Online Food Delivery Platforms and Female Labor Force Participation

Online Appendix

Jialu Liu, Siqi Pei, Xiaoquan (Michael) Zhang

Information Systems Research

A. Alternative Explanations

In this section, we rule out alternative explanations and potential confounding factors, namely, (1) shocks from the childcare industry; (2) shocks from ridesharing, microjobs, and freelancer platforms; (3) changes in eating habits; (4) the market penetration of mobile networks; and (5) the results driven by GDP.

1. Shocks from the Childcare Industry

As childcare is the second most time-consuming activity for women in the home, there is a concern over whether our main effect is driven by shocks from the childcare industry, which assists women in finding nannies to take care of their children, also freeing women from household chores and thus potentially confounding our results. To alleviate this concern, we conduct the same analysis with a different dependent variable, which is a dummy variable that indicates whether the major activity performed is childcare. The results are shown in Appendix Table S15, columns (1)–(4). The analysis reveals that the parallel pretreatment assumption for women is violated, suggesting that we have not captured the entry of new childcare businesses. Moreover, the coefficients after platform entry displayed in columns (1) and (2) are positive, indicating that women engaged in childcare to a greater degree after the entry of the platform than before, which contradicts this concern. Therefore, we eliminate the possibility that our main effect was driven by women being relieved from childcare, as the evidence suggests that women actually engaged in childcare to a greater degree during this period.

2. Shocks from Ridesharing, Microjobs, and Freelancer Platforms

Another concern is that the main driver of the observed effect might simply be general technology advances as a whole. Other platform entries, such as those of ridesharing, microjobs, and freelancer platforms, can also create job opportunities and offer different ways of working. It is possible that the

aggregate effect of these technological advancements is driving our main results. To rule out this alternative explanation, we conduct additional tests to examine the potential impact of ridesharing, microjobs, or freelancer platforms.

Ridesharing services are unavailable in South Korea, as the South Korean government had legally prohibited individuals from using private vehicles to provide transportation services before 2020 (Choi et al. 2022). In addition, only taxi-hailing is permitted under the prevailing regulations (Lee et al. 2022). Moreover, according to KOSIS, the ratio of females to males in the transportation industry in South Korea was approximately 1:9 during our sample period. Similarly, only 14% of Uber drivers were female in the United States in 2015.[1] Therefore, if ridesharing services were available in South Korea, it can be expected that more males would be affected by ridesharing services. However, the effect we observe is more significant for females than it is for males. Therefore, our results are unlikely to capture the effect of ridesharing services.

Through microjob platforms such as Amazon MTurk, people can find paid jobs regardless of their location. The job requirements of microjobs place less emphasis on worker locations, which suggests that the different provinces of South Korea are impacted by these platforms simultaneously. Since the leads-and-lags DID model leverages the fact that provinces are differentially affected by online food delivery platforms, our results are unlikely to be affected by microjob platforms.

To investigate whether freelancer platforms in the market affect our results, we turn to the KLIPS dataset where respondents are asked "are you working as a freelancer?" The dependent variable is a dummy variable that equals 1 if the respondent answers yes. We then conduct a DID analysis (see results in Appendix Table S16). The results suggest that treatment provinces and control provinces were indistinguishable regarding the probability of becoming a freelancer, especially among females. Note that these results do not suggest that there are no freelancer platforms in South Korea. They only suggest that

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[1] https://www.forbes.com/sites/ellenhuet/2015/04/09/female-uber-lyft-drivers/

the probability of a resident becoming a freelancer was not significantly different between treatment provinces and control provinces. Therefore, when we compare the employment rate between treatment provinces and control provinces, our estimates are unlikely to capture the differential effect of freelancer platforms.

In summary, ridesharing platforms, microjob platforms, and freelancer platforms are unlikely to confound our results. Since we cannot rule out all of the available platforms in the current paper, our results could capture the effect of other technological advances or the availability of other platforms. Unless these other platforms entered the market with exactly the same schedule as Baemin, however, our leads-and-lags DID framework should be capable of isolating the distinct effect of Baemin.

3. Changes in Eating Habits

Another potential concern is that the reduction in time spent on meal preparation may not be driven by the presence of an online food delivery platform. It is possible that the people in our treated provinces are more willing to eat fast food than those in other provinces, which could also reduce the time spent on meal preparation by women in the treated provinces. To address this concern, we collect data from the Korea Youth Risk Behavior Survey that was conducted by Statistics Korea.[2] The survey tracks the percentage of South Korean students who ate fast food more than three times in the seven days preceding the survey in every province in every year. The summary statistics are reported in Appendix Table S7(c). We conduct a leads-and-lags DID on the regional data, the results of which are displayed in Appendix Table S17. If the main results are driven by differences in people's dietary habits between the treated and control provinces, we would expect to observe significantly positive coefficients after the entry of the online food delivery platform. However, we detect no differences in dietary habits; i.e., fast food consumption did not differ between the treated and control provinces during our sample period, either for men or for women. The coefficients following the entry of the online fast food delivery platform are negative and not statistically

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[2] Ideally, we would have information on adult eating habits. However, Statistics Korea surveys adults only regarding the habits of smoking, drinking, and skipping breakfast. Only young people are surveyed regarding fast food consumption.

significant. This suggests that the reduction in time spent on meal preparation did not result from differences in dietary habits between the treated and control provinces.

Another alternative explanation is that it is not very time-consuming for people to shop for groceries, especially if the shops are within walking distance. These stores also sell a wide range of prepackaged meals, which can be consumed simply by heating them or following other minimal preparation. To alleviate this concern, we collect data on the number of light food restaurants from KOSIS and conduct a DID analysis, as shown in Appendix Table S18. Light food restaurants include establishments such as bakeries and those that serve pizza, hamburgers, sandwiches, fried chicken, seaweed rolls, and other light food as well as light food take-out restaurants. These restaurants are fast, convenient and provide food that requires minimal preparation. Our results show that there were no differences in terms of the number of light food restaurants between the treatment and control provinces. Therefore, our results are unlikely to be driven by changes in grocery shopping habits.

4. Penetration of Mobile Networks

Another concern is that general technological advances, such as mobile networks and smartphones, which form the basis of online food delivery platforms, may be the main drivers of the observed effect. To alleviate this concern, we provide two pieces of evidence. First, based on data from KOSIS, before the introduction of the online food delivery platform, 96% of individuals already had cellphones, indicating that mobile networks were already well established. Second, we test whether the entry of the online food delivery platform is correlated with mobile devices and mobile internet penetration. We gather data on mobile device availability and internet access methods from KOSIS. We then use two dependent variables to measure the penetration of smartphones and mobile networks. The first dependent variable is the percentage of people who use mobile devices (Appendix Table S19, column (1)), and the second is the percentage of people who access the internet through the use of mobile phone wireless internet (Appendix Table S19, column (2)). The results shown in Appendix Table S19 suggest that the treated provinces were indistinguishable from the control provinces in terms of both mobile device penetration and mobile internet

access method. Therefore, it is unlikely that our main result captures the effects of mobile networks and smartphones.

5. Results Driven by GDP

As the time window of our analysis is 2009–2017, it is possible that our estimates capture the effect of other policies or events, such as an economic boom or downturn or the implementation of policies related to female employment. Therefore, Table S1 lists the nationwide labor market policies in South Korea, which shows that the South Korean government did not implement policies that would have changed the labor market structure within our time window, indicating that our estimates are not driven by these policies. Another concern is that the change in employment is due to economic development (Slivko et al. 2020). For instance, when the South Korean economy is booming, the employment rate naturally increases. In contrast, during an economic downturn, housewives may seek jobs to subsidize household expenditures, and the female employment rate may increase accordingly. Therefore, it is crucial to test whether our significant effect is driven by economic developments in South Korea.

A closer look at South Korean economic development shows that the mean GDP growth rate between 2009 and 2016 was 3.103%. After the global financial crisis of 2008, South Korea experienced an economic downturn in 2009, and its growth rate fell to a low of 0.71%. The economy later recovered and grew, peaking at 6.5% in 2010. After 2010, the GDP growth rate stabilized at approximately 3%. We rule out the possibility of our estimation being driven by GDP for two reasons. First, changing the economic environment should affect men more than it does women in South Korean. However, in our analysis, we find that only the female employment rate was significantly affected. Second, we conduct a standard DID model (using a binary indicator to capture whether the province has the online food delivery platform at time t) for the shorter time period of 2013–2015, during which the economy was very stable. Thus, we rule out the possibility of economic development driving our results. The results are shown in Appendix Table S20 and are consistent with our main analysis. The entry of the online food delivery platform still exerted a positive effect on both total employment and the female employment rate. Taken together, the results

suggest that changes in the economic environment do not drive our results.

B.   Robustness Checks

In this section, we conduct several robustness tests to address the concerns regarding (1) reverse causality; (2) serial correlation in standard errors; (3) provincial differences in the platform's economic trajectory; (4) the effect of other food delivery platforms; (5) the heterogeneous treatment effect; (6) the city- and county-level analyses; and (7) alternative dependent variables.

1. Reverse Causality

The first concern is reverse causality. Places with a high employment rate may have a stronger demand for online food delivery services because employed individuals may be too busy to prepare meals for themselves. As a result, food delivery companies might choose to set up their businesses in provinces that have higher employment rates first. To alleviate this concern, we ask whether measures of our dependent variables for employment can be used to predict the likelihood of a given online food delivery platform entering a province. In Appendix Table S21, we estimate a logit hazard model (Singer and Willett 1993) where the dependent variable is a dummy variable indicating whether the food delivery platform has entered the province. The unit of observation is province-quarter. Following the conventions of survival models, we exclude the observations for a province after platform entry. Other explanatory variables are the set of control variables (which are identical to those in the main model), namely, birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, CPI, university rate, wife's age, and husband's age.

Appendix Table S21 shows that the female employment rate and participation rate were unrelated to the time at which the online food delivery platform enters a province, thus erasing any concerns of reverse causality. Time had a positive relationship with platform entry because, as time goes by, more people become aware of the platform. The birth rate was also positively correlated with the entry of the online food delivery platform. This is probably because parents with babies had less time to prepare meals for themselves and were more likely to order food online. Consumption rates can also predict the time of entry

because platforms prefer provinces with higher consumption rates, as they offer higher profit opportunities.

2. Serial Correlation in Standard Errors

Next, we consider the concern that serial correlation in standard errors can lead to false significance in our estimates. This is discussed by Bertrand et al. (2004), i.e., long time-series data in DID estimation have correlated standard errors, which may result in significant coefficients even in the absence of a clear effect. To address the concern of serial correlation in our standard errors, we follow the random implementation test recommended by Bertrand et al. (2004) which involves randomly reassigning the treatment dummies in our data to create a new, pseudoindicator, and estimating the standard DID model with control variables and fixed effects. We shuffle the 96 indicators of the online food delivery platform's presence in our data to a randomly selected, new set of observations to create a pseudoindicator for treatment. We then estimate the standard DID model (which uses binary indicators to reflect whether a province had the online food delivery platform at time *t*) with time and province fixed effects and control variables. We record the estimated coefficients from the pseudotreatment and repeat the process 1,000 times. The benefit of this test is that it can detect the presence of spurious significant results that arise from the autocorrelation of dependent variables and determine whether or not the effect is driven by outliers (Bertrand et al. 2004).

The results of the random implementation test are presented in Appendix Table S22. The average of the estimated β from random pseudotreatment is not significantly different from zero, suggesting that the significant effect on employment is not derived from correlated standard errors. Therefore, autocorrelation should not be a serious concern. In addition, the estimated β is quite small in magnitude. The difference between the random β and our estimated β_6 (post-Entry [2.5–3 years] in Table III) is statistically significant ($p < 0.001$), which eliminates the possibility of the observed effect occurring purely by chance.

3. Provincial Differences in the Economic Trajectories of Online Food Delivery Platforms

Although our leads-and-lags DID model does not show any significant differences between the treated and control groups in the pretreatment period, there may be structural differences between those provinces that have the online food delivery platform and those that do not. This would increase the employment rate

even in the absence of the platform. To test this, we conduct a random implementation test by swapping the province implementation vectors (i.e., Gyeonggi-do receives the vector of Gyeongsangbuk-do, which receives the vector of Gyeongsangnam-do, which receives the vector of Jeollabuk-do, etc.). We perform the leads-and-lags DID estimation process 500 times after swapping the province vectors, and record the coefficients each time.

Appendix Table S23 displays the mean and standard deviation of β_j obtained after 500 rounds of randomly swapping province vector data. None of the values of β_j are significantly different from zero after swapping the vectors. This suggests that the significant effect is not driven by structural differences between those provinces that have online food delivery platforms and those that do not. Provinces with and without the platform underwent similar economic trajectories.

4. Effect of Other Food Delivery Platforms

Thus far, the online food delivery platform considered in our analysis is Baemin, which held 55% – 65% of the market share of the South Korean food delivery industry. However, other online food delivery platforms may also be in operation in our sample period. Therefore, we need to ensure that disregarding the entry time of other online food delivery platforms does not bias the estimates in our results. Although Baemin was introduced first, it is possible that other online food delivery platforms broke into the market in certain regions of South Korea prior to Baemin. To address this concern, we collect the Google Trend Index information for two other online food delivery platforms, i.e., Yogiyo and Baedaltong. These three platforms together represent approximately 99% of the market share of online food delivery services in South Korea. We then replicated Equation (1) after adjusting the relative time dummies to allow the first entry time to come from any of the three online food delivery platforms in a given province. We select the earliest time of entry of any of the three platforms as the relative time dummy for that province.

The results of the analyses are presented in Appendix Table S24 and are consistent with those of our main results (Table III). None of the pretreatment period coefficients are significantly different from zero. The female employment rate increased immediately after platform entry. Neither the total nor the male

employment rates were significantly affected by the platforms' entry. In sum, including and excluding the other two food delivery platforms from our analysis yields similar results to those of our main analysis.

5. *Heterogeneous Treatment Effect*

The leads-and-lags DID method with two-way fixed effects is likely to produce biased results if the treatment effect is heterogeneous over time (Baker et al. 2021, Imai and Kim 2021). As explained by Goodman-Bacon (2021), the average treatment effect is a weighted average, which may be skewed by comparisons with earlier and later treatments when the treatment effect varies over time. We follow these researchers proposed solution and use their recommended estimator, the Callaway and Sant'Anna (2021) estimator, to modify the standard staggered DID designs. We use the R package provided by Callaway and Sant'Anna (2021) for this, and the results as shown in Figure S1 are consistent with our main results. We observe that the female and total employment rates increased significantly after the entry of the online food delivery platform, whereas the male employment rate remained unaffected.

6. *City- and County-Level Analysis.*

The main analysis is conducted at the province-quarter level, which is relatively coarse. This section presents our analyses conducted at the city and county levels. We collect annual city- and county-level employment data from KOSIS because the data are only provided yearly. We repeat the leads-and-lags DID analysis, as shown in Appendix Table S26. The results are consistent with our main results. The female employment rate increased after the entry of Baemin, whereas the male employment rate did not significantly change.

7. *Alternative Dependent Variables.*

The dependent variables used in our main analysis are employment rate by gender. This section describes another robustness check conducted using the number of employed people by gender as the dependent variable. We estimate our leads-and-lags DID model using the fixed-effects Poisson pseudo-MLE estimator (Bøler et al. 2015). The Poisson model resolves well-known issues through the use of logged count-dependent variables (i.e., the number of employment) (Arvis and Shepherd 2013), which is a method

that has been widely applied in the literature (e.g., Bøler et al. 2015, Zamoff et al. 2022). We also set the working-age population size by gender as the exposure variable in the Poisson model. The results are shown in Appendix Table S27, and they are consistent with the employment rate results.

C.   Tables and Figures

Table S1. Policies Related to South Korean Female Employment

Year	Description
1995	Equal Employment Act: An employer shall not discriminate against men or women based on gender during recruitment.
2001	Labor Standard Act: Maternity leave is extended to 90 days.
2001	Gender Equal Employment Act: The parental leave scheme is changed to paid leave.
2006	Subsidy for Continuous Employment: Support is provided for employers who hire a non-regular female worker during her pregnancy and childbirth.
2006	Unemployed female applicants who have difficulties in entering the labor market are offered vocational skills-upgrade training to help them enhance their employability.
2007	The government subsidizes employers for the costs of establishing and operating company-based childcare facilities to promote women's participation in economic activities by easing their childcare burden. The government also builds and runs public daycare centers for employees in industrial area.
2007	Act on Equal Employment and Support for Work-Family Reconciliation: Parental leave schemes are expanded with respect to payment, length, and flexibility.
2008	Article 19 of the Equal Employment Act: A female employee with a child under 1 year of age is entitled to childcare leave upon her request and an employer who offers such childcare leave is given a subsidy.
2008	Best Family-Friendly Management Program: This certifies employers who foster environments that support a good work-life balance for their employees. Employers with this certification enjoy a diversity of benefits, such as lower interest rates for bank loans.
2010	National Employment Strategy 2020: A plan for part-time employment in permanent positions.
2017	The government promotes the balanced representation of women by raising their participation in government committees to 40%.

Table S2. Main Variables and Definitions (Statistics Korea Data)

Variables	Descriptions
Dependent Variables	
Employment Rate (Total)	Total Employment / Working-Age Population (Over 15 Years Old) × 100
Employment Rate (Male)	Male Employment / Male Working-Age Population (Over 15 Years Old) × 100
Employment Rate (Female)	Female Employment / Female Working-Age Population (Over 15 Years Old) × 100
Independent Variables	
Entry	Food Delivery Platform Entry Dummies
Control Variables	
Birth Rate	Crude Birth Rate (per 1,000 Population)
Death Rate	Crude Death Rate (per 1,000 Population)
Marriage Rate	Crude Marriage Rate (per 1,000 Population)
Divorce Rate	Crude Divorce Rate (per 1,000 Population)
Husband Age	Mean Age at First Marriage for Men
Wife Age	Mean Age at First Marriage for Women
Net Migration Rate	Net Migration / Working-Age Population (Over 15 Years Old) × 100
GDP Rate	Yearly GDP Growth Rate (%)
Consumption Rate	Yearly Consumption Growth Rate (%)
CPI	CPI (Year on Year Change %)
University Rate	University Degree / Working-Age Population (Over 15 Years Old) × 100

GDP: gross domestic product; CPI: consumer price index.

Table S3. Summary Statistics

	Variable	Observations	Mean	Standard Deviation
1	Employment Rate (Total)	256	60.35	2.75
2	Employment Rate (Male)	256	71.31	2.95
3	Employment Rate (Female)	256	49.71	3.13
4	Birth Rate	256	8.71	1.07
5	Death Rate	256	6.8	1.27
6	Marriage Rate	256	5.67	0.82
7	Divorce Rate	256	2.25	0.17
8	Husband Age	256	31.96	0.42
9	Wife Age	256	29.09	0.51
10	Net Migration Rate	256	0.06	0.14
11	GDP Rate	64	4.68	3.38
12	Consumption Rate	64	3.82	1.63
13	CPI	256	1.95	1.44
14	University Rate	256	26.67	4.52

GDP: gross domestic product; CPI: consumer price index.

Table S4. Online Food Delivery Platform's Impact on Employment Rate on a Quarterly Basis

	Employment Rate		
	Total	Male	Female
	(4)	(5)	(6)
Pre-Entry (≤ 3 Years)	-0.031	-0.033	-0.032
	(0.052)	(0.068)	(0.071)
Pre-Entry (2.75–3 Years)	-0.002	-0.004	-0.002
	(0.059)	(0.064)	(0.080)
Pre-Entry (2.5–2.75 Years)	0.020	0.028	0.015
	(0.063)	(0.074)	(0.074)
Pre-Entry (2.25–2.5 Years)	0.018	0.022	0.017
	(0.054)	(0.067)	(0.065)
Pre-Entry (2–2.25 Years)	-0.020	-0.015	-0.026
	(0.038)	(0.059)	(0.049)
Pre-Entry (1.75–2 Years)	0.009	0.025	-0.004
	(0.026)	(0.028)	(0.048)
Pre-Entry (1.5–1.75 Years)	0.041	0.036	0.047
	(0.032)	(0.028)	(0.048)
Pre-Entry (1.25–1.5 Years)	-0.002	-0.003	-0.001
	(0.019)	(0.016)	(0.030)
Pre-Entry (1–1.25 Years)	-0.021	-0.031	-0.016
	(0.017)	(0.019)	(0.028)
Pre-Entry (0.75–1 Years)	-0.012	-0.013	-0.011
	(0.023)	(0.027)	(0.031)
Pre-Entry (0.5–0.75 Years)	0.036	0.037	0.040
	(0.029)	(0.026)	(0.039)
Pre-Entry (0.25–0.5 Years)	-0.003	0.015	-0.016
	(0.015)	(0.027)	(0.015)
Pre-Entry (0–0.25 Years)		Baseline of Dummy	
Entry (0–0.25 Years)	0.028	0.023	0.035
	(0.023)	(0.034)	(0.022)
Post-Entry (0.25–0.5 Years)	0.070**	0.059	0.085***
	(0.023)	(0.042)	(0.023)
Post-Entry (0.5–0.75 Years)	0.045	0.034	0.058*
	(0.033)	(0.048)	(0.029)
Post-Entry (0.75–1 Years)	0.028	0.015	0.041
	(0.028)	(0.032)	(0.033)
Post-Entry (1–1.25 Years)	0.048	0.042	0.060
	(0.030)	(0.037)	(0.032)
Post-Entry (1.25–1.5 Years)	0.088**	0.083*	0.101**
	(0.029)	(0.035)	(0.033)
Post-Entry (1.5–1.75 Years)	0.061**	0.047	0.079**
	(0.022)	(0.030)	(0.030)
Post-Entry (1.75–2 Years)	0.051*	0.018	0.085**
	(0.022)	(0.029)	(0.029)
Post-Entry (2–2.25 Years)	0.075*	0.059	0.098*
	(0.037)	(0.042)	(0.043)
Post-Entry (2.25–2.5 Years)	0.095***	0.070*	0.125**

	(0.027)	(0.035)	(0.039)
Post-Entry (2.5–2.75 Years)	0.087**	0.065	0.116**
	(0.029)	(0.056)	(0.036)
Post-Entry (2.75–3 Years)	0.098*	0.033	0.164***
	(0.039)	(0.067)	(0.042)
Post-Entry (≥ 3 Years)	0.174**	0.115	0.245***
	(0.064)	(0.103)	(0.059)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	256	256	256
Adjusted R-Squared	0.9006	0.8826	0.8975

Note: The dependent variables are employment rate by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S5. Online Food Delivery Platform's Impact on Employment Rate on a Yearly Basis

	Employment Rate		
	Total	Male	Female
	(4)	(5)	(6)
Pre-Entry (≤ 3 Years)	0.026	0.010	0.042
	(0.055)	(0.053)	(0.071)
Pre-Entry (2–3 Years)	0.032	0.025	0.042
	(0.033)	(0.032)	(0.051)
Pre-Entry (1–2 Years)	0.005	-0.008	0.016
	(0.017)	(0.013)	(0.027)
Pre-Entry (0–1 Years)	Baseline of Dummy		
Entry (0–1 Years)	0.029	0.013	0.045**
	(0.018)	(0.031)	(0.016)
Post-Entry (1–2 Years)	0.043**	0.024	0.064***
	(0.016)	(0.025)	(0.018)
Post-Entry (2–3 Years)	0.059**	0.037	0.084**
	(0.019)	(0.028)	(0.026)
Post-Entry (≥ 3 Years)	0.113*	0.063	0.169**
	(0.048)	(0.067)	(0.055)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	256	256	256
Adjusted R-Squared	0.8844	0.8697	0.881

Note: The dependent variables are employment rate by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S6. Variable Definitions

(a)　　　　　Korea Labor and Income Panel Study

Variables	Descriptions
Dependent Variables	
Housework	1: Main activity in previous week is paid work and household chores (employed people) or household chores (non-employed people), 0: otherwise
Childcare	1: Main activity in previous week is paid work and activities other than household chores and attending school (employed people) or childcare activities (non-employed people), 0: otherwise
Control Variables	
Age	Age
Gender	1: Male, 2: Female
University	1: University Degree or Higher, 2: Otherwise
Marriage Status	1: Single, 2: Married and Living with Spouse, 3: Separated, 4: Divorced, 5: Widowed
Insurance	1: Previously Received Payments from Social Insurance, 2: Receiving Payments from Social Insurance, 3: Never Received Payments from Social Insurance
Health	Current Health Condition. 1: Excellent, 2: Good, 3: Fair, 4: Poor, 5: Very Poor
Life Satisfaction	1 to 5 scale of overall life satisfaction. 1: Very Satisfied, 5: Very Dissatisfied
Family Income Satisfaction	1 to 5 scale of household income satisfaction. 1: Very Satisfied, 5: Very Dissatisfied
Living with Family	1: Live with Family, 2: Do Not Live with Family

(b) Time Use Survey

Variables	Descriptions
Dependent Variables	Unit: minutes
Meal Preparation	Time spent by people on meal preparation
Clearing Tables	Time spent by people on clearing tables and washing dishes
Snack-Preserving	Time spent by people on making snacks and emergency food (stored food, etc.)
Clothes Care	Time spent by people on washing clothes, ironing and knitting clothes and shoes, and purchasing clothes and shoes.
Cleaning and Organizing	Time spent by people on cleaning (sweeping, wiping), tidying up rooms, and removing trash.
Home Repairs	Time spent by people on home/equipment repairs and vehicle maintenance.
Purchasing Goods	Time spent by people on shopping in retail stores, shopping in online stores, purchasing recreation-related services, and other leisure activities.
Other	Time spent by people on administrative services (visiting banks and governments) and other household chores.
Control Variables	
Age	Age
Education	0: No Learning, 1: Elementary School, 2: Middle School, 3: High School, 4: University (< 4 years), 5: University (≥ 4 years), 6: Master's Degree, 7: Doctoral Degree
Marriage Status	1: Single, 2: Married and Living with Spouse, 3: Widowed 4: Divorced
Weekday	1: Weekday, 2: Saturday, 3: Sunday
Monthly Income	1: None, 2: < 500,000 won, 3: 500,000–1 million won, 4: 1–1.5 million won, 5: 1.5–2 million won, 6: 2–2.5 million won, 7: 2.5–3 million won, 8: 3–3.5 million won, 9: 3.5–4 million won, 10: 4–5 million won, 11: ≥ 5 million won

(c) Korea Youth Risk Behavior Survey

Variables	Descriptions
Dependent Variables	
Consumption of Fast Food	Percentage of students who ate fast food 3 or more times during the 7 days preceding the survey in a province.

Table S7. Summary Statistics

(a) Korea Labor and Income Panel Study

Variables	Category: Frequency
Housework	1: 39.8%, 0: 60.1%
Childcare	1: 5.7%, 0: 94.3%
Age	Mean: 48.1; Standard Deviation: 18.4
Gender	1: 32.0%, 2: 68.0%
University	1: 19.0%, 0: 81.0%
Marriage Status	1: 28.9%, 2: 51.7%, 3: 0.3%, 4: 2.4%, 5: 16.6%
Insurance	1: 7.4%, 2: 6.7%, 3: 85.9%
Health	1: 5.8%, 2: 43.5%, 3: 25.5%, 4: 19.4%, 5: 5.8%
Life Satisfaction	Mean: 2.6; Standard Deviation: 0.7
Family Income Satisfaction	Mean: 3.1; Standard Deviation: 0.8
Living with Family	1: 96.9%, 2: 3.1%

(b) Time Use Survey

Variables	Observations	Mean	Standard Deviation
Meal Preparation	5800	50.81	43.88
Clearing Tables	5800	31.44	29.55
Snack-Preserving	5800	15.61	41.75
Clothes Care	5800	20.48	31.38
Cleaning and Organizing	5800	38.45	38.94
Home Repairs	5800	2.71	13.40
Purchasing Goods	5800	11.63	28.04
Other	5800	1.94	9.63
Age	5800	46.43	22.79

Variables	Category: Frequency
Education	0: 11.14%, 1: 20.55%, 2: 13.24%, 3: 31.66%, 4: 10.59%, 5: 11.55%, 6: 1.21%, 7: 0.07%
Marriage Status	1: 24.34%, 2: 54.38%, 3: 19.45% 4: 1.83%
Weekday	1: 59.67%, 2: 20.69%, 3: 19.64%
Monthly Income	1: 66.48%, 2: 19.76%, 3: 7.48%, 4: 2.28%, 5: 1.24%, 6: 0.76%, 7: 0.48%, 8: 0.69%, 9: 0.24%, 10: 0.28%, 11: 0.31%

(c) Korea Youth Risk Behavior Survey

Variable: Consumption of Fast Food	Observations	Mean	Standard Deviation
Total	72	13.91	2.73
Male	72	15.15	2.63
Female	72	12.53	3.04

Table S8. Online Food Delivery Platform's Impact on Household Chores

	Female		Male	
	Employed	Non-Employed	Employed	Non-Employed
	(1)	(2)	(3)	(4)
Pre-Entry ($\leq$ 2 Years)	0.274	0.145	4.139***	-0.032
	(0.235)	(0.211)	(1.254)	(0.355)
Pre-Entry (1–2 Years)	0.314	-0.255	1.211	-0.135
	(0.196)	(0.143)	(0.767)	(0.481)
Pre-Entry (0–1 Years)	Baseline of Dummy			
Entry (0–1 Years)	0.081	-0.188**	0.664	0.618
	(0.084)	(0.059)	(0.550)	(0.325)
Entry (1–2 Years)	-1.032***	-0.234*	-3.549**	0.219
	(0.247)	(0.104)	(1.232)	(0.251)
Entry ($\geq$ 2 Years)	-0.538*	-0.430***	-2.707	0.343
	(0.210)	(0.068)	(1.731)	(0.363)
Time Fixed Effect	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	15806	19702	23164	9246
Adjusted R-Squared	0.153	0.3447	0.245	0.1399

Note: The dependent variable is a dummy variable that equals 1 if the main activity is paid work and household chores (employed people) or household chores (non-employed people). The control variables are age, university degree, marriage status, receiving social insurance, health status, life satisfaction, family income satisfaction, living with family, region birth rate, GDP rate, consumption rate, and consumer price index (CPI). The model is generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S9. Changes in Time Spent by People on Different Household Chores

	Meal Preparation (1)	Meal Preparation (2)	Clearing Table (3)	Snack Preparation (4)	Clothes Care (5)	Clothes Care (6)	Cleaning and Organizing (7)	Home Repair (8)	Purchasing Goods (9)	Other (10)
Panel A: Employed Female										
2014	-7.366***	-0.009	-1.515	0.190	-6.462***	-8.078***	5.830***	-2.866***	12.292***	-0.463
	(1.718)	(2.118)	(1.096)	(1.018)	(1.164)	(0.872)	(1.587)	(0.564)	(1.066)	(0.392)
With Food Delivery Platform Entry	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1458	4090	1458	1458	1458	4090	1458	1458	1458	1458
Adjusted R-squared	0.3006	0.2976	0.2122	0.0538	0.1239	0.0930	0.1422	0.0399	0.1077	0.018
Panel B: Non-Employed Female										
2014	-6.794***	-2.394	0.561	1.264	-2.810	-9.201***	7.031***	-4.226***	20.109***	-0.493
	(2.039)	(1.804)	(1.378)	(2.307)	(1.630)	(2.498)	(1.842)	(0.617)	(1.189)	(0.627)
With Food Delivery Platform Entry	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1638	4162	1638	1638	1638	4162	1638	1638	1638	1638
Adjusted R-squared	0.3578	0.4386	0.4294	0.3283	0.0566	0.1528	0.1133	0.2406	0.0493	0.1978
Panel C: Employed Male										
2014	-1.146*	-0.525	-0.699	0.490	-0.238	-0.363	2.365**	-1.961***	5.788***	-0.143
	(0.572)	(0.578)	(0.392)	(0.382)	(0.320)	(0.256)	(0.789)	(0.528)	(0.665)	(0.314)
With Food Delivery Platform Entry	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1926	5142	1926	1926	1926	5142	1926	1926	1926	1926
Adjusted R-squared	0.0865	0.1228	0.0551	0.0066	0.0272	0.0558	0.0486	0.022	0.0673	-0.0029
Panel A: Non-Employed Male										
2014	-2.616**	1.348	-2.017*	-1.430	-0.007	-0.283	-0.002	-5.089***	6.900***	-2.201
	(0.981)	(0.830)	(0.849)	(2.368)	(0.572)	(0.447)	(1.738)	(1.058)	(1.131)	(1.160)

With Food Delivery Platform Entry	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	794	2036	794	794	794	2036	794	794	794	794
Adjusted R-Squared	0.1985	0.1740	0.1797	0.019	0.0766	0.1063	0.1189	0.0517	0.0508	0.0523

Note: The dependent variables are the time spent by people on different activities in minutes. The independent variable is a dummy variable that indicates the year 2014. The control variables are age, education, marriage status, weekday, and average monthly income. Clearing Tables refers to clearing tables and washing dishes. Snack-Preparation includes making snacks and emergency food (stored food, etc.). Clothes Care includes washing clothes, ironing and knitting clothes and shoes, and purchasing clothes and shoes. Cleaning and Organizing includes cleaning (sweeping, wiping), tidying rooms, and removing trash. Home Repairs refer to home/equipment repairs and vehicle maintenance. Purchasing Goods includes shopping in retail stores, shopping in online stores, purchasing recreation-related services, and other leisure activities. Others refers to administrative services (visiting banks and governments) and other household chores. The province with food delivery platform entry before 2014 is Gyeonggi-do. Robust standard errors are in round brackets. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table S10. Difference-in-differences Estimation of the Effect of Food Delivery Platform on Employment Rate by Occupation

	Managers	Professionals and Related Workers	Clerks	Service Workers	Sales Workers	Skilled Agricultural, Forestry, and Fishery Workers	Craft and Related Trade Workers	Equipment, Machine Operation and Assembly Workers	Elementary Occupations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Entry	0.082	-0.010	0.039	0.054**	-0.046	0.017	0.012	-0.067	0.024
	(0.086)	(0.040)	(0.034)	(0.018)	(0.040)	(0.049)	(0.041)	(0.049)	(0.049)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64	64	64	64	64	64	64	64	64
Adjusted R-Squared	0.7422	0.9658	0.9325	0.9468	0.6159	0.9931	0.921	0.9713	0.8223

Note: The dependent variables are the employment rates of the corresponding occupations. Managers include senior public officials and senior corporate officials, public, business administration, and marketing management occupations, professional services management occupations, construction, electricity and production-related managers, and sales and customer service managers. Professionals and Related Workers include engineering professionals and technical occupations, health, social welfare, and religion-related occupations, education professionals and related occupations, business and finance professionals and related occupations, and culture, arts, and sports professionals and related occupations. Clerks include administration and accounting-related occupations, finance and insurance clerks, consulting, statistical, and information clerks, and other clerks. Service Workers include police, firefighting, and security-related service occupations, hairdressing, wedding, and medical assistance service workers, transport and leisure service occupations, and cooking and food service occupations. Sales Workers include sales occupations, store sales occupations, and door to door, street, and telecommunication sales-related occupations. Skilled Agricultural, Forestry, and Fishery Workers include agricultural, livestock-related skilled occupations, skilled forestry occupations, and skilled fishery occupations. Craft and Related Trade Workers include transport and machine-related trade occupations, electrical and electronic-related trade occupations, construction and mining-related trade occupations, and other technical occupations. Equipment, Machine Operating and Assembling Workers include chemical-related machine operating occupations, machine production and related machine operators, electrical and electronic-related machine occupations, and driving and transport-related occupations. Elementary Occupations include construction and mining-related elementary occupations, transport-related elementary occupations, production-related elementary occupations, cleaning and guard-related elementary occupations, household chores and cooking attendants, sales-related elementary occupations, and agriculture, forestry, fishing, and other service elementary occupations. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S11. Difference-in-differences Estimation of the Effect of Food Delivery Platform on Employment Rate by Working Hours and Employment Status

	Working Hours				Employment Status		
	1–14 Hours	15–35 Hours	36–52 Hours	53 Hours and Over	Self-Employed Workers	Regular Employees	Temporary Employees and Daily Workers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Entry	0.034	0.070*	0.003	-0.040	0.018	-0.037	0.080***
	(0.047)	(0.029)	(0.022)	(0.051)	(0.034)	(0.020)	(0.023)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64	64	64	64	64	64	64
Adjusted R-Squared	0.862	0.8372	0.9249	0.899	0.977	0.9798	0.8642

Note: The dependent variables for working hours are the employment rates of people whose weekly working hours are 1–14, 15–35, 36–52, and 53 hours and over. The dependent variables for employment status are the employment rates of people who are self-employed workers, regular employees, temporary employees, and daily workers. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

<div align="center">Table S12: Heterogeneity Analysis</div>

	Female Employment Rate				
	(1)	(2)	(3)	(4)	(5)
Entry	0.097***	0.109***	0.066*	0.093***	0.109***
	(0.020)	(0.020)	(0.030)	(0.021)	(0.025)
Entry × High Income		-0.016			
		(0.020)			
Entry × High Restaurant Density			-0.053		
			(0.031)		
Entry × Urban				0.022	
				(0.024)	
Entry × High Education Level					-0.021
					(0.021)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes	Yes	Yes
Observations	1222	1218	580	1222	1222
Adjusted R-Squared	0.8589	0.8594	0.9037	0.859	0.8603

Note: The dependent variable is the female employment rate. High Income is a dummy variable that equals 1 if the tax revenue of the county is above the median tax revenue of all counties. High Restaurant Density is a dummy variable that equals 1 if the number of restaurants per 100 people in the county is above the median restaurant density. Urban means that the county is classified as an urban area. High Education Level is a dummy variable that equals 1 if the university rate of the inactive population of the county is above the median university rate. The control variables are regional birth rate, death rate, marriage rate, divorce rate, net migration rate, gdp rate, consumption rate, wife age, and husband age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the city level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S13. Online Food Delivery Platform's Impact on Employment Rate after Controlling Labor Demand

	Employment Rate			
	Total	Male	Female	Excluding Employment in the Food and Beverage Sectors
	(1)	(2)	(3)	(4)
Pre-Entry (≤ 3 Years)	-0.019	-0.049	-0.004	-0.025
	(0.069)	(0.116)	(0.056)	(0.066)
Pre-Entry (2.5–3 Years)	0.021	-0.002	0.036	0.014
	(0.067)	(0.098)	(0.065)	(0.065)
Pre-Entry (2–2.5 Years)	0.008	-0.012	0.021	0.002
	(0.053)	(0.084)	(0.051)	(0.052)
Pre-Entry (1.5–2 Years)	0.035	0.021	0.046	0.032
	(0.036)	(0.046)	(0.048)	(0.034)
Pre-Entry (1–1.5 Years)	-0.005	-0.024	0.008	-0.007
	(0.026)	(0.036)	(0.030)	(0.026)
Pre-Entry (0.5–1 Years)	0.018	0.006	0.029	0.016
	(0.022)	(0.023)	(0.031)	(0.022)
Pre-Entry (0–0.5 Years)	Baseline of Dummy			
Entry (0–0.5 Years)	0.049**	0.034	0.066***	0.049**
	(0.016)	(0.030)	(0.015)	(0.016)
Post-Entry (0.5–1 Years)	0.037	0.019	0.057*	0.037
	(0.026)	(0.037)	(0.024)	(0.026)
Post-Entry (1–1.5 Years)	0.067**	0.054	0.086***	0.067**
	(0.022)	(0.029)	(0.021)	(0.021)
Post-Entry (1.5–2 Years)	0.053**	0.024	0.085***	0.053**
	(0.019)	(0.028)	(0.020)	(0.020)
Post-Entry (2–2.5 Years)	0.079**	0.057	0.107**	0.078**
	(0.028)	(0.032)	(0.037)	(0.026)
Post-Entry (2.5–3 Years)	0.077***	0.045	0.113***	0.075***
	(0.023)	(0.041)	(0.030)	(0.021)
Post-Entry (≥ 3 Years)	0.149**	0.102	0.205***	0.152***
	(0.046)	(0.069)	(0.051)	(0.045)
Time Fixed Effect	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	256	256	256	256
Adjusted R-Squared	0.8908	0.8755	0.8867	0.8954

Note: The dependent variables are total employment rate (column (1)), male employment rate (column (2)), female employment rate (column (3)), and total employment rate after excluding employment in the food and beverage industries (column (4)). The common control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, gdp rate, consumption rate, consumer price index (cpi), university rate, wife age, and husband age. In columns (1)–(3), we add controls for the number of establishments and average wages in the food and beverage sectors. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S14. Online Food Delivery Platform's Impact on Employment in Food and Beverage Sectors

	Employment Rate		
	Total Employee	Regular Employee	Temporary Employee
	(1)	(2)	(3)
Pre-Entry ($\leq$ 2 Years)	0.080	0.760*	-0.395
	(0.134)	(0.340)	(0.205)
Pre-Entry (1–2 Years)	0.167	-0.060	0.290
	(0.088)	(0.224)	(0.160)
Pre-Entry (0–1 Years)	Baseline of Dummy		
Entry (0–1 Years)	0.145*	0.227*	0.086
	(0.061)	(0.090)	(0.079)
Entry (1–2 Years)	0.236**	-0.312	0.600***
	(0.078)	(0.255)	(0.110)
Entry ($\geq$ 2 Years)	0.124	-0.273	0.420***
	(0.076)	(0.171)	(0.035)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	56	56	56
Adjusted R-Squared	0.971	0.9316	0.9267

Note: The dependent variable is the ratio of employees in the food delivery and beverage service sectors to the economically active population. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S15. Online Food Delivery Platform's Impact on Childcare Activities

	Female		Male	
	Employed	Non-Employed	Employed	Non-Employed
	(1)	(2)	(3)	(4)
Pre-Entry ($\leq$ 2 Years)	2.494*	-1.100**	-20.277***	160.644***
	(1.173)	(0.372)	(1.440)	(6.563)
Pre-Entry (1–2 Years)	0.539	0.100	-8.872***	329.299***
	(0.641)	(0.246)	(0.970)	(12.535)
Pre-Entry (0–1 Years)		Baseline of Dummy		
Entry (0–1 Years)	0.910	0.131	0.692	-81.906***
	(0.526)	(0.107)	(0.362)	(4.300)
Entry (1–2 Years)	1.743**	0.637***	29.638***	-199.954***
	(0.557)	(0.165)	(1.449)	(5.811)
Entry ($\geq$ 2 Years)	0.527	0.914***	3.979*	-447.369***
	(0.593)	(0.177)	(1.937)	(18.023)
Time Fixed Effect	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	15806	19702	23164	9246
Adjusted R-Squared	0.2044	0.439	0.4769	0.3677

Note: The dependent variable is a dummy variable that equals 1 if the main activity is paid work and activities other than household chores and attending school (employed people) or childcare (non-employed people). The control variables are age, university degree, marriage status, receiving social insurance, health status, life satisfaction, family income satisfaction, living with family, region birth rate, GDP rate, consumption rate, and consumer price index (CPI). The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

<div align="center">Table S16. Freelancer Opportunities</div>

	Freelancer		
	Total	Female	Male
	(1)	(2)	(3)
Pre-Entry (≤ 2 Years)	-1.680***	-1.043	-2.403***
	(0.419)	(0.677)	(0.711)
Pre-Entry (1–2 Years)	0.039	0.771	-0.563
	(0.439)	(0.522)	(0.431)
Pre-Entry (0–1 Years)		Baseline of Dummy	
Entry (0–1 Years)	-0.147	0.847	-0.922
	(0.624)	(0.696)	(0.806)
Entry (1–2 Years)	0.179	0.817	-0.325
	(0.815)	(0.802)	(0.995)
Entry (≥ 2 Years)	0.491	1.196	-0.104
	(0.765)	(0.766)	(1.230)
Time Fixed Effect	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observation	67921	35507	32414
Adjusted R-Squared	0.0692	0.095	0.104

Note: The dependent variable is a dummy variable that equals to 1 if the respondent is a freelancer. The set of control variables is age, university degree, marriage status, receiving social insurance, health status, life satisfaction, family income satisfaction, living together with family, region birth rate, GDP Rate, Consumption Rate, and CPI. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

<u>Table S17. Online Food Delivery Platform's Impact on Fast-food Consumption</u>

	Consumption of Fast Food		
	Total	Male	Female
	(1)	(2)	(3)
Pre-Entry ($\leq$ 2 Years)	-0.062	-0.090	-0.033
	(0.122)	(0.142)	(0.169)
Pre-Entry (1–2 Years)	-0.142*	-0.220***	-0.046
	(0.064)	(0.054)	(0.103)
Pre-Entry (0–1 Years)		Baseline of Dummy	
Entry (0–1 Years)	-0.059	-0.078	-0.022
	(0.060)	(0.056)	(0.079)
Entry (1–2 Years)	-0.044	-0.057	-0.017
	(0.074)	(0.100)	(0.069)
Entry ($\geq$ 2 Years)	0.046	0.022	0.081
	(0.090)	(0.130)	(0.081)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	72	72	72
Adjusted R-Squared	0.9205	0.881	0.8894

Note: The dependent variable is the percentage of students who ate fast food 3 or more times during the 7 days preceding the survey. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S18. Light Food Restaurants

	Light Food Restaurant
	(1)
Pre-Entry (≤ 2 Years)	-0.064
	(7.082)
Pre-Entry (1–2 Years)	-0.025
	(6.299)
Pre-Entry (0–1 Years)	Baseline of Dummy
Entry (0–1 Years)	-0.009
	(3.976)
Entry (1–2 Years)	-0.006
	(7.526)
Entry (≥ 2 Years)	0.009
	(4.443)
Time Fixed Effect	Yes
Province Fixed Effect	Yes
Control Variables	Yes
Observations	56
Adjusted R-Squared	0.9884

Note: The dependent variable is the number of light food restaurants per 100 people. Light food restaurants include places such as bakeries and those that serve pizza, hamburgers, sandwiches, fried chicken, seaweed rolls, and other light food, and take-out light food restaurants. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S19. Mobile Devices and Mobile Internet Usage

	Mobile Device (%)	Mobile Internet (%)
	(1)	(2)
Pre-Entry (≤ 2 Years)	-3.538	-5.987
	(6.045)	(7.664)
Pre-Entry (1–2 Years)	-2.746	-1.735
	(5.274)	(6.507)
Pre-Entry (0–1 Years)	Baseline of Dummy	
Entry (0–1 Years)	-1.095	-1.172
	(3.130)	(4.113)
Entry (1–2 Years)	-0.792	0.799
	(3.424)	(4.140)
Entry (≥ 2 Years)	0.569	2.204
	(3.706)	(4.518)
Time Fixed Effect	Yes	Yes
Province Fixed Effect	Yes	Yes
Control Variables	Yes	Yes
Observations	64	56
Adjusted R-Squared	0.8400	0.506

Note: The dependent variable is the percentage of people who use mobile devices (column (1)) and the percentage of people who use mobile phone wireless Internet (column (2)). The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S20. Online Food Delivery Platform's Impact on Employment During 2013–2015

	Employment Rate		
	Total	Male	Female
	(1)	(2)	(3)
Entry	0.043*	0.050	0.043***
	(0.021)	(0.024)	(0.027)
Time Fixed Effect	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	84	84	84
Adjusted R-Squared	0.9294	0.9211	0.9143

Note: The dependent variable is the employment rate by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the city level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S21. Logit Hazard Model Predicting Food Delivery Platform's Entry into a Province

	(1)	(2)
Time	1.269**	1.447*
	(0.420)	(0.631)
Employment Rate (Female)	67.907	
	(68.579)	
Participation Rate (Female)		94.351
		(82.630)
Net Migration Rate	2.226	0.802
	(6.325)	(6.569)
Birth Rate	2.347**	2.645*
	(0.901)	(1.062)
Death Rate	-0.891	-1.401
	(1.569)	(2.366)
Marriage Rate	0.916	1.228
	(0.922)	(1.234)
Divorce Rate	4.789	5.621
	(5.978)	(5.765)
GDP Rate	0.645	0.748
	(0.376)	(0.478)
Consumption Rate	3.379	4.066
	(2.115)	(2.460)
CPI	-1.596	-2.096
	(1.868)	(2.153)
University Rate	-0.114	-0.149
	(0.494)	(0.591)
Wife Age	2.760	3.090
	(4.756)	(5.027)
Husband Age	8.948	11.079
	(7.944)	(10.634)
Constant	-471.886	-572.140
	(384.659)	(447.735)
Observations	168	168

Note: The dependent variable Food Delivery Platform Enters at Time t is a dummy that takes the value 1 for the period in which the food delivery platform enters a given province. The province is included in the sample in the period following entry. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S22. Random Implementation Test

Estimation	Employment (Female)	Employment Rate (Female)
Mean of Random β	0.01145	0.00016
Standard Deviation of Random β	3.07256	0.00763
Estimated Beta (Post-Entry (2.5–3 Years))	29.54400	0.10400
Replications	1,000	1,000
Z-Score	-303.94906	-430.15211
p-Value	< 0.001	< 0.0

Note: The number of observations in each random implementation test is 256.

Dependent Variable	Employment (Female)	Employment Rate (Female)
Mean of Pre-Entry (≤ 3 Years)	9.59973883	0.00464786
Standard Deviation of Pre-Entry (≤ 3 Years)	35.5641762	0.06880203
Mean of Pre-Entry (2.5–3 Years)	6.18428766	0.00500534
Standard Deviation of Pre-Entry (2.5–3 Years)	32.0242999	0.06035134
Mean of Pre-Entry (2–2.5 Years)	4.71733624	0.00356092
Standard Deviation of Pre-Entry (2–2.5 Years)	22.369607	0.04484345
Mean of Pre-Entry (1.5–2 Years)	3.05937288	0.0031496
Standard Deviation of Pre-Entry (1.5–2 Years)	17.2024802	0.04087721
Mean of Pre-Entry (1–1.5 Years)	1.28403211	0.00148489
Standard Deviation of Pre-Entry (1–1.5 Years)	11.7856382	0.03036792
Mean of Pre-Entry (0.5–1 Years)	0.47227508	0.00104509
Standard Deviation of Pre-Entry (0.5–1 Years)	8.17819398	0.02538842
Mean of Entry (0–0.5 Years)	-1.1444293	0.00012647
Standard Deviation of Entry (0–0.5 Years)	7.37152284	0.02851317
Mean of Post-Entry (0.5–1 Years)	-1.7448128	-0.0001417
Standard Deviation of Post-Entry (0.5–1 Years)	9.85289682	0.03062189
Mean of Post-Entry (1–1.5 Years)	-2.8684098	-0.0008045
Standard Deviation of Post-Entry (1–1.5 Years)	10.7729631	0.04707491
Mean of Post-Entry (1.5–2 Years)	-3.4418767	-0.0008782
Standard Deviation of Post-Entry (1.5–2 Years)	10.3387754	0.05082356
Mean of Post-Entry (2–2.5 Years)	-4.0400659	-0.0016093
Standard Deviation of Post-Entry (2–2.5 Years)	14.8933727	0.06802403
Mean of Post-Entry (2.5–3 Years)	-2.2793805	-0.0029103
Standard Deviation of Post-Entry (2.5–3 Years)	22.5894391	0.07508416
Mean of Post-Entry (≥ 3 Years)	7.67713514	-0.0027573
Standard Deviation of Post-Entry (≥ 3 Years)	54.6059105	0.10482143
Replication	500	500
Time Fixed Effect	Yes	Yes
Province Fixed Effect	Yes	Yes

Note: The number of observations in each random-implementation swapping province vector regression is 256.

Table S24. Effect of Other Food Delivery Platforms

	Employment Rate		
	Total	Male	Female
	(4)	(5)	(6)
Pre-Entry (≤ 3 Years)	0.005	-0.011	0.014
	(0.038)	(0.050)	(0.061)
Pre-Entry (2.5–3 Years)	0.007	-0.028	0.031
	(0.041)	(0.052)	(0.058)
Pre-Entry (2–2.5 Years)	0.020	0.004	0.031
	(0.035)	(0.044)	(0.050)
Pre-Entry (1.5–2 Years)	0.023	0.009	0.035
	(0.024)	(0.032)	(0.044)
Pre-Entry (1–1.5 Years)	0.004	-0.010	0.013
	(0.012)	(0.017)	(0.019)
Pre-Entry (0.5–1 Years)	0.007	-0.008	0.018
	(0.020)	(0.026)	(0.025)
Pre-Entry (0–0.5 Years)	Baseline of Dummies		
Entry (0–0.5 Years)	0.029	-0.023	0.072**
	(0.021)	(0.029)	(0.023)
Post-Entry (0.5–1 Years)	0.015	-0.024	0.047*
	(0.018)	(0.025)	(0.021)
Post-Entry (1–1.5 Years)	0.023	-0.018	0.059***
	(0.022)	(0.031)	(0.017)
Post-Entry (1.5–2 Years)	0.035*	-0.007	0.074***
	(0.016)	(0.025)	(0.020)
Post-Entry (2–2.5 Years)	0.029	-0.026	0.078**
	(0.032)	(0.042)	(0.029)
Post-Entry (2.5–3 Years)	0.026	-0.029	0.076**
	(0.030)	(0.042)	(0.028)
Post-Entry (≥ 3 Years)	0.104*	0.010	0.199***
	(0.041)	(0.069)	(0.033)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	256	256	256
Adjusted R-Squared	0.8807	0.8692	0.8797

Note: The dependent variable is the employment rate by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S25. Difference-in-differences models Excluding Provinces with Entry Time before 2011

	Employment Rate		
	Total	Male	Female
	(4)	(5)	(6)
Entry	0.054*	0.049	0.062***
	(0.026)	(0.050)	(0.016)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	224	224	224
Adjusted R-Squared	0.9005	0.873	0.892

Note: The dependent variables are employment rate by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration rate, GDP rate, consumption rate, consumer price index (CPI), university rate, wife's age, and husband's age. The models are obtained from a generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table S26. Online Food Delivery Platform's Impact on Employment at City and County Level

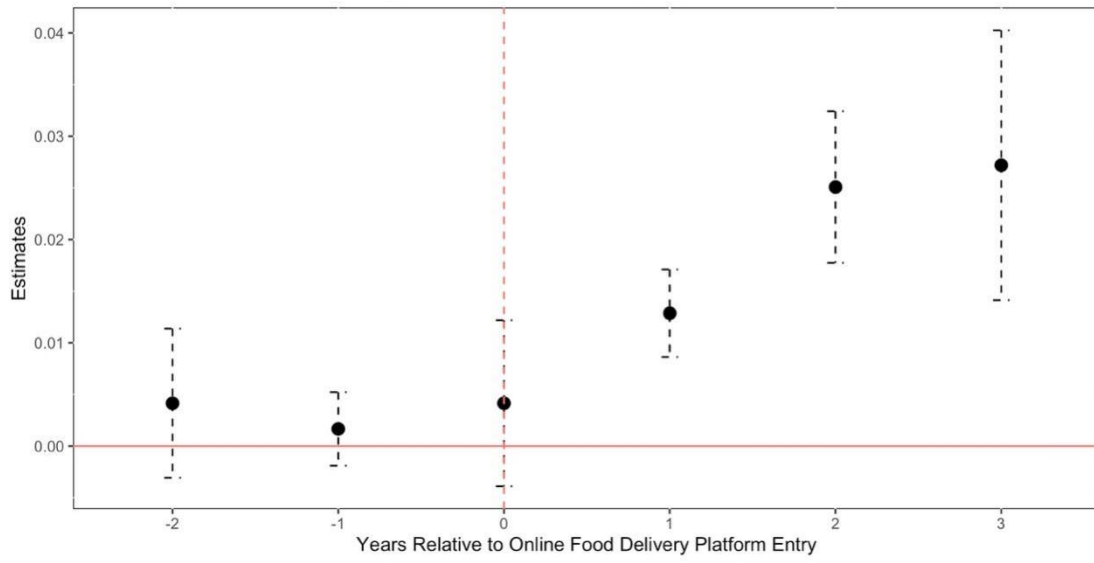|	Employment Rate		
	Total	Male	Female
	(1)	(2)	(3)
Pre-Entry (≤ 2 Years)	-0.034	-0.019	-0.047
	(0.021)	(0.024)	(0.027)
Pre-Entry (1–2 Years)	-0.004	-0.001	-0.008
	(0.011)	(0.014)	(0.013)
Pre-Entry (0–1 Years)	Baseline of Dummy		
Entry (0–1 Years)	0.004	-0.005	0.011
	(0.008)	(0.010)	(0.010)
Entry (1–2 Years)	0.017	-0.005	0.036*
	(0.013)	(0.016)	(0.016)
Entry (≥ 2 Years)	0.043*	-0.002	0.085***
	(0.021)	(0.025)	(0.026)
Time Fixed Effect	Yes	Yes	Yes
City Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Observations	1218	1218	1218
Adjusted R-Squared	0.9295	0.8895	0.9293

Note: The dependent variable is the employment rate by gender. The control variables are regional birth rate, death rate, marriage rate, divorce rate, net migration rate, gdp rate, consumption rate, university rate, tax revenue, wife age, and husband age. The model is generalized linear model (GLM) regression. Robust standard errors are displayed in round brackets and clustered at the city level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

### Table S27. Online Food Delivery Platform's Impact on Employment Number

	Employment Number		
	Total	Male	Female
	(1)	(2)	(3)
Pre-Entry ($\leq$ 3 Years)	0.011	-0.001	0.031
	(0.018)	(0.020)	(0.024)
Pre-Entry (2.5–3 Years)	0.021	0.009	0.039
	(0.018)	(0.018)	(0.025)
Pre-Entry (2–2.5 Years)	0.009	-0.004	0.027
	(0.016)	(0.019)	(0.020)
Pre-Entry (1.5–2 Years)	0.016	0.002	0.034
	(0.010)	(0.010)	(0.018)
Pre-Entry (1–1.5 Years)	-0.003	-0.008	0.004
	(0.008)	(0.010)	(0.010)
Pre-Entry (0.5–1 Years)	0.011	0.003	0.021
	(0.008)	(0.006)	(0.014)
Pre-Entry (0–0.5 Years)	Baseline of Dummy		
Entry (0–0.5 Years)	0.016*	0.007	0.028***
	(0.006)	(0.007)	(0.008)
Post-Entry (0.5–1 Years)	0.007	0.001	0.017*
	(0.006)	(0.006)	(0.007)
Post-Entry (1–1.5 Years)	0.021*	0.010	0.034***
	(0.008)	(0.007)	(0.010)
Post-Entry (1.5–2 Years)	0.010	-0.003	0.027**
	(0.007)	(0.007)	(0.010)
Post-Entry (2–2.5 Years)	0.020*	0.003	0.042***
	(0.008)	(0.008)	(0.010)
Post-Entry (2.5–3 Years)	0.017*	-0.003	0.044***
	(0.009)	(0.012)	(0.008)
Post-Entry ($\geq$ 3 Years)	0.046**	0.014	0.092***
	(0.017)	(0.020)	(0.019)
Time Fixed Effect	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes
Exposure Variable	Total Working Age Population	Male Working Age Population	Female Working Age Population
Observation	256	256	256
Adjusted R-Squared	0.8761	0.8648	0.8963

Note: The dependent variables are employment number by gender. The control variables are birth rate, death rate, marriage rate, divorce rate, net migration, gdp, consumption, consumer price index (cpi), university, wife age, and husband age. The estimators are fixed effects Poisson pseudo-MLE estimators. Robust standard errors are displayed in round brackets and clustered at the province level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.
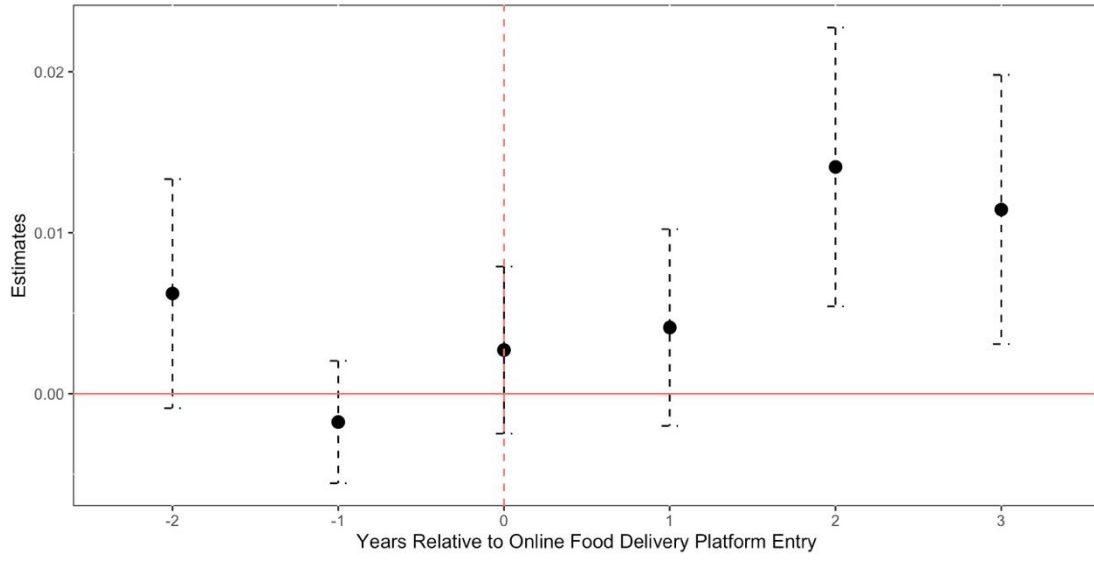
Figure S1. Callaway and Sant'Anna (2021) Estimator
(a) Female Employment Rate

(b) Male Employment Rate
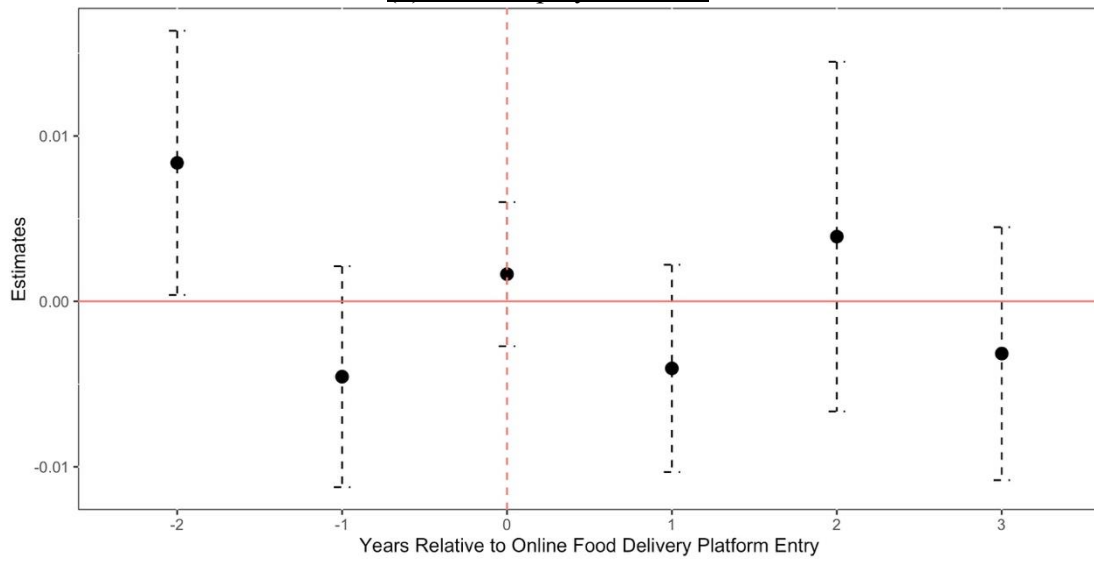
(c) Total Employment Rate

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