$, p-value <.001), indicating that a large share of the composed error term is driven by deviations from the fully efficient benchmark.

Because of the nonlinearity of the model, the coefficient estimates of the inefficiency equation are difficult to interpret, apart from their sign (Kumbhakar et al., 2015). Following Kumbhakar and Sun (2013), we computed the observation-specific marginal effects for each covariate z ($\frac{\partial E(u|v-u)}{\partial z}$) using the formula by Jondrow et al. (1982) to derive the conditional mean of the inefficiency term. Table 6 presents summary statistics for the estimated marginal effects.

Table 6. Summary statistics of the observation-specific marginal effects of determinants on profit inefficiency (column 2 in Table 5).

Variable	Mean	SD	Min	Max
Experience	0.003	3.9e-04	0.002	0.006
Multi-outlet	−0.203	0.025	−0.382	−0.132
Restaurant	−0.090	0.011	−0.168	−0.058
LS	0.109	0.013	0.070	0.205
COVID-19	0.005	6.4e-04	0.003	0.010

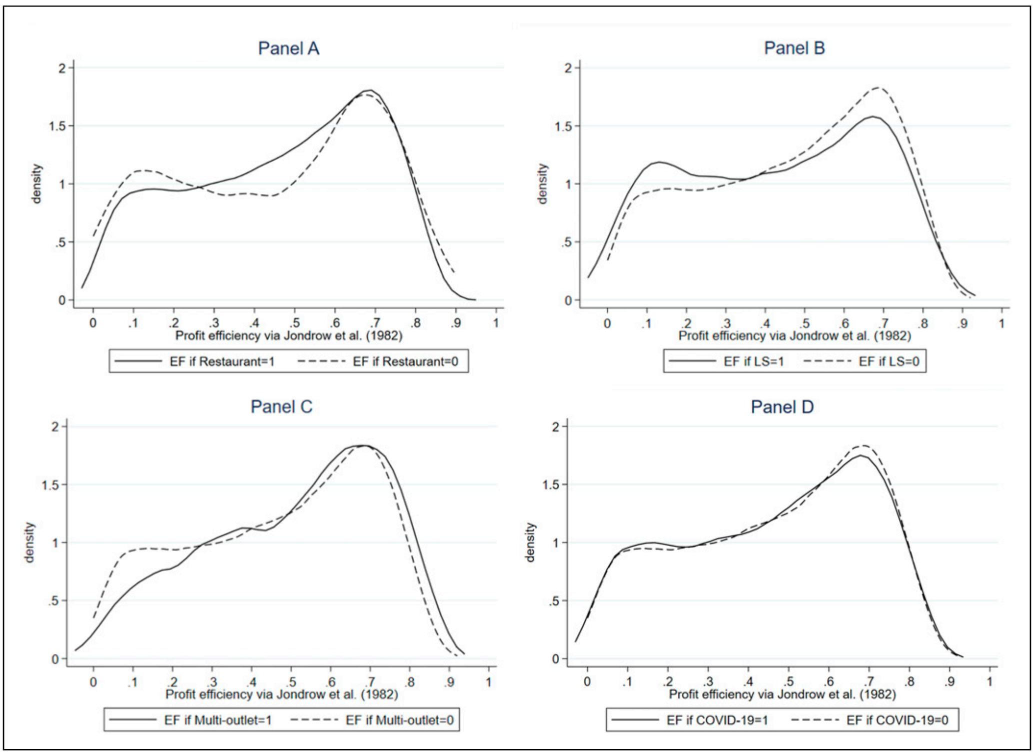

Figure 1. Kernel density plots of efficiency estimates by subgroups.

Contrary to our expectations, we document that profit inefficiency increases with the years in operation. Therefore, this finding indicates that firms operating for longer generate profits below the frontier, which is compatible with preliminary descriptive evidence showing that negative profits are more prevalent among older firms (Table 3). Therefore, we reject H1. Nonetheless, the effect size is quantitatively small and close to zero (0.003 per year, on average).

The dummy for multi-outlet firms negatively correlates with profit inefficiency, supporting H2. That is, restaurants with more than one sales point can obtain larger profits given their output and input prices. Concerning firm typology, LS restaurants are significantly more inefficient than FS restaurants, thereby supporting H3. We also find that restaurant firms are less profit-inefficient than other food service enterprises, thereby rejecting H4. Finally, in terms of COVID-19 shock, no differences are found during the pandemic; the average distance to the profit frontier is approximately the same before and during COVID-19. Therefore, we also reject H5.

Distribution of efficiency estimates

Next, by exploiting the Jondrow et al. (1982) estimator of observation-specific estimates of the inefficiency term ($\widehat{u_{it}}$), we computed profit efficiency estimates using $EF_{it} = exp(-\widehat{u_{it}})$. These scores are bounded between zero and one and have a straightforward interpretation: the closer to one, the closer the observed profits are to the profit frontier.

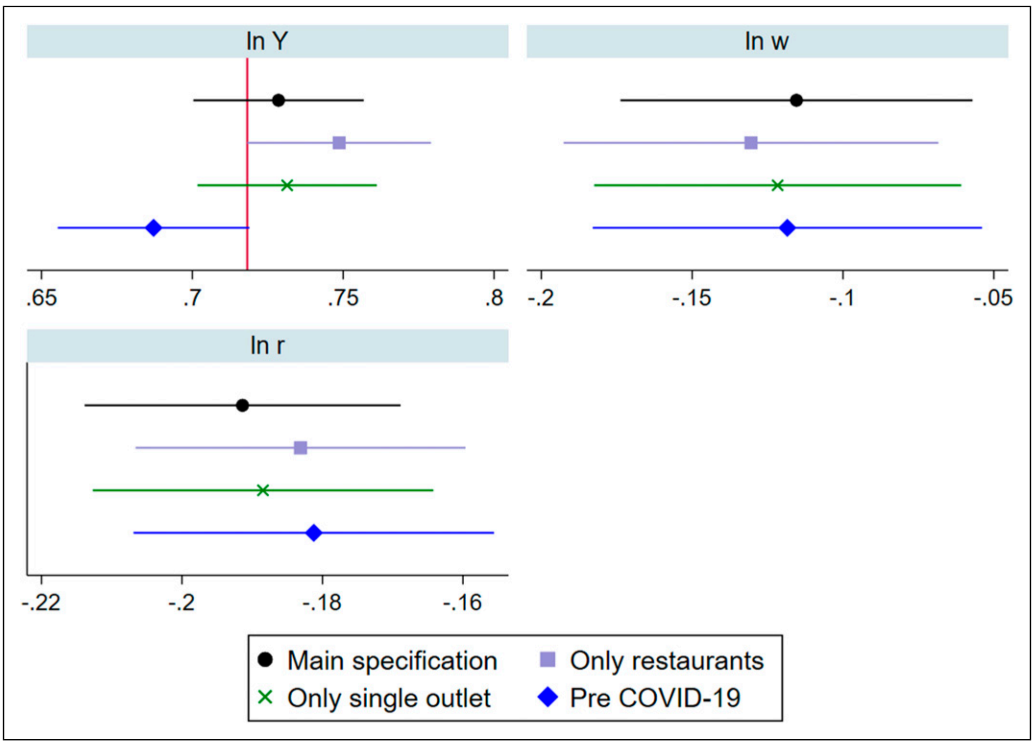

Figure 2. Comparison of first-order coefficient estimates and confidence intervals for profit frontier function across subsamples.

The average profit efficiency is 0.467, implying that an average restaurant loses more than half of its potential profit. This estimate is very close to the average technical efficiency of 46.1 % presented by Assaf et al. (2011), using data on Australian restaurants. Interestingly, mean efficiency was almost constant over the study period (0.475 in 2017, 0.469 in 2018, 0.464 in 2019, 0.465 in 2020, and 0.464 in 2021). This pattern is consistent with the null significance of the year dummies in the profit frontier and COVID-19 dummy in the inefficiency equation.

Figure 1 presents kernel density plots of the efficiency scores, separately for restaurants versus non-restaurants (Panel A), LS versus FS restaurants (Panel B), multi- versus single-outlet (Panel C), and pre- and COVID-19 years (Panel D). The distribution of efficiency scores is bimodal: there is a high mass of observations around 0.2 and 0.7 levels, indicating a clear dichotomy between lowly efficient (0.2) and moderately efficient (0.7) firms. These kernels illustrate that multi-outlet and FS restaurants are more profit efficient, whereas no differences are found between pre- and COVID-19 periods.

Robustness checks

Some robustness checks were performed on our main analysis. First, we re-estimated the model for different subsamples: (i) restaurants only, (ii) single outlet only, and (iii) pre-COVID-19 only. A comparison of the coefficient estimates for the output and input price elasticities and inefficiency shifters is shown in Figures 2 and 3, respectively. The full regression output is presented in Table A3

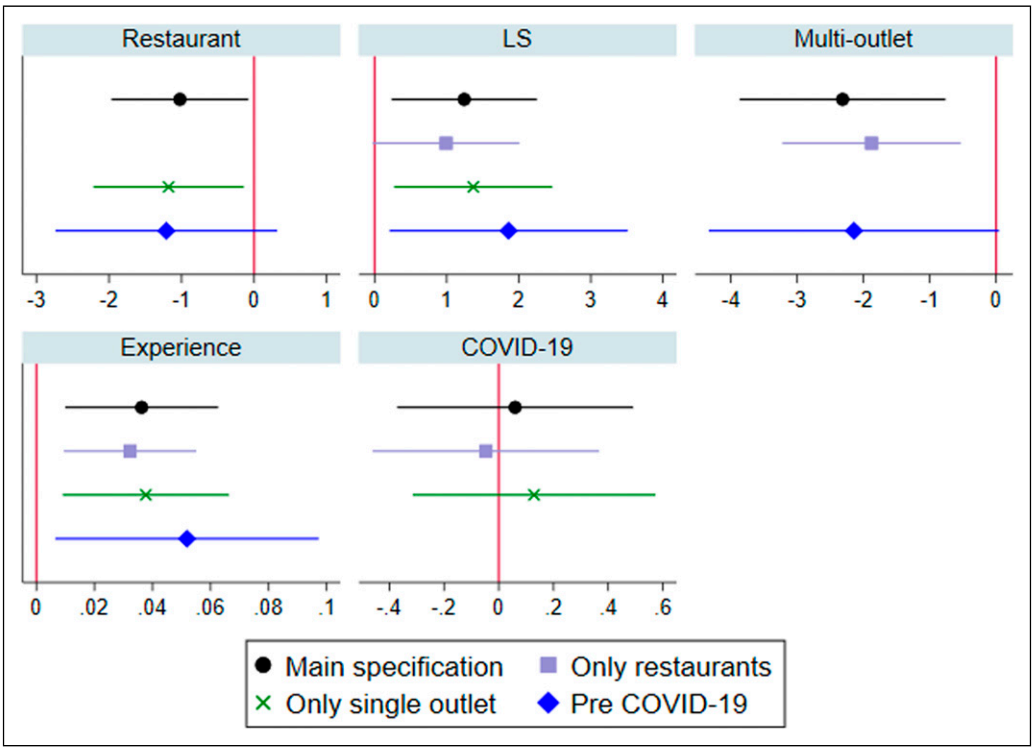

Figure 3. Comparison of coefficient estimates and confidence intervals for profit inefficiency shifters across subsamples.

of the Online Appendix. Overall, as compared to Table 5, we document consistency in both the frontier and inefficiency shifters estimates across subsamples.

Second, we estimate the SFA model in equation (5), including a full set of firms' fixed effects. We adopted the True Fixed Effects model proposed by Greene (2005), excluding firms that were not observed during the full sample period. Although this potentially introduces a sample selection problem, this approach better controls for unobserved firm characteristics. We assume a half-normal distribution for the inefficiency component, and the inefficiency determinants are here assumed to explain the variance rather than the inefficiency mean. The regression results are presented in Table A4 in the Online Appendix. We document that our core findings remain robust, with the exception that no significant differences in profit efficiency are found between LS and FS restaurants and based on the years in operation. Consequently, it seems that firm fixed effects already capture profit differentials associated with restaurant typology and experience.

Discussion and conclusions

This study evaluated the drivers of profit inefficiency in the restaurant industry using panel data of 4779 firms in Sweden for the period 2017-2021. After presenting a characterization of the profit frontier under product differentiation and our research hypotheses, we conducted an empirical analysis using Stochastic Frontier Analysis.

Our estimates indicate that profit inefficiency increases with the firm's years in operation. This result is contrary to our first hypothesis, since patterns of demand accumulation over time (Foster et al., 2016), decreased price elasticity with respect to product variety as the firm builds a customer base (Foster et al., 2008), and improvements in productive efficiency through learning by doing (Arbelo et al., 2018, 2021; Bahk and Gort, 1993) would suggest older firms to be less inefficient.

Although differences in the sector, country, and data considered make the comparison difficult, this finding could be reconciled with the results presented in Coad et al. (2013, 2018) on the firm age-performance relationship and the theory of the liabilities of aging (Barron et al., 1994). Senescence and obsolescence (i.e. organizational ossification and structural rigidity) may lead to profit inefficiencies as firms age in ever-changing environments. In the absence of technology adoption, increases in labor and capital productivity, and ignorance of emerging consumer choices and trends in the restaurant industry over time might cause revenue gains to be lower than increases in marginal costs. In addition, the most plausible reason for the greater profit efficiency of younger firms could be self-selection; in a highly competitive market, only highly productive and allocatively efficient young firms survive. In a sector that has been disrupted by the emergence of food delivery services and the use of online applications (Khan, 2020), young survivors might be more innovative and trend-focused in their product and service supply, thus leveraging new technologies and better assessing their customers' willingness to pay.

We also find that multi-outlet firms are less profit inefficient. This result supports H2 and is consistent with Alberca and Parte (2018), Assaf et al. (2011), and Demydyuk et al. (2015), among others. Our findings can be explained by larger firms offering a wider variety of products (Hottman et al., 2016), better exploiting economies of scale in production (Mun and Jang, 2018), and exerting some monopsony power over upstream suppliers in the input market (Waterman, 1996). In addition, there is scope for spatial monopolies in the form of clusters of own establishments without competition (Stelder, 2012), which increases profit efficiency through market power.

Furthermore, limited-service restaurants are found to be more profit inefficient, supporting H3. This finding is consistent with previous studies (e.g., Mhlanga, 2018a), and can be the result of monitoring problems (Krueger, 1991) and workers' dissatisfaction due to reduced internal job ladders (Mohsin and Lengler, 2015). Moreover, restaurants are less inefficient than other firms offering food services like canteens, catering or beverage serving. While contrary to research hypothesis, this finding can be explained by price level expectations (Brown, 1990), coupled with the fact that traditional restaurants have more potential for setting higher prices and increasing sales by selling additional products and services.

Finally, the demand shock produced by COVID-19 has not caused a significant change in the wedge between actual and potential profits. Since the pandemic has led to Schumpeterian "cleansing" of less productive firms (Muzi et al., 2023), restaurants that survived during 2020 and 2021 might be the most efficient ones. Furthermore, COVID-19 programs implemented by the Swedish Government were slightly different from those in other countries (Yan et al., 2020), thus supporting 'healthy' firms during the pandemic. Government aid during this period was limited to: (a) short-time work allowance, offering employers the possibility of reducing employees' working hours and wages; (b) tax deferments, allowing firms to defer the payment of social security contributions, taxes on salaries, and VAT; and (c) a temporary discount on fixed rental costs, with the state covering 50% of the agreed rent. Moreover, Swedish restaurants were regulated to close earlier and limit the number of guests per table instead of a complete closure. Altogether, these factors plausibly explain why we do not detect significant differences between pre- and during pandemic periods in market profit inefficiency, on average.

This study contributes to the growing literature on firm performance in the food service sector by presenting one of the first empirical analyses on the drivers of *profit inefficiency*. While some previous studies have investigated the role of size and experience in explaining sales (e.g., Alberca and Parte, 2018; Assaf et al., 2011) and cost inefficiency (e.g., Mhlanga, 2018b), we investigated departures from the profit frontier. Our analysis revealed that young and multi-outlet restaurant firms are closer to their profit potential while mature and single-outlet firms are getting lower profits than they could, given their outputs and input factor prices.

Our results offer some practical implications for struggling Swedish restaurants and the hospitality sector in general. Grappling with high staff turnover and an above-average bankruptcy rate (Carlbäck et al., 2024; UC, 2023), our findings could prove valuable in the aftermath of the pandemic. The industry, often traditional and, in many cases, conservative, has expressed a need for revised business models. Profit efficiency is a central element of business management and uncovering the factors that explain differences in foregone rents across firms provides business operators with relevant information about how their business compares to that of competitors. Our findings call for the need to review and update the operational structures and market relevance of mature firms that appear to suffer from senescence and obsolescence. Moreover, since the Swedish restaurant scene is predominantly composed of smaller establishments, the results presented here indicate the necessity to reconsider the ideal number of service outlets for standing a chance in this highly competitive sector.

While the need to rectify production inefficiencies is obvious, improving the pricing structure throughout the industry could improve performance. Optimal pricing does not mean higher prices, but a maximization of customer willingness-to-pay. Value-informed pricing involves the assessment of the product value to customers and requires a clear understanding of their importance-performance scores (Carlbäck, 2008). Hence, systematic customer value information should be integrated into regular menu engineering and further guide the entire operating and strategic resource allocation to realize full profit potential (Carlbäck, 2022). In this regard, the use of price discrimination strategies targeted towards specific segments could be an effective way to enhance the producer's surplus and revenue.

This study has several shortcomings that we deem valuable avenues for future research. Owing to data limitations, we do not have information on the prices of other input factors, such as food or intermediate goods. Moreover, we lack data on other relevant dimensions, such as managerial experience, chain affiliation, ownership structure, seating capacity, quality indicators of the specific services and amenities provided by the restaurant, previously related to revenue generation, and cost structure (Assaf et al., 2011; Mhlanga, 2018a, 2018b; Sveum and Sykuta, 2019). A further focused study of restaurant firms within their first years in operation, perhaps using a more detailed dataset and additional covariates, could provide more insightful advice to this important group of entrepreneurs for future start-ups.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. Returns to scale refers to how output changes when all input factors are increased proportionally. Under constant returns to scale, output doubles when all input factors are doubled.
2. The firms that do not belong to the restaurant category are those pertaining to groups 56210 (*Event catering activities*), 56291 (*Canteens*), 56292 (*Catering for hospitals*), 56293 (*Catering for schools, welfare and other institutions*), 56294 (*Catering for the transport sector*), 56299 (*Other catering*) and 56300 (*Beverage serving activities*) of the Swedish Standard Industrial Classification 2007.
3. During the COVID-19 pandemic, several regulations and restrictions aimed at curbing the spread of the virus were implemented in the Swedish restaurant industry (Folkhälsomyndigheten, 2024). The Swedish government limited the number of patrons allowed inside restaurants, mandating physical distancing between tables, and restricted the operation hours (Yan et al., 2020). Additionally, restaurants were required to enforce strict hygiene protocols, including regular sanitation of surfaces and providing hand sanitizers for customers (Regeringskansliet, 2024). Buffet-style dining was prohibited to minimize contact, and establishments had to ensure that guests remained seated to reduce mingling. These measures significantly impacted the operational capacity and revenue of restaurants, leading to a challenging period for the industry.

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