Who Really Benefits from Consumption Tax Cuts? Evidence from a Large VAT Reform in France

By Youssef Benzarti and Dorian Carloni*

This paper evaluates the incidence of a large cut in value-added taxes (VATs) for French sit-down restaurants in 2009. In contrast to previous studies, which only focus on the price effects of VAT reforms, we estimate the effects of the VAT cut on four groups: workers, firm owners, consumers and suppliers of material goods. Using a difference-in-differences strategy on firm-level data we find that: (1) firm owners pocketed more than 55 percent of the VAT cut, (2) consumers, sellers of material goods and employees shared the remaining windfall with consumers benefitting the least, (3) the employment effects were limited.
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The Value-Added Tax (VAT) is one of the most widely used taxes in the world. More than 160 countries and all developed economies – with the exception of the United States (US) – have adopted a form of VAT.[1] VATs are often among the largest source of government revenue; for example in the European Union (EU), they account for 30 percent of total tax revenue, or 12 percent of GDP. Some US politicians have proposed adopting a VAT, either as a replacement for other taxes or to fund specific government programs. However, relatively little attention has been dedicated to this tax compared to other taxes. In this paper we help fill this gap by analyzing the incidence of a large VAT cut for French sit-down restaurants.

Member States of the EU have increasingly relied on sector-specific and general VAT cuts to stimulate the economy. Through these tax breaks, governments generate windfalls for firms and hope that firms use them to increase demand through price reductions, increased employee wages and investment. However, little is known about the efficacy of such fiscal policies. These policies are at the same time very expensive: for example it is estimated that a VAT cut for French sit-down restaurant cost 3 billion euros in 2010, while the 2009 temporary VAT reduction in the UK cost 12.4 billion pounds. This paper sheds light on the incidence of VAT cuts and finds that they mostly benefit firm owners through

[1] Source: U.S. Department of the Treasury.

increased profits.

Empirical studies on tax incidence have provided limited evidence on the effects of VAT changes on outcomes other than prices. Primarily because of data limitations, previous research has been unable to disentangle the effects of VATs on employees, suppliers of non-labor intermediate inputs and capital owners.[2] One notable exception is Kosonen (2015), which estimates the incidence of a large VAT cut on hairdressers in Finland. While the data in Kosonen (2015) would, in principle, allow a full incidence estimate of the VAT cut, the hairdressing sector relies substantially less on employees (most firm owners are the sole employees) and material goods (hairdressers require very little input costs) making the analysis on these two groups limited. Our paper helps fill this gap by providing a full incidence analysis of a large reduction in the VAT rate in France. In July 2009, the VAT rate for meals consumed in French sit-down restaurants was reduced from 19.6 percent to 5.5 percent, while the VAT rates applied to the rest of the economy were unaffected. To study the effects of this particular reform we combine information on French national level prices from Eurostat with firm level data from Bureau van Dijk's Amadeus. Our empirical analysis proceeds in two steps.

First, we use a difference-in-differences strategy and compare sit-down restaurants (our treatment group) to other market services (our control group). We find that prices charged by sit-down restaurants decreased slightly after the tax cut. The reform also led to a moderate increase in the costs of both labor and non-labor intermediate inputs, and large increases in owners' profits. In addition, and despite the reform's goal of increasing employment in the restaurant sector, we find limited evidence of positive employment effects. These findings indicate that sit-down restaurant owners were the main beneficiaries of the tax cut, while a much more limited benefit was shared between employees, consumers and suppliers of material goods.

Second, we build on the theoretical framework of Auerbach and Hines (2002) and use the reduced-form coefficients to develop a welfare analysis, in which we estimate the incidence of the VAT cut on consumers, employees, sellers of material goods and firm owners. Our estimates suggest that in the long-run (30 months after the reform) firm owners pocketed around 55.7 percent of the VAT cut, employees and sellers of material goods received 18.6 and 12.1 percent of the VAT cut respectively, while consumers received the remaining 13.6 percent.

Our study faces three limitations. First, we do not observe the quantity or quality of the factors of production. This makes disentangling price versus quality/quantity effects difficult for factors of production. However, we provide evidence that the effect of the VAT cut on the quantity of meals served was limited.

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[2]See Houel (2010) and Lafféter and Sillard (2014) for an analysis of the price effect of the 2009 VAT cut for French sit-down restaurants, Carbonnier (2007) and Carbonnier (2008) for estimates of the effects of other VAT changes on prices in France, and Chouinard and Perloff (2004), Doyle and Samphantharak (2008), Kopczuk et al. (2013)), Gruber and Kőszegi (2004), Hanson and Sullivan (2009), and Kenkel (2005) the incidence of sales and excise taxes on prices in the US.

The absence of a quantity response for the final output is hard to reconcile with an increase in the quality or quantity of the factors of production. In particular, an increase in the quality or quantity of raw materials should result in an increase in the quantity of meals sold. Similarly, there should be a positive correlation between the number of hours worked by employees and the quantity of meals served. The fact that we observe no change in the quantity of meals served suggests that it is the prices of the factors of production that changed rather than their quality or quantity.

Second, we might be over-estimating the response of some of the factors of production. In particular, the increase in cost of employees could in part be due to the repeal of the payroll subsidy cut. Similarly, the increase in the cost of material goods could be due to the general increase in the price of raw materials at the time or a decrease in evasion as a response to a decrease in VAT rates. While we try to address these concerns by controlling for these changes using different counterfactuals, we cannot fully rule them out. Over-estimating these effects would lead to under-estimating the increase in profits. For this reason, a conservative interpretation of our results is that we are estimating a lower bound on the effect of the VAT cut on profits: firm owners may have benefited even more from the VAT cut.

Third, our incidence analysis relies on national rather than firm-level price indexes. Therefore, we are unable to observe the price charged by each individual firm in our sample, but can only provide an estimate of the aggregate effect of the reform on prices. Given that balance sheet data is missing for very small firms, which are also less likely to react to the reform, it is probable that our estimate of the incidence on consumers is biased upward.[3]

I. Institutional Background

A. The 2009 VAT Reform

Before the reform was implemented in 2009, the French restaurant industry had two different VAT regimes: a standard rate of 19.6 percent applied to sit-down meals, and a reduced rate of 5.5 percent for take-away meals. Following a campaign promise by then French President Jacques Chirac, France applied for an authorization to re-classify sit-down restaurants from the standard to the reduced VAT rate in 2002. The application was first turned down by the European Commission because of strong opposition by then German Chancellor Gerhard Schroder. After some negotiations between France and Germany, an agreement was reached on January 20, 2009 allowing all Member States to re-classify sit-down restaurants to the reduced rate. The reclassification was implemented in France on July 1st 2009.

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[3]For example, Harju, Kosonen and Nordström Skans (2017) focus on a VAT cut for sit-down restaurants in Finland and Sweden and show that small firms are less likely to cut their prices than larger firms.

The reform's main goals were to (a) decrease the price of meals consumed in sit-down restaurants, (b) stimulate employment and investment in the sit-down restaurant industry, where total turnover had declined by around 10 percent in the period 1995-2009, and (c) equalize the VAT rate between sit-down meals and take-away meals. Importantly, the French government gathered the representatives of the business associations of the restaurant sector (*Etats généraux de la restauration*) and asked them to commit to a non-binding agreement called *Contrat d'Avenir* three months before the reform was implemented. This agreement, which was signed on April 28th 2009, offered precise directives on how the tax cut should be used to benefit consumers, and to increase both employment and investment (see Appendix Section A.A1 for details on the *Contrat d'Avenir*). However, the limited decrease in prices we observe in the 30 months following the reform signals that the *Contrat d'Avenir* played a limited role.

At the same time the French government removed a payroll subsidy to which all restaurants and hotels had been eligible since August 2004, and which had been introduced as a temporary measure to stimulate employment in restaurants and hotels. The monthly amount of the subsidy received for each employee hired depended on whether the worker was paid close to minimum wage, and on the tenure of the firm, and reached a maximum of 1,368 euros per year. While the timing of the subsidy removal overlapped with the VAT reform, previous studies have shown that the employment effects of the subsidy were limited.[4] We discuss and address these concerns in more details in Section V and conclude that incorporating the effects of the payroll subsidy cut would further reduce the estimated incidence of the VAT cut on employees and increase it on firm owners.

B. Employment and Wages in the Restaurant Sector

Restaurants are an important part of the economy in France. According to the French National Institute of Statistics and Economic Studies (INSEE), the share of consumer spending on restaurants has increased from 5.1 percent to 5.9 percent between 1960 and 2007, while the share on food expenditures has decreased from 31.4 percent to 21.9 percent. Around two thirds of consumer spending on food services outside the home goes to sit-down and fast-food restaurants, with the remaining third spent on caterers, canteens, bars and cafeterias.

While the industry has been growing over the years, the traditional structure of sit-down restaurants has not changed over time. According to FAFIH (2011), which reports employment characteristics for French restaurants and hotels, around 47 percent of workers were employed in establishments with less than 10 workers in 2010, while 14 percent were in restaurants or hotels with more than 50 workers. In addition, sit-down restaurants are highly labor-intensive: labor costs are a major cost in restaurants, and wage setting dynamics can be summarized as follows.

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[4]See for example Houel (2010) for a description of the effects of the subsidy program.

First, labor is not very flexible: around 78 percent of individuals working in restaurants and hotels were hired with open-ended contracts (*Contrat à Durée Indeterminée* – CDI) in 2013, and around 16 percent had fixed-term contracts (*Contrat à Durée Determinée* – CDD). CDI are contracts that are very hard to revoke: if a worker is fired, employers can incur substantial penalties. It is also costly to fire a worker under a CDD contract, but employers are not required to extend expired contracts.[5] The remaining share of workers is composed of apprentices, workers whose employment is subsidized by the government (*Contrats Aidés*), and owners, who account for 1.8 percent of the industry workforce.

Second, a considerable fraction of workers are minimum wage employees. The French minimum wage (SMIC, *Salaire Minimum Interprofessionel de Croissance*) is set at the national level and applies to all employees and businesses. It is indexed to both inflation and past wage growth and is raised every year in July. The wage varies depending on the employee's tenure and job category, and in 2015 started at 9.61 euros per hour. Seguin (2011) estimated that in restaurants and hotels, around 40 percent of employees were paid the minimum wage in 2003, compared to 12-15 percent nation-wide.

Third, wage setting is unaffected by collective bargaining because the industry is dominated by very small firms and collective agreements are very scarce (Fougère, Gautier and Le Bihan (2010)). This feature differentiates the restaurant sector from other sectors of the economy, where annual wage negotiations between employer associations and union or employee representatives occur at both the industry and company level.

II. Data

Our analysis combines firm-level balance sheet information with aggregate national price indexes in the period 2004-2012. Annual data on French firms' balance sheets come from the Bureau van Dijk's Amadeus dataset, which covers all private firms reporting to local tax authorities and/or data collection agencies. The dataset includes around one third of French sit-down restaurants, and the universe comprises around 100,000 establishments per year. The data include standard income statement and balance sheet information such as total turnover, cost of employees, profits, material costs, and firms' assets and liabilities.

The data we use contain detailed information on the industry in which the firm operates, which allows us to distinguish between sit-down restaurants and other firms operating in the restaurant industry, such as take-away restaurants. Industries are classified according to the French national statistical classification of activities (NAF Rev.2) introduced in 2008 and each firm is associated with a unique industry code, corresponding to its core activity. For instance, if a restaurant offers both sit-down and take-away services, it only receives one industry code. Because VAT rates do not specifically apply to restaurants but rather to

[5]Details on these contractual forms can be found in Appendix Section A.A3.

commodities, a restaurant classified as sit-down but offering take-out food should apply the take-out VAT rate. In practice, restaurants are unlikely to charge different VAT rates to sit-down and take-out meals, limiting the effect of this source of bias on our results.

We select our sample based on the following criteria. First, our analysis only considers unconsolidated balance sheets to avoid biasing our estimates with any reporting manipulation that could occur between a subsidiary and its parent company. Unconsolidated data constitute around 70 percent of observations in Amadeus. While the incidence of the VAT cut may be different for consolidated firms as chains may have different price setting strategies than independents, our price data covers both consolidated and unconsolidated firms. Unfortunately we cannot analyze balance sheet items for consolidated firms separately as consolidated data account for only 0.2 percent of observations in the period 2004-2012.[6] Second, our analysis focuses on firms providing information on their number of employees, which is a crucial piece of information to distinguish between the employment and wage effects of the reform. Even though only half of unconsolidated balance sheets contained in Amadeus has information on the number of employees, we show that including firms without employment information does not substantially change our results. Third, we only consider firm-year observations with non-missing information on firm turnover, the cost of employees, the cost of material and profits. As shown in Table 1, which displays summary statistics for our treatment and control groups, this selection leaves us with 132,232 sit-down restaurants in the period 2004-2012.

The main control group we use in the analysis is non-restaurant market services, for which we have 997,826 observations. The definition of market services follows the INSEE definition and includes services that are comparable to the restaurant industry because of their similar nature, but not directly substitutable with restaurants. Appendix Section C provides a detailed description of services included, which are wholesale and retail trade; repair of motor vehicles and motorcycles; accommodation service activities; information and communication; financial and insurance activities; real estate activities; professional, scientific and technical activities; and administrative and support service activities. Excluded are sectors that are not traded on the market such as transportation, public administration activities, education, human health and social work activities as well as entertainment and recreation activities.

We are primarily interested in estimating the effect of the reform on the number of employees, the cost per employee (which includes wages, salaries and taxes on salaries), the cost of materials purchased by sit-down restaurants and profits. In order to link the reduced form results to our incidence analysis we further focus on of the effects of the VAT cut on sit-down restaurants' return on total assets, a measure of the average return to capital for restaurant owners. We choose return on total assets as our main measure largely because it is a widely used accounting

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[6]Most of the remaining observations is constituted by firms with limited financial information.

measure of corporate performance, but we show in Appendix Figure A.1 that an alternative measure of return to capital reported in Amadeus yields similar results.[7]

We complement this balance sheet information with Eurostat's national level monthly data on the price of meals consumed in French sit-down restaurants. Because Eurostat provides information on the price of goods by Classification of Individual Consumption According to Purpose (COICOP) group and on the weights assigned to each group, we compute a weighted average of price indexes for our control groups. We cannot distinguish between the price charged by small firms versus large firms, which motivates using market services as our primary control group and only using small firms as an additional control group as a robustness check.

Finally, we use information on hours and days worked per week from the labor force survey *Enquete Emploi en Continu* (EEC), which contains detailed information on employment (as well as unemployment and training activities) over the twelve months prior to the date of the interview. The survey samples around 400,000 individuals per year and interviews them for six quarters. It contains self-reported information on the industry of employment, the total number of hours worked during a reference week, and the number of hours worked above the legal limit set by French law. Because of differences in sampling frame and reporting behavior, the survey of employees is unlikely to perfectly match the sample of employees covered in Amadeus. Importantly, Amadeus under-samples very small firms, which are not required to report balance sheet information to local tax authorities, whereas the *EEC* survey is a nationally representative survey. Nonetheless, the *EEC* survey is the best source of publicly available information on workers in France.

III. Empirical Strategy

A. Mean Impact Estimation

In order to effectively model the mean impact of the VAT change, we use a difference-in-differences (DD) framework, and compare sit-down restaurants (our treatment group T) to firms in other market service industries (our control group). Our analysis focuses on how differences between those two groups changed between the pre-reform period 2004-2008 and the post-reform period 2009-2011. Because the VAT rate in the restaurant sector was raised from 5.5 to 7 percent on January 1, 2012, we do not extend the analysis beyond 2011.

We focus on four main outcomes: the number of employees, the cost per employee, the cost of material goods purchased and the before-tax profit. Their unconditional means are reported in Appendix Figure A.2. To estimate the mean

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[7]See for example Love (2010) for a recent literature on measures of firm performance, and Gentry and Shen (2010) for a comparison between accounting and market measure of firm performance.

effect of the VAT reform on those outcomes we use the following specification:

$$(1) \qquad \log Y_{idt} = \eta \cdot \mathbb{1}\{i \in T\} \times After + \lambda_t + \omega_i + \epsilon_{idt}$$

where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured, $After$ is a dummy variable equal to one in the post-reform period 2009-2011 and Y is the outcome of interest.[8] We include year fixed effects λ_t to control for differences across years shared by the treatment and control groups, and firm fixed effects ω_i to control for firm characteristics that do not change over time. We do not assign observation specific weights. As a result, our identification strategy uses within firm variation across time once aggregate differences over time are controlled for.

The error term ϵ_{idt} is clustered by *département* to control for the possibility of within group correlation among firms located in the same geographical area. ϵ_{idt} captures unobserved individual $\times$ *département* $\times$ year shocks to the outcome of interest. It is also assumed to be uncorrelated with the regressor of interest, so that

$$(2) \qquad E[\epsilon_{idt} \times (\mathbb{1}\{i \in T\} \times After)|\lambda_t, \omega_i] = 0$$

is satisfied. While this identifying assumption is not directly testable in the data, it would be violated only if there were omitted factors that are not controlled by firm characteristics and that affect the treatment and control groups differentially over time.

In addition, because the logarithmic function is not defined for non-positive values, we complement the analysis above with estimates on the probability of each outcome being positive and also perform the analysis using an inverse hyperbolic sine function instead of the logarithmic function. The results of these robustness checks are reported in Appendix Table A.1 and Appendix Figure A.3. We find very similar results for all outcomes at the exception of number of employees which still shows small effects but now exhibits decreasing pre-trends. This suggests that the employment effects of the reform are to be interpreted with caution but are likely to be relatively limited.

B. Estimates of Dynamic Effects

In order to explore the dynamics of how the main outcomes of interest adjust over time, we augment the main model with leads and lags and consider the

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[8]France is divided into 96 *départements*, which are administrative divisions whose land area covers around 2300 square miles on average, and median population around 500,000 in 2001, which is around 21 times the median population of a U.S. county.

period 2004-2012:

$$(3) \qquad \log Y_{idt} = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$$

where k is an index for years prior to the reform and q is an index for years after the reform. Because we are controlling for time-invariant characteristics of the treatment group, not all the difference-in-difference coefficients are identified. For this reason, we impose $\eta_{2008} = 0$. The coefficients of interest η_ν deliver dynamic coefficients, which allow us to quantify the effect of the reform every year before and after it is implemented. It can be interpreted as the percent change in the outcome of interest in each given year relative to 2008 assuming that, absent the tax change, the difference between treatment and control groups would have been the same as in 2008. This specification allows us to assess whether changes are temporary or long-lasting, and informs our incidence analysis, which distinguishes between short-run, medium-run and long-run effects of the reform.

IV. Results

In this Section, we first address the standard incidence question of the effect of the tax change on prices and quantities (Figure 1). Finding that most of the incidence falls on firms, we further focus on the production side firms and show the effect of the VAT cut on the number of employees, the average cost per employee, the cost of material goods purchased and profits before taxes (Figure 2).

A. Incidence on Price

Our price analysis focuses on VAT-inclusive prices and compares the price of sit-down meals to the price of non-restaurant market services. We observe a discontinuous drop in the price of sit-down meals at the time of the reform in July 2009. Panel a. of Figure 1 shows that it was small relative to the VAT cut. Prices dropped by around 1.3 percent in the first month after the reform, while the VAT cut amounted to 14.1 percent, implying a pass-through of 9.7 percent. The small pass-through of VAT cuts is consistent with the more general findings of Benzarti et al. (2017) that uses evidence across the EU to show that VAT cuts have limited effects on prices.

The limited effect on prices persists when we construct a price series for our control group. Panel b. of Figure 1 shows the log-difference between the seasonally adjusted price of sit-down meals and the price of market services relative to June 2009. We seasonally adjust the price series by estimating monthly fixed effects for the period January 2004 to December 2011, and by subtracting those fixed effects from the non-seasonally adjusted series provided by Eurostat. The Figure shows that, relative to the control group, the price of sit-down meals dropped by around

2.1 percent in the month after the reform, that the log-difference increased until the beginning of 2010, and that it reached 1.9 percent in December 2011.[9] This evidence suggests that while the VAT cut had an immediate effect on prices, it was small but permanent.

While the pass-through of the VAT cut was low, the true effect on prices could have been even lower if sit-down restaurants had increased their prices in anticipation of the reform. This concern is shared by Lafféter and Sillard (2014), which points out that prices increased at an unusually high rate in the months preceding the reform. Though this is a possibility, the increase in price observed for restaurants and hotels in the period January 2008-July 2009 was not specific to France but was also observed in other European countries, as also documented in Lafféter and Sillard (2014). It is therefore likely that the pre-reform increase in prices had been at least partly driven by the increase in the international price of food materials, which peaked in the middle of 2008. Furthermore, the change in VAT rate applied to sit-down restaurants was approved by the European Commission in January 2009, while the increasing price trend started at the beginning of 2008. Therefore, the timing of the price increase does not seem to support anticipatory behaviors. Nonetheless, because we cannot fully rule out anticipatory behaviors, we also show how our results would have differed in this case. Using a counterfactual price series, as shown in panel b. of Figure 1, leads to an even lower estimated decrease in prices following the VAT cut.

B. Incidence on Quantities

We find that the reform had limited effects on the volume of goods sold. Panels c. and d. of Figure 1 use monthly aggregate statistics on the volume and value (revenue net of tax) of goods sold by sit-down restaurants from January 2004 to January 2013.[10] Panel c. shows no response of the volume of goods sold, whereas Panel d. of the same Figure shows a strong response of the VAT-exclusive value of goods sold at the time of the reform.[11] This implies that most of the observed increase in value is due to an increase in VAT-exclusive prices rather than an increase in volume. The absence of response of quantity of goods sold is important. It allows us to bound several dimensions of response. First, any increase in the quality of goods sold should result in an increase in quantity. The absence of response in quantity of goods sold suggests that quality did not increase and that most of the observed price increase is an increase in markups. A similar argument can be made for the cost of goods sold. Because there is no increase in the volume of goods sold and the cost of goods sold is equal to the

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[9]Our results do not change substantially if we use semi-annual or annual log-differences between the average price of sit-down restaurants and market services. In this case, relative to the month prior to the reform, prices of sit-down restaurant meals dropped by 1.8 percent between July and December 2009, by 2.4 percent between January and December 2010, and by 2 percent between January and December 2011.

[10]Volume and value are aggregated by INSEE using a sample of 10 million firms.

[11]Appendix Figure A.4 shows the effect of the VAT cut on turnover using the Amadeus data.

volume of goods sold multiplied by their average unit price, most of the observed increase in the cost of goods sold is driven by an increase in the average unit price. Second, an increase in the number of hours worked by employees should reflect an increase in quantities. Because volumes do not increase, it is reasonable to infer that hours worked did not increase and that most of the observed increase in the cost of employees was due to an increase in their hourly wages.

C. Incidence on Factors of Production

Panels A. of Table 2 shows the mean effect of the reform on the main outcomes of interest. Column (1) shows that the cost of employees increased by 4.1 percent after the VAT cut while columns (2) and (3) show the separate effects on employment and the average cost per employee. Column (2) shows no statistically significant effect on employment in sit-down restaurants, which is consistent with limited effects on overall output produced. The estimated coefficients displayed in Figure 2 confirm that the reform did not affect the number of employees of sit-down restaurants. Two considerations are necessary. First, new firms could have entered the market at the time of the reform, therefore increasing overall employment. Unfortunately, because the Amadeus coverage has improved over time, this is something our data fail to capture accurately. Second, Amadeus only records information on firms that are required to report to local tax authorities and misses information on small firms. The effect we estimate on employment is therefore biased if the reform had an effect on the employment of unrecorded small sit-down restaurants. Column (3) shows that the average cost per employee increased by 3.9 percent after the reform. As displayed in panel c. of Figure 2, the effect on the average cost per employee was limited in the first year after the reform and increased subsequently. Because the average cost per employee includes both wages and payroll taxes, this increase could in part reflect the 2009 payroll subsidy cut for hotels and restaurants, a measure that was implemented at the same time of the VAT cut. We return to this in sub-section V.B.

Column (4) shows the effect on the cost of material goods purchased, which increased by 5 percent in the post-reform period. Panel d. of Figure 2 shows that this increase was immediate and is consistent with suppliers of those goods trying to extract part of the rent generated by the VAT cut by increasing their prices. Since the quantity of meals sold does not increase following the VAT cut, the increase in the cost of material goods is unlikely to be due to an increase in their quantity but rather to an increase in their prices.

Finally, we find that the reform had large positive effects on both profits and on return on total assets. Column (5) in panel A. of Table 2 shows that before-tax profits of profitable firms increased by 24 percent in the post-reform period. In addition, we show in Appendix Table A.1 that the fraction of sit-down restaurants with positive profits increased by 9 percent after the reform. Given that the average profit per employee in 2008 was 2,500 euros, our findings suggest that total profits of profitable firms increased by about 3,600 euros for an average

sit-down restaurant hiring six employees. Panel e. of Figure 2 shows that the positive effect on profits peaked in 2010 and decreased afterwards. Column (6) shows that the return on total assets increased by 29 percent after the reform.[12]

Overall, this reduced-form evidence is consistent with sit-down restaurant owners being the main beneficiaries of the VAT cut. In fact, because we may have over-estimated the response of the different factors of production, due to a general increase in the cost of material goods, a decrease in evasion or the repeal of the payroll subsidy cut, we may be under-estimating the incidence of the reform on profits: restaurant owners may have pocketed more of the VAT cut than our results suggest.

D.   Robustness Checks

DFL RE-WEIGHTING. — The composition of firms in the treatment and control groups might change over time for reasons that are unrelated to the reform, which could bias our estimates. To make sure the treatment and control groups are fully comparable based on observable characteristics, and that the results are not purely driven by compositional changes, we re-weight the group-by-year distribution to match the distribution of observables in the treatment group in 2008. We use the approach from DiNardo, Fortin and Lemieux (1996) and re-weight the group-by-year distribution within ten size bins based on assets crossed with ten size bins based on firm age and *département* of residence. The residual group means plotted on Appendix Figure A.5 are then constructed by first running count weighted cross-sectional regressions for each year of the outcome variable on an indicator for treatment group, total assets and indicator variables for firm age and the *département* of residence. The average group-by-year residual is then standardized by subtracting the 2008 residual group mean and adding back the 2008 residual pooled mean. Panel b. of Figure A.5 shows slightly larger effects on the number of employees than estimated in our baseline specification. The positive effects of the reform on the cost per employee, the cost of material goods and profits are similar after re-weighting, as shown in panels c., d. and e. of the same Figure. Overall, the re-weighing mostly shows parallel trends; however, for employee and material goods costs, we observe a slight downwards divergence of the control group a few years prior to the reform. This is likely to bias our estimates of these costs upwards and further confirms that our profit estimates are likely to be lower bounds.

CHANGES IN LOCAL ECONOMIC CONDITIONS. — The effects we identify could be driven by changes in local economic conditions that affect the treatment and

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[12]As shown in Appendix Figure A.1, an alternative measure of return to capital reported in Amadeus also indicates that the benefits to sit-down restaurant owners were large.

control groups differently. We therefore add a control for the *département* unemployment rate:

$$(4) \qquad \log Y_{idt} = \eta \cdot \mathbb{1}\{i \in T\} \times After + \gamma \cdot \text{URate}_{dt} + \lambda_t + \omega_i + \epsilon_{idt}$$

For this purpose we use INSEE data on quarterly unemployment rates by *département* and compute the average unemployment rate by *département* in each given year. Panel B. of Table 2 shows that the results of our main analysis are robust to controlling for the local unemployment rate. The estimated coefficients are comparable to the ones we get in our main specification.

USING SMALL FIRMS AS A CONTROL GROUP. — About 90 percent of sit-down restaurants in our sample are small firms, defined as firms with less than 10 employees. Panel C. of Table 2 shows that the effect of the reform on sit-down restaurants, when using this alternative control group, is comparable to what we found in our main analysis, with the exception of the effect on the number of employees. This is due to the fact that the definition of small firms constrains the maximum number of employees in each given year, preventing us from reliably estimating the effect of the VAT cut on employment. This is also the main reason we do not use small firms as our main control group.

Column (2) in Panel C. of Table 2 shows that the effect on the number of employees is positive and statistically significant. The positive coefficient is unlikely to be driven by the reform, given that employment is growing over time for sit-down restaurants while it is capped for small firms. The remaining coefficients reported in Panel C. of Table 2 are very similar to the ones found in the main analysis. Column (3) shows that the cost per employee increased by 3.8 percent, whereas columns (4) and (5) show that the coefficients for the cost of material goods and profits increased by 6.2 and 30 percent respectively. Importantly, our analysis also reveals a positive trend in the log-difference between the price of sit-down restaurant meals and the price of the remaining goods and services sold in France in the years prior to the reform.[13]

FULL SAMPLE. — The main analysis of this paper uses a sample of firms with information on the number of employees. The main advantage of restricting the sample this way is that we can separate the effect of the reform on wages and salaries from changes in employment. While this helps the interpretation of our results, it comes at the cost of reducing the sample size by half. Figure A.6 shows our estimates when including firms which are missing information on employment. The Figure shows that the reform had similar effects on profits for firms missing employment information, confirming that restaurant owners were the main beneficiaries of the VAT cut.

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[13]This result is not reported for brevity but available on request.

V. Are Wages Really Higher?

A. Changes In Hours Worked

We show that the observed change in the cost per employee reflects an increase in the hourly wage rather than an increase in the number of hours worked. While hours worked per week are highly regulated in France, employees are allowed to work supplementary hours in an amount that varies with firm size, the nature of the business and the period of the year. The national legal limit on hours worked is 39 hours per week for restaurant employees, which is higher than the 35 hours per week the other sectors of the economy. Supplementary hours are allowed with the condition that total hours do not exceed 48 per week. It is therefore possible that employees adjusted their hours worked after the reform, and that the increase in the average cost per employee observed is due to increased working hours rather than increased wages.

In order to test for this, we use survey data from the *Enquete Emploi en Continu* (EEC) and estimate dynamic effect coefficients for changes in hours worked using within region and across time variation in hours worked:[14]

$$(5) \quad \log h_{irt} = \gamma \cdot \mathbb{1}\{i \in T\} + \sum_{\nu=-k}^{q} \delta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + X_{irt} + \lambda_t + \omega_r + \epsilon_{irt}$$

where h_{irt} is a measure of the labor intensity of individual i employed in region r in year t, the treatment group T includes all employees of sit-down restaurants, X_{irt} includes individual characteristics, λ_t are year fixed effects, ω_r are region fixed effects, and standard errors are clustered by region. We include age, gender, education, tenure, occupation, marital status, number of employed workers, number of unmarried children living in the household, establishment size, firm size, birth region, and quarter in which the worker was surveyed. The outcome variables we focus on are self-reported measures of the number of hours worked during a reference week (both base and supplementary), as well as the average number of days worked in a given week. Consistent with the limited effect of the reform on output, Figure 3, Appendix Table A.2 and Appendix Figure A.7 show that there was no statistically significant response in the number of hours or days worked after the VAT cut. Using the standard errors from Appendix Table A.2, we can reject, with 95 percent confidence, that hours worked increased by more than 3.5 percent.

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[14]France is divided into 27 administrative regions, which are larger than *départements*, and are the most detailed geographic information contained in the EEC data.

B.   The Effect of the Payroll Subsidy Cut

In this Section we assess the effect of the 2009 payroll subsidy cut on the average cost per employee. The payroll subsidy cut, which also became effective in July 2009, ended a monthly subsidy for which all restaurants and hotels had been eligible since 2004. The subsidy provided relief in amounts that varied based on the employee's wage and the tenure of the firm.[15]

Even though the payroll subsidy expired at the same time the VAT cut was implemented, its effect on employees is likely to have been limited compared to the effects of the VAT cut, mainly because the payroll subsidy was substantially smaller. Payroll subsidies were at most 1,368 euros per employee per year, while the VAT cut was a 14.1 percent reduction in the tax on total value-added. Given that the average value-added in our sample is around 300,000 euros, and that each sit-down restaurant hires six employees on average, it follows that the VAT cut resulted in average savings of 8,200 euros per employee per year.

In order to take into account this additional effect on the cost of employees, we compare the average cost per employee for sit-down restaurants, which were affected by both the VAT cut and the payroll subsidy cut, to the hotel industry, which was affected by the subsidy cut but not by the VAT cut. While this approach potentially mitigates concerns over the effect of the repeal of the payroll subsidy on cost of employees, it is possible that cost of employees in hotels and restaurants responded differently to the reform.[16]

Our control group includes the three sub-sectors of the hotel industry eligible for the payroll subsidy: (a) hotels and similar accommodation, (b) holiday and other short-stay accommodations and (c) camping grounds and recreational vehicle parks. We compare the sit-down restaurants to firms in those three sub-sectors using the same specification we used in our main analysis (equation (1)).

Figure A.8 shows that taking into account the effect of removing the hiring subsidy would lower the estimated effect on the average cost per employee. This evidence is consistent with what we show in Panel D. of Table 2, which indicates that the payroll subsidy cut reduced the cost per employee for sit-down restaurants and hotels (which are classified as market services) in the pre-reform period. Therefore, a conservative interpretation is that we are estimating an upper bound on the effect of the VAT cut on the cost of employees.

C.   Incentive to Reclassify Profits as Wages

It is also unlikely that the average cost per employee increased as a result of sit-down restaurant owners paying higher wages to themselves. This is unlikely because restaurant owners in France are primarily self-employed, and it is more beneficial for self-employed individuals to declare income in the form of profits, an

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[15]See Appendix Section 2 for details on the payroll subsidy program.
[16]See appendix A.A2 of the paper for a more detailed discussion of the payroll subsidy.

incentive that the VAT cut did not change. Restaurants in France are considered part of the *artisans, commercants et industriels* (craftsmen and traders) sector and are subject to a specific tax regime, under which the tax on firm owners is lower than the tax on employees. Profits in this sector, from which firm owners pay themselves, are called *revenue mixte* by the fiscal authority and are treated as a mix of wage and profit income. The *revenue mixte* is subject to the sum of income tax and an *artisans, commercants et industriels* specific payroll tax rate, which is lower than the regular payroll tax rate paid by employees because firm owners do not contribute to (and are therefore not eligible for) unemployment insurance. Appendix Tables A2 and A3 show the payroll tax rates for owners versus employees of restaurants, and the breakdown of these taxes is included in Appendix Tables A4 and A5. The tax rates are systematically higher for employees. Hence restaurant owners would have no tax incentives to reduce firm profits and increase their own wages and salaries.

VI. Welfare Analysis

A.   Theory

In this Section we build on the theoretical framework of Auerbach and Hines (2002) and develop a formula that allows us to empirically estimate the share of the consumption tax falling on consumers, employees, firm owners and sellers of material goods. The framework defined in Auerbach and Hines (2002) shows that while the marginal excess burden created by an increase in consumption taxes can be of first order significance if a tax is already in place, the first order welfare effect of the tax A is given by the change in the revenue collected keeping quantities fixed and is a reasonable approximation for the total welfare effect of the tax.[17] This framework offers a reasonable approximation of the incidence of the reform we consider in this paper given that, as documented above, the reform did not have large effects on output and employment in the restaurant industry.

Figure 4 illustrates the effect of a VAT cut on consumers. To help intuition, panel a. shows a scenario in which supply is perfectly elastic and prices faced by consumers decrease by exactly the amount of the tax change, that is $p_1 = p_0 + \Delta\tau$. The change in total revenue produced by the tax equals A-D, with A being the loss in revenue on the quantity sold before the reform, and D being the revenue collected on the additional units sold as the tax is lowered. Given that the deadweight loss decreases by $C+D$ with the tax cut, the overall welfare effect of the tax equals $A+C$, where A is first-order and C is second-order. In our analysis, we are assigning shares of the first order welfare effect of the tax to

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[17]While the framework defined in Auerbach and Hines (2002) is mostly suited to studying differential changes in taxes and prices, the change in revenue holding quantities fixed is a better approximation of the total welfare effect of the tax than the change in the total revenue collected after the tax change, which would include the extra revenue raised on the units sold previous to the tax change and the revenue loss from the decrease in quantity sold.

consumers, employees, firm owners, and sellers of material goods.

If, as it is the case in panel a. of Figure 4, the price cut observed after the reform equals the pre-reform price plus the tax change ($p_1 = p_0 + \Delta\tau$), then consumers are the only beneficiaries of the tax cut, and the change in tax revenue (holding quantities fixed) corresponds to the first order effect of the tax on consumers. If instead, as shown in panel b. of Figure 4, $p_1 > p_0 + \Delta\tau$, then the effect on consumers (the area $A1+C1$) is smaller than the change in tax revenue, and some of the tax cut (the area $A2 + C2$) is distributed to employees, sellers of material goods and firm owners through changes in wages (w_x), per-unit cost of material goods (c_x) and return to capital (r_x).

It can be shown (Appendix Section D) that in a competitive market the first order welfare effect of the tax is equal to the sum of the extra revenue collected on the pre-reform value-added and the extra revenue collected from the increase in value-added produced by the change in the price of output and material goods:

$$(6) \qquad d\tau[Xp_x - c_x M_x] + \tau[Xdp_x - M_x dc_x] = \\ Xdp_x + L_x(-dw_x) + K_x(-dr_x) + M_x(-dc_x)$$

where X is ouput produced, M_x is the quantity of material goods, L_x is labor employed and K_x is capital used in the production process. This expression can be rearranged to show that the welfare effect of the VAT cut is split between the suppliers of capital, labor and sellers of material goods. The relative benefit of the tax cut on consumers, employees, capital owners and sellers of material goods can be decomposed as follows:

$$(7) \qquad \underbrace{\frac{d\ln p_x}{\Omega}}_{\text{Share on Consumers}} - \underbrace{\gamma\frac{d\ln w_x}{\omega}}_{\text{Share on Employees}} \\ - \underbrace{(1 - \gamma - \delta)\frac{d\ln r_x}{\Omega}}_{\text{Share on Capital Owners}} - \underbrace{\delta\frac{d\ln c_x}{\Omega}}_{\text{Share on Sellers of Material Goods}} = 1$$

where $\Omega = d\tau(1 - \delta) + \tau(d\ln p_x - \delta d\ln c_x)$, which scales the shares so that they add to one. This formula shows that the incidence on each group depends on the percent change of the relevant factor price, and on the share of total sales going to that group before the tax cut. For example, the share of the VAT cut going to employees depends on the percent change in wages ($d\ln w_x$) and on the ratio between the cost of employees and total sales γ. The next Section brings together the theoretical framework and the reduced-form estimates of our main analysis.

B. Results

In this Section we compute the incidence of the VAT cut on consumers, employees, sellers of material goods and firm owners. Table 3 shows our incidence estimates, and focuses on three time horizons, which correspond to the normal firms' balance sheet closing dates (December of 2009, 2010 and 2011). These three time horizons help create an overlap between firm balance sheet information and the monthly price data. We denote the short-run as 6 months after the reform (December 2009), the medium-run as 18 months after the reform (December 2010), and the long-run as 30 months after the reform (December 2011). December 2011 is a reasonable choice for our longest time horizon because a new VAT reform was implemented on January 1, 2012, when the VAT rate on all restaurants was raised from 5.5 to 7 percent.

To implement equation (7) empirically, we need information on the percent changes in p_x, w_x, c_x and r_x, as well as the sales share going to employees, sellers of material goods and firm owners. We use the estimated η_ν for the cost per employee, the cost of material goods and the return on total assets to approximate $d\ln w_x$, $d\ln c_x$ and $d\ln r_x$, and the log-differences in prices shown in panel b. of Figure 1 as an estimate for $d\ln p_x$. Using the percent change in the return on total assets as the empirical counterpart of the average return to capital $d\ln r_x$ is reasonable because the return on total assets is a measure of the income generated by all of a company's assets, which include investment financed by either issuing debt or equity assets.[18] Given that capital K is a measure of all capital used in the production process, and our welfare analysis assumes perfectly competitive markets, the return on total assets is a reliable measure of both the average and marginal return on total capital.

We compute the sales share going to employees, sellers of material goods and firm owners by dividing each firm's cost of employees and cost of material goods by its total sales in the pre-reform year 2008. We then estimate the average share of sales revenue going to workers ($\gamma = 0.39$) and to sellers of material goods ($\delta = 0.32$). The share of sales going to capital owners is the residual share $(1 - \gamma - \delta) = 0.29$.

SHORT-RUN INCIDENCE. — The short-run incidence of the reform is measured in December 2009, six months after the reform. Panel A. of Table 3 shows that the VAT cut increased the return on total assets by 19.4 percent between June and December 2009. While the number of employees did not change significantly with the reform, we show that the cost of employees and the cost of materials both increased 6 months after the VAT reform, but less than the return on total assets. On average, the cost of employees went up by 1.1 percent and the cost of

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[18]See Brainard et al. (1980) and Gilchrist and Himmelberg (1998) for an overview of how to measure the return to capital empirically, and Damodaran (2007) for a review of accounting measures of return to capital.

materials increased by 4.4 percent. These estimates, which are weighted by the 2008 sales share, imply that the VAT cut largely benefited sit-down restaurant owners. We estimate that 57.7 percent of the incidence was on restaurant owners, as opposed to 4.1 on employees and 14.4 on sellers of material goods.

Surprisingly our estimates also suggest that 23.7 percent of the short-run incidence of the tax fell on consumers. There is one main reason why this result is likely an upper bound on the incidence on consumers. Our analysis combines national price data with balance sheet information from a subset of firms sampled in the Amadeus data: if changes in prices for firms not reported in Amadeus is smaller than that of the firms we consider, then our estimated incidence on consumers is larger than it is in the population. While we would need firm-level price data to address this point fully, smaller firms being less likely to cut prices is consistent with the evidence provided by Harju, Kosonen and Nordström Skans (2017).

MEDIUM-RUN INCIDENCE. — The medium-run impact of the reform reflects the effect of the tax 18 months after the reform, in December 2010. Panel B. of Table 3 shows that the cost of employees increased by 4.9 percent relative to 2008, a larger increase if compared to the short-run effect on the same outcome. On the other hand, cost of materials increased by 4.2 in the medium-run, a number that is comparable to the one estimated for the same outcome in the short-run. The benefit to consumers is smaller in the medium-run than it was in the short-run. The lower incidence on consumers relates to the medium-run increase in the price of sit-down meals, as shown in Figure 1, which is consistent with Lafféter and Sillard (2014).

Firm owners were again the main beneficiaries of the tax cut 18 months after the reform, sharing 62.4 percent of the benefit from the VAT cut. Even though the share of the VAT cut going to employees (12.8 percent of the total) was higher 18 months after the reform than it was 6 months after the reform, partly because wages are likely to take some time to adjust, the share of the VAT cut going to sellers of material goods (8.7 percent of the total) and consumers (16.1 percent of the total) both decreased in the medium-run, contributing to the increased benefit to restaurant owners.

LONG-RUN INCIDENCE. — Panel C. of Table 3 shows that in December 2011 (two and a half years after the VAT cut) the share of the burden on employees and sellers of material goods increased to 18.6 and 12.1 percent respectively. On the other hand, given the increase in the price of sit-down restaurant meals relative to the price of non-restaurant services, the benefit to consumers further decreased (to 13.6 percent) in the long-run. As a result, sit-down restaurant owners were still the main beneficiaries of the VAT cut 30 months after the reform: we estimate that 55.7 percent of the VAT cut went to sit-down restaurant owners.

Incidence using Counterfactual Price Series. — Prices of sit-down restaurant meals increased in the months preceding the reform. Interpreting this as an anticipatory effect, we construct a counterfactual price series in panel b. of Figure 1. Using this counterfactual price series, the benefit of the VAT cut on consumers would be even lower and the benefit to restaurant owners would be larger. Our incidence estimates shown in the last column of Table 3 indicate that in this case only 11.4 percent of the VAT cut would go to consumers in the medium-run and 8.3 percent in the long-run, further increasing the benefit to restaurant owners.

VII.   Conclusion

In this paper, we use a large VAT cut in France to augment and nuance the standard consumption tax incidence model. Differently from previous papers in the literature, our results provide important insights on the distributional effects of consumption tax cuts, taking into account the effect on employees and sellers of material goods. We find that : (1) firm owners pocketed more than 55 percent of the VAT cut (2) consumers, sellers of material goods and employees shared the remaining windfall with consumers benefitting the least.

Our paper also raises important policy implications regarding the use of temporary VAT cuts to stimulate demand. Such policies have been implemented in several countries with the goal of reducing prices in order to increase demand. Given how expensive these policies are, understanding who really benefits from them is important. Our results show that these policies do not have the intended effects as VAT cuts are barely passed through to prices. Instead, VAT cuts tend to benefit firm owners with limited "trickle down" to consumers or employees.

a. Price of Sit-Down Meals

b Log-Difference in Prices and Counterfactual

c. Sit-Down Restaurants, Volume

d. Sit-Down Restaurants, Revenue Net of Tax
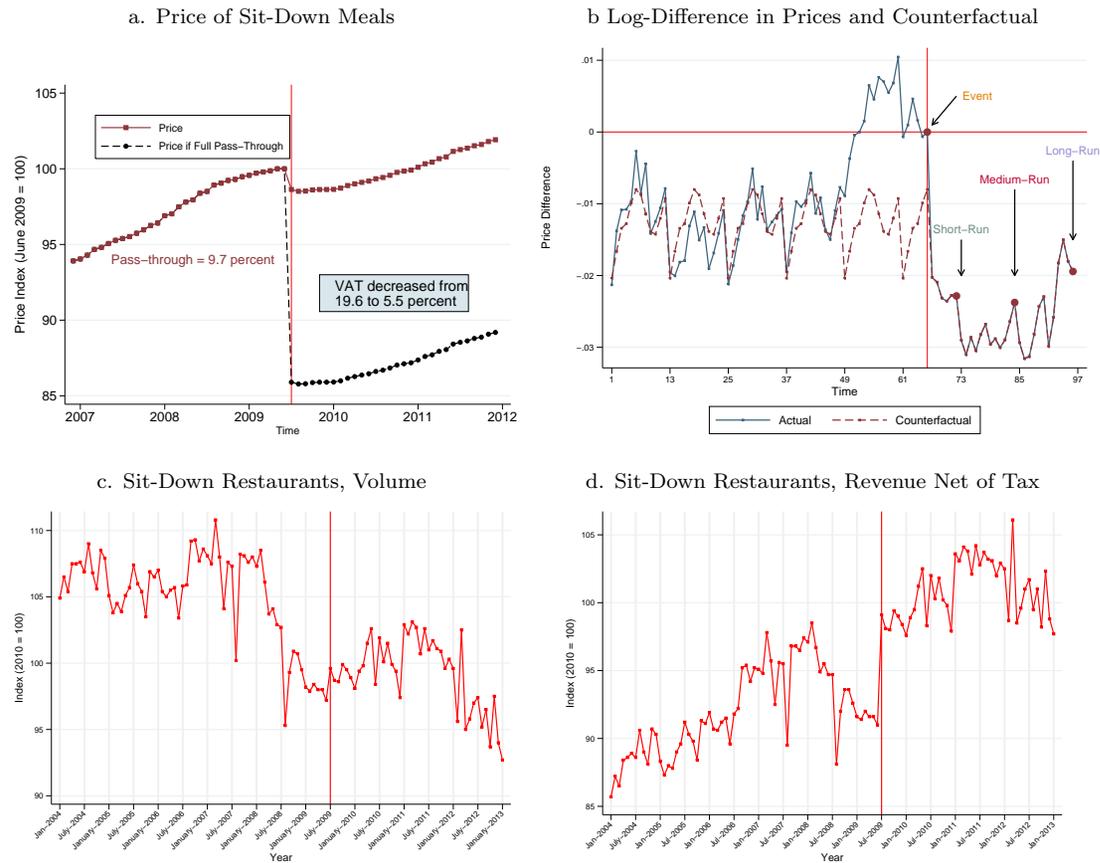
Figure 1. : Effect of VAT Cut on Prices and Quantities

Note: In panel a. the counterfactual price under full pass-through is computed assuming a 14.1 percent decrease in prices, equal to the level drop in the VAT rate from 19.6 to 5.5 percent. Panel b. is based on authors' computations using Eurostat data and shows the log-difference between the price of sit-down restaurant meals and the price of non-restaurant market services. The price of market services is computed as a weighted average of Eurostat price data using weights provided by Eurostat. Price series are seasonally adjusted using monthly dummies. Panel b. also shows possible anticipatory behaviors prior to the VAT cut by plotting a counterfactual log-difference in prices. The counterfactual is constructed from fitting the price change in the period January 2004-December 2007 on an eighth order polynomial of the month variable. Panels c and d show aggregate data on the volume and value of goods sold by sit-down restaurants and collected by the INSEE. The value of goods is measured using VAT-exclusive prices (producer prices).

a. Cost of Employees   b. Number of Employees   c. Cost per Employee

d. Cost of Material Goods   e. Profits   f. Return on Total Assets
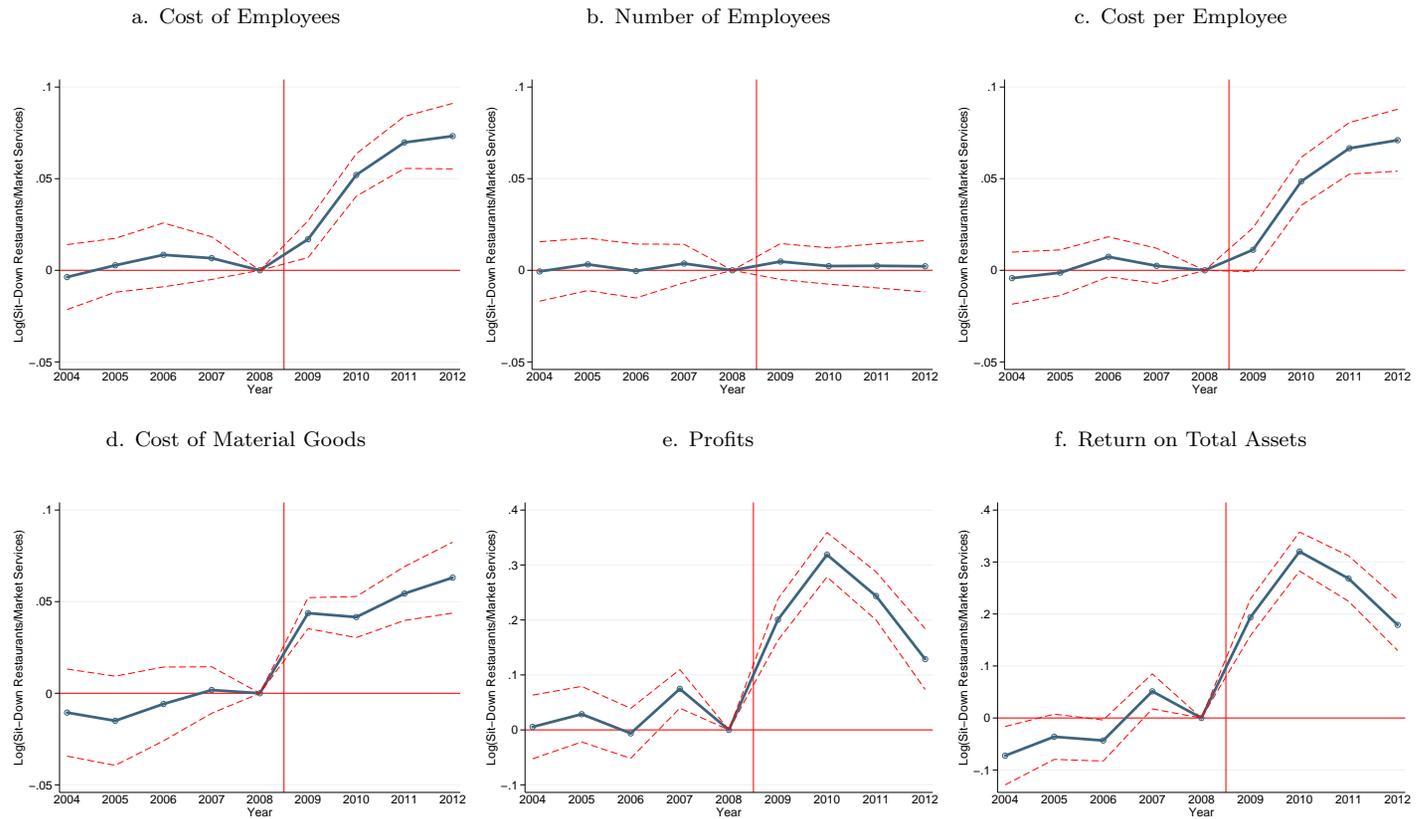
Figure 2. : Dynamic Effects of the VAT Cut: Sit-Down Restaurants vs. Market Services

Note: The Figure shows event-time coefficients estimated from: $\log Y_{idt} = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where k are leads and lags, where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. The treatment group T includes sit-down restaurants, while the control group includes firms in non-restaurant market service sectors. The dashed lines are 95 percent confidence intervals.

a. Total Hours

b. Days Worked

Figure 3. : Hours and Days Worked during Reference Week: Event-Time Estimates

Note: The Figure shows the dynamic effects of the VAT cut on hours worked using the following specification: $\log h_{irt} = \gamma \cdot \mathbb{1}\{i \in T\} + \sum_{\nu=-k}^{q} \delta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + X_{irt} + \lambda_t + \omega_r + \epsilon_{irt}$, for worker i employed in region r in year t. the treatment group T includes all employees of sit-down restaurants, while the control group includes employees of non-restaurant market service sectors. We also include year fixed effects λ_t, region fixed effects ω_r and employees' individual characteristics X_{irt} (age, gender, education, tenure, occupation, marital status, number of employed workers, number of unmarried children living in the household, establishment size, firm size, birth region, and quarter in which the worker was surveyed). Standard errors are clustered by region and 95 percent confidence intervals are displayed.

a. Perfectly Elastic Supply

Welfare Effect on
Consumers = A+C

Price

p_0

A

C

$p_0 + \Delta\tau$

0

1'   1

B

D

E

p_{notax}

Marshallian Demand

Hicksian Demand

x_0 x_1 x_{notax}

Quantity

b. Inelastic Supply

– Welfare Effect on
Consumers = A1+C1

Price

p_0

0

A1   C1

– Welfare Effect on
Producers = A2+C2

p_1

1'   1

A2   C2   C3

Marshallian Demand

$p_0 + \Delta\tau$

B   D   E

p_{notax}

Hicksian Demand

x_0 x_1 x_{sp} x_{notax}

Quantity

Figure 4. : Welfare Effect of VAT Cut

Note: In these two Figures p_0 is the price of the good before the VAT cut, $p_0 + \Delta\tau$ is the price of the good after the VAT cut if there is full pass-through to prices, and p_{notax} is the price of the good absent any tax. Panel a. shows a scenario in which consumer prices decrease by the amount of the tax after the VAT cut, so that $p_1 = p_0 + \Delta\tau$. This is for example the case if supply is perfectly elastic. In this case the welfare effect of the VAT cut on consumers equals the change in tax revenue. Panel b. shows the case with imperfect pass-through of the tax to prices, so that $p_1 > p_0 + \Delta\tau$. This is for example the case if supply is somewhat inelastic, and implies that the welfare effect on consumers is lower than the change in tax revenue. In this case, part of the decrease in tax revenue increases producers' welfare.

Table 1—: Summary Statistics: Sit-Down Restaurants vs. Control Groups for 2004-2012

	Treatment Group: Sit-Down Restaurants	Control Groups	
		Non-Restaurant Market Services	Non-Restaurant Small Firms
	(1)	(2)	(3)
Age	8	13	11
	(6)	(10)	(8)
Profit/Loss before tax	15,611	81,918	13,990
	(6,986)	(15,240)	(7,616)
Operating revenue (Turnover)	412,754	3,180,034	382,496
	(254,998)	(554,004)	(285,628)
Sales	401,668	3,113,092	374,979
	(247,948)	(542,512)	(280,096)
Costs of employees	158,862	447,144	118,825
	(93,784)	(128,561)	(87,366)
Number of employees	6	12	4
	(4)	(4)	(3)
Material costs	119,545	2,038,159	140,050
	(77,027)	(194,470)	(76,497)
Total Assets	268,640	1,746,905	236,929
	(163,382)	(323,412)	(158,469)
Return on Total Assets	4.5	5.5	5.7
	(4.8)	(5.0)	(5.3)
Observations	132,232	997,826	1,737,234

Note: This Table shows summary statistics for the outcomes of interest for treatment and control groups. The Table shows sample means with median values in parenthesis. The sample includes Bureau Van Dijk's Amadeus unconsolidated balance sheets of French firms, and includes observations for which information on employment, the cost of employees, turnover, the cost of materials and profits are not missing. EBIT stands for earnings before interest and tax, while EBITDA stands for earnings before interest, tax, depreciation and amortization; EBIT and EBITDA margins are computed taking the ratios between those measures and turnover.

Table 2—: Mean Impact Estimates of the VAT Cut

	Cost of Employees (1)	Number of Employees (2)	Cost per Employee (3)	Cost of Materials (4)	Before-Tax Profits (5)	Return on Total Assets (6)
A. Main Outcomes of Interest						
After × Sit-Down Restaurant	0.041	0.0017	0.039	0.050	0.24	0.29
	(0.0077)	(0.0065)	(0.0051)	(0.0084)	(0.017)	(0.015)
R^2	0.95	0.95	0.81	0.96	0.81	0.62
Observations	1,019,080	1,020,157	1,019,080	1,011,518	763,172	762,117
B. Controlling for Local Unemployment Rate						
After × Sit-Down Restaurant	0.041	0.0014	0.039	0.050	0.24	0.29
	(0.0074)	(0.0062)	(0.0050)	(0.0087)	(0.017)	(0.015)
Urate$_{dt}$	-0.018	-0.015	-0.0036	0.0063	-0.022	-0.0039
	(0.0039)	(0.0023)	(0.0040)	(0.0092)	(0.0067)	(0.0060)
R^2	0.95	0.95	0.81	0.96	0.81	0.62
Observations	1,019,080	1,020,157	1,019,080	1,011,518	763,172	762,117
C. Using Small Firms As Control Group						
After × Sit-Down Restaurant	0.070	0.031	0.038	0.062	0.30	0.32
	(0.0087)	(0.0078)	(0.0046)	(0.0085)	(0.017)	(0.016)
R^2	0.91	0.88	0.78	0.93	0.68	0.59
Observations	1,257,510	1,258,695	1,257,510	1,249,069	913,688	912,155
D. Controlling For the Payroll Subsidy Cut						
After × Sit-Down Restaurant	0.037	0.015	0.021	0.064	0.14	0.17
	(0.0098)	(0.0076)	(0.0073)	(0.014)	(0.029)	(0.026)
Received Payroll Subsidy	-0.0044	0.014	-0.019	0.015	-0.11	-0.12
	(0.0084)	(0.0065)	(0.0063)	(0.019)	(0.024)	(0.022)
R^2	0.95	0.95	0.81	0.96	0.81	0.62
Observations	1,019,080	1,020,157	1,019,080	1,011,518	763,172	762,117

Note: Panels A. and B. and D. compare sit-down restaurants to non-restaurant market services around the 2009 VAT cut, while panel C. compares sit-down restaurants to small firms. The panels show mean effects estimated using: $\log Y_{idt} = \eta \cdot \mathbb{1}\{i \in T\} \times After + \lambda_t + \omega_i + \epsilon_{idt}$, where Y is the outcome of interest, i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured, $After$ is a dummy variable equal to one in the post-reform period 2009-2011, and λ_t and ω_i are year and firm fixed effects. Additionally, Panel B. includes the unemployment rate of the *département* in which the firm is located as an additional regressor, whereas Panel D. controls for the payroll subsidy cut by including an indicator for having received a payroll subsidy. Standard errors are clustered by *département* and reported in parenthesis.

Table 3—: Incidence of the VAT Reform

| | *Panel A: Short-Run Incidence* | | | | |
| | Main Estimate | | | Counterfactual Price | |
	Outcome Δlog (1)	Weighted Δlog (2)	Incidence Share (3)	Weighted Δlog (4)	Incidence Share (5)
Cost per Employee	0.011	0.004	**4.1**	0.004	**4.5**
Return on Total Assets	0.194	0.056	**57.7**	0.056	**62.9**
Cost of Materials	0.044	0.014	**14.4**	0.014	**15.7**
Prices	-0.023	-0.023	**23.7**	-0.015	**16.9**
	Panel B: Medium-Run Incidence				
	Main Estimate			Counterfactual Price	
	Outcome Δlog	Weighted Δlog	Incidence Share	Weighted Δlog	Incidence Share
Cost per Employee	0.049	0.019	**12.8**	0.019	**13.5**
Return on Total Assets	0.320	0.093	**62.4**	0.093	**65.9**
Cost of Materials	0.042	0.013	**8.7**	0.013	**9.2**
Prices	-0.024	-0.024	**16.1**	-0.016	**11.4**
	Panel C: Long-Run Incidence				
	Main Estimate			Counterfactual Price	
	Outcome Δlog	Weighted Δlog	Incidence Share	Weighted Δlog	Incidence Share
Cost per Employee	0.067	0.026	**18.6**	0.026	**19.7**
Return on Total Assets	0.268	0.078	**55.7**	0.078	**59.1**
Cost of Materials	0.054	0.017	**12.1**	0.017	**12.9**
Prices	-0.019	-0.019	**13.6**	-0.011	**8.3**

Note: Column (1) shows reduced form coefficients estimated using the following specification: $\log Y_{idt} = \eta \cdot \mathbb{1}\{i \in T\} \times After + \lambda_t + \omega_i + \epsilon_{idt}$, where Y is the outcome of interest, i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured, $After$ is a dummy variable equal to one in the post-reform period 2009-2011, and λ_t and ω_i are year and firm fixed effects. The short-run incidence analysis uses η_{2009}, the medium-run incidence η_{2010}, and the long-run incidence η_{2010}. Estimates for the percent change in prices uses Eurostat price data and is computed from the log-difference in prices between sit-down restaurants and non-restaurant market services in December 2009 (short-run), December 2010 (medium-run) and December 2011 (long-run). Column (2) weighs the reduced form estimates from column (1) by the sales shares of the cost of employees (0.39), the cost of materials (0.32) and the residual share (0.29) in 2008. Column (3) shows incidence shares computed by summing the absolute value of the weighted coefficients in column (2) and dividing the absolute value of each weighted coefficient by that total. Columns (4) and (5) report weighted coefficients and incidence shares when using a counterfactual price series, which takes into account the possibility of anticipatory behavior prior to the VAT cut.

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APPENDIX FOR ONLINE PUBLICATION

Appendix

A1. Contrat D'Avenir Details

The Sarkozy government signed the *Contrat D'Avenir* in April 2009, at the time of the restaurant VAT reform we are analyzing. The contract was not binding and only involved unionized restaurants, which represent approximately 50 percent of the restaurant industry.

The goal of the contract was to give directives on how to allocate the surplus created by the reduction in the VAT rate. These directives involved four broad categories: employment; prices; investments and modernization of the restaurant sector; and work conditions and social dialogue.

The price directives depended on the type of restaurant:

- Sit-down restaurants were encouraged to reduce prices by 11.8 percent for 7 out of the 10 following items: appetizer, entree (meat or fish), daily special, dessert, appetizer-entree menu, entree-dessert menu, kid's menu, soda or fruit juice, mineral water, coffee, tea or herbal tea. In case a restaurant did not sell at least seven of these products, it could also reduce prices by 11.8 percent for products that represent more than one third of total turnover, excluding alcoholic drinks.

- Although no tax reduction was enacted in take-out restaurants, the government instructed them to reduce price for their reference menus by 5 percent.

- Cafes and juice bars: a full incidence of the VAT reduction on the price.

The employment directives aimed to create 40,000 jobs over two years in addition to the 15,000 jobs that are created in the restaurant industry every year on average.

The work conditions and social dialogue directives aimed to broadly improve remuneration (for example, faster salary increases over the years), health coverage and training, and to reduce the use of illegal workers.

Finally, the modernization directive aimed at improving employee and customers' safety (including better hygiene), increasing customers' comfort (for example through the purchase of better tables and chairs), the acquisition of environmentally friendly equipment, the renewal of electronic equipment, and increasing the size of the restaurants.

A report by the *Ministere de l'Artisanat, du Commerce et du Tourisme*[19] attempts to analyze whether these directives were achieved. A significant issue they

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[19]Ministry of Craft, Commerce and Tourism.

struggle with is that no clear measures were established ex-ante. For example, the price drops the directives suggest are not given a time frame making it hard to assess.

It is worth re-emphasizing that these measures were not binding and were not enforced by the government.

A2. *2004-2009 Payroll Tax Reductions*

This government subsidy program, targeting the *Hotels Cafés et Réstaurants* (HCR) industry, was implemented in 2004 as a temporary measure to help restaurants before the introduction of the VAT cut in 2009. The 2004-804 Law established that firms operating in the HCR sector are eligible for an employment subsidy, initially available for one year and a half. In addition, the 2004-1239 Decree approved on November 22, 2004 defined the criteria for the implementation of the subsidy. The subsidy was subsequently extended to the period 2006-2008 by the 2005-1719 Law (December 30, 2005), the 2006-1666 Law (December 21, 2006) and the 2007-1822 Law (December 24, 2007), with small changes relative to the original measures. In July 2009, the 2009-888 Law abolished the subsidy, as the VAT cut from 19.6 to 5.5 percent became effective.

Table A1—: Maximum Monthly Subsidy per Full-Time Employee in 2008

	Employee Earning Reference Salary	Employee Earning More than Reference Salary	
		Existing Establishments	New Establishments
	(1)	(2)	(3)
Hotels and similar accommodation (55.10Z)[a]	114.4	114.4	28.6
Holiday and other short-stay accommodation (55.20Z)	114.4	114.4	57.2
Camping grounds and recreational vehicle parks (55.30Z)	114.4	114.4	28.6
Sit-down restaurants (56.10A)	180	180	180
Cafeterias and other self-service catering (56.10B)	180	180	180
Fast food restaurants (56.10C)	114.4	67.925	67.925
Event catering activities (56.21Z)	114.4	114.4	57.2
Beverage serving activities (56.30Z)[b]	114.4	90	90

Note: Reference salary is defined as the minimum wage (SMIC) from 2004 to 2007 and the SMIC plus 3 percent after 2007. Existing establishments have been open for more than a year, while new establishments have operated for a year or less. All amounts are expressed in euros.
(a) Different amounts apply to the sub-category *Hôtels touristiques avec restaurant*. In this case a new firm hiring an employee earning more than the reference salary gets up to 90 euros.
(b) Both existing and new bowling alleys and casinos receive 28.6 euros for each worker earning more than the reference salary, while both existing and new discos receive 71.5 euros for each worker earning more than the reference salary.

Subsidies under this program could not be claimed for the following categories of workers:

- All young workers below 18 years old, who already receive a subsidy of 10-20 percent.

- Employees hired under one of these contracts: (a) *contrat jeune en entreprise*, (b) *contrat initiative emploi*, (c) *contrat d'apprentissage*, (d) *contrat d'insertion RMA*, (e) *contrat de l'aide dégressive a l'employeur (ADE)*, (f) *contrat d'accès a l'emploi dans les DOM*.

- Employees for which the employer claims the minimum wage (SMIC) in the hotel industry.

- Employees working in the following sub-industries: *hébergements non touristiques* (NAF 55.2 F), *cantines et restaurants d'entreprise* (code NAF 55.5A) and *restauration collective sous contrat* (NAF 55.5 C)

Though these subsidies were industry-specific, restaurants also received government subsidies that applied to all industries, and that were not abolished in 2009. These included subsidies on contributions paid (*allègements de cotisations sociales*) established by the January 2003 Fillon law, which could be received on top of the industry specific subsidies, and subsidies for firms operating in economically depressed geographic areas,[20] which a firm could not receive if it claimed the industry specific subsidies. Finally, subsidies received by each firm could not be larger than 200,000 euros over three years, as established by European rules on government subsidies.

A3. Employment Contract types

INDETERMINATE LENGTH CONTRACT. — Indeterminate Length Contracts (*Contrats a Duree Inderterminee*) do not have a specific expiry date. Workers are employed for an undetermined length of time. Termination occurs if workers decide to quit, if they are fired or if they retire. If workers are fired, employers are expected to pay them a severance pay. This type of contract usually starts with a 4-month trial period during which the contract can be terminated at no cost.

DETERMINATE LENGTH CONTRACT. — Determinate Length Contracts (*Contrats a Duree Derterminee*) have a specific expiry date after which the contract is terminated unless it is renewed for an additional period of time or if the contract is transformed into an Indeterminate Length Contract. It is estimated that there were 2,250,002 such contracts in 2009.

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[20]These include the *Zones Franches Urbaines (ZFU)*, the *Zones de Revitalisation Rurale (ZRR)* and the *Zones de Redynamisation Urbaine (ZRU)*

A4.   Payroll Tax Rates

Table A2—: *Revenue Mixte* Scheme.

Annual Income Threshold	Total Rate
27,459	44.20%
37,546	47.70%
39,228	48.70%
43,150	31.30%
54,919	32.15%
156,912	30.00%
196,140	22.00%
Above 196,140	21.30%

Note: This Table reports the breakdown by income bracket of the *Revenue Mixte* scheme which is the tax restaurant owners have to pay on profits.

Table A3—: Payroll Taxes for Restaurant Wage Earners (Inclusive of Employer Share).

Annual Income Threshold	Total Rate
7,721	71.03%
15,417	75.28%
39,732	80.38%
152,279	69.28%
158,928	75.68%
317,856	73.42%
Above 317,856	32.87%

Note: This Table reports the breakdown by income bracket of the payroll tax burden of restaurant employees, it includes both the employer and the employee share.

Table A4—: Breakdown of the *Revenue Mixte* Scheme

Name of Fund	Income	Rate	Name of Fund	Income	Rate
CSG			AGGF tranche B		
	All income	7.5%		above 39,732 and below 158928	2.2%
CRDS			Arrco tranche 1		
	All income	0.5%		below 39,732	7.75%
Contribution solidarite autonomie			Agirc tranche B		
	All income	3%		above 39,732 and below 158928	20.55%
Assurance maladie			Agirc tranche C		
	All income	13.59%		above 158,928 and below 317,856	20.55%
Assurance vieillesse plafonne			Assurance Dcs		
	below 39,732	15.45%		below 39,732	1.5%
Assurance vieillesse dplafonne			Apec		
	All income	2.3%		Below 158,928	0.06%
Allocations Familiales			CET		
	All income	5.25%		Below 317,856	0.35%
Aide au Logement			Taxe d'apprentissage		
	below 39,732	0.1%		All income	0.73%
Cotisation Chomage			Taxe sur les salaires		
	below 158,928	6.4%		Below 7,721	4.25%
Fond de garantie des salaires				From 7,721 to 15,417	8.5%
	below 158,928	0.3%		From 15,417 to 152,279	13.6%
AGGF tranche A				Above 152,179	20%
	below 39,732	2%			

Note: This Table reports the breakdown of payroll taxes borne by restaurant employees (both the employer and employee share) by fund and specifies the tax rate for each income bracket.

Table A5—: Breakdown of Payroll Taxes for Restaurant Employers

Name of Fund	Income	Rate
Maladie - Maternite		
	below 27,459.60	3%
	above 27,459.60	6.5%
Indemnites journalieres		
	below 196,140	0.7%
Allocations Familiales		
	below 43,150.80	0%
	between 43,150.80 and 54,919.20	2.15%
	above 54,919.20	0%
CSG		
	All income	8%
CRDS		
	All income	6.2%
Retraite de base		
	below 39,228	17.75%
	above 39,228	0.6%
Retraite complementaire		
	below 37,546	7%
	between 37,546 to 156,912	8%
Invalidite - deces		
	between 0 and 43,150.80	1.3%
Formation professionnelle		
	below 39,228	0.25%

Note: This Table reports the breakdown of payroll taxes borne by restaurant owners as part of the *revenue mixte* scheme by fund and specifies the tax rate for each income bracket.

Additional Robustness Checks

B1.   Weighting

While weighting does slightly change the magnitude of the estimated coefficients in equation (1), reducing the incidence of the tax on employees and sellers of material goods, we believe that un-weighted estimates are preferable for our analysis. First they are more likely to reflect the average response of a firm in the economy. Given that 90 percent of sit-down restaurants have less than ten employees (and a within group average of 4 employees per firm) while the remaining 10 percent hires around 19 employees per firm, weighting by number of employees would increase the weight on the medium-sized and large firms. Second, very small firms are under-represented in AMADEUS, meaning that our estimates already assign higher weight to firms that are larger than the population average. Weighting by number of employees would exacerbate this problem.

B2.   Other Restaurants

While other restaurants (which includes both cafes and other self-service catering (56.10B) and take-away restaurants (56.10C)) would also seem at first glance to be an appealing control group because it has similar characteristics to the sit-down restaurants sector and was not affected by the VAT reform, we do not consider it in our analysis. First, from a consumer perspective, it is likely that sit-down restaurants and other restaurant services are highly substitutable. Therefore, when sales increase in one sector, they probably decrease in the other sector as consumers move from one to the other. Second, from a producer perspective, *other restaurants* might react to price changes in sit-down restaurants by adjusting their own prices in the same direction. Finally, there is a large pre-trend in the difference between prices of sit-down restaurant meals and goods consumed in *other restaurants*, which makes it an unappealing control group.

DATA APPENDIX

C1. *Definition of Market Services*

Following level 1 of the French NAF Rev.2 industry classification and the official definition from the French National Institute of Statistics and Economic Studies (INSEE), this group includes: wholesale and retail trade, repair of motor vehicles and motorcycles (Section G), accommodation service activities (division 55 in Section I), information and communication (Section J), financial and insurance activities (Section K), real estate activities (Section L), professional, scientific and technical activities (Section M) and administrative and support service activities (section N).

Market services does not include services that are either non-marketable or subsidized by the government such as transportation and storage (section H), public administration and defense, compulsory social security (section O), education (section P), human health and social work activities (section Q), arts, entertainment and recreation (section R), and other services (section S).

C2. *Goods Produced in Market Services*

Table C1—: Services Included in Price Index for Market Services

COICOP Code	Description
03.1.4	Cleaning, repair and hire of clothing
04.1.1/2	Actual rentals paid by tenants including other actual rentals
04.3.2	Services for the maintenance and repair of the dwelling
04.4.2	Refuse collection
04.4.3	Sewage collection
04.4.4	Other services relating to the dwelling n.e.c.
05.1.3	Repair of furniture, furnishings and floor coverings
05.3.3	Repair of household appliances
05.6.2	Domestic services and household services
08.1.0	Postal services
08.2/3.0	Telephone and telefax equipment and telephone and telefax services
09.1.5	Repair of audio-visual, photographic and information processing equipment
11.2.0	Accommodation services
12.5.2	Insurance connected with the dwelling
12.5.3	Insurance connected with health
12.5.4	Insurance connected with transport
12.5.5	Other insurance
12.6.2	Other financial services n.e.c.
12.7.0	Other services n.e.c.

Note: This Table reports COICOP codes used by Eurostat to describe price categories included in the service sector and categorized as market services by the INSEE.

Table C2—: Services Excluded from Price Index for Market Services

COICOP Code	Description
06.2.1/3	Medical and paramedical services
06.2.2	Dental services
06.3.0	Hospital services
07.2.3	Maintenance and repair of personal transport equipment
07.2.4	Other services in respect of personal transport equipment
07.3.1	Passenger transport by railway
07.3.2	Passenger transport by road
07.3.3	Passenger transport by air
07.3.4	Passenger transport by sea and inland waterway
07.3.5	Combined passenger transport
07.3.6	Other purchased transport services
09.2.3	Maintenance and repair of other major durables for recreation and culture
09.4.1	Recreational and sporting services
09.4.2	Cultural services
09.6.0	Package holidays
10.X.0	Pre-primary and primary, secondary, post-secondary non-tertiary, tertiary education, and education not definable by level
11.1.1	Restaurants, cafes and the like
11.1.2	Canteens
12.1.1	Hairdressing salons and personal grooming establishments
12.4.0	Social protection

Note: This Table reports COICOP codes used by Eurostat to describe price categories included in the service sector but excluded from the market services definition used by INSEE.

Technical Appendix

In equilibrium, total after-tax firm revenue equals total income, that is:

$$(1 - \tau)(p_x X - c_x M_x) = w_x L_x + r_x K_x$$

By the envelope theorem, we have:

$$(1 - \tau)p_x dX = w_x dL_x + (1 - \tau)c_x dM_x + r_x dK_x$$

In this case the first order effect of the tax is given by:

$$X d(\tau p_x) - c_x M_x d\tau - \tau M_x dc_x = X dp_x + L_x(-dw_x) + K_x(-dr_x) + M_x(-dc_x)$$

from which:

$$\frac{X dp_x}{X d(\tau p_x) - c_x M_x d\tau - \tau M_x dc_x} - \frac{L_x dw_x}{X d(\tau p_x) - c_x M_x d\tau - \tau M_x dc_x} -$$
$$- \frac{K_x dr_x}{X d(\tau p_x) - c_x M_x d\tau - \tau M_x dc_x} - \frac{M_x dc_x}{X d(\tau p_x) - c_x M_x d\tau - \tau M_x dc_x} = 1$$

Given the Cobb-Douglas production function, we have $\gamma = \frac{w_x L_x}{p_x X}$, $\delta = \frac{c_x M_x}{p_x X}$ and $(1 - \gamma - \delta) = \frac{r_x K_x}{p_x X}$. It follows that:

$$\underbrace{\frac{d \ln p_x}{d\tau(1 - \delta) + \tau(d \ln p_x - \delta d \ln c_x)}}_{\text{Share on Consumers}} - \gamma \underbrace{\frac{d \ln w_x}{d\tau(1 - \delta) + \tau(d \ln p_x - \delta d \ln c_x)}}_{\text{Share on Employees}}$$
$$- (1 - \gamma - \delta)\underbrace{\frac{d \ln r_x}{d\tau(1 - \delta) + \tau(d \ln p_x - \delta d \ln c_x)}}_{\text{Share on Capital Owners}} - \delta \underbrace{\frac{d \ln c_x}{d\tau(1 - \delta) + \tau(d \ln p_x - \delta d \ln c_x)}}_{\text{Share on Sellers of Material Goods}} = 1$$

Appendix Tables and Figures

Table A.1—: Mean Impact Estimates of the VAT Cut: Extensive Margin

	Cost of Employees (1)	Number of Employees (2)	Cost per Employee (3)	Cost of Materials (4)	Before-Tax Profits (5)	Return on Total Assets (6)
A. Main Estimates						
After × Sit-Down Restaurant	0.00019		0.00019	-0.00039	0.091	0.092
	(0.00021)		(0.00021)	(0.00028)	(0.0043)	(0.0043)
R^2	0.59		0.59	0.61	0.49	0.49
Observations	1,020,157		1,020,157	1,020,157	1,020,157	1,020,157
B. Controlling for Local Unemployment Rate						
After × Sit-Down Restaurant	0.00019		0.00019	-0.00039	0.091	0.091
	(0.00021)		(0.00021)	(0.00028)	(0.0042)	(0.0042)
Urate_{dt}	0.00017		0.00017	-0.00011	-0.0080	-0.0079
	(0.000094)		(0.000094)	(0.00031)	(0.0024)	(0.0024)
R^2	0.59		0.59	0.61	0.49	0.49
Observations	1,020,157		1,020,157	1,020,157	1,020,157	1,020,157
C. Using Small Firms as Control Group						
After × Sit-Down Restaurant	0.00027		0.00027	-0.00097	0.11	0.11
	(0.00021)		(0.00021)	(0.00024)	(0.0038)	(0.0038)
R^2	0.59		0.59	0.60	0.45	0.45
Observations	1,258,695		1,258,695	1,258,695	1,258,695	1,258,695

Note: Panels A. and B. compare sit-down restaurants to non-restaurant market services around the 2009 VAT cut, while panel B. compares sit-down restaurants to small firms. The panels shows mean effects estimated using: $I_{Y_{idt}>0} = \eta \cdot \mathbb{1}\{i \in T\} \times After + \lambda_t + \omega_i + \epsilon_{idt}$, where $I_{Y>0}$ is the an indicator function for the outcome of interest being positive, i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured, *After* is a dummy variable equal to one in the post-reform period 2009-2011, and λ_t and ω_i are year and firm fixed effects. Additionally, Panel B. includes the unemployment rate of the *département* in which the firm is located as an additional regressor. Standard errors are clustered by *département* and reported in parenthesis.

Table A.2—: Hours Worked: Sit-Down Restaurants vs. Non-Restaurant Market Services

	Panel A: Total Hours			
	(1)	(2)	(3)	(4)
After × Sit-Down Restaurants	-0.012	-0.0084	-0.011	0.0040
	(0.015)	(0.015)	(0.015)	(0.016)
After	0.017	0.048	0.045	0.00080
	(0.0030)	(0.0055)	(0.0052)	(0.0057)
Sit-Down Restaurants	0.029	0.025	0.026**	0.053
	(0.0092)	(0.0094)	(0.0094)	(0.0083)
Year FE	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes
Individual Characteristics	No	No	No	Yes
R^2	0.00031	0.0044	0.012	0.14
Observations	338,331	338,331	338,331	256,464
	Panel B: Days Worked			
	(1)	(2)	(3)	(4)
After × Sit-Down Restaurants	-0.0017	-0.0010	-0.0011	0.0044
	(0.0074)	(0.0075)	(0.0074)	(0.0085)
After	0.0074	0.010	0.010	-0.00091
	(0.0017)	(0.0027)	(0.0026)	(0.0029)
Sit-Down Restaurants	0.046	0.046	0.046	0.045
	(0.0060)	(0.0060)	(0.0060)	(0.0053)
Year FE	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes
Individual Characteristics	No	No	No	Yes
R^2	0.0016	0.0023	0.0034	0.037
Observations	369,660	369,660	369,660	297,502

Note: The Figure shows dynamic effects of the VAT cut on hours and days worked using the following specification: $\log h_{irt} = \gamma \cdot \mathbb{1}\{i \in T\} + \delta \cdot \mathbb{1}\{i \in T\} \cdot After + X_{irt} + \lambda_t + \omega_r + \epsilon_{irt}$, for worker i employed in region r in year t. the treatment group T includes all employees of sit-down restaurants, while the control group includes employees of non-restaurant market service sectors. We also include year fixed effects λ_t, region fixed effects ω_r and employees' individual characteristics X_{irt} (age, gender, education, tenure, occupation, marital status, number of employed workers, number of unmarried children living in the household, establishment size, firm size, birth region, and quarter in which the worker was surveyed). Standard errors are clustered by region and reported in parenthesis. Pre-treatment period is 2004-2008, while the post-treatment period includes 2009-2011.

Table A.3—: Approximation Error

	Short-Run: 6 Months after Reform	Medium-Run: 18 Months after Reform	Long-Run: 30 Months after Reform
Ω	0.089	0.089	0.088
Sum of Numerators	0.097	0.149	0.150
Approximation Error	0.008	0.060	0.062

Note: This Table shows the approximation error when implementing this formula empirically: $\frac{d\ln p_x}{\Omega} - \gamma\frac{d\ln w_x}{\Omega} - (1-\gamma-\delta)\frac{d\ln r_x}{\Omega} - \delta\frac{d\ln c_x}{\Omega} = 1$, where $\Omega = d\tau(1-\delta) + \tau(d\ln p_x - \delta d\ln c_x)$. The first line is the estimated using the estimated cost of employees to sale share $\delta = 0.32$, the change in VAT rate $(0.196 - 0.055 = 0.141)$, the pre-reform VAT rate 0.196 and the reduced form coefficients $dlnp_x$ and $dlnc_x$. The sum of numerators sum the estimated weighted reduced form effects estimated in Table 3.
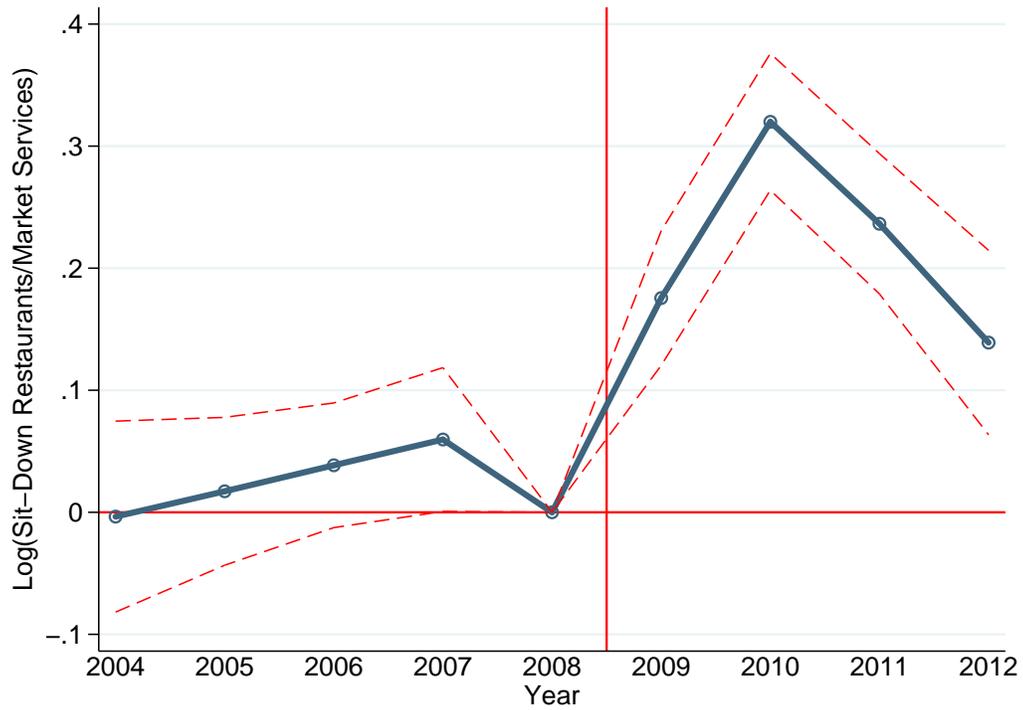
Figure A.1. : Alternative Measure of Return to Capital: Return to Capital Employed

Note: The Figure shows event-time coefficients estimated from: $\log Y_{idt} = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where k are leads and lags, where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. Return to capital employed is defined as profit before taxes plus interest paid over shareholder funds plus non-current liabilities. The treatment group includes sit-down restaurants, while the control group includes firms in non-restaurant market service sectors. The dashed lines are 95 percent confidence intervals.
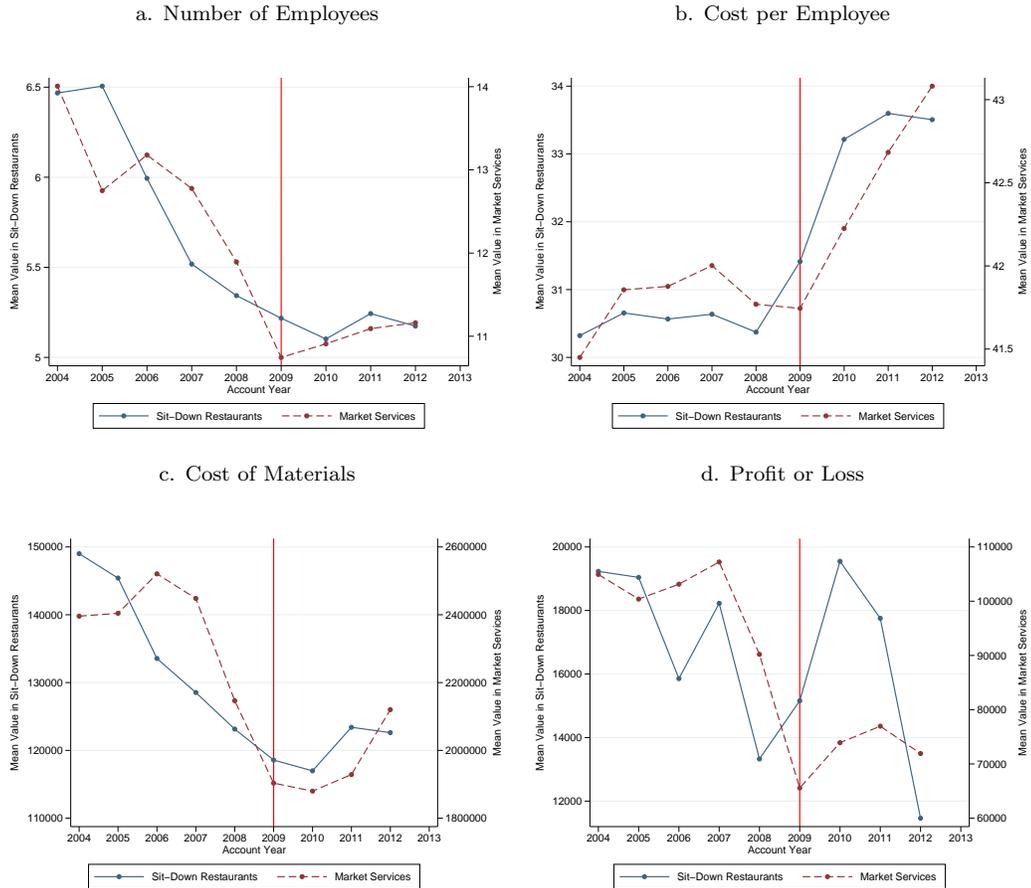
a. Number of Employees

b. Cost per Employee

c. Cost of Materials

d. Profit or Loss

Figure A.2. : Unconditional Means: Sit-Down Restaurants vs. Market Services

Note: Computed using data on French sit-down restaurants from Bureau Van Dijk's AMADEUS data. The sample includes unconsolidated balance sheets of French firms for which information on employment, the cost of employees, turnover, the cost of materials and profits are not missing. All amounts are expressed in 2012 euros. The treatment group includes French sit-down restaurants, while the control group includes all firms in non-restaurant market service sectors.
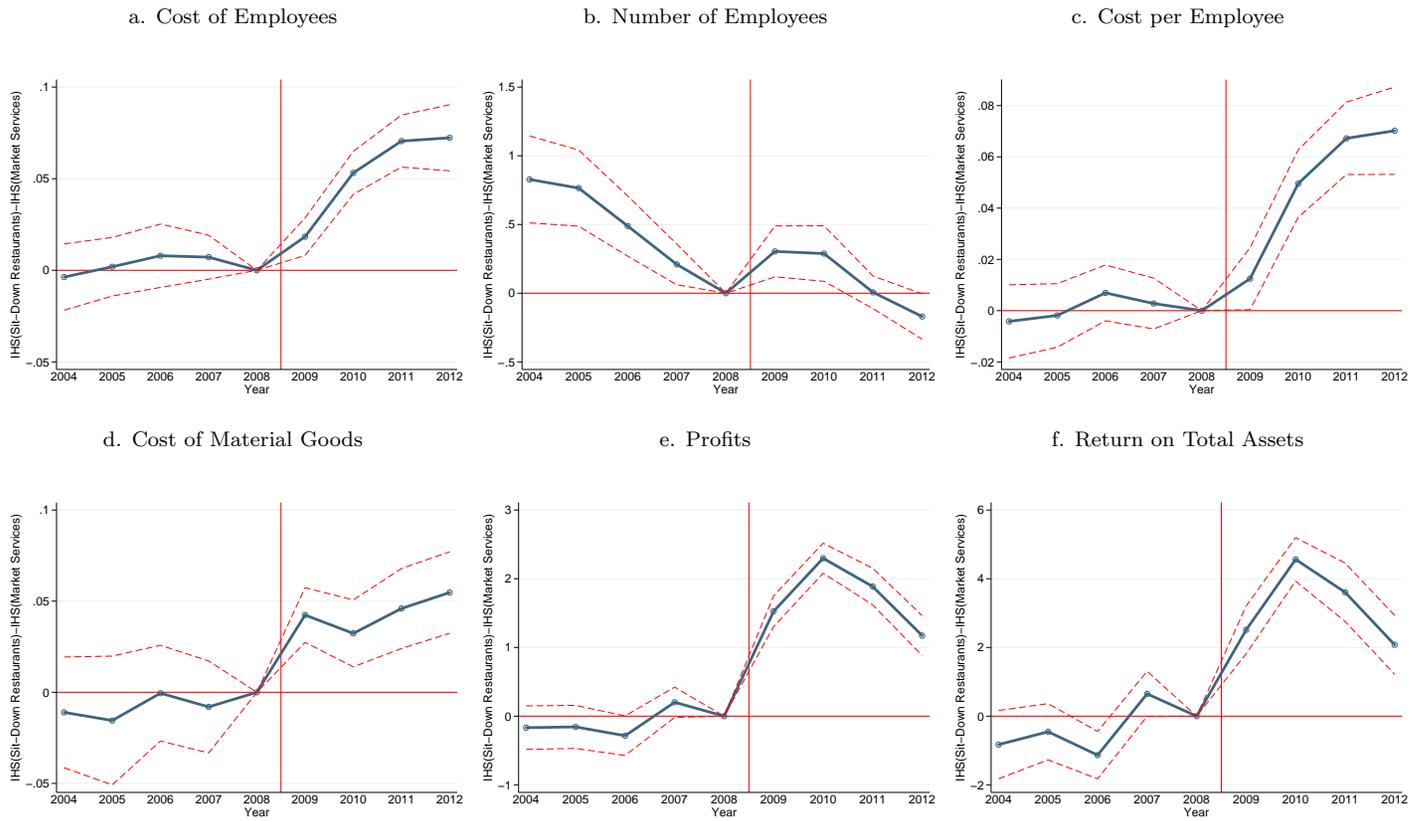
a. Cost of Employees   b. Number of Employees   c. Cost per Employee

d. Cost of Material Goods   e. Profits   f. Return on Total Assets

Figure A.3. : Dynamic Effects of the VAT Cut Using Inverse Hyperbolic Sine

Note: The Figure shows event-time coefficients estimated from: $ihs(Y_{idt}) = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where $ihs(Y_{idt})$ is the inverse hyperbolic sine of Y_{idt}, k are leads and lags, where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. The treatment group T includes sit-down restaurants, while the control group includes firms in non-restaurant market service sectors. The dashed lines are 95 percent confidence intervals.
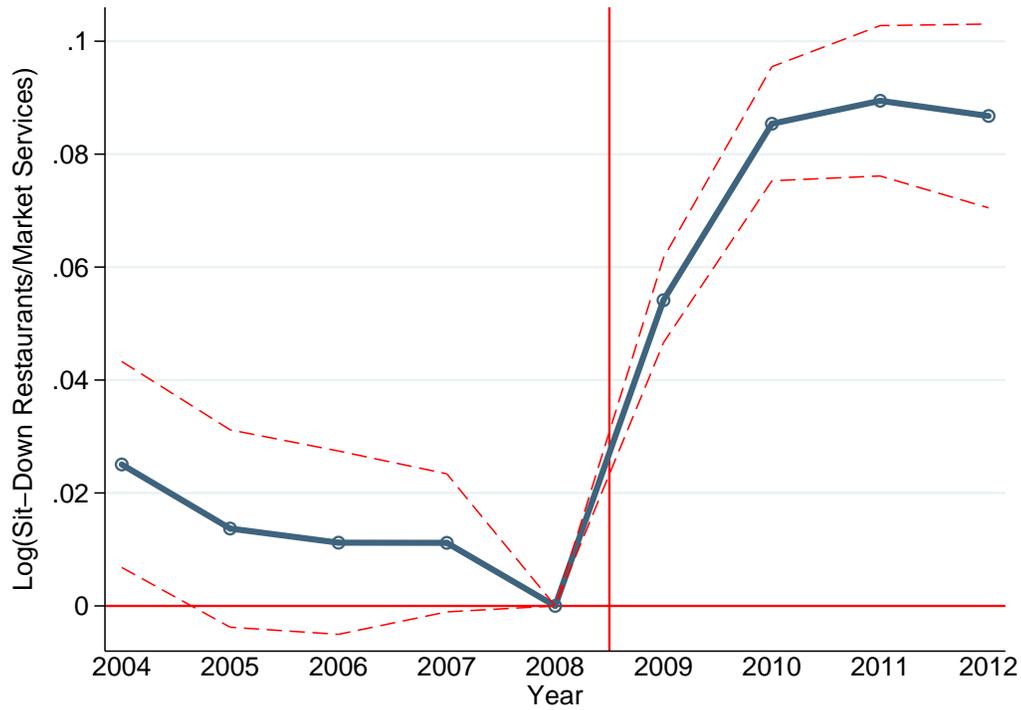
Figure A.4. : Dynamic Effects of the VAT Cut on Turnover (exclusive of VAT): Sit-Down Restaurants vs. Market Services

Note: The Figure shows event-time coefficients estimated from: $\log Y_{idt} = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where k are leads and lags, where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. The treatment group includes sit-down restaurants, while the control group includes firms in non-restaurant market service sectors. The dashed lines are 95 percent confidence intervals.
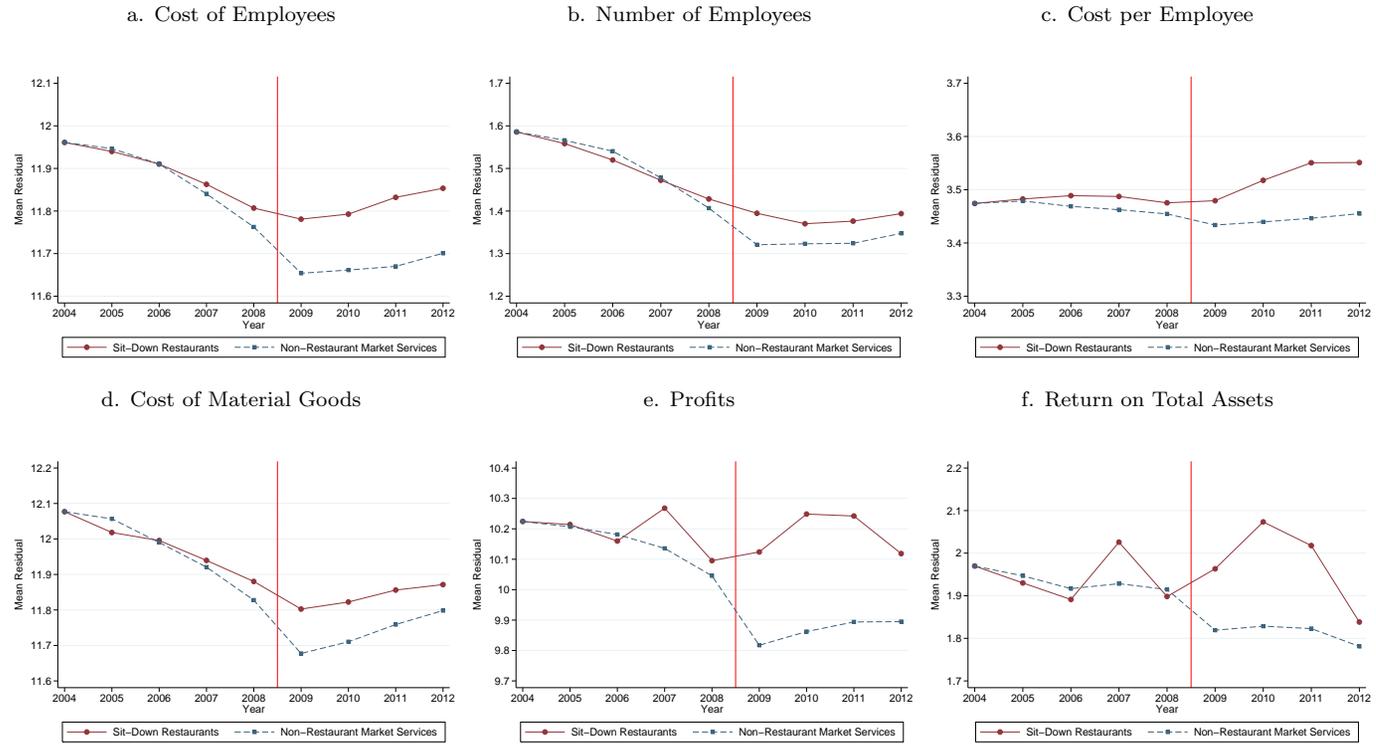
a. Cost of Employees

b. Number of Employees

c. Cost per Employee

d. Cost of Material Goods

e. Profits

f. Return on Total Assets

Figure A.5. : Dynamic Effects of the VAT Cut: Difference-in-differences using DFL Re-weighting

Note: The Figure plots standardized residual group-year means after re-weighting the group-by-year distributions to match the distribution of observable characteristics in the treatment group in 2008. First, we re-weight the group-by-year distribution, using the approach from DiNardo, Fortin and Lemieux (1996), within ten size bins based on assets crossed with ten size bins based on firm age and with the *département* of residence. Second, we run count weighted cross-sectional regressions for each year of the outcome variable on an indicator for treatment group, total assets, and indicators for firm age and *département* of residence. The residual group-year means are then standardized by subtracting the 2008 residual group mean and by adding back the 2008 residual pooled mean.

Figure A.6. : Dynamic effects on firm in Full Sample: Sit-Down Restaurants vs. Market Services

Note: The Figure shows event-time coefficients estimated from: $\log Y_{idt} = \sum_{\nu=-k}^{q} \eta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where k are leads and lags, where i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. The treatment group includes sit-down restaurants, while the control group includes firms in non-restaurant market service sectors. The dashed lines represent 95 percent confidence intervals. The Figures consider the sample of firms with missing employment information. The dashed lines are 95 percent confidence intervals.
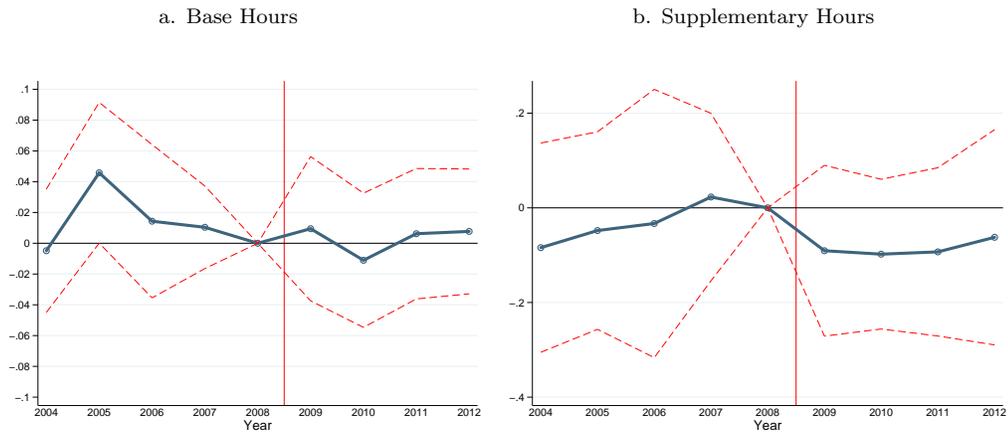
a. Base Hours   b. Supplementary Hours

Figure A.7. : Hours Worked during Reference Week: Event-Time Estimates

Note: The Figure shows the dynamic effects of the VAT cut on Hours worked using the following specification: $\log h_{irt} = \gamma \cdot \mathbb{1}\{i \in T\} + \sum_{\nu=-k}^{q} \delta_\nu \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + X_{irt} + \lambda_t + \omega_r + \epsilon_{irt}$, for worker i employed in region r in year t. the treatment group T includes all employees of sit-down restaurants, while the control group includes employees of non-restaurant market service sectors. We also include year fixed effects λ_t, region fixed effects ω_r and employees' individual characteristics X_{irt} (age, gender, education, tenure, occupation, marital status, number of employed workers, number of unmarried children living in the household, establishment size, firm size, birth region, and quarter in which the worker was surveyed). Standard errors are clustered by region and 95 percent confidence intervals are displayed.
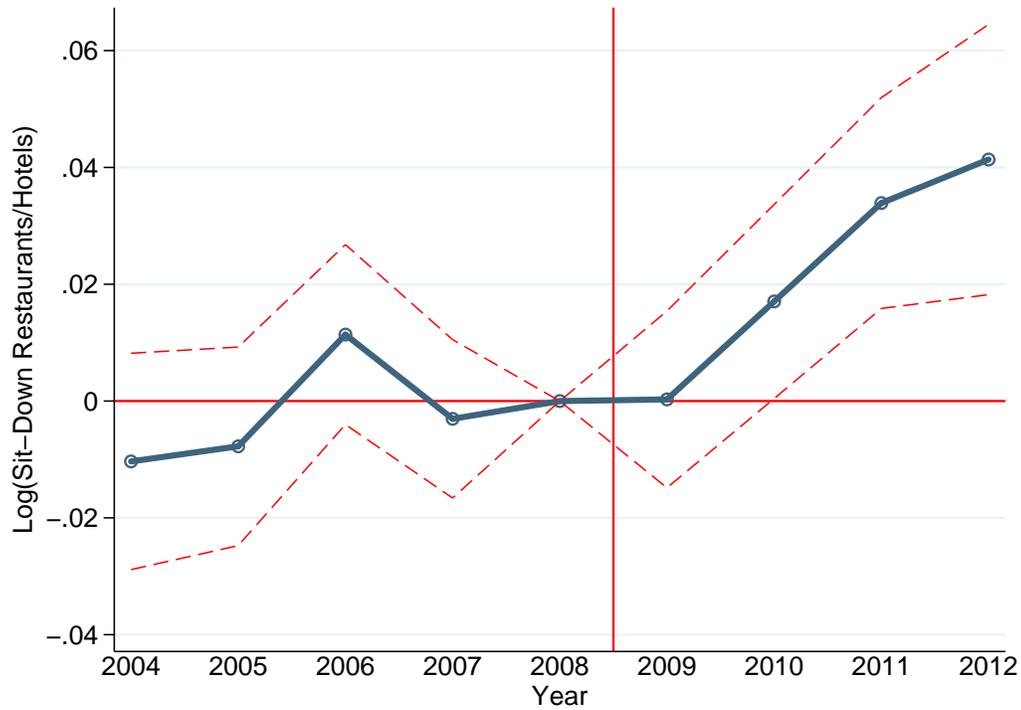
Figure A.8. : Effect of Hiring Subsidy Cuts on the Cost per Employee

Note: The figure shows the dynamic effect of the payroll subsidy cut when comparing sit-down restaurants to hotels using this specification: $\log Y_{idt} = \sum_{\nu=-k}^{q} \eta_{\nu} \cdot \mathbb{1}\{i \in T\} \times \mathbb{1}\{t = \nu\} + \lambda_t + \omega_i + \epsilon_{idt}$, where k are leads and lags, i indexes the individual firm, d indicates the *département* in which the firm is located, t indexes the year in which the outcome is measured. We include firm and year fixed effects and cluster standard errors by *département*. The dashed lines are 95 percent confidence intervals.