

# Modern Solutions to Age-Old Problems: The Impact of Proliferation of Online Food Delivery on Poverty

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## Introduction

The world economy nowadays is influenced by market processes and entrepreneurial activities compared to the dawn of human history. This evolution is marked by a profound recognition among development experts regarding the pivotal role entrepreneurship plays in fostering economic growth and alleviating poverty. Both development experts, economists, and policymakers reached consensus towards the importance of entrepreneurship and poverty alleviation through job creation and income generation. In the context of developing economies, entrepreneurship, particularly through MSMEs, appears as a potential panacea for poverty alleviation, premised on the capitalist assumption of higher income prospects and job creation (Filippinni, 2021). Within this framework, entrepreneurship becomes a pathway to poverty alleviation. Moreover, Nirathron (2006) asserts that MSMEs, particularly those in the food and beverage sector like street vendors, act as significant absorbers of surplus labour, notably unemployed women.

Indonesia, is an interesting case study to examine whether 'gig economy' is a boon or bane for small businesses and poverty reduction. The country's economic landscape is shaped largely by the significant presence of micro, small, and medium enterprises (MSMEs), which make up nearly all firms in the country (Economic Census 2016), although informal enterprises still dominate the sector. Between 2018 and 2021, informal MSMEs accounted for up to 65 percent, with the food, beverage, and accommodation sector representing the largest portion (42 percent). These informal MSMEs, which range from street vendors to established eateries, are a significant part of the economy (Hapsari et al., 2023; BPS, 2022).

Simultaneously, Indonesia experienced a rapid rise in its internet user-base within the last decade, launching from 28.3 percent of total population in 2013 (70.5 million individuals with internet access) to 77 percent of total population in 2023 (213 million individuals with internet access). Additionally, smartphones which used to be considered as a luxury item in 2013 have transformed into a necessary item for Indonesian in 2022. Approximately 67.9 percent of the Indonesian population in 2022 are having access to smartphones and the internet (BPS, 2023). Henceforth, the advent of innovative digital platforms has ushered in a new era in Indonesia, driven by increased smartphone ownership and internet access. Among these, food delivery applications have rapidly gained traction, with platforms like Grab-Food revolutionising consumption behaviour since their inception in the end of 2014. Tenggara Strategics (2022) reports that approximately 35.5 percent of smartphone users in Indonesia, totaling around 67.2 million users in 2022, engage with the Grab-Food application, generating an annual revenue of approximately 30.7 trillion IDR in 2022 alone. Meanwhile, Go-food, another behemoth in food delivery application, launched their 77 application as a rival to Grab-food in 2015 in Jakarta. Go-food reached 67 out of 98 cities and 6 regency out of 399 in 2022, contributing to twice the size of Grab-food, amounting to 66 Trillion IDR within the same year (Demographic Institute, 2022). Beyond their substantial market influence, these platforms offer MSMEs in the food and beverage sector an avenue to join their network, granting access to a broader consumer base within a 25-kilometre radius, thus potentially expanding their potential market reach beyond their traditional local demand.

While existing literature has predominantly explored the study regarding digital boom and its benefit to general economic growth, however most of these studies are either small sample studies for specific regions or limited timeframe during COVID period in Indonesia (between 2019 to 2021), with less focus on MSMEs, specifically MSME in food and beverage sector. Meanwhile, there also exists little literature exploring the topic of online food delivery on dietary patterns in Indonesia, these studies are mostly limited to cross-sectional study. Hence, there exists a notable gap regarding research on the potential of flourishing food and beverage MSME entrepreneurship and its broader implications for **poverty alleviation**. Thus, this study seeks to bridge this gap by examining the role of online food

delivery in fostering **food entrepreneurship** and augmenting overall **labour market incomes**.  
**Our case study refers to** Go-Food – the leading digital business platform in Indonesia..

Given the foregoing, the primary aim of this paper is to quantify the potential impact of online food delivery platforms on **entrepreneurship and poverty alleviation** through **income generation**. The hypothesis position that the proliferation of entrepreneurship hinges on the availability of higher-income markets in urban or semi-urban environments in Indonesia which are in close proximity of economically disadvantaged area where food MSMEs are located, thereby providing potential access to market with higher purchasing power compare to their local market, providing benefits of attracting customers with greater purchasing power. Therefore, our main research question is **“Does proliferation of barriers, in our case, food delivery platforms help to reduce households’s poverty?”** We measure poverty reduction through following outcome variables:

- (i) increased food entrepreneurship among food SMES through improved market access,**
- (ii) increased employment within the food sector, (iii) increased income level, and (iv) increased labour productivity**

## **Conceptual Framework**

### **Role of Digital Boom of Food Delivery Service to Poverty Reduction**

Exploring the potential mechanisms through which online food delivery platforms help reduce poverty, this paper will try to dissect the four outcome variables from our main research question as the indicators of poverty alleviation in our conceptual frameworks.

- (i) increased food entrepreneurship among food SMES through improved market access  
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- (ii) increased employment within the food sector  
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- (iii) increased income level  
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- (iv) increased labour productivity through working hours  
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## **Methodology and dataset**

The preliminary analysis combines data from the Indonesian Labor Force Survey (SAKERNAS) and the Indonesian Household Socio-Economic Survey (SUSENAS) to generate indicators of socio-economic status and labour market outcomes. Both SAKERNAS and SUSENAS data are nationally representative at district level, covering 497 of panel district concordances from 2010. SUSENAS covers 345,000 households in Indonesia, providing information of socio-economic variables such as per-capita expenditures, household food expenditures, and demographic information such as individual age, gender, education, kitchen ownership and internet access. Meanwhile, SAKERNAS covers 300,000 households which represent individuals above the age of 15 years old at district level. Furthermore, the dataset will also provide information on entrepreneurship and potentially female and Gen Z (younger generation with high connectivity to social media and internet) entrepreneurship activity in Indonesia between the year of 2010 to 2023. The reason to start the analysis from 2010 is based on the logic that the digital boom is highly correlated with internet access and smartphone ownership in Indonesia, which was introduced to the masses during that period.

In addition, this study will utilise the presence of online food delivery service in all Indonesian districts between their inception in 2015 to 2023 as our treatment and mean channel of analysis. Go-food and Grab-food rollout services in any district are collected using web-scraping from local and national news services. The company started serving 5 cities at its inception in 2015 and expanded its operations to 73 cities by 2022. Among all online food delivery services in Indonesia, both Grab-food and Go-food are the largest amalgamation of entity which covers around 122 cities as well as 1.8 million food and beverages merchants in Indonesia by 2023, enveloping not only restaurant and big chain franchise such as Kentucky Fried Chicken (KFC) or McDonalds, but also majority of MSME food vendor called Warung in Indonesia. This gradual roll-out of Go-Food services is the main treatment variable in this study. As a note, the city selection for rollout is not totally exogenous. Both Gojek and Grab Indonesia, the mothership of their respective online food proliferation in Indonesia, decided to put their service based on their potential assessment of market availability, road and public infrastructures, and internet - smartphone connectivity in the area. Therefore,

controlling these potentially endogenous treatments with these variables will be crucial for this study.

In order to enhance the descriptive aspect of this study, we will also utilise frontier microdata from World Bank, the Digital Economy Household Survey 2020. This cross-sectional data was constructed as a quantitative household survey, covering 7 major islands of Indonesia (Sumatera, Java, Kalimantan, Sulawesi, Maluku, Nusa Tenggara, and Papua) and 3,063 households. The data contains important information to check the behaviour of Indonesian consumers towards online food proliferation, as well as the supply side that are using this service to deliver the food to their respective base of customers. However, the data is only limited to cross-sectional information, and provide no benefit in form of data representativeness to national, district, or sub-district level. Therefore we will only infer this survey as a cross-sectional case study. Moreover, the data will be urban biased, as World Bank Jakarta Office was considering sampling the area that have high internet access and mobile phone ownership from Indonesian Village Census data (PODES or Potensi Desa).

Lastly, PODES from Indonesian Statistics (Badan Pusat Statistik) is utilised to complement the survey data with village-level measures of socio-economic conditions, demography and geographical characteristics, from 2011 to 2021. As a complement to PODES, this study will also utilise Village Poverty data from SMERU Research Institute in 2011 and 2016. The marriage of Village Poverty and PODES will provide the potential location which fits the precondition of our village level analysis. Villages that are deemed as poor and have clusters of MSMEs food vendor (Warung) numbered in minimum 10 in 2011 will be the first step of selection. Regarding potential access to the market, we will assume using the radius of maximum distance in Grab-food and Go-food application, which is 25 kilometres as the base of search. Therefore, we will generate a binary variable at village level, which indicates the value of 1 if the village is not a poor village based on Village Poverty data in 2011. If within the radius of 25 kilometres from the poor village clustered of Warung there exists a richer village(s), another binary variable will be generated, namely Area of Study, which satisfies the precondition to simulate market access towards these clusters of warung in the poorer village.

## Measurement of Variables

### Treatment Variable

Rollout of Gfood (Grab-food or Go-food)

### Outcome Variables (measuring poverty)

- (i) increased food entrepreneurship among food SMES
- (ii) increased employment within the food sector
- (iii) increased income level
- (iv) increased labour productivity

### Empirical Estimation

This study will employ an event study design (staggered difference-in-differences) with permanent roll-out at a different timeline based on Clarke and Schyte (2021), estimating the following regression:

$$LO_{it} = \sum_{p=-T}^T \delta_p \text{GFood}_{it} + \omega_i + \theta_t + \gamma_i t + \epsilon_{i,t}$$

$LO_{it}$  represents labour market outcome variables in district  $i$  and year  $t$ , including the

- (a) the employment rate in the food and beverage sector within the district (per-1,000 of local inhabitants),
- (b) the number of entrepreneurs (self-employed) in the food and beverage sector (per-1,000 of local inhabitants), and the
- (c) natural logarithm of labour market incomes in the food and beverage sector.

The treatment variable takes one starting with the year when Gfood (Go-Food or Grab-food) has been introduced within the district capital and zero otherwise. In our baseline specification,  $\omega_i$  is the district fixed effect, which controls for average time-invariant differences across Indonesia's districts, while  $\theta_t$  is the year fixed effect that captures common nation-wide trends in employment and food consumption.  $\gamma_i t$  is controlling for the district-specific linear trends. The error terms  $\epsilon_{i,t}$  are clustered at the district level.

## Descriptive Statistics

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## Preliminary Findings

The initial results from Table 1 indicate less than 1% increase in terms of employment rates and employment creation in the food and beverage sector immediately and in the medium term following the introduction of Go-Food and Grab-Food. Moreover, there is a modest growth rate of 0.9% in food and beverage productivity post-rollout. However, the significance of this model is still being revitalised by authors, and will include more specification, controls, and explore different outcome variables, as well as expand the size of the year of the study. As a footnote, the sector is still a combination between Accommodation as well as food sector into one category, which need to be revisit soon and re-classified.

**Table 1. Employment Outcomes in Urban Area of Indonesia, 2011 - 2018, F&B + Accommodation Sector**

	<b>Employment Outcome, F&amp;B + Accommodation sector,</b>	
	<b>Employment Rates</b>	<b>Log of Weekly Working Hours</b>
T+3	0.0004	0.009
T+2	0.0003	0.001
T+1		base
T+0	0.0003	-0.014
T-1	-0.004	-0.001
T-2	-0.0022	0.010
T-3	-0.0023	0.036
_cons	0.999***	3.856***
Controls	NO	NO
TWFE	YES	YES
Prob>F	0.58	0.397
R-sq (within)	0.08	0.009
Obs	332	332

\* significant at 10%, \*\* significant at 5%, and \*\*\*significant at 1%



This paper offers insights for scholars and Indonesian policymakers, serving as a starting point for further research into the effects of the digital revolution via online food platforms on labour markets and poverty alleviation.

#### **Problem with the study so far:**

- SAKERNAS, the labour market data isolates 3 digit KBLI classification between 2010 - 2015, which needs to be converted first to Food and Beverages sector
  - However, post 2015, SAKERNAS provides 17 sectors and no longer has the 3 digit KBLI classification. The 17 sectors combined the F & B sector with Hotel/Motel service. Therefore the impact of Gfood rollout would not be purely from F & B sector
  - This could be addressed by extracting the aggregated number of Warung and Restaurant from PODES at district level, however, PODES only covered 2011, 2014, 2018, 2019, 2020, and 2021
- Kitchen ownership in SUSENAS only being asked between 2013 to 2023
- PODES is prone to bias, as the response was from the chief of the village. However, since restaurant and warung are part of the village infrastructure, it is most likely to be recall accurately
- Have to check the parallel trend assumption

#### **What to do next?**

As an extension, this study will try to explore the impact of the boom in online food delivery to Indonesian nutritional transition: (1) Will the extended access to the food market enhance or exacerbate the nutrient intakes in Indonesia? (2) What type of food consumption and behaviour changes within the Indonesian household?

This will require exploring the nutrient transition using SUSENAS consumption module M41, and probably will split this into different study (?)

**Keywords:** Online Food Delivery, Go-Food, MSME, Food Entrepreneurship, Poverty Alleviation, Market Access, Food System, Indonesia

**List of References <tba this weekend for full one>**

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## Appendix

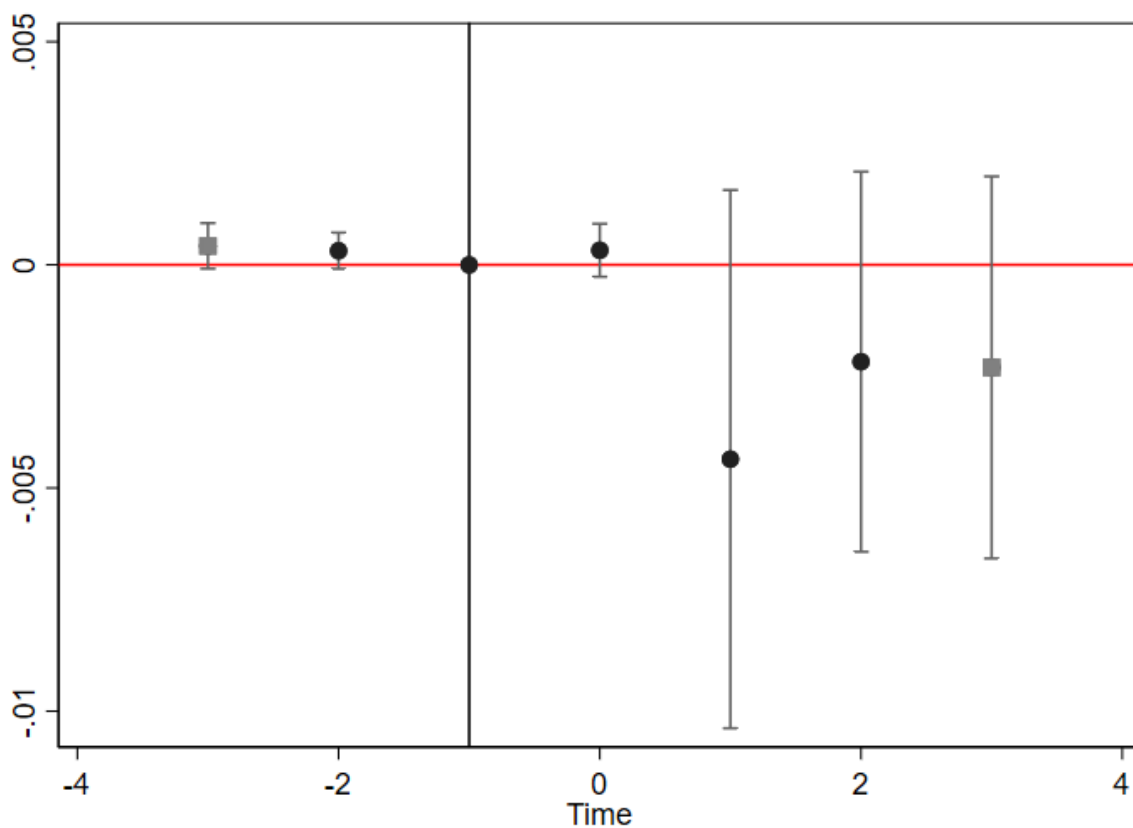
### Coefficient Plots - Event DD

#### Event study DiD - urban only, no control variables

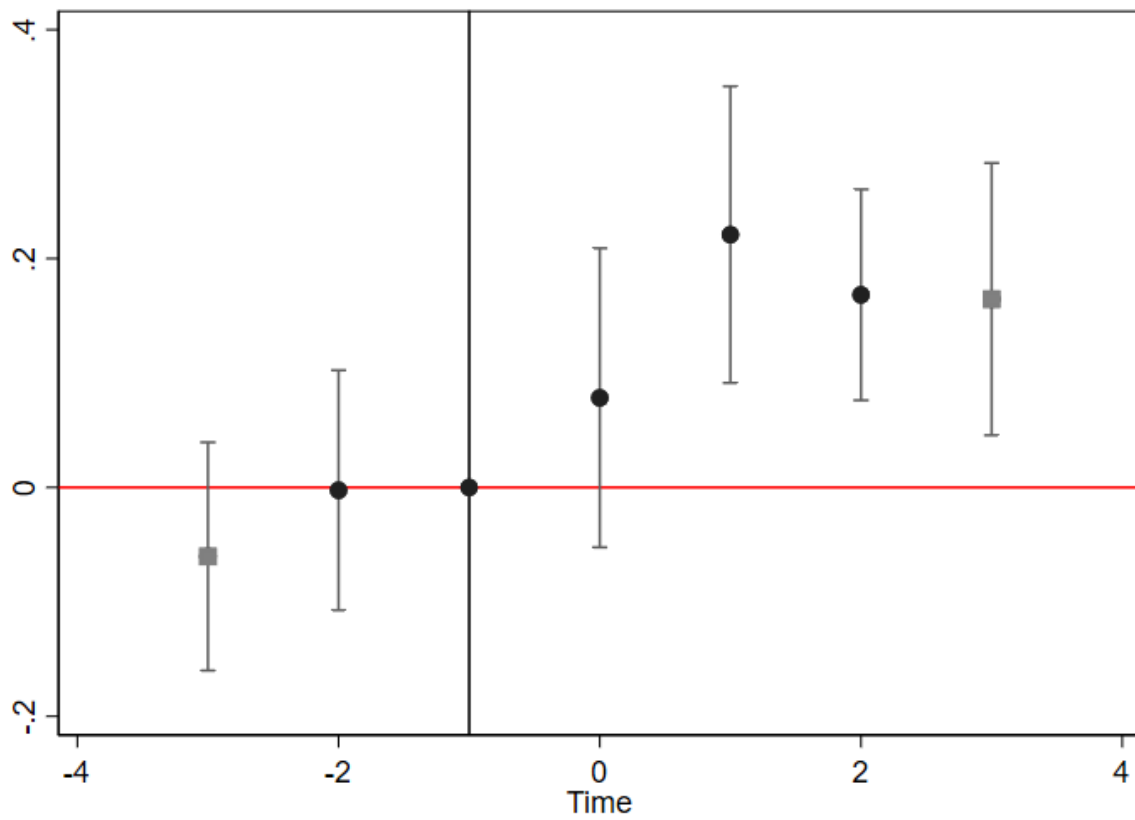
Employment Outcome, F&B + Accommodation sector, only Urban Area			
	Employment Rates	Log Real Wage	Log of Weekly Working Hours
T+3	0.0004	-0.060	0.009
T+2	0.0003	-0.003	0.001
T+1		base	
T+0	0.0003	0.078	-0.014
T-1	-0.004	0.221***	-0.001
T-2	-0.0022	0.168***	0.010
T-3	-0.0023	0.165***	0.036
_cons	0.999***	13.9***	3.856***
Controls	NO	NO	NO
TWFE	YES	YES	YES
Prob>F	0.58	0.000	0.397
R-sq (within)	0.08	0.14	0.009
Obs		332	332

\* significant at 10%, \*\* significant at 5%, and \*\*\* significant at 1%

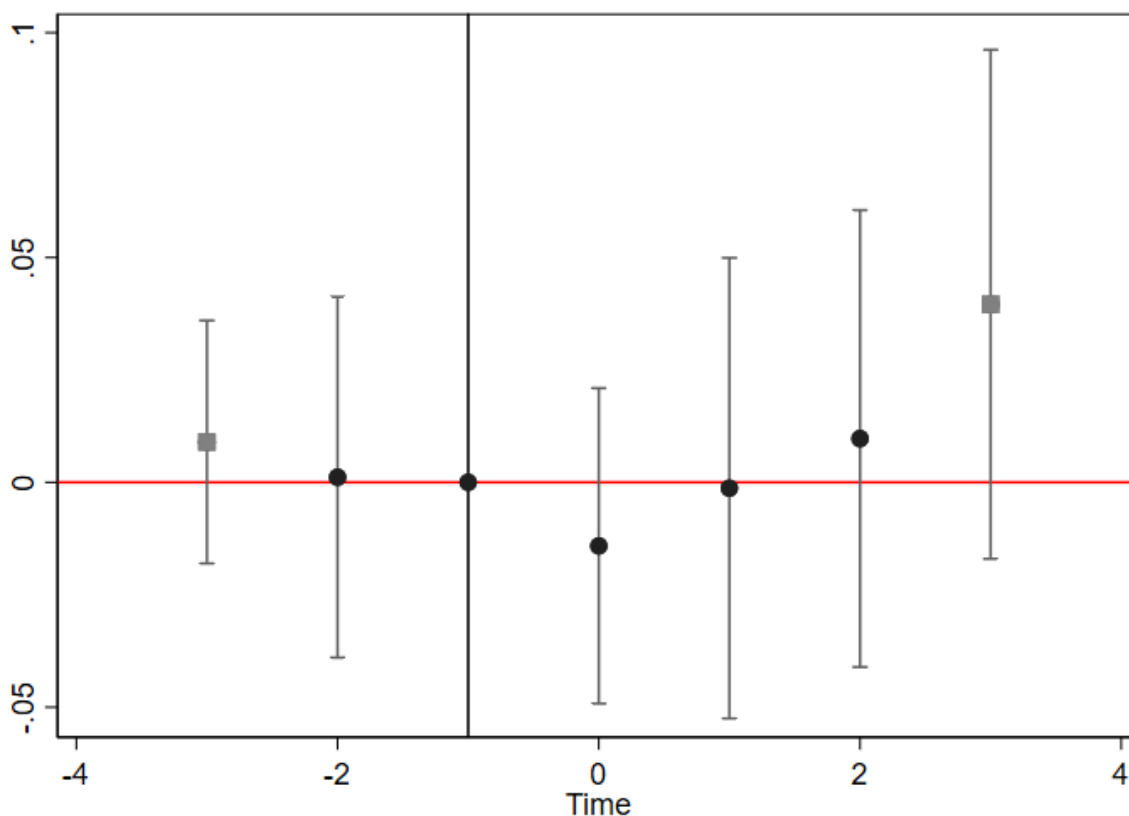
#### 1. Employment Rates



## 2. Log Real Wages



## 3. Log Weekly Working Hours

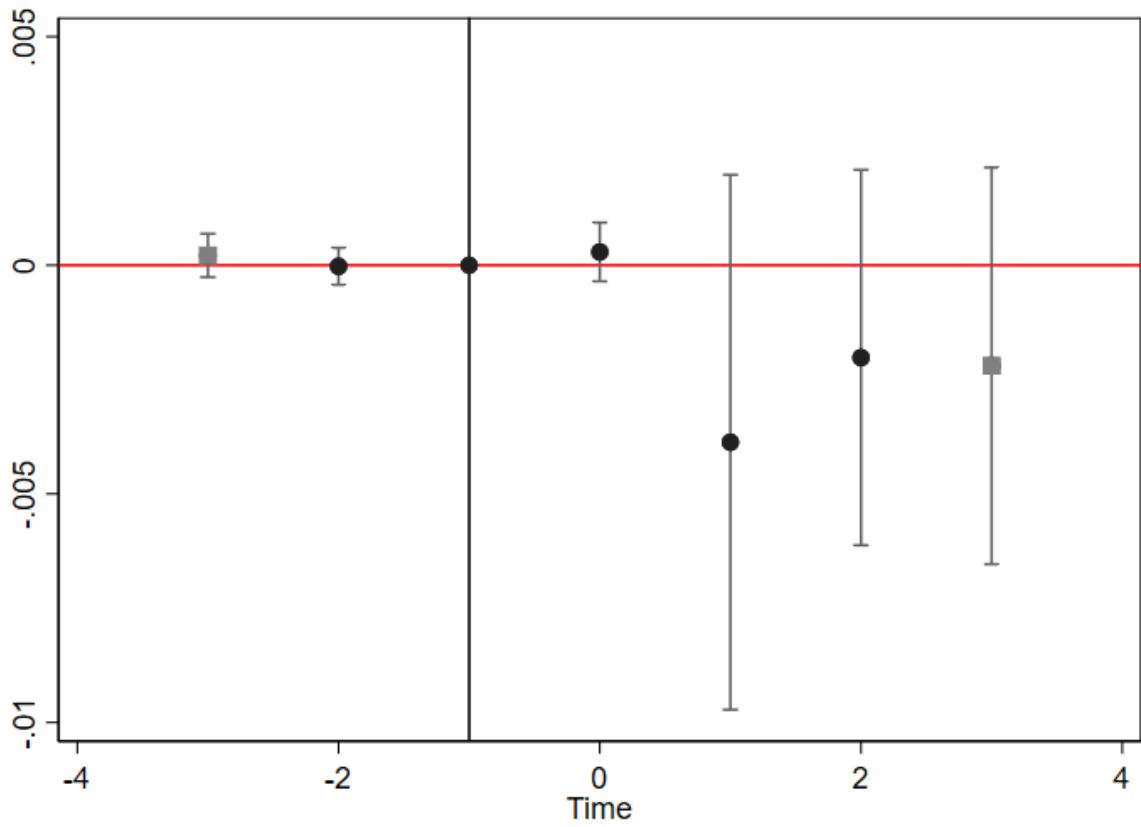


#### Event study DiD - urban only, no control variables

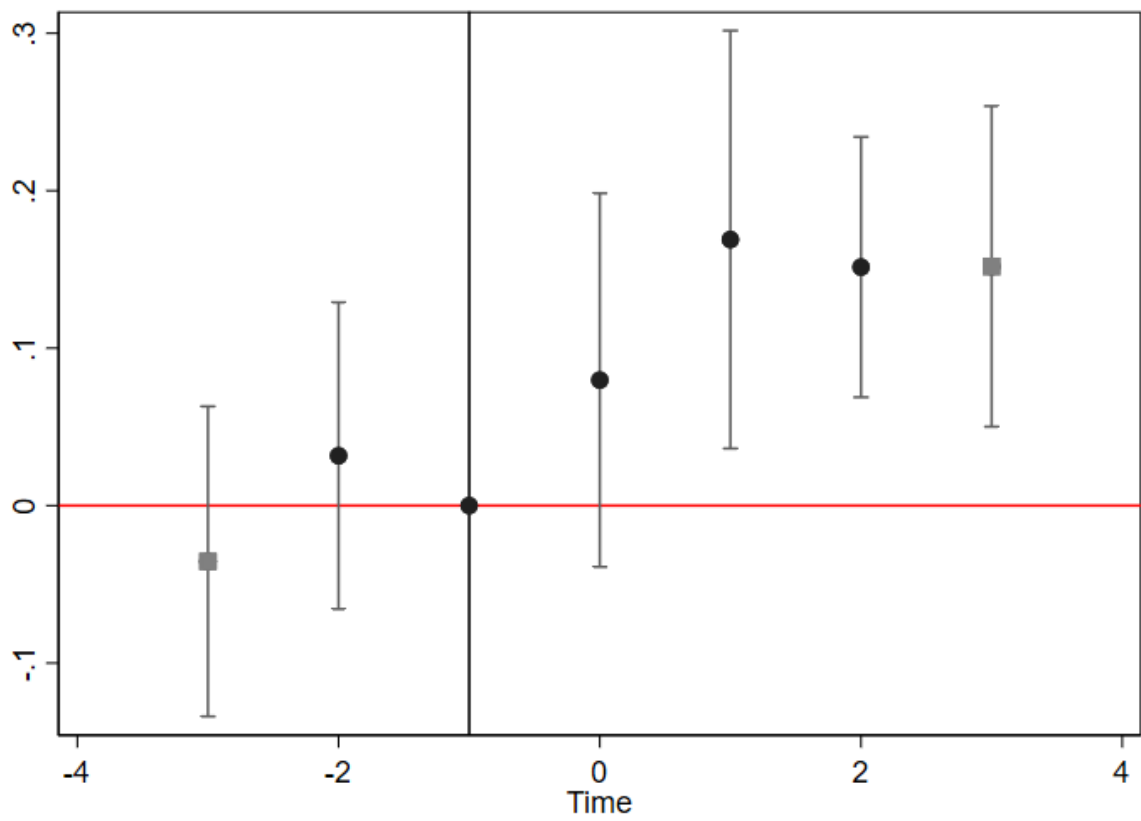
Employment Outcome, F&B + Accommodation sector, only Urban Area			
	Employment Rates	Log Real Wage	Log of Weekly Working Hours
T+3	0.0002	-0.04	0.012
T+2	-0.00002	-0.032	0.006
T+1		base	
T+0	0.0003	0.08	-0.014
T-1	-0.004	0.169***	-0.008
T-2	-0.002	0.151***	0.007
T-3	-0.002	0.152***	0.038
_cons	1.011***	12.8***	3.704***
Controls	YES	YES	YES
TWFE	YES	YES	YES
Prob>F	0.62	0.000	0.78
R-sq (within)	0.09	0.2	0.013
Obs	329	329	329

\* significant at 10%, \*\* significant at 5%, and \*\*\*significant at 1%

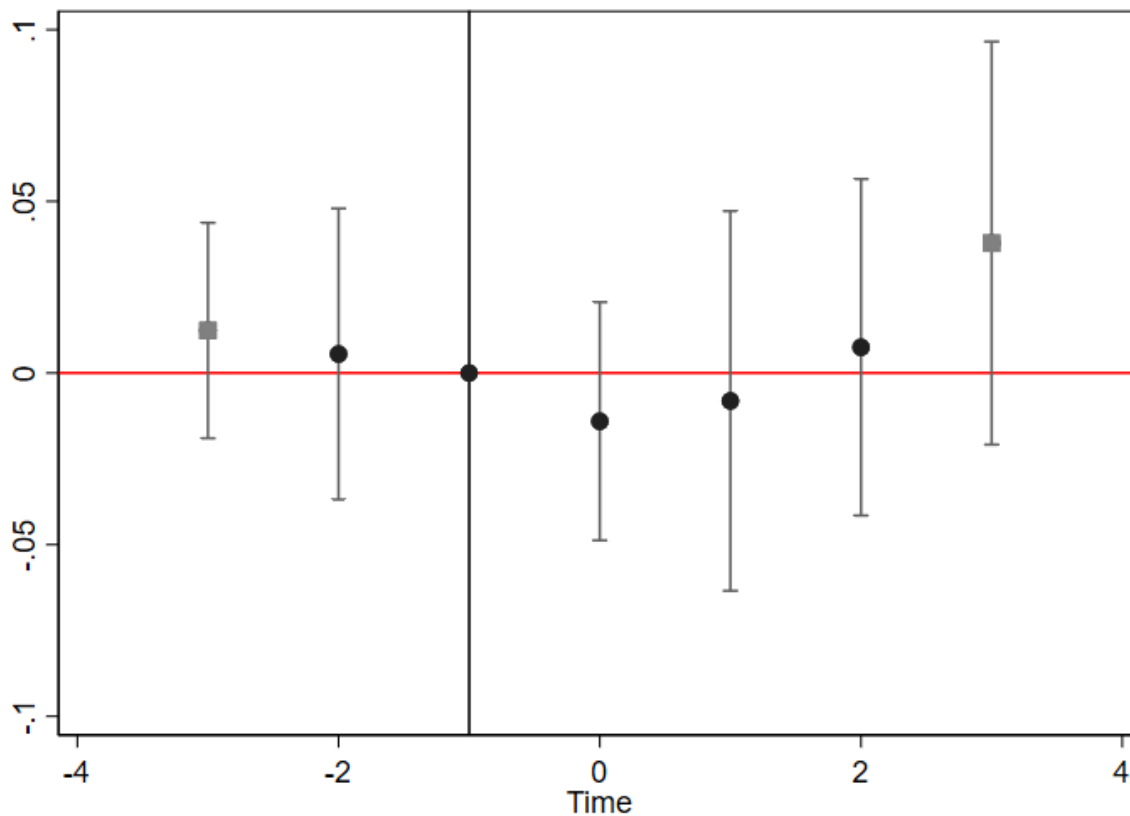
#### 4. Employment Rates



### 5. Log Real Wages



## 6. Log Weekly Working Hours

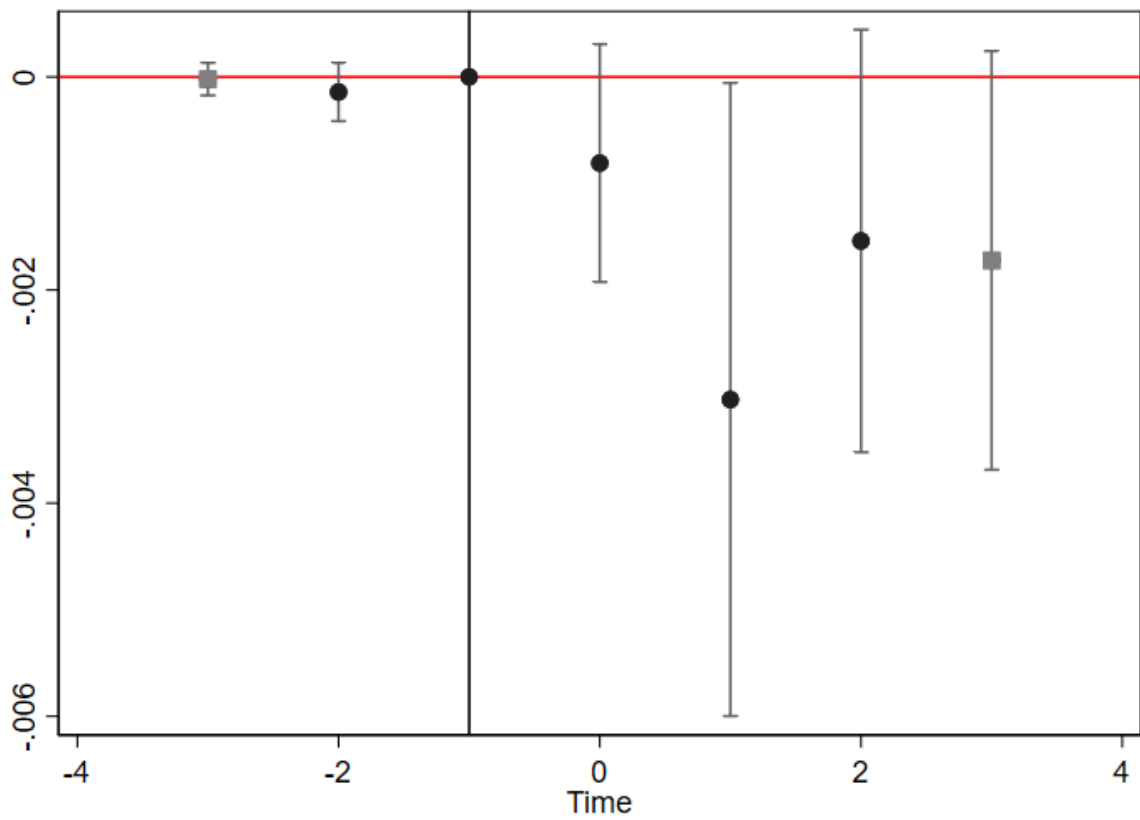


### Event study DiD - urban only, no control variables

	Employment Outcome, F&B + Accommodation sector, Urban + Rural		
	Employment Rates	Log Real Wage	Log of Weekly Working Hours
T+3	-0.00002	-0.08***	0.02*
T+2	-0.0001	-0.031	-0.011
T+1		base	
T+0	-0.0008	0.08***	0.015
T-1	-0.003**	0.141***	0.002
T-2	-0.002	0.175***	0.004
T-3	-0.002*	0.185***	0.014
_cons	1.001***	13.1***	3.764***
Controls	YES	YES	YES
TWFE	YES	YES	YES
Prob>F	0.08*	0.000	0.160
R-sq (within)	0.02	0.09	0.002
Obs		497	497

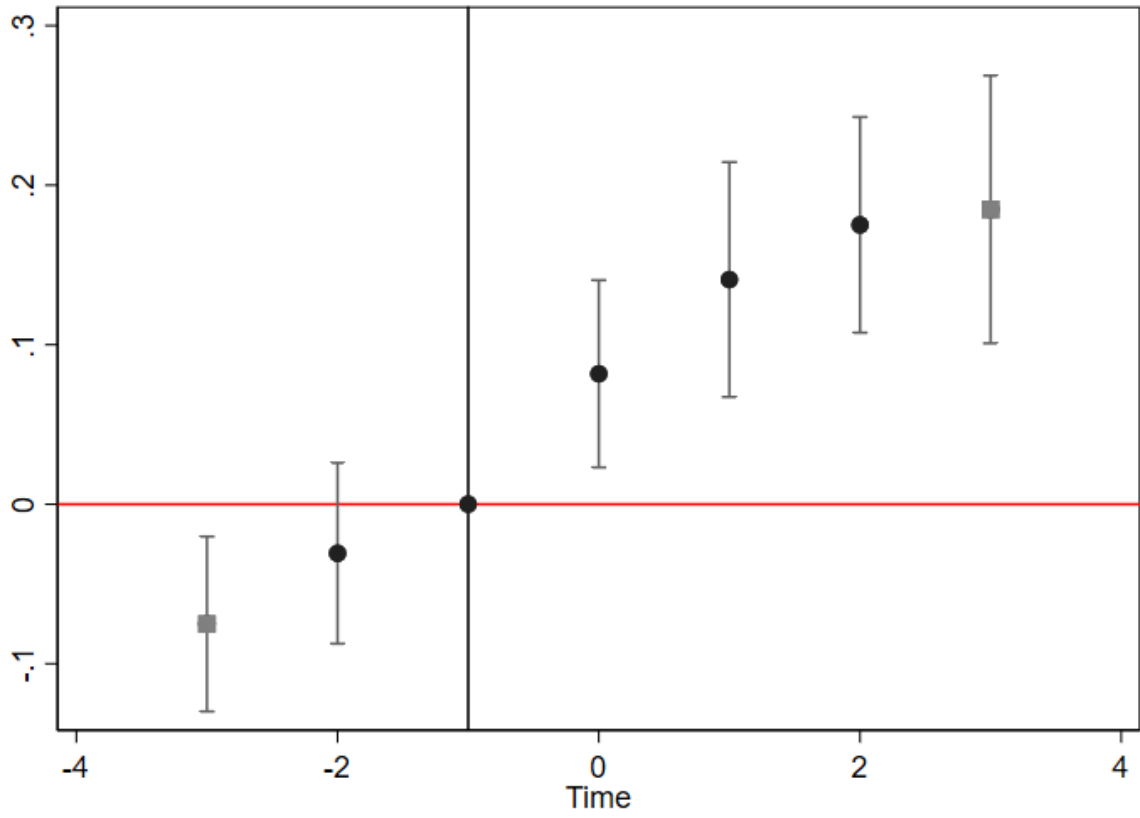
\* significant at 10%, \*\* significant at 5%, and \*\*\* significant at 1%

## 7. Employment Rates



## 8. Log Real Wages





**9. Log Weekly Working Hours**

