Spillovers from Foreign Direct Investment and Export:

Firm- and Household-Level Evidence

By

Dang Thi Kim Dung

Dissertation

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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IN PUBLIC POLICY

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Professor Changkeun LEE

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Committee in charge:

Professor Changkeun, LEE, Supervisor. _____

Professor David Sungho, PARK _____

Doctor Heehyun Rosa, LIM _____

Professor Jinseong, PARK _____

Professor Thi Tuyet Trinh, PHAM _____

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Abstracts

While foreign direct investment is a major driver of economic growth and structural change in many developing countries, probing its microeconomic mechanism still needs more research. This dissertation investigates the spillover effects of foreign investment on domestic businesses and households in Vietnam.

Particularly in *Chapters 1* and *2*, I focus on the most prominent episode of the "big foreign firm opening" in a developing country—Samsung Electronics—a mega multinational corporation (MNC). *Chapter 1* examines the spillover effects of Samsung's investment on the productivity of domestic enterprises. Employing the two-way fixed-effects model and the synthetic control method (SCM), I estimate the spillover effects on firms in the same industry and/or region as horizontal spillovers, and in upstream industries for vertical spillover channels. Examining firm-level microdata, I find that the establishment of Samsung raised total factor productivity and labor productivity in the same regions by two and twelve percentage points, respectively. Such positive spillover effects are concentrated among manufacturing firms in the same industry as Samsung Electronics. Additionally, we find that Samsung's Consultation Program targeting vendors in the upstream sectors is associated with productivity improvement and presents little evidence of spillovers to other industries. Another key finding is the positive effects of the entry channel—new domestic firms tend to be more productive in the affected regions and industries. The synthetic control analysis corroborates our results.

Chapter 2 examines the transformative impact of the big foreign firm's entry on household labor decisions, especially young women's work. Examining the Vietnamese household living standard survey, I find a shift from informal employment, including self-employment, toward formal jobs, primarily into wage work and work for foreign firms, along with increased household expenditures and income in the provinces with Samsung production

facilities. We observe smaller but significant results for households in the adjacent regions. Impacts are more substantial for households with female members aged 18-35, a demographic specifically targeted by Samsung's local recruitment efforts. Synthetic control analysis confirms our main results. Our study shows how a big foreign company hiring less-utilized demographic groups can cause a fundamental change in household labor supply behavior.

Finally, *Chapter 3* analyzes the structure of job creation and destruction from the firm dynamics' perspective, examining the role of size and age. The structure of enterprises in Vietnam reveals that the firm size distribution has increasingly shifted toward micro and small firms, including self-employed and household businesses, becoming more right-skewed over time. In addition, the empirical results indicate that given the same number of years in operation, large enterprises exhibit a higher job creation rate, and the difference in job creation rates between small and large firms is even more pronounced for female employment. In terms of the number of jobs, large enterprises again outweigh small ones. Moreover, this study highlights the gender-based hiring trends of firms, large enterprises tend to hire more female workers than male workers. In contrast, firms with less than 50 employees prefer males to females, especially new entrants.

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Lists of Abbreviations

BNIZ	Bac Ninh Industrial Zone
CECC	Central Emulation and Commendation Council
EAs	Enumeration Areas
FA	Fixed Assets
FLFP	Female Labor Force Participation
FDI	Foreign Direct Investment
FIs	Foreign Invested Firms
GDP	Gross Domestic Product
GSO	General Statistics Office of Vietnam
HH	Household
ILO	International Labour Organization
MNCs	Multinational Corporations
MOF	Ministry of Finance
NG	Not Good
OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
SAVINA	Samsung Vina Electronics
SCM	Synthetic Control Method
SCP	Samsung Consultation Program
SDV	Samsung Display Vietnam
SEHC	Ho Chi Minh City CE Complex
SEMV	Samsung Electro-Mechanics Vietnam

SEV	Samsung Electronics Vietnam
SEVT	Samsung Electronics Vietnam Thai Nguyen
SMEs	Small and Medium Enterprises
TFP	Total Factor Productivity
TWFE	Two-Way Fixed Effect
UNCTAD	United Nations Conference on Trade and Development
VA	Value-added
VSIC	Vietnam Standard Industry Classification
VES	Vietnam Enterprise Survey
VHLSS	Vietnam Household Living Standard Survey
VIR	Vietnam Investment Review
YPIP	Yen Phong Industrial Park
WB	World Bank

Chapter 1

Mega Foreign Firm's Entry and Productivity Spillovers:

Evidence From Samsung In Vietnam[1]

Abstract: Economists have explored how foreign direct investment (FDI) improves developing countries' economic outcomes, such as jobs and firm productivity. Recent literature has shown that the effects go beyond FDI firms, creating spillover effects for firms in the same industry or region. This paper investigates the most prominent episode of "big foreign firm opening" in a developing country - Samsung Electronics in Vietnam. Examining firm-level microdata, we find that the establishment of Samsung, one of the largest MNCs in the world, raised the TFP and labor productivity in the same regions by two and twelve percentage points. Such positive spillover effects are concentrated among the manufacturing firms in the same industry as Samsung Electronics. We also find that Samsung's Consultation Program targeting vendors in the upstream sectors is associated with their productivity improvement and has little evidence of spillovers to other industries. Another key finding is the positive effects of the entry channel – new domestic firms tend to be more productive in the affected region and industries. Synthetic control analysis corroborates our results.

JEL codes: D24, D22, F21, F23, F61, O12

Keywords: Big Foreign Firm, Domestic firms, Spillovers, New Entrants, Incumbents, most affected sectors, upstream industries.

[1] Co-authored by Changkeun Lee.

1.1. Introduction

Foreign direct investment (FDI hereafter) is considered one of the most powerful channels to improve firm and industry productivity in developing countries (Cravino & Levchenko, 2017; Djankov et al., 2000; Ha et al., 2023; Sajod et al., 2010; Schmidt-Petersen, 2023; Setzler & Tintelnot, 2021; Sokhanvar, 2023; Spithoven et al., 2023; Thompson et al., 2023). While much of the policymakers' interest lies in the direct effects, such as job creation and investment in the local economy (ILO, 2006; WB, 2020), economists have paid considerable attention to the indirect or spillover effects (Amiti & Konings, 2007; Glitz & Meyersson, 2020; Kim et al., 2010; Vu et al., 2023; Zhow et al., 2010).

Early research focused on estimating the causal effects of FDI on productivity, suggesting several potential channels. For example, Javorcik (2004) indicates that multinationals can improve the performance of local firms by increasing the demand for intermediate goods, transferring knowledge to local upstream suppliers, and facilitating productivity improvement by imposing higher quality improvement. Later studies elaborate the mechanism by examining heterogeneity in FDI's effects by pre-investment firm characteristics and post-investment firm behaviors. Arnold and Javorcik (2009) analyze the behaviors of firms acquired by multinationals and find that they increase inputs and integrate more into global economies.

Recently, studies have shed light on the spillover or productivity effects on incumbent firms (Greenstone et al., 2010; Kejžar & Ponikvar, 2014; Khachoo & Sharma, 2017; Lembcke et al., 2020). Lembcke et al. (2020) utilized firm-level microdata from 13 OECD nations to examine the occurrence of local spillovers (or crowding out) within and across industries for incumbent firms. They find that foreign investment in the same region as the firm is linked to

a boost in productivity for local enterprises, mainly through cross-sector externalities. In addition, horizontal externalities within the same sector can negatively impact, mostly when originating from foreign companies in remote areas. FDI is often linked to decreased employment inside manufacturing companies but may lead to some growth in smaller firms. However, they have failed to distinguish between existing firms and recently formed enterprises.

Another strand of literature regarding the spillovers from FDI receiving recent attention is the impact of establishing a big plant on the host country (Ciani et al., 2020; Greenstone et al., 2010; Patrick & Partridge, 2022). Greenstone et al. (2010) show that a giant plant's opening has a causal effect on incumbent plants' productivity. The trade or FDI literature brings this perspective to the international context, where the shock can be even more enormous. They highlight that big foreign firms' quality requirements lead to different responses from local suppliers regarding different firms' quality. For example, Iacovone et al. (2015) found that Walmart's entry into Mexico attracted producers with high-appeal products. A more recent work by Alfaro-Urena et al. (2022) also finds that supplying to multinational corporations creates more benefits for better-managed firms in Costa Rica. These findings are in line with the discussion regarding "absorptive capacity."

Hong et al. (2024) examine the impact of large-scale companies on the local manufacturing industry in emerging countries, specifically focusing on the consequences of agglomeration. They rely on evidence obtained from Foxconn, the leading global provider of electronic manufacturing services. By leveraging the spatial decline of the agglomeration effects from Foxconn factories, they employ a geographic difference-in-difference technique to analyze the unforeseen investment in the Henan province of China as a quasi-natural experiment. They observe a greater enhancement in the labor productivity of the regions near Foxconn manufacturing compared to those at a greater distance. This discovery remains strong

and consistent even after rigorous tests to ensure its accuracy and reliability. According to the agglomeration spillovers, regions closer to Foxconn facilities have a greater increase in firm entrance and labor expenses than those further away.

Despite some existing studies (Greenstone et al.,2003; Greenstone et al.,2010; Iacovone et al., 2015; Patrick et al., 2022), research on the spillover effects of large FDI enterprises on domestic enterprises still needs to be further explored regarding the conditions and mechanisms of impact due to data constraints and the scarcity of large firms in low—and middle-income countries (Ciani et al., 2020).

This paper investigates the most significant episode in "big firm opening" in a developing country. Specifically, we examine how Samsung Electronics' entry affected the performance of local companies, focusing on Total Factor Productivity (TFP) and labor productivity. Samsung's investment is considered to have the most significant influence on Vietnam's economy. Since its first investment of 670 million USD for Samsung Electronic Vietnam in 2008, Samsung's total investment capital in Vietnam increased nearly 30 times to over 20 billion USD in 2022. Now, it is the largest firm in Vietnam, accounting for 25% of total export turnover and 23% of the country's GDP.

Our research aligns with Lembcke et al. (2020) and Hong et al. (2024) in emphasizing that the effects of FDI are contingent upon geographic proximity. Hence, we distinguish between firms within the same regions and those in different regions of the country, as well as between businesses in the same sectors and those in different sectors.

However, our study diverges from theirs in several vital respects. Firstly, we concentrate on the impact of a single prominent foreign entity, which substantially contributes to the overall economy of the host country through activities such as job creation, export expansion, and GDP growth. Secondly, instead of solely examining the impact of FDI on

established businesses, we explore its effects on pre-existing and newly established manufacturing firms. By doing so, we test whether new firms, with less sunk investment, demonstrate more adaptability and flexibility in capitalizing on the arrival of a large foreign firm. In other words, we assess whether these new entrant domestic firms possess greater absorptive capacity than incumbent ones. In addition, our study traces the impact of Samsung along the supply chain of Samsung, focusing on firms in upstream industries, especially the ones in the industries that participated in the Samsung Consultation Program (SCP).

Using the Vietnam Enterprises Survey (VES) from 2006 to 2018, we check the impact of the establishment of Samsung on domestic firms within the invested regions and neighboring provinces, compared to the remaining localities. Our analysis suggests considerable spillover effects that amount to 9, 2, 10, and 11 percent increase in the wage level, total factor productivity, revenue per worker, and labor productivity of domestic manufacturing firms located in the regions where Samsung has made its investment. We refine the analysis to find the nature of the spillover effect. We see more vigorous and robust spillover effects on domestic manufacturing enterprises in the electrical and electronic sectors, implying that local firms would have learned technological capability or better production operation.

Samsung's need to secure reliable supplier also helped local firms to improve their production. Before 2015, Samsung predominantly relied on imported materials for its production processes, potentially leading to a constrained spillover effect, mainly when the primary avenue for dissemination involves participation in the supply chain. However, in 2015, Samsung initiated a consultation program and various other activities to assist regional domestic firms in enhancing their capabilities and productivity. The overarching goal was to meet Samsung's stringent material requirements and thereby qualify as a supplier for the corporation. The empirical results find supporting evidence for productivity gains of upstream industries after implementing the Samsung Consultation Program.

Concerning the spillover effects observed on both newly established and existing firms, our findings indicate a more substantial increase in total factor productivity among new entrants. In contrast, incumbent firms exhibit a higher increase in value added per worker and revenue per worker. Incumbent firms in the province where Samsung invested would also have increased their capital investment, whereas new firms would have started with better technology.

To further ensure the robustness of the causal effect, we repeat the analysis using the synthetic control method, considering that a small number of provinces were "treated," being the target of Samsung's investment. Our synthetic control analysis supports the main result—spillover effects regarding domestic firms' productivity.

Our study makes a significant contribution to the FDI literature. Our work's main contribution comes from studying the spillover effects of a large foreign corporation on the productivity of local domestic firms. The introduction of Samsung into the market encourages and supports domestic businesses in enhancing productivity and elevating wage levels. The greatest beneficiaries of this phenomenon are the domestic firms within the same industry in the invested regions. Additionally, we delineate the disparities in the impact of Samsung's entry on newly established firms versus existing ones.

Secondly, to the best of our knowledge, this research represents the inaugural empirical paper examining the repercussions of investment from Samsung, recognized as one of the largest enterprises in Vietnam, on the productivity and various characteristics of domestic firms. Vietnam is an economy that shows rapid growth and successful integration into the global value chain. However, little is known about the effects of attracting a big foreign company to the local economy. While economists still consider FDI a powerful policy tool for enhancing

the economy but speak more about absorptive capacity, the Vietnamese case, possibly the best scenario many developing countries can imagine, gives helpful policy implications.

The paper is organized as follows. Section 1.2 delves deeper into the background of Samsung's investment in Vietnam. Section 1.3 explicates the data used and outlines our empirical strategies. Sections 1.4 and 1.5 showcase the primary empirical findings derived from the Two-way fixed effect model and synthetic control method. Finally, Section 1.6 furnishes conclusions and highlights the implications drawn from the study.

1.2. Samsung’s Investment in Vietnam and Domestic Firms

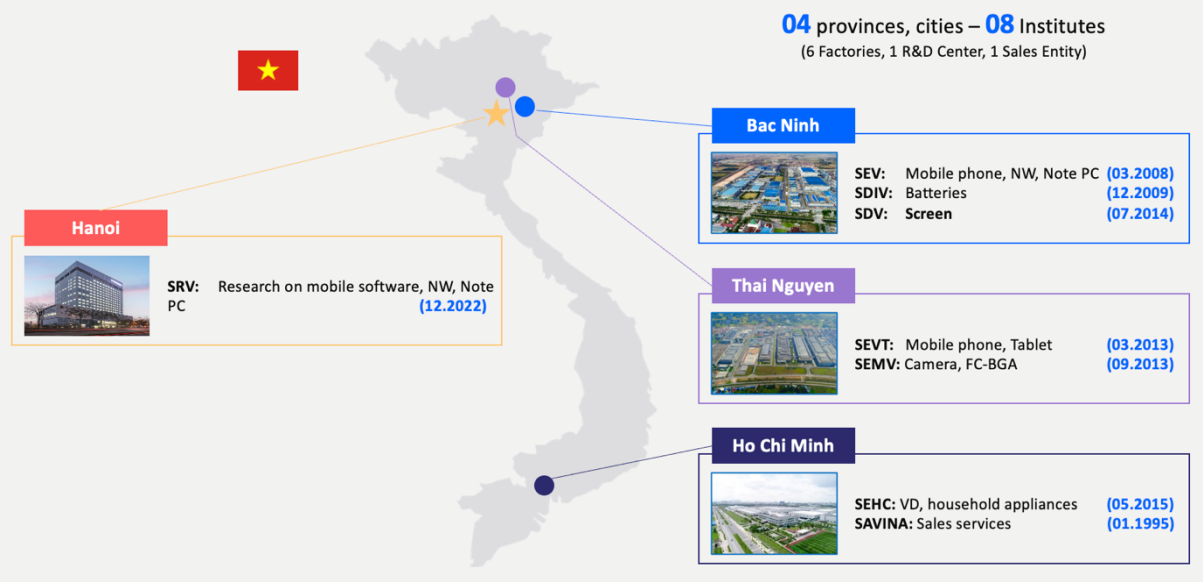
1.2.1. Samsung Investment in Vietnam

Samsung Electronics has been one of the world's largest electronics manufacturers for many years. In fierce competition with Apple and other electronics manufacturers from Taiwan, China, and Japan, Samsung Electronics and satellite companies have invested tens of billions of dollars in developing large-scale production complexes in the northern and southern parts of Vietnam. Specifically, Samsung has six factories, one Research and Development Center (R&D) and one sales entity in Vietnam, namely Samsung Electronics Vietnam (SEV), Samsung Display Vietnam (SDV) and Samsung SDI Vietnam in Bac Ninh, Samsung Electronics Vietnam Thai Nguyen (SEVT), Samsung Electro-Mechanics Vietnam (SEMV) in Thai Nguyen, Samsung Electronics HCMC CE Complex (SEHC) and Samsung Vina Electronics (SAVINA) in Ho Chi Minh City. In 2018, 50 percent of Samsung's mobile devices supplied to the global market were manufactured in Vietnam, including all the newest and most advanced product lines (Ha Van, 2023).

In 2008, Samsung officially received an investment license and began constructing the

Samsung Electronics Vietnam (SEV) mobile phone factory in Yen Phong Industrial Park (YPIP) in Bac Ninh. Samsung's primary aim for SEV in YPIP was to enhance its competitiveness in global markets by setting up a factory to manufacture hi-tech mobile phone handsets. Samsung quickly became a prominent presence not only in YPIP but also in Bac Ninh province - investment from Samsung accounts for 45 percent of total foreign investment in Bac Ninh in 2022. In 2018, SEV employed over 42,000 Vietnamese workers and was responsible for 75 percent of the province's total export earnings. Additionally, within this industrial complex, Samsung established its inaugural mobile phone research center in Southeast Asia (Bac Ninh Industrial Zones, 2018).

Figure 1.1. Samsung Investment in Vietnam



Source: Samsung Newsroom

In 2013, Samsung further expanded its investment in Vietnam by establishing the Samsung Electronics Vietnam-Thai Nguyen Company (SEVT) with an initial capital of $2 billion. After only one year, SEVT increased its capital by $3 billion. In the following years, Samsung continued to invest in new projects and expand its operations in Thai Nguyen. As of 2022, Samsung's total investment capital in Thai Nguyen has exceeded $7.5 billion, accounting

for nearly 73 percent of the total FDI investment capital in the province.

By 2022, Samsung's cumulative capital outlay in Vietnam had surged approximately thirty times, exceeding US$20 billion. Samsung's investment represents a substantial fraction of the aggregate foreign investment inflow and positioned Samsung as the largest foreign investor in Vietnam.

Samsung Vietnam's main products include computers, electronics, optical products, and electrical equipment, especially mobile device manufacturing. These are industries characterized by high sophistication and a significant technology component. Initially, when Samsung entered production in this sector, it relied entirely on imported components to manufacture mobile phone products. Samsung heavily depends on imported input materials primarily because Vietnamese enterprises need help to meet Samsung's high product quality standards and comply with the strict rules regarding output, delivery times, and production processes. The challenges Vietnamese businesses face create a situation where Samsung imports materials to maintain its quality standards and meet its production needs. This import-dependent scenario prevailed until 2014 when only four businesses achieved the status of Level 1 vendors, and less than 20 firms attained the status of Level 2 vendors for Samsung.

Since 2015, notable initiatives have been undertaken, such as the Consultation Program organized by Samsung Electronics Vietnam (SEV) to enhance the productivity and ongoing effectiveness of local Vietnamese enterprises. Manufacturing experts from Samsung Korea have supported nearly 400 Vietnamese companies in improving their competitiveness and product quality. In addition, a comprehensive program has been implemented that includes training sessions and active knowledge sharing. This program empowers local enterprises to refine their expertise, amplify productivity, reduce operational costs, and elevate the quality and reliability of their products.

In 2015, Samsung's Consultation Program focused on printing, packaging, and plastic injection industries. Since 2017, Samsung has expanded the scope of consulting and support to the field of high-tech industries, such as electricity/electronics (PCB electronic circuit boards, TV speakers, electrical wiring harnesses, etc) to help Vietnamese enterprises produce complex electronic components with added value and high technology content in the global supply chain. In addition, Samsung also applies a model for level 1 supplier businesses to guide level 2 supplier businesses in creating a spillover development effect in Vietnam's supporting industries. As a result, in 2018, up to 210 Vietnamese enterprises entered the satellite business chain for Samsung, including 29 level 1 suppliers and 181 level 2 suppliers. The domestic rate of Samsung components increased to 57 percent (Samsung Newsroom, 2023).

In conjunction with stringent supplier selection criteria, Samsung undertakes annual evaluations of its suppliers, discontinuing relationships with those failing to meet the stipulated criteria. Vietnamese enterprises aspiring to remain in Samsung's supplier network must prioritize adherence to discipline, industrial conduct, and transparency. Specifically, Samsung institutes an annual classification program categorizing businesses into ranks A, B, C, and D. Instances of recurrent errors or delayed deliveries lead to the reclassification of suppliers into C or D categories, resulting in their removal from the supply chain (Ministry of Finance (MOF), 2017).

This study investigates the impact of Samsung's entry on domestic firms' performance and some characteristics, especially productivity (represented by total factor productivity and labor productivity). With the motivation to become a supplier for a mega multinational corporation and several supporting programs, Samsung's entry is expected to impact domestic businesses positively. Given that Samsung's current support program primarily directs its focus toward businesses within the invested locality and its neighboring areas, the study aims to pinpoint the regions most influenced by the recipients of this investment and the surrounding

regions. Although Samsung's consulting program focuses on a group of domestic businesses, it cannot be said that all changes in domestic companies result from the consulting program. However, implementing the consulting program can create a positive spillover effect, motivating domestic enterprises to improve productivity and competitiveness by participating in the consulting program and becoming suppliers for Samsung and other FDI enterprises.

1.2.2. Possible Spillover Channels from Samsung to Domestic Firms

Samsung manufactures and assembles various products in Vietnam, including smartphones, tablets, smartwatches, and primary phone products. Notably, smartphones constitute approximately 80% of the total production output. Vietnam lacks domestic enterprises capable of producing these products, rendering direct competition between Samsung and local companies non-existent. Consequently, competition effects would not occur between Samsung and domestic enterprises. Any horizontal spillovers might happen through a knowledge exchange channel. Other firms may learn from Samsung through various channels, such as employee mobility, informal networks, collaborations, or observation. Such a learning effect can lead to productivity improvements and innovation across the industry or region, even for firms that did not invest directly in the initial knowledge creation. Knowledge spillovers are often seen as a critical driver of economic growth and innovation, particularly in high-tech industries and clusters where firms and institutions are closely interconnected.

Vertical spillovers represent another productivity effect that Samsung may generate for Vietnamese domestic enterprises. With an annual production of nearly 200 million electronic products, becoming an input supplier for Samsung offers significant advantages for local businesses. This scenario could foster competition among domestic enterprises striving to become suppliers to Samsung. Moreover, Samsung’s stringent requirements for input

quality, standardized production processes, and tight delivery schedules necessitate continuous innovation, process improvement, and quality enhancement from domestic firms to meet Samsung's standards. Additionally, Samsung places a strong emphasis on human resource development by offering numerous training programs through its training centers to enhance employee capabilities, thereby contributing to its growth. The potential labor mobility between Samsung and local enterprises may also yield positive spillover effects for domestic businesses.

In addition, most of Samsung's products are final goods intended for export, with only a tiny portion distributed through domestic electronic retail networks. Consequently, the likelihood of forming downstream linkages is minimal.

When discussing the impact on the labor market, it is essential to recognize that to produce a large volume of products, Samsung must maintain an adequate workforce, particularly production workers, due to the nature of its operations in Vietnam, which primarily involves assembly. Consequently, this creates competition among businesses within the same sector for recruiting workers, especially skilled laborers, given labor shortages in Bac Ninh and Thai Nguyen.

Since its implementation in 2015, Samsung's consultation program has had a positive impact on the companies that received advice. These companies reported significant achievements, including reduced defect rates, improved product quality, and enhanced delivery processes that ensure timely deliveries. Additionally, these companies generate positive spillover effects on other domestic enterprises through horizontal and vertical spillovers, as well as impacts on the labor market and workforce quality (Chi Mai, 2017; General Department of Customs, 2021; Samsung Newsroom, 2016).

> “Hanpo Vina Joint Stock Company is a supplier of plastic molding products to Samsung's Tier 1 contractors. A company representative reported that the defect rate (NG) decreased by 53% after implementing improvements. The factory layout was redesigned to facilitate easier identification of inventory locations and more effective management of actual inventory levels. Additionally, Hanpo Vina developed a production management system to compare actual output with plans, ensuring timely deliveries.
>
> Thinh Vuong Production and Trading Co., Ltd. is a Tier 1 supplier to the SDV (Samsung Display Vietnam) factory, providing plastic trays for screens. The company achieved the following improvements: a 20% reduction in product defect rate (NG), a 20% reduction in mold changeover time, and a 30% reduction in production process losses.”

The SCP appears to have achieved its goal. The number of suppliers for Samsung increased from 24 to 288 in 2018. There were only four first-tier suppliers in 2014, but the number grew to 35 in 2018 and 50 in 2020. The increasing number of Vietnamese businesses becoming Samsung's first-tier and second-tier suppliers would have motivated other domestic enterprises to strive to become suppliers for Samsung and other foreign direct investment companies in Vietnam. Since 2022, Samsung has initiated a collaborative project to develop smart factories for enterprises in Bac Ninh, Vinh Phuc, Hanoi, Hung Yen, and Ha Nam. This initiative is expected to significantly enhance the development of numerous Vietnamese businesses.

1.3. Data and Empirical Strategy

1.3.1. Data

The primary source for this study is the Vietnam Enterprises Survey (VES) carried out by the General Statistics Office of Vietnam in 2006-2018. The data covers two years before and 10 years following Samsung's first investment in Vietnam. Detailed information on characteristics such as the number of workers, turnover, labor compensation, assets, industry code, and year of establishment is included in the survey, which enables us to assess the impact of Samsung's entry on the performance of other firms by geographical location, industry, and firm characteristics. Only a few papers have utilized VES, particularly for the extended period from 2004 to 2018 (McCaig et al., 2022; Newman et al., 2016).

Since this study focuses on the manufacturing sector (code 10-32 in the Vietnam Standard Industrial Classification system), 84.7 percent of the observations are dropped, and the sample size is reduced to between 25.000 and 35.000 firms per year. In addition, we have decided to omit the data from Hanoi, Ho Chi Minh City, and their adjacent provinces from our analysis. This decision is grounded in various influential factors specific to these two major socio-economic hubs. Hanoi and Ho Chi Minh City are recognized as the primary drivers of GDP growth in Vietnam, consistently outpacing the national average by a substantial margin. Additionally, they stand out as regions with a noteworthy influx of social investment capital.

Furthermore, an examination of the Labor and Employment Survey conducted by the General Statistics Office of Vietnam (GSOV) underscores that Hanoi and Ho Chi Minh City consistently maintain a significantly higher proportion of skilled labor and individuals holding bachelor's degrees than do other provinces. These demographic and economic disparities set them apart from the remaining areas in the country. To address potential concerns linked to endogeneity, it is essential to exclude these two cities and their neighboring provinces from our

sample. Another 9.9 percent of firms are removed from the sample. Moreover, to enhance the robustness of our findings, we conducted supplementary regression analyses that excluded solely Hanoi and Ho Chi Minh City (Tables A5 to A8).

For some years, there was missing information about the establishment year; we overcame this challenge by submitting information about the same firm from the surveys in other years. We also removed any that have missing values, report zero sales, zero employment, or fail to fulfill any of the other fundamental error checks, which accounts for 1.9 percent of firms. Finally, the dataset comprises a total of 150,892 observations. Within the dataset, the sample size fluctuates between 6,000 to 16,000 enterprises in a given year for domestic firms.

Table 1.1 provides the descriptive statistics for key variables of 2007, one year before the first investment from Samsung. Startups and firms younger than 5 years constituted 59.4, 67.5, and 69.8 percent of the total firms in 2007 for the three distinct groups: provinces where Samsung made investments, neighboring provinces, and provinces that were neither invested in nor neighboring, respectively. In terms of firm size, the majority are classified as small and medium enterprises, with firms having fewer than 20 employees accounting for more than 40 percent of all three groups. Moreover, about 30 percent of domestic firms exhibit a ratio of tangible assets over total assets of 25% or less.

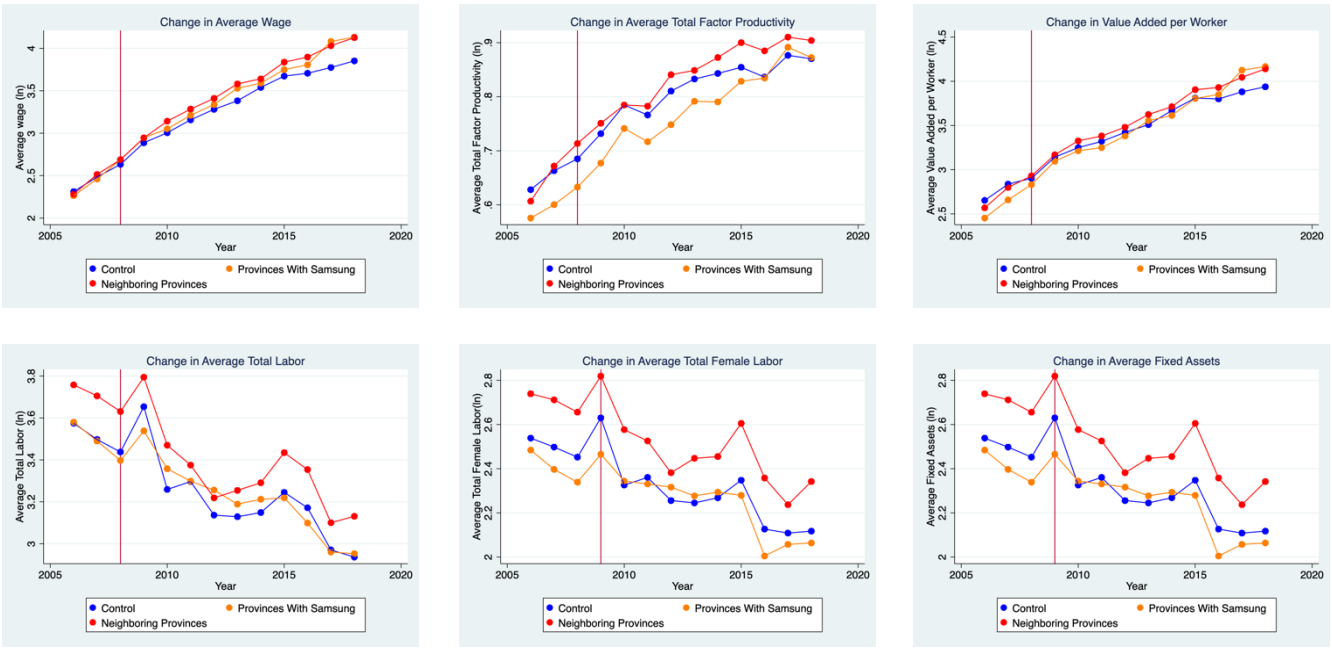
Analyzing by industry, firms engaged in manufacturing food, beverage, and tobacco represent the highest proportion of the total domestic firms. Conversely, firms in the electrical and electronic industries constitute the smallest ratio, accounting for less than four percent. Additionally, newly established firms since 2006 account for about 70 percent, whereas incumbent firms represent only less than 30 percent of the total firms. This indicates that the business structure primarily consists of young enterprises, and only a small number of enterprises manage to sustain long-term operations in Vietnam.

Table 1. 1. Descriptive Table, 2007

Year = 2007	Non-invested and non-neighboring provinces	Samsung invested provinces	Neighboring provinces
Firm age distribution (%)			
0 - 5	59.4	67.5	69.8
6 - 10	24.6	24.5	21.1
11 - 20	11.6	5.1	5.6
21 - 30	1.8	0.9	1.0
>31	2.7	2.0	2.5
Firm size distribution (%), measured by total employment			
1-10	30.0	19.7	22.3
11-20	18.3	24.3	18.8
21-49	20.1	29.4	20.0
50-99	11.2	12.2	14.7
100-249	10.7	8.5	13.4
250-499	5.1	2.6	6.2
>500	4.7	3.4	4.6
Ownership distribution (%)			
SOEs	4.6	2.0	3.2
Private	95.4	98.0	96.8
Tangibility			
0 - 0.25	31.9	35.2	26.2
0.26 - 0.5	38.2	30.9	34.8
0.51 - 0.75	21.7	26.8	28.7
0.76 - 1	8.2	7.1	10.3
Incumbent			
= 1 if established before 2006	73.7	74.5	69.2
Industry			
Food, beverage & tobacco	38.4	26.0	26.6
Textiles, wearing apparel, leather	8.5	5.5	11.7
Wood, paper & printing products	19.2	27.1	17.4
Chemical & refined petroleum products	3.4	1.8	4.0
Non-metallic & metal products	16.8	23.5	21.7
Electrical and electronics products	0.8	1.8	3.8
Machinery, equipment & transport equipment	4.4	2.2	7.4
Furniture and others	8.4	12.0	7.3
Total	6,318	649	1,041

Figure 1.2 portrays the trajectory of the mean values of our focal outcomes across three distinct groups: provinces where Samsung made investments, neighboring provinces, and provinces that were neither invested in nor neighboring. We generally note a broadly analogous trend in all outcomes among these groups, although specific differences are evident.

Figure 1.2. Domestic Firms' Performance and Characteristics Across Time



1.3.2. Empirical Strategy

The primary purpose of this paper is to explore the impact of a big foreign firm's entry as an FDI shock on the performance of manufacturing domestic firms. To be more specific, we look at different margins, including the changes in the performance of firms within the more affected regions and less affected ones, firms in more affected sectors with those of less affected ones, and the change in performance of existing firms with those of new entrants.

The following equations are used to examine the impact of a large foreign firm on domestic firms in the host country by geographical location:

$$y_{ijt} = \beta_0 + \beta_1 \cdot Samsung_{pt} + \beta_2 \cdot Neighboring_{pt} + \Theta X_{ipt} + \gamma_j + \alpha_t + \mu_p + \varepsilon_{ipt} \quad (1)$$

Where y_{ijt} represents our primary interested performance of firm *i* in industry j, province *p*, and year *t*, which are TFP and labor productivity measures. All dependent variables are in natural logarithm. $Samsung_{pt}$, which identifies the treatment, takes value one if Samsung operates in province *p* at time *t*. $Neighboring_{pt}$ is dummy, which takes value one if province *p* is next to the treated provinces at time *t*.

On the other hand, time α_t, industry γ_j, and regional μ_p fixed effects will control for the unobservables that may be driving changes in, for instance, the attractiveness of a particular region or industry. The error term is aggregated at the province level to account for the possibility of serial correlation within an area.

In addition, we incorporate an industry's Herfindahl index to account for market structure changes caused by foreign firms (FIs). If these measurements capture market competition changes, FDI's impact on firms' activities and performance should exceed the typical competition effect.

Equation 1 examines the effect of operating in the same and neighboring provinces. However, our ultimate interest lies in investigating horizontal and vertical productivity spillover. We identify the upstream industries using the Vietnam input-output table. We find that 70 percent of electronics and electrical equipment inputs comes from the same industries. Therefore, in equation 2, $Industry_j$ is dummy to indicate the firm operates in same industry with Samsung, and the interaction term between $Samsung_{pt}$ and $Industry_j$ measures the spillovers into the same industry firms. Similarly, we conider vertical spillover effect by considering all upstream industries, including the electronics and electrical equipment industries.

$$y_{ijt} = \beta_0 + \beta_1 \cdot Samsung_{pt} + \beta_2 \cdot Neighboring_{pt} + \beta_3 \cdot Samsung_{pt} \cdot Industry_{jt} + \beta_4 \cdot Neighboring_{pt} \cdot Industry_{jt} + \Theta X_{ipt} + \gamma_j + \alpha_t + \mu_p + \varepsilon_{ipt} \quad (2)$$

In addition, some papers indicate that the new firms are more flexible and willing to innovate than rigid incumbents (Baek et al., 2021; Johansen, 1959; Sorkin, 2015). Thus, we divide the sample into two groups and run regression separately to see the spillover difference between new entrants and incumbent firms. The first group includes new entrants established yearly; the second group contains existing firms established before 2006.

To enhance the reliability of identifying the specific impacts of productivity spillovers, it is essential to account for additional variables that might influence the firm's productivity. X_{ijt} represents a set of firm-specific characteristics, encompassing factors such as tangibility and leverage. For the total labor and fixed assets, we use the average value between the value at the beginning and at the end of the year to deal with the issue of significant change within the year. We also added controls for firm age and size to run the regression for the robustness check. The results are in the appendix, Tables A5-A8.

In the next part, we consider the spillovers from Samsung's entry into domestic firms conditional on the Consultation Program that Samsung has implemented since 2015. This program aims to help domestic firms improve their productivity capacity and product quality to participate in Samsung's supply chain. We trace the impact by identifying the sectors that Samsung focuses on in the program's first few years and setting them as upstream industries. The effect of Samsung's presence on those industries is expected to be positive.

1.3.3. Measuring Productivity

Total Factor Productivity. Total Factor Productivity (TFP) measures economic efficiency, which shows how well a business uses its resources to make a product (Barnett et al., 2014). The endogeneity problem exacerbates productivity estimation because input decisions are influenced by a productivity shock that can only be observed by a single firm. Specifically, an individual's productivity is a significant factor in a company's recruiting

decisions. This causes simultaneity bias, which can be circumvented using the two-stage estimation method proposed by Ackerberg, Caves, and Frazer (2016). Some previous techniques, including OP proposed by Olley and Pakes (1996) and LP proposed by Levinsohn and Petrin (2003), are supposedly surpassed by this method. By estimating all the input coefficients in the second stage, this estimate approach can rectify the functional dependence problem of labor input. This is because labor input may not fluctuate independently of the non-parametric function.

In its most fundamental form, the Ackerberg, Caves, and Frazer technique is predicated on the assumption that a Cobb-Douglas production function can represent a company's production technology. This function is characterized by the fact that a particular technology is used to generate a certain number of outputs (Y) from some different inputs (X) = [X1, X2,...], yielding Y = f (Y, X, A), where A represents the efficient level of the firm. Using a natural log, we can obtain a linear production function:

$$y_{it} = \beta_0 + \sum_k \beta_k x_{it}^k + \omega_{it} + \eta_{it}$$

For company *i* at time *t,* the log of output and the log of the k input are denoted by y_{it} and x_{it}^k, respectively. Due to the availability of the data, output is determined by revenue, and k represents the capital of company *i* at the moment *t.* The log of total factor productivity (TFP) of firm *i* at time *t* is equal to the sum of β_0, ω_{it}. Through a two-stage estimate process, it is possible to predict the log of total factor productivity (TFP) by using investment value as a proxy variable for unobserved productivity.

Value Added . The value added is the net result obtained by subtracting the intermediate inputs from the gross outputs. Unfortunately, the data on production costs is not accessible in VES. Hence, I employ the income factor approach in this chapter to ascertain the Value Added. The General Statistical Office of Vietnam suggests using the following formula to calculate value added (VA):

Value - Added = Labor compensation + Operating surplus

Labor Costs consist of three components: Wages and other allowances, social insurance payments made instead of salary, and any other payments not accounted for in the cost of production. To calculate the Operating surplus, I utilize the pre-tax earnings for the year.

1.4. Empirical Results

1.4.1. Testing Parallel Trend Assumption

What guarantees the validity of regression outcomes utilizing the TWFE method? Incorporating fixed effects and firm-specific time-varying controls necessitates that no other omitted time-varying and firm-specific factors are correlated with Samsung's entry or pre-treatment productivity. A prevalent method to articulate this is positing that enterprises in the regions receiving investment would have had analogous productivity changes over time, as those in the non-invested areas would have had the intervention not taken place. The temporal patterns of the "comparison" enterprises must serve as a precise counterfactual for the "treated" firms.

A standard method to test the assumption of parallel trends is an event study. The equation below modifies the primary specification (1) by substituting the treatment variable, multiplied by a posttreatment dummy, with year dummies that interact with the treatment. We ran an event study for treated provinces with the comparison group of non-invested and non-neighboring areas of Bac Ninh since this is the region where Samsung invested and implemented the Samsung Consultation Program first. The equation for event study in Bac Ninh will be:

$$y_{ijt} = \beta_0 + \sum_{l=-1}^{11} \beta_y 1(l = t - 2007) \times 1(p = \text{BacNinh}) + \Theta \text{X}_{\text{ipt}} + \ \gamma_j + \alpha_t + \mu_p + \varepsilon_{ipt} \quad (3)$$

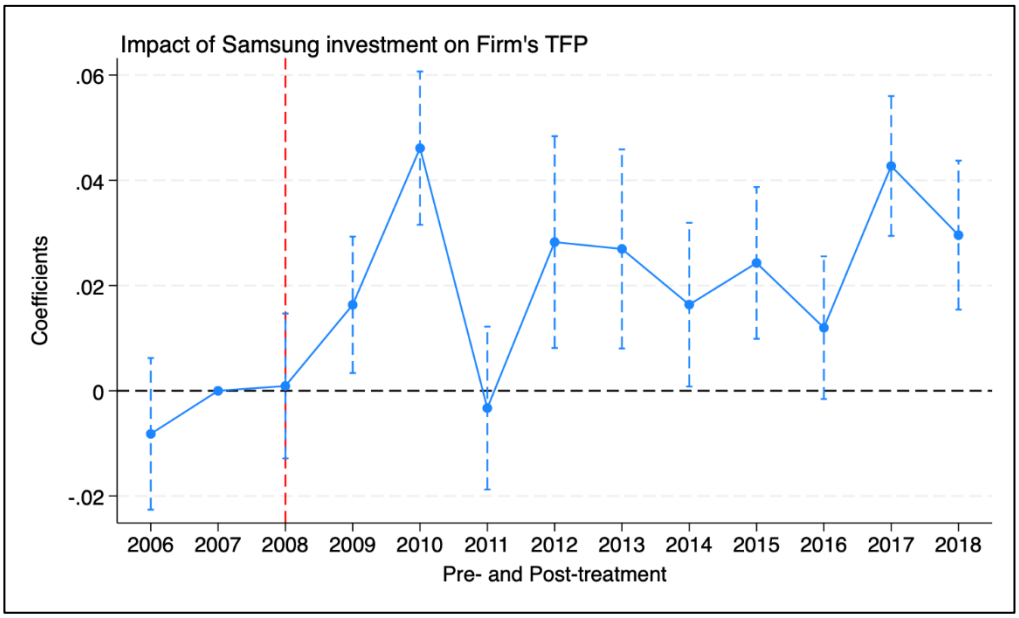
The β_y coefficients are assessed in relation to 2007, the year preceding Samsung's entry, which is standardized to zero. Ideally, the coefficients representing the investment effect before 2007 should be zero during pretreatment. During the post-treatment era, the coefficients relative to 2007 are anticipated to be positive, indicating a favorable treatment effect in comparison to the year preceding the investment.

The event studies are illustrated in Panels A and B of Figure 1.3, with outcomes being TFP and labor productivity, respectively. For both TFP and value-added per worker, there are no significant pretreatment trends, as evidenced by the fact that all pretreatment coefficients are close to zero and lack statistical significance. This absence of significant differences implies that productivity levels among domestic enterprises did not exhibit any notable shifts before Samsung's entry, which aligns well with the assumption of parallel trends.

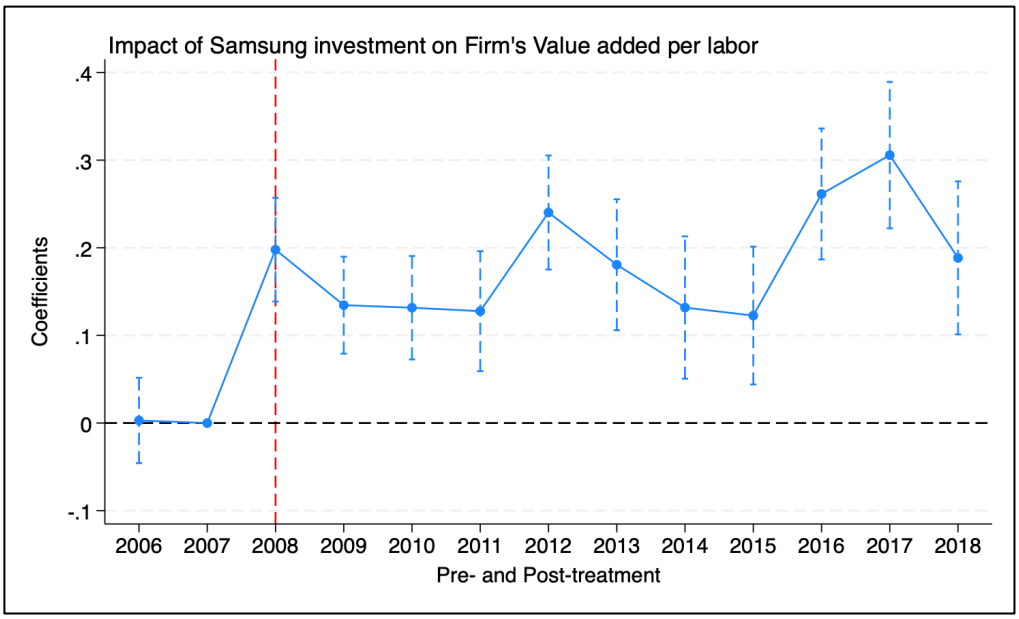
Moreover, when looking at post-treatment years relative to 2007, we observe a noticeable increase in the coefficients for productivity, with values that are statistically different from zero. This post-investment rise in productivity indicators suggests a positive treatment effect on domestic firms following Samsung's investment. Although there was a sharp decline in total factor productivity in 2011, we cannot reject the null hypothesis that the impact on productivity remains identical across the post-treatment years. We observe an increase in the value added per worker for domestic enterprises starting from the first year of the treatment. This is likely due to a rise in fixed-asset investments by other regional firms during the same year. Combined, these findings support the assumption of parallel trends and reinforce the interpretation that Samsung’s investment had a meaningful impact on productivity among domestic firms, validating the use of the Two-way Fixed Effect method in this analysis.

Figure 1. 3. The Change in Productivity Is Subject to Samsung's Entry into Bac Ninh

Panel A. Total Factor Productivity



Panel B. Value-added per Worker



1.4.2. The Spillovers on Domestic Firms from Samsung's Entry

Samsung's influence on Vietnamese enterprises is illustrated through two distinct panels. In Panel A, we present the foundational regression analysis, which elucidates Samsung's impact on domestic businesses in the investment provinces and the spillover effects

of Samsung's entry on enterprises in neighboring regions. Numerous studies have demonstrated the existence of evidence supporting the occurrence of spillover effects from Foreign Direct Investment (FDI) into adjacent localities.

Table 1. 2. Spillovers from the Entry of Samsung on Domestic Firms

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	Fixed assets
Panel A. Basic Regression							
Samsung-invested provinces	0.11***	0.02***	0.13***	0.12***	-0.03	-0.01	0.11*
	(0.02)	(0.01)	(0.05)	(0.03)	(0.04)	(0.05)	(0.06)
Neighboring provinces	0.07*	0.01	0.02	0.03	-0.02	0.02	0.06
	(0.04)	(0.01)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.09***	0.01**	0.12***	0.11***	-0.04	-0.01	0.11*
	(0.02)	(0.00)	(0.04)	(0.03)	(0.04)	(0.05)	(0.06)
Samsung-invested provinces × same industry	0.34***	0.27***	0.25*	0.35***	0.24*	0.34**	-0.06
	(0.06)	(0.05)	(0.13)	(0.08)	(0.12)	(0.13)	(0.16)
Neighboring provinces	0.08*	0.01	0.03	0.03	-0.02	0.01	0.06
	(0.04)	(0.01)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)
Neighboring provinces × same industry	-0.13**	-0.01	-0.09	-0.19**	0.18	0.23*	-0.09
	(0.05)	(0.04)	(0.10)	(0.08)	(0.11)	(0.13)	(0.14)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	150,892	150,892	150,892	150,892	150,892	150,892	150,892

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

In Panel B, our analysis further scrutinizes the ramifications on businesses operating within the same industry in the investment provinces and neighboring areas. The theoretical framework concerning the impact of FDI on firms in the host country posits that when high-technology FDI enterprises invest in the recipient nation, local businesses may replicate the technology and management processes of the investing foreign entity, subsequently enhancing their operational efficiency. Additionally, a dynamic labor exchange exists, with local workers

transitioning to employment with FDI enterprises and, conversely, FDI enterprise employees moving to work for local businesses following their tenure within FDI establishments. Furthermore, local enterprises may encounter competitive pressures from FDI firms if they produce similar products. In addition, the spillover effect generated by FDI enterprises can manifest through customer-supplier relationships. All the above impacts are often observed when businesses operate within the same industry or diverge into different sectors. Therefore, in this segment, we categorize local companies into two distinct groups: those operating within the same sector as Samsung and those operating in different industries.

The regression findings illustrating the spillover effects of Samsung's market entry on domestic firms are detailed in Table 1.3. The initial regression analyses in Panel A reveal a discernible relationship between Samsung's investment and domestic firms' performance. Specifically, the result indicates a two percent rise in TFP, and a 12 percent boost in labor productivity in the invested regions. In addition, the findings reveal no evidence of spillovers to domestic firms' productivity upon broadening the analysis to encompass spillover effects in neighboring provinces. This finding contradicts some studies indicating that Foreign Direct Investment (FDI) typically generates spillover effects in adjacent regions (Fujata & Thisse, 1996; Baptista & Swann, 1998; Liang, 2017). This discrepancy may be attributed to the primary diffusion channel operating through cooperation with Samsung, which currently predominantly engages with businesses in close geographical proximity within the same area.

To identify the changes within domestic firms that contribute to productivity gains, we conducted additional regressions using variables such as wages, revenue per worker, total labor, and fixed assets. The regression results indicate that, except for labor, Samsung's investment is associated with increases in wages, revenue per worker, and fixed assets, with corresponding growth rates of 11%, 13%, and 11%, respectively. Thus, it can be observed that under Samsung's influence, domestic firms are investing more in fixed assets, which may

include expanding facilities and acquiring additional machinery. At the same time, they are increasing their average wage levels, leading to a corresponding rise in average revenue per worker. In contrast to the significant impact in the investment area, the regression results show no evidence of spillover effects from Samsung's investment, except for the increase in the average wage level of domestic firms in neighboring regions.

To gain deeper insights, regressions were conducted separately for new entrants (firms established since 2006) and incumbent firms. The findings in Table A1 and A2 in the appendix reveal distinctive trends. The results indicate that new firms experience a more significant increase in TFP, while incumbent firms exhibit a higher growth in labor productivity. Additionally, a considerable difference between the two groups is that older firms show a substantial increase in investment in fixed assets. In contrast, new firms do not demonstrate any meaningful change. The initial technological levels of the firms can explain this difference. Newly established firms are likely to have more modern machinery and technology than older firms, reducing their need to invest in upgrading equipment and allowing them to benefit more quickly from external positive impacts. In contrast, older firms, which may be using outdated machinery, tend to upgrade their equipment when faced with external shocks to take advantage of the benefits.

In panel B, we examine the spillovers for domestic firms in the same industry. We find a much higher statistically positive effect on firms operating in the same sector with Samsung's investment within the same invested provinces. The productivity gains are 27 and 35 percent for TFP and value-added per worker. Moreover, there are 34 and 25 percent increases in wage and revenue per worker. Interestingly, we find a strong growth in the total labor and female laborers working in the electronics sector. Even though the coefficients of total labor and female labor in other industries in invested regions are not statistically

significant, the negative sign suggests the reallocation of laborers from different sectors to work in the electronics manufacturing industry.

Furthermore, our findings reveal a 13 and 19 percent reduction in wage level and value-added per worker among firms in the same sector with Samsung's investment in neighboring provinces. Along with the negative sign of the coefficients from TFP and revenue per worker among these firms, there may have been a shift in industry development, with the electronics sector concentrating its growth in areas with Samsung's investment while experiencing a decline in development in other regions.

1.4.3. The Effect of Samsung's Consultation Program

Since 2015, the Ministry of Industry and Trade and Samsung have coordinated to implement an innovation consulting program to improve the competitiveness of Vietnamese enterprises. In this part, we investigate the spillover effect from Samsung's entry for the period before Samsung's consultation program starts. If the consultation program is effective, then we should find no or little evidence for the positive effect of Samsung's entry.

In the initial regression outcomes presented in Panel A of Table 1.4 examining Samsung's entry impact on regions with investments compared to those without investment and non-neighboring reveals a rise in wage and revenue per labor. However, these increments are comparatively smaller in scale when contrasted with the findings outlined in Table 1.3. Furthermore, we do not see any statistically significant increase in fixed assets.

As shown in Table 1.4, Samsung's entry had less effect on domestic firms' characteristics and performance than in the previous section. Overall, Panel A reveals that Samsung's entry had a positive effect on labor productivity in invested regions but no statistically significant impact on the TFP of domestic firms in both invested and neighboring provinces.

Table 1. 3. Samsung's Spillovers on Domestic Firms before SCP

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	Fixed assets
Panel A. Basic Regression							
Samsung-invested provinces	0.05*	-0.00	0.10**	0.06***	-0.05	-0.02	0.05
	(0.03)	(0.01)	(0.04)	(0.02)	(0.03)	(0.03)	(0.06)
Neighboring provinces	0.05	0.01	-0.01	0.03	-0.04	0.01	-0.00
	(0.04)	(0.02)	(0.05)	(0.04)	(0.04)	(0.03)	(0.05)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.04	-0.01	0.09**	0.05***	-0.06*	-0.03	0.05
	(0.03)	(0.01)	(0.05)	(0.02)	(0.03)	(0.03)	(0.06)
Samsung-invested provinces × same industry	0.32***	0.22***	0.24**	0.28***	0.34***	0.55***	-0.03
	(0.05)	(0.03)	(0.11)	(0.08)	(0.13)	(0.12)	(0.21)
Neighboring provinces	0.06	0.01	-0.00	0.03	-0.04	0.01	-0.00
	(0.04)	(0.01)	(0.05)	(0.04)	(0.04)	(0.03)	(0.05)
Neighboring provinces × same industry	-0.11**	-0.04	-0.09	-0.15**	0.12	0.16	-0.02
	(0.04)	(0.03)	(0.13)	(0.07)	(0.10)	(0.12)	(0.18)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	94,737	94,737	94,737	94,737	94,737	94,737	94,737

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

For additional effect by industry, the principal observation of significance in this context is the discernible increase in TFP and other characteristics except fixed assets among businesses operating within the same sector as Samsung's investment. This outcome suggests an evident influence stemming from Samsung's entry into the electrical and electronic sectors even before the consultation program. As we explained in the previous part, this spillover effect is likely not the result of competitive impacts but rather arises from mutual learning among firms within the same industry. Nevertheless, in its absence, a decline in reinvestment in fixed assets exists, as previously noted in the preceding section.

1.4.4. Treatment Effect for Upstream Industries

Inter-industry spillover denotes the transference of knowledge, skills, or technology from one industry to another. Vertical spillovers may arise from the symbiotic customer-supplier relationship between domestic and foreign entities. Even firms lacking a contractual affiliation with foreign counterparts may accrue spillover benefits, incentivizing them to enhance product quality or capitalize on scale economies resulting from heightened demand for domestic inputs (Javorcik, 2004; Newman, Rand, Talbot, & Trap, 2015).

Table 1. 4. Spillover Effects for Upstream Industries

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	Fixed assets
Panel A. Heterogeneity effects for upstream industries (2006-2018)							
Samsung-invested provinces	0.10***	0.01	0.08**	0.12***	0.06	0.09*	0.12
	(0.02)	(0.01)	(0.04)	(0.04)	(0.05)	(0.05)	(0.10)
Samsung-invested provinces × upstream industries	-0.00	0.00	0.11**	0.00	-0.21***	-0.22***	-0.00
	(0.01)	(0.01)	(0.04)	(0.02)	(0.06)	(0.07)	(0.10)
Neighboring provinces	0.07*	0.02	-0.01	0.02	-0.04	0.00	0.02
	(0.04)	(0.02)	(0.05)	(0.05)	(0.05)	(0.05)	(0.09)
Neighboring provinces × upstream industries	0.01	-0.01	0.09*	0.02	0.03	0.04	0.12
	(0.03)	(0.01)	(0.04)	(0.02)	(0.07)	(0.06)	(0.09)
Number of years	13	13	13	13	13	13	13
Observations	148,867	148,867	148,867	148,867	148,867	148,867	148,867
Panel B. Heterogeneity effects for upstream industries (2006-2014)							
Samsung-invested provinces	0.06***	-0.01	0.05	0.08***	0.10**	0.14***	0.08
	(0.02)	(0.01)	(0.05)	(0.02)	(0.05)	(0.05)	(0.08)
Samsung-invested provinces × upstream industries	-0.04*	0.01	0.11**	-0.05	-0.32***	-0.34***	-0.03
	(0.02)	(0.01)	(0.04)	(0.03)	(0.07)	(0.09)	(0.09)
Neighboring provinces	0.04	0.01	-0.04	0.01	-0.02	0.03	-0.02
	(0.04)	(0.02)	(0.06)	(0.04)	(0.05)	(0.05)	(0.06)
Neighboring provinces × upstream industries	0.05***	-0.01	0.09*	0.04**	-0.04	-0.03	0.07
	(0.02)	(0.02)	(0.05)	(0.02)	(0.08)	(0.08)	(0.09)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	93,672	93,672	93,672	93,672	93,672	93,672	93,672

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Potential negative repercussions manifest as backward spillovers when foreign firms heavily rely on imported inputs, intensifying competition from abroad. To scrutinize inter-industry spillover, this part analyzes the impact of Samsung's entry on upstream industries, predicated on the Vietnam Input-Output Table 2012 (See Table A9). We exclude those affiliated with the electrical and electronic sectors to avoid potential endogeneity issues. The number of excluded observations is 2,026. Table 1.5 reports the regression results.

The empirical results indicate no total factor productivity gains in the broadly upstream industries but some labor productivity spillovers for other firms even before the introduction of the Consultation Program. The results imply that while Samsung's presence in the market may positively affect wage levels and other aspects of domestic firms, achieving a meaningful increase in productivity requires an active transfer of knowledge and expertise from multinational corporations to local firms. This underscores the importance of structured programs and initiatives to bridge knowledge gaps, ensuring that foreign direct investment (FDI) provides capital and fosters long-term productivity growth within domestic industries.

From 2015 to 2017, exclusive consultation services from Samsung were availed solely by enterprises operating within the paper and paper product, packaging, and printing sectors. Consequently, we categorize entities within these industries as the upstream. The empirical findings in Table 1.6 indicate that before the implementation of the SCP, there were no discernible productivity gains except an increase in revenue per worker, as depicted in Panel B. However, after the program's initiation, a notable upswing of two percent in the TFP of domestic firms was observed within the industries that sought consultation from Samsung. For other sectors, these firms have a one percent increase in TFP among these firms. In addition, we see a substantial decrease in labor and female laborers among upstream firms and an increase in female laborers in other firms. This suggests a reallocation of labor, especially females.

Table 1. 5. Spillovers Effect for Upstream Industries Receiving Samsung's Consultation

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	Fixed assets
Panel A. Heterogeneity effects for upstream industries (2006-2018)							
Samsung-invested provinces	0.09***	0.01*	0.10**	0.12***	0.01	0.06**	0.10
	(0.02)	(0.01)	(0.04)	(0.03)	(0.03)	(0.03)	(0.07)
Samsung-invested provinces × upstream industries	0.06**	0.02***	0.22***	0.02	-0.30***	-0.43***	0.11
	(0.02)	(0.01)	(0.05)	(0.05)	(0.07)	(0.10)	(0.08)
Neighboring provinces	0.08*	0.01	0.03	0.03	-0.03	0.01	0.06
	(0.04)	(0.01)	(0.04)	(0.05)	(0.04)	(0.04)	(0.07)
Neighboring provinces × upstream industries	-0.02	-0.01	0.01	0.01	0.13**	0.09*	0.16*
	(0.04)	(0.01)	(0.06)	(0.05)	(0.06)	(0.05)	(0.09)
Number of years	13	13	13	13	13	13	13
Observations	148,867	148,867	148,867	148,867	148,867	148,867	148,867
Panel B. Heterogeneity effects for upstream industries (2006-2015)							
Samsung-invested provinces	0.03	-0.00	0.05	0.06***	0.01	0.07***	0.06
	(0.04)	(0.01)	(0.04)	(0.02)	(0.03)	(0.02)	(0.07)
Samsung-invested provinces × upstream industries	0.08*	0.00	0.26***	0.01	-0.33***	-0.50***	0.04
	(0.05)	(0.01)	(0.05)	(0.07)	(0.07)	(0.11)	(0.10)
Neighboring provinces	0.05	0.01	-0.00	0.03	-0.05	0.01	-0.01
	(0.04)	(0.01)	(0.05)	(0.04)	(0.04)	(0.03)	(0.05)
Neighboring provinces × upstream industries	-0.01	-0.02**	-0.00	0.02	0.20***	0.14***	0.12
	(0.03)	(0.01)	(0.05)	(0.05)	(0.05)	(0.05)	(0.09)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	93,672	93,672	93,672	93,672	93,672	93,672	93,672

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

In conclusion, before initiating the Consultation Program, the spillover effects were confined to firms operating within the same industries as Samsung (specifically, the electrical and electronic industries). These spillover effects could be attributed to indirect influences from a demonstration effect. Nevertheless, following the implementation of the consultation program, the spillover effects extend beyond firms solely within the same industries as

Samsung to encompass both the entities receiving consultation and those within analogous industries.

1.5. Synthetic Control Method Analysis

While our TWFE analysis yields consistent results, there remains a concern for endogeneity. Therefore, this section utilizes the Synthetic Control Method to verify the results. This approach entails choosing control provinces to act as the control and selecting critical, independent variables. Using this method, a synthetic treated unit mirrors a comparable temporal pattern to the actual treated unit before Samsung's establishment. Each control unit is assigned a specific weight to aid in matching the treated unit with the comparison groups.

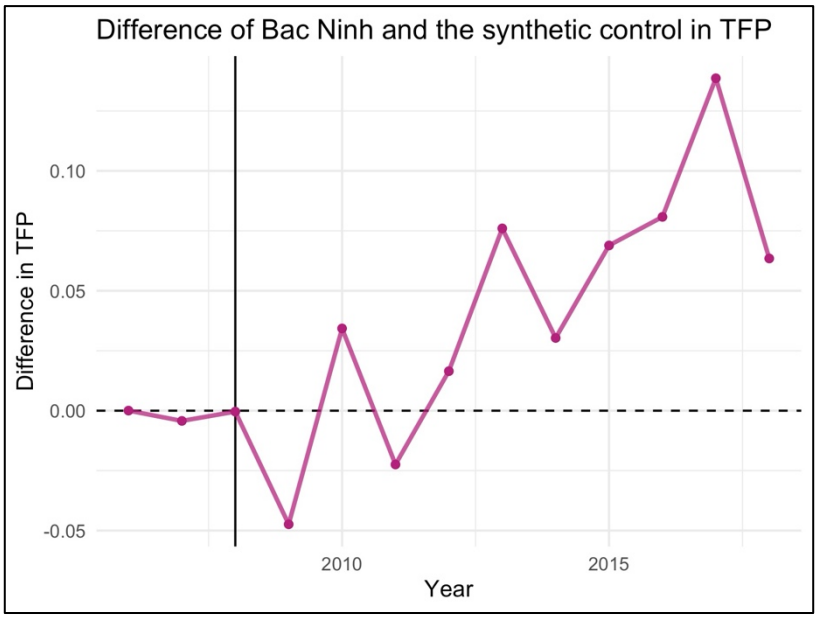
Our study generally focuses on two designated provinces, Bac Ninh and Thai Nguyen, which are subject to different treatment durations. We independently establish a synthetic control for each treatment unit. We exclude the remaining treated unit from the donor pool to mitigate potential endogeneity issues. Section 1.4 of the study encompasses eight different outcomes; however, the present analysis concentrates on two primary productivity measures - total factor productivity and value added per worker - discussed in depth, specifically on the impact of Samsung's entry on domestic firms in invested regions comparing to non-invested and non-neighboring provinces. Therefore, the synthetic control method analysis in this section is associated with coefficients in Table 1.3 for firms in the same provinces as Samsung.

Figure 1.4 depicts the outcomes of the synthetic control method applied to Bac Ninh concerning total factor productivity. The Figure graphs the difference in average TFP of domestic firms in Bac Ninh and firms in the synthetic control. The synthesis of the control for Bac Ninh involved key predictors, including pre-treatment total factor productivity, firm age, firm size, tangibility level, and market concentration. Specifically, the synthetic control for Bac

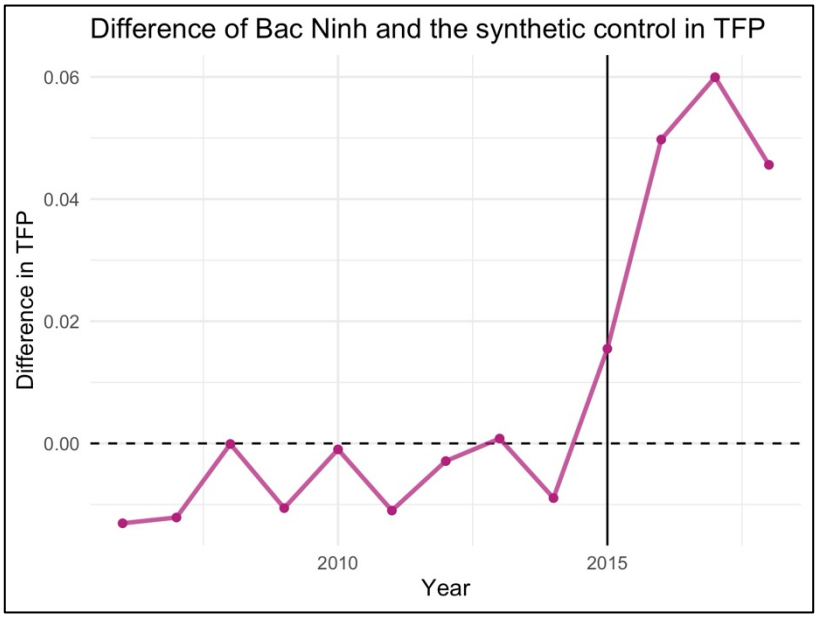
Ninh was derived from four primary control provinces - Binh Dinh, Ninh Thuan, Quang Tri, and Lang Son—where Binh Dinh held the highest weight of 0.323 in the synthesis process.

Figure 1. 4. Treatment Effect of Samsung's Entry into Bac Ninh

Panel A. Treatment Effect of Samsung's Entry

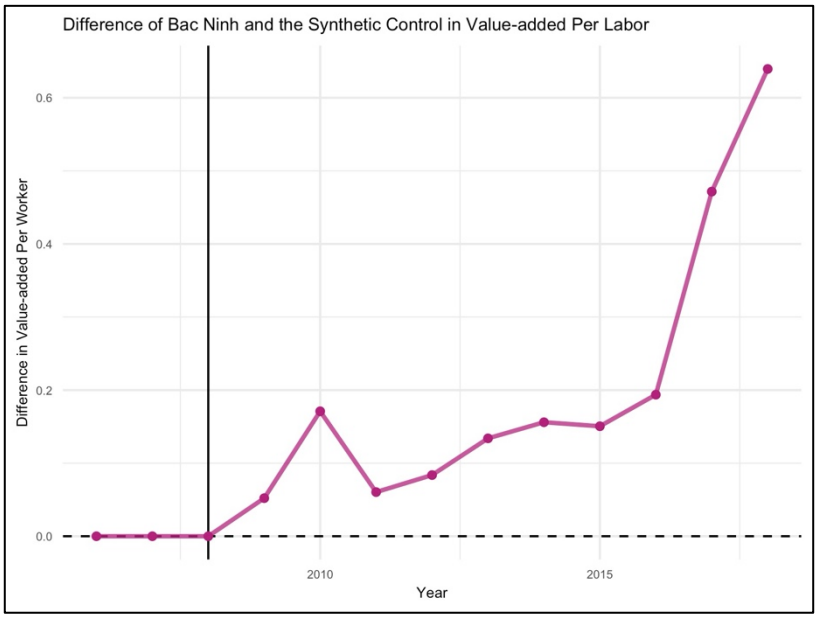


Panel B. Treatment Effect of Samsung's Consultation Program



Panel A indicates that before Samsung's entry, the observed total factor productivity in Bac Ninh mirrored the trend exhibited by the synthetic control's total factor productivity. Moreover, the balance test results (Figure A2) demonstrated no significant disparities between the treatment unit and the synthetic control before the treatment periods. After the intervention, the graph illustrates that before 2014, following Samsung's establishment in the province, discernible evidence of total factor productivity (TFP) enhancement was absent. Nevertheless, post-2015, an upturn in TFP is evident in Bac Ninh in contrast to the synthetic control. This outcome aligns consistently with our prior findings from the preceding section.

Figure 1. 5. Treatment Effect of Samsung's Entry on Labor Productivity in Bac Ninh



Furthermore, Panel B in Figure 1.4 illustrates the difference in TFP between the treated regions and the synthetic controls with the treatment of Samsung's Consultation Program in 2015. The Figure reiterates the validation of our hypothesis regarding the affirmative spillover effects derived from Samsung's consultation program on the productivity of domestic firms.

Regarding the outcomes of value-added per worker, Figure 1.5 depicts a marginal increase in labor productivity preceding 2008, followed by a notable escalation. This aligns with the findings expounded upon in section 1.4. Notably, the disparity between Bac Ninh and the synthetic control in value added per worker demonstrates a progressive escalation, reaching its zenith in 2018, with Bac Ninh exhibiting a difference of approximately 0.58 compared to the synthetic control.

To validate the SCM analysis, we perform placebo tests by allocating the therapy to each province in the dataset. If Samsung's arrival has a genuine impact, the effect in our treated units should much exceed any effect observed in other regions. Figures A2 to A4 validate our primary findings' accuracy and SCM's efficacy. Fundamentally, the outcomes obtained from the Synthetic Control Method align consistently with the conclusions drawn in section 1.4 utilizing Two-way Fixed Effects.

1.6. Conclusions and Implications

Numerous developing countries, including Vietnam, aim to attract foreign direct investment (FDI) as a catalyst for economic growth, with the intention of generating spillover effects on local businesses, thereby striving for long-term and sustainable development. Nonetheless, empirical evidence indicates that favorable spillover effects are not consistently prevalent. On occasions, the establishment of FDI enterprises equipped with competitive capabilities and advanced technology may result in the inability of local enterprises to compete, leading them to exit the market.

This article furnishes novel empirical insights into the ramifications of investments from a leading global foreign corporation on the characteristics and performance of local enterprises. Our study demonstrates that introducing Samsung into a particular market yields

discernible spillover effects on wage levels, revenue per worker, and labor productivity. However, our findings suggest that this impact does not extend to total factor productivity (TFP). This limited effect on TFP is attributable to the tenuous connections between Samsung and local enterprises. Primarily, this disconnect arises from the inadequate capabilities of domestic firms to fulfill the standards set by Samsung.

However, as the capacity of domestic businesses has improved through Samsung's consulting activities, TFP has shown an upward trend. This increase can be attributed to the consulting efforts of foreign direct investment (FDI) enterprises, improvements in domestic firms, and the learning that domestic enterprises have gained from FDI enterprises. Thus, positive spillover effects on business productivity are achievable; domestic businesses must adapt and absorb these changes. For businesses in developing countries like Vietnam, capitalizing on opportunities from attracting FDI, particularly from large multinational corporations (MNCs), necessitates internal transformation and improvement within domestic enterprises.

It is a fact that the presence of foreign direct investment (FDI) enterprises in Vietnam is not limited to Samsung; other large FDI firms operating in Vietnam include LG, Intel, etc. In this case, our control provinces may not be pure controls. However, Samsung's investment is significantly larger than other companies. For instance, the total investment of LG, the second-largest FDI enterprise in Vietnam, is nearly $8 billion. As a result, the impact of Samsung's entry into the market is likely to be much greater than other enterprises. Therefore, our estimates serve as the lower bound for the spillovers from Samsung’s investment in domestic firms.

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Chapter 2

Global Investment And Household Labor Supply:

Evidence From Samsung's Entry In Vietnam[2]

Abstract: We investigate how Samsung's investment in Vietnam affected household labor supply decisions. Samsung, a Korean firm, is the biggest producer and exporter in Vietnam, which created a transformative impact on the host economy. Examining the Vietnamese household living standard survey, I find a shift from informal employment, including self-employment, toward formal jobs, primarily into wage work and work for foreign firms, along with increased household expenditures and income in the provinces with Samsung production facilities. We observe smaller but significant results for households in the adjacent regions. Impacts are more substantial for households with female members aged 18-35, a demographic specifically targeted by Samsung's local recruitment efforts. Synthetic control analysis confirms our main results. Our study shows how a big foreign company hiring less-utilized demographic groups can cause a fundamental change in household labor supply behavior.

JEL Codes: F21, J16, J22, J24, O12

Keywords: Foreign direct investment, labor supply, Vietnam, large plant

[2] Co-authored by Changkeun Lee, David Sungho Park.

2.1. Introduction

Over the past decades, low- and middle-income countries have witnessed a surge in foreign investment, becoming the primary recipients of foreign direct investment (FDI) (UNCTAD, 2014). This influx has garnered extensive scholarly attention, particularly its multifaceted impact on domestic economies. Researchers have extensively examined how FDI increases jobs and investment in the local economy, alongside its indirect effects on productivity, technological innovation, and wage disparity in host countries (for reviews, see Harrison and Rodríguez-Clare 2010 and Alfaro et al. 2022). Such effects are more pronounced in countries with heavy agricultural dependence and low industrial capacity. To many of them, multinational corporations (MNCs hereafter) serve as a crucial catalyst in successful structural change. They have a good example to follow - China (Tseng and Zebregs 2002) , inspiring many countries to pursue a similar path by leveraging low labor costs to attract substantial FDI.

While the existing literature has shed light on the economic effects of FDI and MNCs, most studies focus on their effects without distinguishing between types of firms. However, the world sees a growing influence of gigantic MNCs; less than 10% of publicly traded corporations worldwide generate more than 80% of global income, and a few MNCs have a market capitalization greater than the GDP of a less developed country (Global Finance, 2023). In such an environment, the FDI effect of large-size MNCs deserves closer scrutiny.

This paper is an empirical investigation of a particularly illustrative instance: the entry of Samsung, a global leader in the electronic industry and one of the world's largest companies by market capitalization, into Vietnam. We examine how Samsung's investment affected household labor supply decisions, particularly the shift away from the informal labor market. The Vietnamese economy provides a unique and perfect backdrop for the analysis because it

is characterized by rapid growth and a substantial informal labor sector. The Korean firm's initial investment amounted to $670 million in 2008 and escalated to over $23 billion within a decade, establishing it as Vietnam's largest enterprise[3]. Such investment created about 150,000 production facility jobs, which were primarily filled in by young female workers. While this is a well-known fact, little is known about how newly created jobs for young women changed the labor supply decision of households.

Our focus is on the reallocation of labor between informal and formal sectors and other labor supply decisions at the household level. We utilize the Vietnamese Household Living Standard Survey (VHLSS), spanning from 2004 to 2020. This comprehensive dataset provides detailed information on household demographics, employment, income, and expenditures across various regions of Vietnam. Its time coverage includes the periods before and after Samsung's substantial investment, offering the opportunity to observe the changes over time. This time series allows us to observe labor market shifts before and after Samsung's investment, revealing patterns both in provinces directly impacted by Samsung's presence and in neighboring or unaffected regions. This rich dataset is instrumental in capturing the nuanced effects of Samsung's expansion on Vietnam's labor market and household economic dynamics, thereby providing a comprehensive empirical investigation of FDI's transformative role in an emerging economy.

We first explore the direct impact of Samsung's investments on households in provinces hosting its production facilities. We have three main findings. First, we observe a shift in household employment patterns in these provinces: there's a notable increase in wage labor participation, particularly in foreign-invested enterprises, coupled with a decline in self-employment, especially in agriculture. Second, despite a modest, statistically insignificant rise

[3] https://vnr500.com.vn/Charts/Index?chartId=1

in overall labor hours, we document a substantial reallocation of these hours from secondary to primary occupations, predominantly in foreign firms. Third, we find that households in Samsung-invested provinces show increased expenditures and wage incomes. The wage income effect is driven by the increases in primary jobs and employment in foreign firms with a small decrease in secondary jobs, a switching pattern consistent with the observed labor hours shift.

We also investigate the spillover effects on adjacent provinces. Compared to the direct impacts, we find similar results for the neighboring provinces, though the magnitudes are smaller. This finding is supported by our site-visit interview with the local authority that most workers in Samsung facilities commute from neighboring provinces, in which households would have increased labor supply with a subsequent increase in income and expenditures as captured in the analysis.

To further delve into mechanisms, we examine the subgroup of households with any female member of age between 18 and 35. Samsung Vietnam's recruitment typically targets this demographic subgroup, and so expect them to be most affected by Samsung's investment. We find that both the direct and spillover effects are significantly stronger for this subgroup, suggesting that the increase in labor income and expenditures is driven by those who were a direct recruitment target for Samsung facilities.

Lastly, in an effort to identify a more robust causal link between Samsung's market entry and labor market dynamics, we conduct an additional analysis by employing the Synthetic Control Method (Abadie 2021). By creating synthetic controls predicated on pre-treatment data for treated units, we affirm our earlier findings, thereby confirming the discernible impact of Samsung's entry on the decision-making processes pertaining to labor within households.

Our study contributes to the literature on the influence of large foreign firms in host countries. Studies in this area are often country-specific and have mixed findings. Méndez and Van Patten (2022) examine the United Fruit Company in Costa Rica, finding improved access to basic necessities for families in regions with the company's presence. Freedman (2017) notes the rise in female labor force participation and education levels in Mississippi counties following the establishment of large manufacturing firms. In contrast, Patrick and Partridge (2019) find limited empirical support for substantial productivity spillovers from incentivized large plants. Our paper adds a new perspective by examining the impact of a large foreign firm in a lower middle-income country, focusing on household labor decisions and working behavior, a relatively unexplored area in the existing literature. To the best of our knowledge, our study is one of the first empirical explorations delving into the ramifications of the entry of a colossal foreign entity, Samsung, on the labor market landscape in Vietnam.

This paper also speaks to the broader globalization literature, particularly studies focusing on how globalization affects labor market participation, wage levels, and productivity. Notable works in this area include McCaig and Pavcnik (2018) on Vietnam's manufacturing sector post-tariff reductions and Dix-Carneiro et al. (2021) on Brazil's transition from informal to formal sectors due to trade openness. They commonly highlight that trade liberalization and FDI expand markets, boost productivity, and create jobs, but at the same time, they also increase competitive pressure. Our study extends this narrative by illustrating the positive effects of a substantial investment from a global MNC in Vietnam on the labor market restructuring.

Our results also resonate with the findings from the literature about the impact of new investment shocks on local development. The investment of an MNC like Samsung in a region can be viewed as a positive local investment and labor demand shock. Scholars have shown that the shock creates considerable spillover effects to local firms. Setzler and Tintelnot (2021)

examine U.S. employer-employee data to show that foreign-multinational employment expansion increases employment, value-added, and wages at domestic firms. Greenstone and Moretti (2003) and Greenstone et al. (2010) indicate that new large manufacturing plants lead to increased labor earnings and property values. Of course, some studies report negative impacts, such as Fons-Rosen et al. (2017) finding foreign company presence negatively affecting domestic firm productivity in Spain and Di Ubaldo et al. (2018) showing negative horizontal spillovers of FDI in Ireland. We contribute to the literature by looking at what happens inside the household. We highlight that better job opportunities for young women also made the household head focus on primary jobs, which is positive for the economy. We also show that the positive effect of Samsung goes beyond the province it entered.

The remainder of this paper is organized as follows. Section 2 describes the study context of Samsung's investment in Vietnam. Section 3delineates the research design, data, and empirical strategy, followed by Section 4, which presents the empirical results of our primary specifications. Section 5 provides results from a further investigation using the synthetic controls method. Section 6 explains some robustness check to verify the validity of the empirical results. Finally, Section 7 concludes with policy implications.

2.2. Samsung Investment in Vietnam

Our research draws upon the extensive investment of Samsung Electronics Co., Ltd., a key subsidiary of the South Korean conglomerate, Samsung Group, which stands as one of the leading global corporations in the 21st century. In 2008, Samsung first granted an investment certificate with an initial capital infusion of US$ 670 million, this marked the inception of Samsung Electronics Vietnam in the Bac Ninh province. Subsequently, Samsung Electronics

expanded its financial commitment, establishing additional manufacturing facilities in Bac Ninh, Thai Nguyen, and Ho Chi Minh City. In addition, Samsung established a research and development (R&D) team in Vietnam in 2012, which culminated in the 2022 opening of the Samsung R&D Center in Hanoi's Tay Ho Tay urban area.

By 2022, Samsung's total investment in Vietnam had escalated nearly 30-fold to over US$20 billion, accounting for 9% of total accumulated foreign investment and making Samsung the largest foreign investor in Vietnam. With 3 large factories located in Bac Ninh and Thai Nguyen, this investment was particularly impactful in these two provinces, accounting for 45% and 73% of their total foreign direct investment, respectively. In which, Samsung Electronics Vietnam Thai Nguyen (SEVT) represents Samsung's most extensive smartphone manufacturing facility globally (BNIZ 2018; BNIZ 2022). This article examines Samsung's investment activities in the provinces of Bac Ninh and Thai Nguyen, where the company's manufacturing plants are concentrated. The focus is on the distinct characteristics of labor between electronics and smartphone manufacturing plants, and sales centers, as well as research centers.

Bac Ninh is a smallest province in Vietnam regarding land area, with a labor force of over 590,000 individuals in 2008. Among them, the proportion of laborers who had received specialized technical training was about 20 percent, while the proportion of those who had received vocational training was only 18 percent. These figures were 4 percent higher than the national average but lower than the average for the Northern Economic Region, 7.2 percent (Bac Ninh Statistical Yearbook, 2009).

As of the end of 2008, there were 6 industrial parks operational in Bac Ninh province. The shortage of labor was not only prevalent among skilled workers but also among unskilled laborers. Some regional enterprises have shown little interest in establishing salary scales or

have created superficial ones. Working hours are often extended, and labor intensity is high. Only 50.75 percent of workers participate in social insurance and health insurance schemes. This reality has led to spontaneous strikes by workers demanding wage increases, bonuses, shorter working hours, improved meal provisions, housing allowances, etc. These strikes primarily occur in foreign-invested enterprises (from Taiwan, China), becoming more common since early 2008. Consequently, the bond between workers and enterprises is relatively weak, and the role of labor unions has not been fully realized. Workers are willing to leave their current jobs to join other companies if they perceive better working conditions, salaries, and incomes.

The presence of Samsung with attractive employment benefits such as high salaries, healthcare provisions, housing construction for employees, and transportation services is likely to attract labor from within the province as well as neighboring regions. Additionally, this will pressure other domestic and foreign enterprises in the province to compete for labor, especially in the context of labor shortages.

Samsung has made a substantial contribution to Vietnam's economic growth in terms of GDP and exports. Since 2017, Samsung has been the largest enterprise in Vietnam, generating revenue equivalent to more than 25 percent of the country's GDP. Furthermore, Samsung's exports account for more than 20 percent of Vietnam's total export earnings annually (GSOV 2023; VIR 2018).

In terms of employment, Samsung has created nearly 200,000 jobs in Vietnam, primarily in the invested and neighboring provinces. The company offers a range of employee benefits, including transportation, canteen facilities, health services, training courses, and extracurricular activities. These efforts have been acknowledged by national and international organizations (CECC 2020; SEV 2023; Thu Cuc 2023).

Local state agencies also recognize Samsung's positive impact on workers and communities in Vietnam. Following Samsung's establishment, numerous satellite manufacturers have entered Vietnam, contributing billions in investment, job creation, and state revenue. This influx has been instrumental in transforming the labor and economic structure of the region, shifting employment from agriculture to manufacturing (VIR 2023).

Moreover, Samsung's presence has facilitated many local residents' career transitions and new job opportunities. The influx of Samsung employees has stimulated growth in ancillary industries like food services, improving living standards in these areas (Governments News, 2023; Thai Nguyen News, 2015)

2.3. Data and Research Design

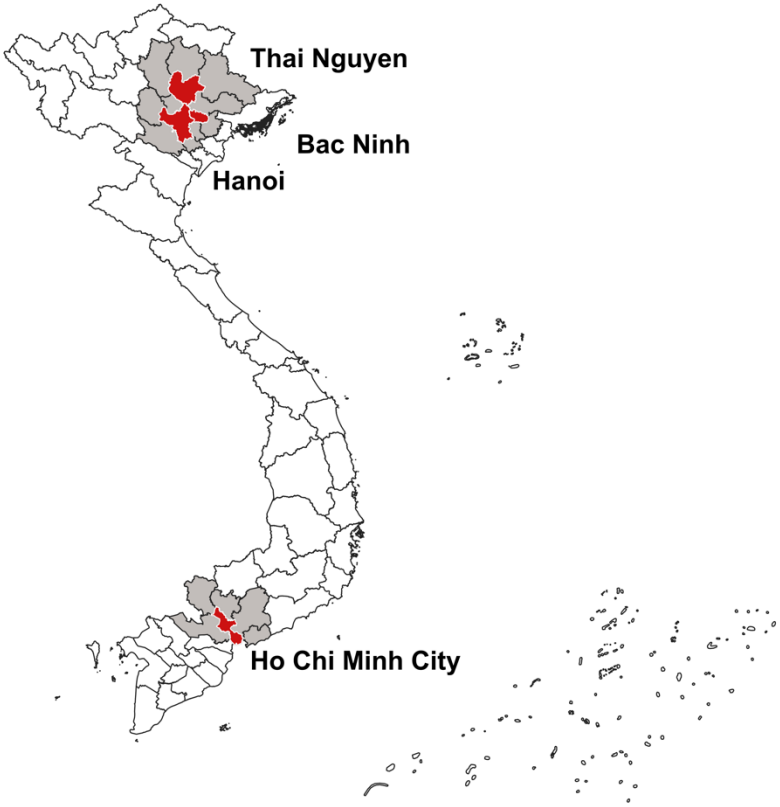
Our research is designed to analyze the economic impact of Samsung's investment in Vietnam, focusing specifically on its effects on the local labor market and household-level economic decisions. The core of our research design revolves around exploiting the regional and temporal variations in Samsung's investments. This design enables us to identify causal effects by comparing outcomes in regions and time periods with varying levels of exposure to Samsung's investment.

The identification strategy hinges on the quasi-experimental nature of Samsung's investment in Vietnam. Given the significant scale of the investment and the fact that it was not uniformly distributed across all regions of Vietnam, we can observe differential impacts, allowing us to employ a difference-in-differences approach. This approach compares changes

over time in labor market outcomes in regions with high Samsung investment (treatment group) against those in regions with no investment (control group), before and after the investment.

Moreover, while Samsung's investments in Vietnam primarily involve either production or R&D facilities, we confine our analysis to production investments, intentionally excluding the R&D center located in Hanoi. These two investment types involve different work and labor skills, and our research specifically targets household employment decisions related to production facilities. This focus, therefore, allows us to interpret the shifts in household labor decisions more accurately in relation to Samsung's production facility investments.

Figure 2. 1. Samsung Investment in Vietnam



Note: Red areas are the provinces where Samsung invested, grey areas are the neighboring provinces, and the remaining white are the non-treated and non-neighboring provinces

2.3.1. Data

The primary data source for our analysis is the Vietnamese Household Living Standards Surveys (VHLSS) for the period 2004-2020. These surveys, conducted biennially by the General Statistics Office of Vietnam (GSOV) in even-numbered years, track the living standards of various segments of the Vietnamese populace and provide comprehensive data on household demographics, employment, income, and expenditures. The VHLSS is nationally representative, covering various levels, including national, regional, urban, rural, and provincial. From 2004 to 2020, it employed consistent survey methodologies and instruments[4]. Each round involved re-interviewing selected households from previous rounds and adding new households to ensure a dynamic panel. However, given that the number of re-surveyed households decreases by half each year, and considering the extensive time period from 2004 to 2020, the dataset lacks a sufficient number of observations to construct a panel data sample for the analysis. Consequently, the data for this study is treated as repeated cross-sectional rather than a full panel survey.

The structure of the VHLSS comprises three levels: communes/wards (level 1), enumeration areas (EAs, level 2), and households (level 3). Our analysis focuses on household-level data to assess changes in labor decisions among survey subjects. To avoid any double counting, given the mobility of the surveyed individuals, we only include individuals considered permanent residents of a household.

The VHLSS is carried out on a national scale, encompassing a sample of approximately 45,000 households for the income survey and 9,000 households surveyed for both income and expenditure across 3,063 communes/wards. In this paper, we exclusively utilize the income

[4] Initially, the VHLSS sampling was based on the 1999 census (2004 to 2008), and later on the 2009 census (2010 to 2020).

and expenditure survey data due to its availability and alignment with the primary research objectives, except in 2008 and 2018, we used the income survey. Since both samples are nationally representative, and by using the appropriate weight for each sample, this dataset can represent the characteristics of the entire population, correcting for over- or under-sampling in specific groups. The data covers 4 years before and 12 years after the first investment of Samsung, which allows us to investigate the change in household labor decisions before and after the entry of Samsung. The dataset consists of 156,820 households.

Vietnam's administrative division comprises 63 provinces and cities. For this study, we exclude residents of Hanoi, Ho Chi Minh City, and their nine neighboring provinces in order to address potential confounding factors. Hanoi and Ho Chi Minh City are Vietnam's primary socio-economic hubs, exhibiting GDP growth rates approximately 1.5 times the national average and high levels of social investment capital. Additionally, data from the General Statistics Office of Vietnam (GSOV) indicate these cities have a substantially higher proportion of trained labor and degree holders than other regions, marking them as demographically and economically distinct. To avoid endogeneity issues, we have removed these two major cities and their adjacent provinces from our analysis, leaving 52 provinces for our main study, including 118,577 observations. To further ensure the robustness of our results, additional regression analyses were performed, excluding only Hanoi and Ho Chi Minh City.

2.3.2. Empirical Strategy

Our empirical strategy unfolds through a systematic sequence of analyses. We begin by estimating the changes in household (HH) labor decisions within provinces affected by Samsung's investment, focusing on shifts in employment dynamics. We then extend our analysis to neighboring regions, exploring the broader impact of Samsung's investment on the

regional labor market.

The primary focus of our study lies in examining several key outcomes. Primarily, we assess HH labor participation and decision-making across different employment types, such as wage work and self-employment. A critical aspect of our analysis is exploring how HH members allocate their working hours across various job categories.

Much of our investigation delves into the repercussions of these labor decisions on household income and expenditure. We aim to understand how alterations in HH labor dynamics influence financial outcomes, exploring the complex interplay between employment choices, income generation, and expenditure patterns.

Our comprehensive approach intends to illuminate the immediate impacts of the immediate labor market and the broader economic implications for households. We strive to provide a nuanced understanding of the socioeconomic effects of Samsung's investment.

To analyze the fundamental influence of Samsung's operation in a province on household outcomes, we consider the following specification:

$$Y_{ipt} = \beta_0 + \beta_1 Samsung_{pt} + \beta_2 Neighboring_{pt} + \theta X_{ipt} + \alpha_t + \gamma_p + \varepsilon_{ipt} \quad (1)$$

where Y_{ipt} is the outcome of household *i* in province *p* at year *t*. Outcomes of interest include those representing for extensive and intensive margin of household working decision, which are the number of household members, total number of hours household members worked for informal and formal jobs. We identify a household member who works for the informal job if he/she works self-employed or works for another household business. In contrast, a household member works for formal employment if he/she works for wage work at state-owned, collaborative, private or foreign firms. This classification was utilized by McCaig & Pavcnik (2018) in their study and aligns with the differentiation between household businesses and

registered enterprises according to Vietnam's Enterprises Law. This information is extracted from the question of "For whom has household member worked in the past 12 months?" in VHLSS. In addition, we check for the income and expenditure consequence of household working decision to see whether household benefit from that decision.

$Samsung_{pt}$ is a dummy which takes value 1 if Samsung operated in province p at year t, and 0 otherwise. We also include the spillover effect into the neighboring region by including $Neighboring_{pt}$, which is equal to 1 if province p is next to the treated province at time t. X_{ipt} is a vector of covariates including gender, age, education of HH's head, number of members in the family and so on. α_t and γ_p are year and province fixed effects which will control for the unobservables that may be driving changes in, for instance, attractiveness of a particular region. Standard errors are clustered at the province level.

Based on the fact that nearly 80% of Samsung factory workers are females aged 18 to 35, we investigate heterogeneous effects for this subgroup. In the regression specification, we introduce an interaction term between Samsung's presence and a dummy variable for households with female members in this age group. Our hypothesis is that the impact of Samsung's investment might be more pronounced in this demographic, given their significant representation in the company's workforce. This approach enables us to explore potential gender disparities and their implications for local development.

$$Y_{ipt} = \beta_0 + \beta_1 Samsung_{pt} + \beta_2 Neighboring_{pt} + \beta_3 female_{1835_{ipt}} + \beta_4 Samsung_{pt} \times female_1835_{ipt} + \beta_5 Neighboring_{pt} \times female_1835_{ipt} + \theta X_{ipt} + \alpha_t + \gamma_p + \varepsilon_{ipt} \quad (2)$$

where $female_1835_{ipt}$ equals one if the household has any female members aged between 18-35. As this is the subpopulation targeted by Samsung Vietnam's recruitment, we are supposed to find stronger effects for this subsample.

2.4. Empirical Results

2.4.1. Descriptive Statistics

Our study sample is divided into three categories: households from provinces where Samsung has made no investments, those in provinces where Samsung built production facilities, and those in the neighboring provinces. Table 2.1 reports a summary of statistics in 2006, the survey period right before Samsung made the initial investment in 2008.

While the three groups show similar demographic composition, the educational attainment of household heads reveals a notable disparity. In Samsung-invested and neighboring provinces, about 41% hold a bachelor's degree or higher, compared to 27.1% in non-invested and non-neighboring provinces. This is because many rural provinces are included in the first group. We control for the province-specific factors in our main two-way fixed effect model, and we also conduct a synthetic control analysis to establish a more credible comparison group.

In terms of the age of the household head, 43-47% of the sample falls within the 36-50 years range, and 71-82% of the household heads are male. A significant majority of household heads are married. Family size distribution indicates that households in Samsung-invested provinces and their neighbors tend to have more members, with approximately 54% of households falling in the 3-4 member category.

The composition of female household members shows that 1-2 female members are more common in Samsung-invested (72%) and neighboring provinces (70%). For the age group 18-35, most households across all categories have 1-2 members in this bracket, with Samsung-invested and neighboring provinces showing higher percentages (63-64%).

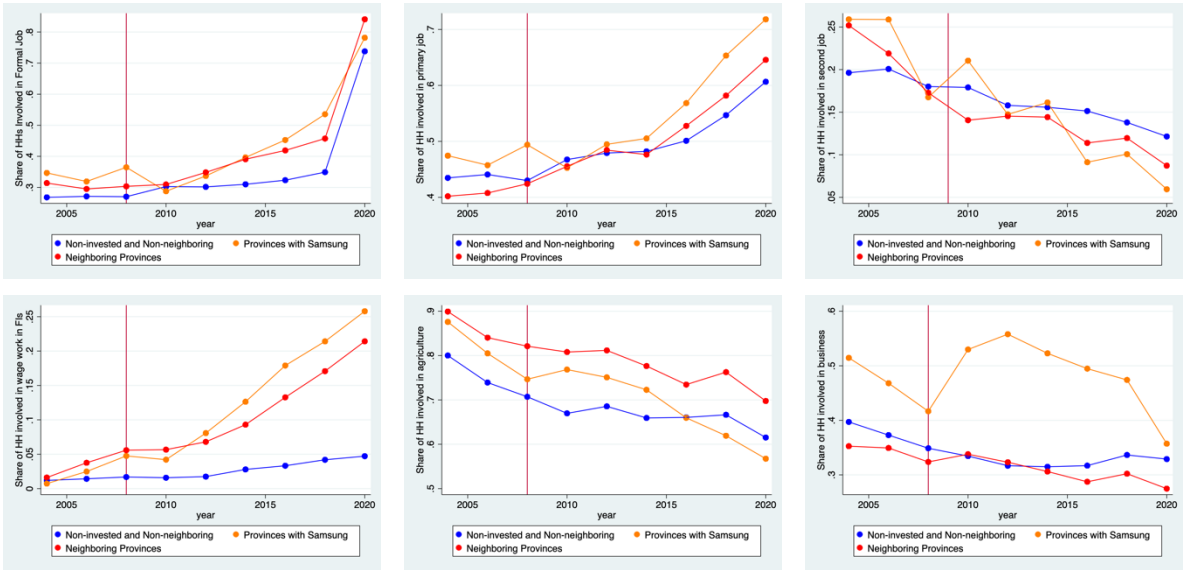
Table 2.1. Summary Statistics on Households, 2006

Year = 2006	Non-invested and non-neighboring provinces	Samsung invested provinces	Neighboring provinces
Distribution of Age of HH head			
below 18	0.0	0.0	0.1
18-25	0.9	1.1	1.4
26-35	13.9	14.9	17.7
36-50	44.5	43.6	46.7
>50	40.7	40.4	34.1
Sex of HH head			
=1 if Male	76.9	71.6	81.0
Marital status if HH head			
=1 if Married	82.1	81.6	87.2
Education level of HH head			
No diploma	12.5	5.3	5.5
Primary to high school	19.1	9.9	11.9
Vocational training	26.8	25.2	23.0
Bachelor and above	27.1	41.1	41.5
Household size			
1-2	13.4	16.0	13.0
3-4	44.5	53.5	54.7
>5	42.3	30.5	32.3
Number of female member in the HH			
0	1.3	2.1	0.5
1-2	64.4	72.0	70.1
3-4	30.0	23.8	27.0
>5	4.2	2.1	2.4
Number of member age 18-35 in the HH			
0	31.9	31.2	28.9
1-2	58.9	62.8	64.0
3-4	8.4	5.7	6.6
5-8	0.9	0.4	0.5
Working hours			
=1 if <= 200	13.1	14.2	11.4
=1 if 201-500	46.9	42.2	45.7
=1 if >500	40	43.6	43
Total	5,880	285	954

Figure 2.2 displays the proportion of households engaged in wage work and self-employment over time. It is evident that wage work is gradually increasing across all three groups of provinces, accompanied by a gradual decline in self-employment. However, the pace

of this transformation varies across provinces.

Figure 2.2. Share of Households Involved in Formal and Informal Job



The rate of households engaging in wage labor witnessed a more rapid escalation in provinces that received investments from Samsung compared to those in the remaining provinces. Simultaneously, there was a swifter decline in the proportion of households involved in self-employment within the former provinces.

2.4.2. Impact on Household's Working Decision

In subsections 2.4.2 and 2.4.3, we present our main analysis results in two steps. First, in Panel A of each table, we examine the changes in household's working decisions in Samsung-invested provinces and the spillovers onto neighboring provinces compared to the non-treated and non-neighboring regions. Secondly, the regression results in Panel B show the heterogeneous effects on households with female members aged 18 to 35[5].

[5] As mentioned earlier, in Samsung's official employment notification, eligibility criteria stipulate that prospective employees should fall within the age range of 18 to 35, and in specific instances, the company accords

Table 2.2. The Number of HH's Members Worked in the Past 12 Months

	Number of HH members worked past 12 months for						
	Formal Job				Informal job		
	Total	Primary job	Second job	Foreign firm	Total	Agriculture	Production
Panel A. Basic Regressions							
Samsung-invested provinces	0.12**	0.16***	-0.03***	0.14***	-0.28***	-0.35***	0.05
	(0.06)	(0.05)	(0.01)	(0.04)	(0.02)	(0.03)	(0.06)
Neighboring provinces	0.10**	0.12***	-0.01	0.10***	-0.17***	-0.20***	-0.01
	(0.04)	(0.04)	(0.01)	(0.03)	(0.05)	(0.06)	(0.02)
Observations	118577	118577	118577	118577	118577	118577	118577
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.02	0.06**	-0.03***	0.04*	-0.22***	-0.28***	0.03
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Samsung-invested provinces × having female 18-35	0.20***	0.21***	-0.00	0.20***	-0.12***	-0.14**	0.05
	(0.06)	(0.05)	(0.01)	(0.03)	(0.02)	(0.05)	(0.06)
Neighboring provinces	0.02	0.04	-0.02***	0.03*	-0.12***	-0.15***	0.00
	(0.04)	(0.03)	(0.01)	(0.02)	(0.04)	(0.04)	(0.03)
Neighboring provinces × having female 18-35	0.18***	0.17***	0.01	0.15***	-0.11	-0.10	-0.02
	(0.05)	(0.05)	(0.01)	(0.03)	(0.07)	(0.09)	(0.03)
Sum of the first two coefficients	0.22	0.26	-0.04	0.25	-0.34	-0.43	0.08
P value	0.00	0.00	0.01	0.00	0.00	0.00	0.41
Sum of the last two coefficients	0.20	0.21	-0.01	0.18	-0.23	-0.25	-0.02
P value	0.00	0.00	0.62	0.00	0.01	0.01	0.53
Control mean	0.45	0.40	0.05	0.03	2.11	1.58	0.53
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table 2.2 shows regressions for the number of household members who have worked for different jobs in the past 12 months. In Panel A, households tend to switch from being self-employed and working for other household businesses, especially in agriculture, forestry, and aquaculture, towards working for wages and salaries in the formal sector. On average, the number of household members working for informal jobs in non-treated and non-neighboring

preference to female applicants. Additionally, in accordance with the labor statistics disclosed by Samsung, the workforce comprises a notable 80\% representation of women in their twenties.

regions is 2.11 persons, about four times the number of formal employment. After the entry of Samsung, we see a decrease in the self-employed involvement of household members by 13.3%. In comparison, there is a 26.7% increase in the number of household members working for formal jobs in invested provinces. Among the formal employment, we find new HH members entering the wage labor market (40% increase in "primary job"), while we find a significantly lower engagement in a second job by 60%. Notably, households in treated provinces are 4.7 times more likely to work for foreign-invested firms than those in the non-treated and non-neighboring provinces. We find no evidence for change in the number of HH members self-employed in production other than agriculture, forestry, and aquaculture.

These findings on the decrease in the number of household members engaged in self-employed in agriculture, forestry, and aquaculture are consistent with the finding from Liu et al. (2020), who noted agriculture's declining employment capacity, particularly for the young and a shift among rural households towards non-farm income sources[6].

In addition, we find significant spillover effects in neighboring provinces. Households in neighboring provinces experience a similar pattern of change in working decisions, with a 8.1% decrease in self-employment and a 22.2% increase in formal work.

Panel B shows that for households with female members aged 18-35 in treated provinces, the supposedly most affected group, there was an increase in the average number of people working for formal work and first jobs equivalent to 44.4 percent and 52.5 percent, respectively. Thus, within this group, there is a noticeable increase in the number of members

[6] The study was conducted on the evolution of agriculture and labor force dynamics during the swift structural transformation from 1992 to 2016. The researchers observe that the agricultural workforce is not only contracting but also aging at a more accelerated pace compared to the general labor force. This phenomenon is not confined to the labor market alone; it is also evident among farming families. They also find a notable shift in the larger proportion of their household earnings now being sourced from non-farm sectors, a trend that underscores the changing economic landscape in rural areas.

engaging in wage work overall. Specifically, households with female members aged 18-35 are 6.7 times more likely to work for foreign-invested firms. Moreover, this cohort of households exhibits a decrease of 5.7 percent in the number of household members engaging in self-employment and household businesses, with a particularly pronounced reduction of 8.9 percent in the likelihood of involvement in agricultural pursuits. This result suggests that the presence of Samsung has induced an increased propensity among women in the impacted regions to engage in wage-based employment, particularly in their most time-consuming jobs.[7]

Table 2.3. Number of Hours HH's Members Worked the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regression							
Samsung-invested provinces	0.36***	0.38***	-0.08	0.60***	-0.34***	-0.28***	-0.60***
	(0.12)	(0.11)	(0.11)	(0.17)	(0.08)	(0.10)	(0.22)
Neighboring provinces	0.36**	0.37**	-0.02	0.44***	-0.23**	-0.21***	-0.24
	(0.15)	(0.15)	(0.09)	(0.13)	(0.09)	(0.07)	(0.25)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.11**	0.12**	-0.09	0.23**	-0.39***	-0.34***	-0.52**
	(0.05)	(0.05)	(0.07)	(0.10)	(0.09)	(0.10)	(0.20)
Samsung-invested provinces × having female 18-35	0.53***	0.53***	0.02	0.78***	0.11***	0.12***	-0.17***
	(0.14)	(0.14)	(0.08)	(0.09)	(0.03)	(0.02)	(0.03)
Neighboring provinces	0.08	0.09	-0.05	0.16**	-0.16**	-0.15*	-0.17
	(0.13)	(0.13)	(0.08)	(0.07)	(0.08)	(0.07)	(0.23)
Neighboring provinces × having female 18-35	0.61***	0.61***	0.07	0.62***	-0.13	-0.13	-0.14
	(0.12)	(0.13)	(0.05)	(0.13)	(0.08)	(0.08)	(0.09)
Sum of the first two coefficients	0.64	0.65	-0.07	1.01	-0.28	-0.22	-0.69
P value	0.00	0.00	0.62	0.00	0.00	0.01	0.00
Sum of the last two coefficients	0.69	0.70	0.02	0.78	-0.30	-0.27	-0.31
P value	0.00	0.00	0.83	0.00	0.01	0.00	0.27
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form.*

[7] To investigate this phenomenon more comprehensively, we run the regressions with households with female members and those with members aged 18-35 separately (Appendix 2B) The findings are consistent with the the main results.

In addition, we check for the total effects of this subgroup in invested and neighboring provinces. The coefficients and p-values indicate that in the invested region, there is an overall increase of 48.9 percent in the number of household members employed in formal jobs. Additionally, there is an increase in the number of members working in primary jobs, while there is a decrease in the number of members employed in secondary jobs and self-employment. The effect is slightly lower in neighboring provinces, with 40 percent more members working in formal employment.

Table 2.3 examines the distribution of working hours at the household level for wage-based employment[8]. Over the past 30 days, within the invested provinces, our analysis reveals a statistically significant increase in total working hours for formal jobs and a statistically significant decrease in total working hours for informal employment in both primary and secondary jobs. Since the VHLSS does not report working hours for self-employment in agriculture, forestry, and aquaculture, as well as for self-employment in production and business, the working hours for informal employment reported here pertain only to those working for other household businesses. The results indicate that household members are reducing their working hours for informal jobs while working more in more stable formal positions. Among formal employment, we find an increase in working hours only for primary jobs and positions with foreign firms, while there is no evidence of an increase in working hours for secondary formal jobs.

Within the provinces subject to treatment, there is a substantial reduction of 34 percent in working hours dedicated to informal work compared to the non-treated and non-neighboring provinces. Additionally, the changes in working hours for foreign businesses reflect a 60 percent increase. When we consider the findings presented in conjunction with the data from

[8] Labor supply hours for self employment is not available in VHLSS.

Table 2.2, it becomes evident that employment with foreign-invested enterprises has emerged as a prevailing and predominant trend in both provinces that have received foreign investments and their adjacent regions, as discernible in both the allocation of working hours and the number of household members involved in this pursuit. This trend can be attributed to multiple factors, including the direct influence of Samsung's entry into these regions and the indirect impact of the subsequent investments made by other foreign firms in these areas in response to Samsung's presence.

When we scrutinize Samsung's impact on the subgroup of interest in Panel B, we observe a more substantial effect on the number of hours dedicated to foreign-owned businesses within households containing female members aged 18 to 35. Household members in these subgroups tend to work 78 percent more for foreign-invested firms. These findings underscore the inclination of this specific group to increase their work hours in wage-based employment and, notably, their participation in FDI-related firms. For neighboring provinces, we find more minor in magnitude but still significant effects.

2.4.3. Impact on Household Labor Income and Expenditure

We now turn to household income results to examine whether shifts in labor decisions and the reallocation of working hours translate into labor income. Table 2.4 shows the change in household labor income over the past 12 months with the entry of Samsung.

In Panel A, the results show that compared to the comparison regions, households in treated localities experience an increase in income of 37 percent from formal jobs, primarily wage work. Simultaneously, there is a statistically significant increase of 15 percent in total income. The rise in household income primarily emanates from an escalation in earnings derived from the most time-intensive occupations and income generated through employment with foreign-invested firms. Furthermore, regarding spillovers to neighboring provinces, the

results suggest that total household income from formal jobs registers a significant surge of 29 percent in neighboring provinces compared to non-treated and non-neighboring regions. This indicates that switching from informal to formal employment is associated with an increase in household income. Similar to the results in invested regions, this substantial income boost is mainly attributable to increases in wage income, notably from primary job engagements and employment with foreign-invested firms. Income levels stemming from wage/salary employment and FDI firms were similarly observed in neighboring localities; however, these increases were comparatively more modest when contrasted with households in the invested region. We also observe a statistically significant increase of 17 percent in total income in neighboring areas.

Consistent with our discovery of a decrease in engagement and working hours for the second most time-consuming job, we also find evidence of a reduction in income derived from secondary employment in both panels. One possible explanation is that Samsung's entry creates greater wage employment opportunities, particularly in foreign firms that likely offer higher income to households. Consequently, households opt for less involvement in secondary jobs, concentrating instead on their primary employment. This strategy enables households to enhance their income more efficiently than by juggling multiple jobs simultaneously.

In Panel B, we find that households in areas receiving investments, particularly those with female members aged 18 to 35, experience a notable increase in income from wage-based employment. For these households, income from formal work and the primary occupation rose by 41 percent and 40 percent, respectively. Remarkably, income from jobs in foreign enterprises for these households surged by 44 percent relative to the comparison group. However, there was a decrease of 1 percent in income from secondary occupations, although it was not statistically significant. These findings highlight a significant shift in income dynamics, particularly among households with young female members in regions influenced

by Samsung's investments, including the directed investment areas and those adjacent to them.

Table 2.4. Household Labor Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Jobs				Informal Job			Total
	Total	Primary job	Second Job	Foreign Firms	Total	Agriculture	Production	Income
Panel A. Basic Regressions								
Samsung-invested provinces	0.37***	0.39***	-0.04*	0.36***	-0.14*	-0.32**	0.19	0.15***
	(0.11)	(0.09)	(0.02)	(0.10)	(0.07)	(0.15)	(0.16)	(0.05)
Neighboring provinces	0.29***	0.29***	-0.01	0.25***	-0.20***	-0.26***	0.01	0.17***
	(0.09)	(0.09)	(0.01)	(0.08)	(0.05)	(0.09)	(0.03)	(0.06)
Observations	118577	118577	118577	118577	118577	118577	118577	118577
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.17***	0.20***	-0.04**	0.15**	-0.20***	-0.26**	0.08*	0.01
	(0.05)	(0.05)	(0.02)	(0.07)	(0.03)	(0.10)	(0.05)	(0.03)
Samsung-invested provinces × having female 18-35	0.41***	0.40***	-0.01	0.44***	0.13	-0.13	0.23	0.27***
	(0.08)	(0.07)	(0.01)	(0.05)	(0.10)	(0.10)	(0.23)	(0.05)
Neighboring provinces	0.10	0.11	-0.02**	0.09**	-0.18***	-0.21***	-0.01	0.01
	(0.07)	(0.06)	(0.01)	(0.04)	(0.03)	(0.06)	(0.02)	(0.05)
Neighboring provinces × having female 18-35	0.43***	0.41***	0.02	0.34***	-0.03	-0.12	0.05	0.35***
	(0.09)	(0.09)	(0.02)	(0.07)	(0.06)	(0.09)	(0.04)	(0.07)
Sum of the first two coefficients	0.58	0.59	-0.05	0.59	-0.07	-0.39	0.31	0.29
P value	0.00	0.00	0.10	0.00	0.55	0.05	0.26	0.00
Sum of the last two coefficients	0.53	0.51	-0.00	0.44	-0.21	-0.33	0.03	0.36
P value	0.00	0.00	0.83	0.00	0.02	0.01	0.48	0.00
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

The coefficient on total income for this subgroup of households is positively estimated at 27 percent. This indicates that the increase in income from wage labor—particularly from primary formal employment—outweighs the simultaneous decrease in earnings from secondary jobs, agriculture, forestry, and fisheries. This shift suggests an overall boost in household income, implying improved welfare. The expenditure results further elucidate this pattern and its implications.

Table 2.5. Household's Expenditure in the Past 12 Months

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.02	0.01**	0.07**	0.02	0.09***	0.08	0.09	0.10***
	(0.01)	(0.00)	(0.03)	(0.02)	(0.02)	(0.05)	(0.10)	(0.04)
Neighboring provinces	0.02**	0.00	0.06***	0.02	0.07***	0.07***	0.05	0.06**
	(0.01)	(0.00)	(0.02)	(0.03)	(0.02)	(0.02)	(0.06)	(0.03)
Panel B. Heterogeneity for Households with female members of age 18-35								
Samsung-invested provinces	0.01*	0.00	0.07***	-0.00	0.07***	0.05*	0.09	0.11***
	(0.01)	(0.00)	(0.02)	(0.01)	(0.01)	(0.03)	(0.09)	(0.02)
Samsung-invested provinces × having female 18-35	0.02	0.01***	0.00	0.05	0.03**	0.07	0.00	-0.02
	(0.03)	(0.00)	(0.02)	(0.04)	(0.01)	(0.05)	(0.04)	(0.05)
Neighboring provinces	0.01	0.00	0.04**	0.01	0.07***	0.05***	0.04	0.05
	(0.01)	(0.00)	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.03)
Neighboring provinces × having female 18-35	0.01	0.00**	0.03***	0.02	0.01	0.04*	0.03	0.03
	(0.01)	(0.00)	(0.01)	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)
Sum of the first two coefficients	0.03	0.01	0.07	0.04	0.10	0.12	0.09	0.09
P value	0.30	0.00	0.08	0.21	0.00	0.10	0.45	0.12
Sum of the last two coefficients	0.03	0.00	0.07	0.03	0.08	0.09	0.06	0.07
P value	0.01	0.33	0.00	0.55	0.00	0.00	0.27	0.01
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Finally, we examine the shifts in household expenditures resulting from Samsung's investment. As shown in Table 2.5, the increase in household income is corroborated by heightened expenditures overall, particularly in the categories of holiday foods, health, and housing in treated provinces, as well as in most categories in neighboring regions, except for holiday foods, education, and durable goods. Total expenditures in invested and neighboring provinces increased by ten percent and six percent, respectively.

The increase in expenditures is most pronounced among households that include both

female members and individuals aged 18 to 35 (see Table B7). Within the investment-receiving area, this demographic cohort experiences substantial increases in spending categories such as daily food, holiday food, health-related expenses, educational outlays, durable goods, and total expenditure. Specifically, compared to households without both female members and individuals aged 18 to 35 in non-invested and non-neighboring localities, total spending within this specific group of households amplifies by 36 percent, 7 percent, 9 percent, 24 percent, 35 percent, and 83 percent, respectively, for the aforementioned categories. The increase in spending among this demographic segment within neighboring localities registers figures of 25 percent, 11 percent, and 33 percent for daily food, health, and education. While these increments are lower in magnitude compared to the corresponding figures for the investment-recipient locality, they nonetheless indicate a commendable and notable rise in expenditure.

2.4.4. Event Study and Testing the Parallel Trend Assumption

To ensure the validity of regression outcomes using the TWFE method, which includes fixed effects and household-specific, time-varying controls, one must eliminate any omitted variables that could be correlated with Samsung's entry or the initial outcome levels prior to the investment. A common way to frame this is by assuming that households in the regions receiving Samsung's investment would have experienced similar outcome trends over time as households in non-invested areas would have, had the investment not occurred. For this assumption to hold, the temporal trends in the control households must serve as a reliable counterfactual for the treated households.

An event study is a widely used approach to test the assumption of parallel trends. This study adapts the main regression specification by replacing the interaction of the treatment variable with a post-treatment indicator instead of using year dummies that interact with the treatment variable. For Bac Ninh, we conduct the event study comparing treated provinces

against a control group of non-invested, non-neighboring regions. The equation for this event study is:

$$y_{ijt} = \beta_0 + \sum_{j=-1}^{11} \beta_j 1(j = t - 2007) \times 1(s = \text{Bacninh}) + \theta_k \sum_{k=1}^{m} X_{ipt} + \gamma_j + \alpha_t + \mu_p + \varepsilon_{ipt} \quad (3)$$

Here, the β_j coefficients are evaluated relative to 2007, the year before Samsung's entry, which is normalized to zero. Ideally, pre-2007 investment effect coefficients should be zero, reflecting no pretreatment effect. Post-treatment, the coefficients relative to 2007 are expected to be positive, reflecting a beneficial impact of the investment compared to the year before it occurred. The results of checking parallel trends are in Figures 2.3, 2.4 and are summarized in Table 2.8

Table 2.6. Parallel Trend Assumption Testing

Extensive margin	Parallel trend assumption	**Intensive margin-**	Parallel trend assumption	**Household's income**	Parallel trend assumption
Formal job	**Satisfied**	Formal job	**Satisfied**	Formal job	**Satisfied**
Primary job	**Satisfied**	Primary job	**Satisfied**	Primary job	**Satisfied**
Second job	**Satisfied**	Second job	**Satisfied**	Second job	**Satisfied**
FIs	**Satisfied**	FIs	**Satisfied**	FIs	**Satisfied**
Agriculture	Not satisfied			Agriculture	**Satisfied**

For outcomes where the parallel trend assumption holds according to the event study, the pre-treatment trends exhibit no significant deviations, with coefficients in the pre-treatment period close to zero and statistically insignificant. This lack of notable differences across groups before Samsung's investment entry suggests stable outcome levels in the pre-investment period, reinforcing the practical validity of the parallel trend assumption. Post-investment

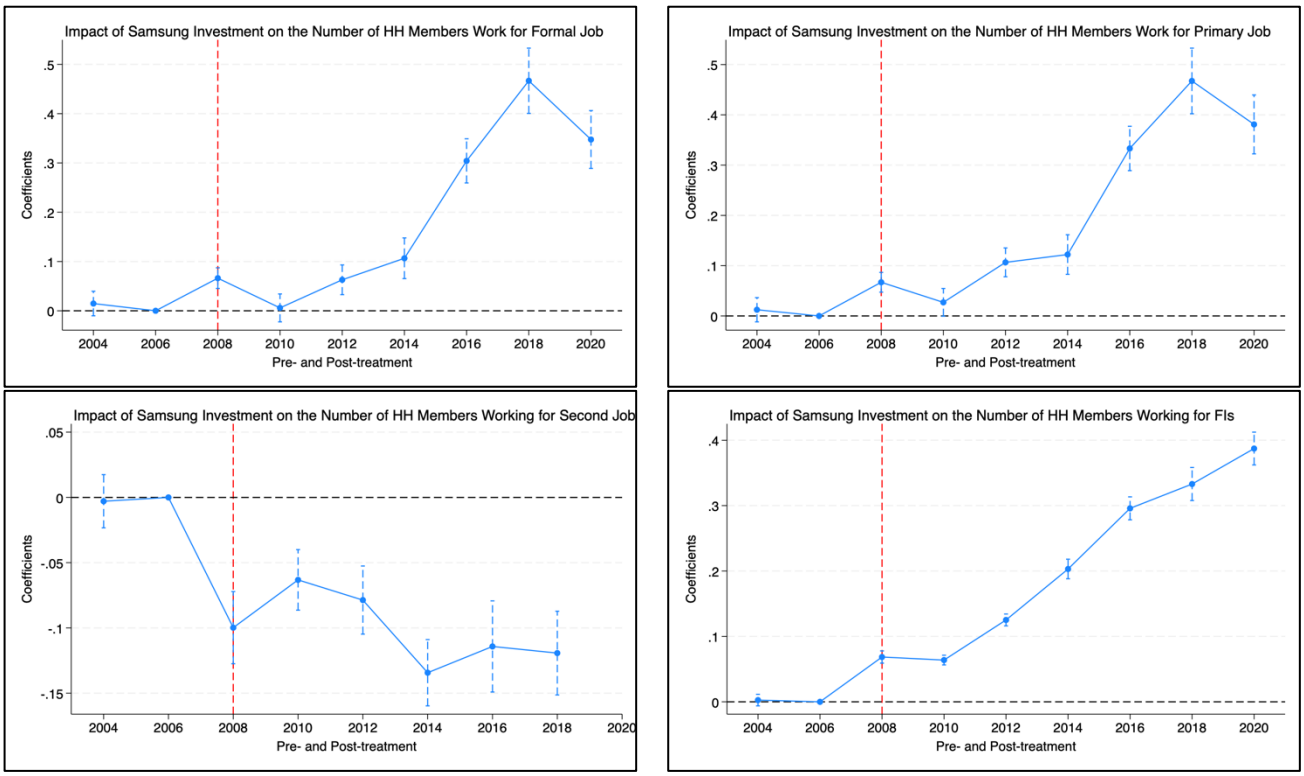
trends in regions with Samsung's presence mirror findings from our two-way fixed effects (TWFE) analysis, providing consistent insights into both extensive and intensive labor margins.

In terms of extensive margin, following Samsung's entry, we observe a reduction in the number of household members engaging in secondary employment. At the same time, there is a noticeable shift towards working more in foreign-invested firms. This suggests a reallocation of labor as households prioritize employment in foreign-invested entities over secondary or informal job opportunities. On the intensive margin, household members spend fewer hours in wage work overall, particularly in secondary jobs, which might indicate a shift in focus towards more stable or lucrative positions within foreign-invested firms. However, the hours spent on primary jobs show a less distinct pattern, which may reflect varying impacts depending on individual household circumstances or regional labor market conditions. Despite this ambiguity for primary jobs, the data consistently show increased hours worked for foreign-invested firms, paralleling our TWFE results and underscoring the transformative role of foreign investment in local labor allocation.

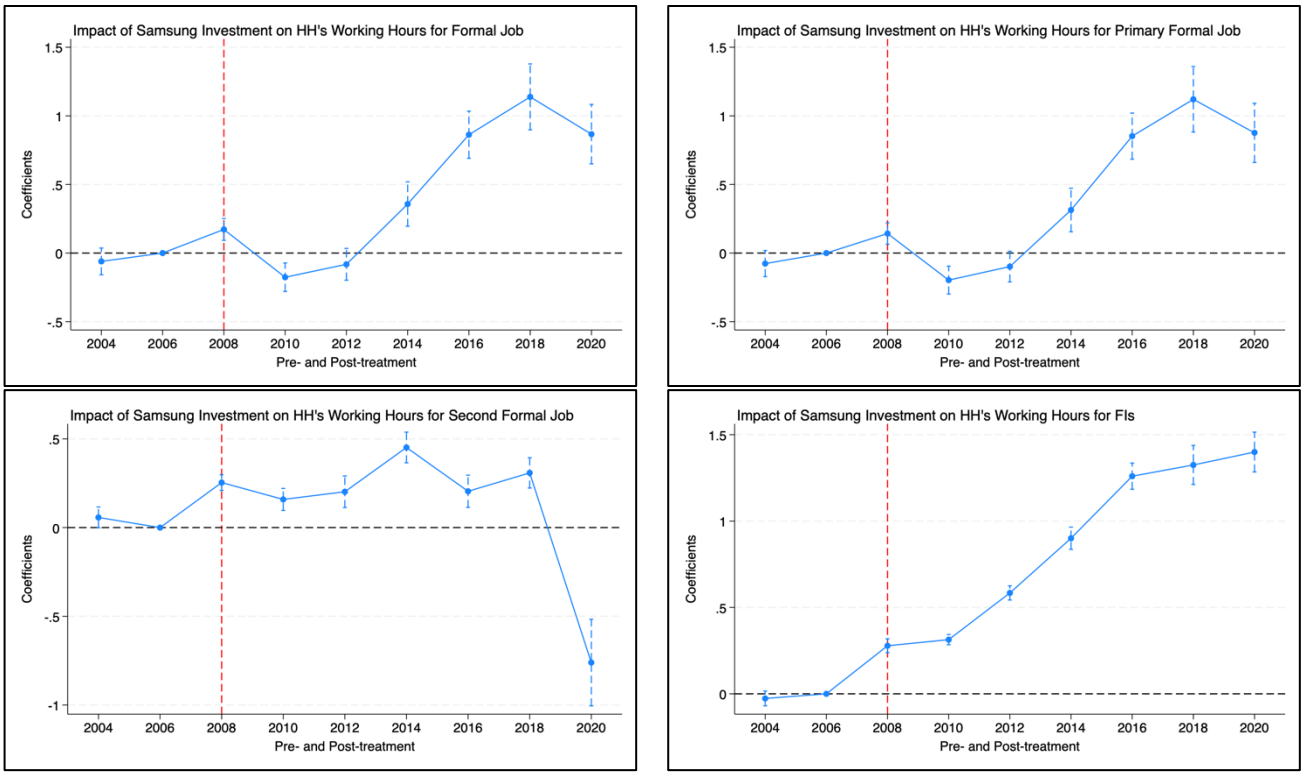
For some other outcomes, however, the parallel trend assumption does not fully hold, with pre-treatment trends showing differences that challenge this assumption. Despite these limitations, the post-treatment trends in these cases align closely with those found in the TWFE analysis, suggesting that Samsung's investment impacts are similarly detectable across models. To address any potential biases arising from these deviations, we further supplement our findings by applying the Synthetic Control Method in Section 2.5, providing an additional robustness check and enhancing the credibility of our conclusions. This multi-method approach strengthens the overall validity of our analysis by corroborating results across different methodological frameworks.

Figure 2.3. Pre- and Post-Treatment Effects on Working Decision

Panel A. Extensive margin

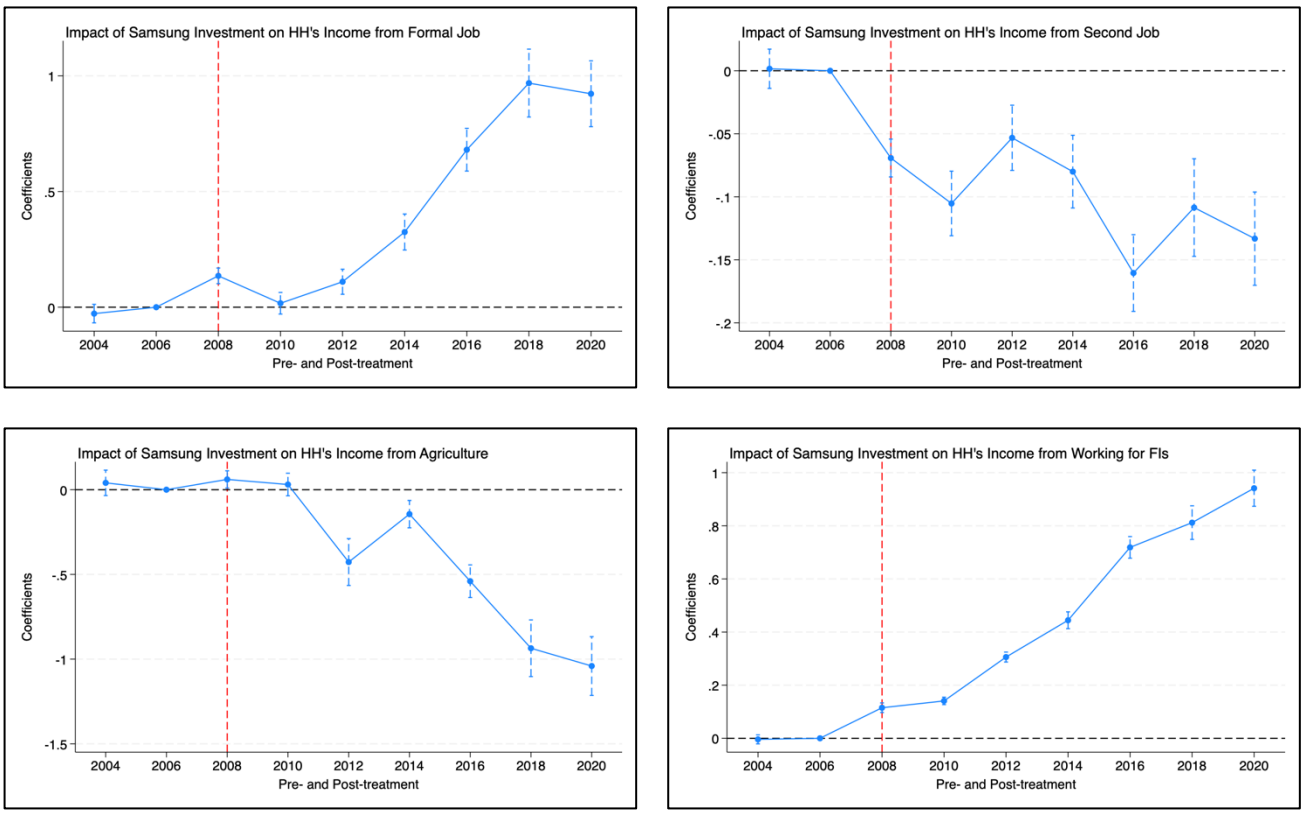


Panel B. Intensive margin



For household income outcomes, the parallel trend assumption held for several categories, including total household income, income from primary job, second job, income from foreign firm employment, and income from self-employment in agriculture, forestry, and aquaculture. Our analysis reveals an increase in total household income, income from primary job and income earned from employment with foreign firms, paired with a decrease in income from second job and from self-employment in traditional sectors like agriculture, forestry, and aquaculture. This suggests a shift in household labor from self-employment toward more stable positions in wage work or foreign firms. These findings align with our main results, which highlighted shifts in employment and income composition due to the influence of foreign investment. This pattern supports the interpretation that foreign investment not only raises household income but also reshapes the economic activities within households, favoring wage employment over self-employment in agriculture and other primary sectors.

Figure 2.4. Pre- and Post-Treatment Effects on Household's Income

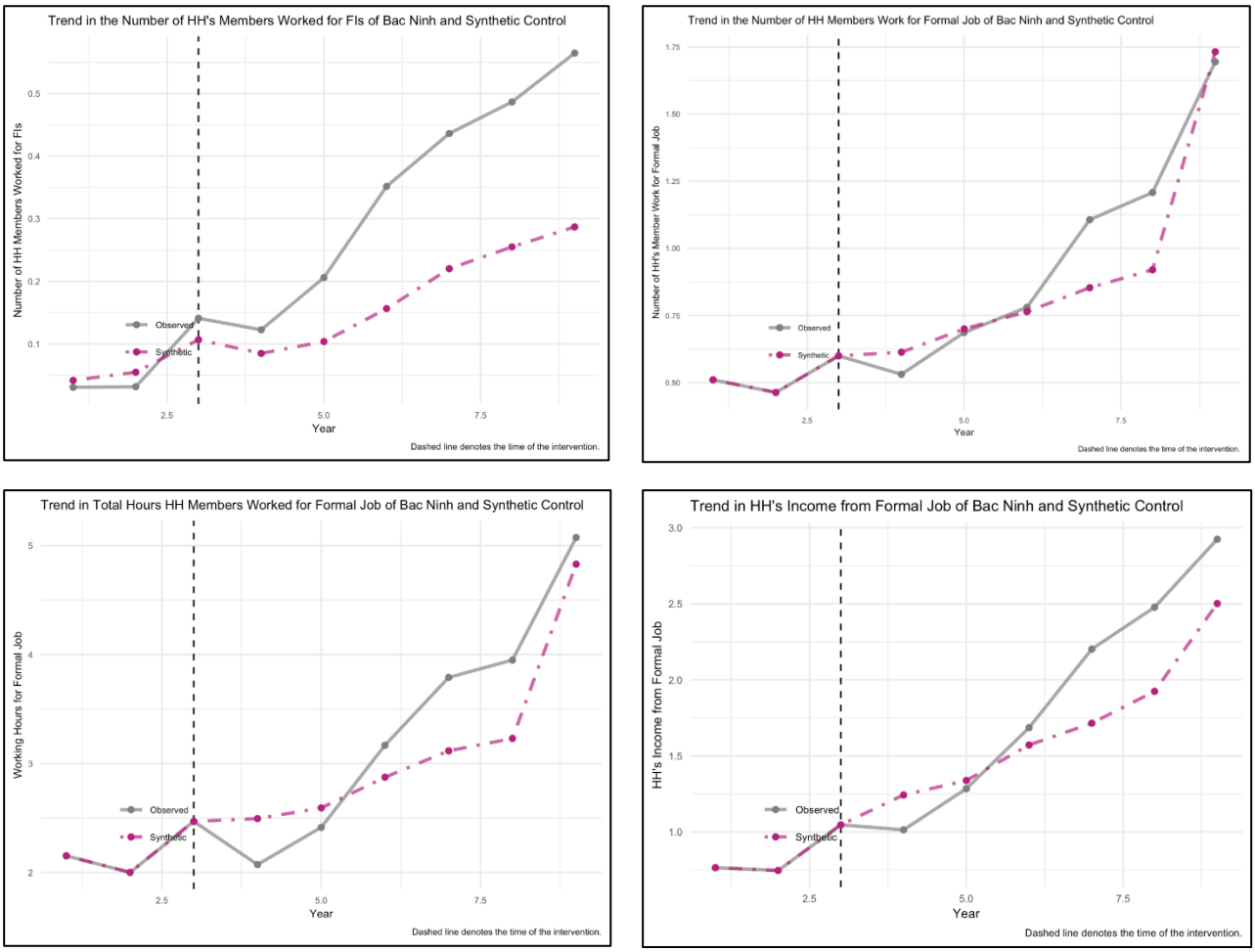


2.5. Synthetic Control Method Analysis

In this section, we employ the synthetic control method to draw more precise causal impacts of Samsung's market entry on household labor force participation decisions. This method entails selecting control provinces as donors and choosing key independent variables. Our objective is to construct a synthetic treated unit that mirrors the pre-intervention characteristics of the actual treated unit before Samsung enters the market. Here, we focus on the young female employment channel, thus limiting the sample to households with females aged 18-35. Then we compare Samsung-invested provinces against the others. In constructing the control group, we assign weights to each control unit, effectively matching the treated and comparison groups. This approach allows for a more nuanced and controlled analysis of the impact of Samsung's market entry on household labor decisions by comparing the post-entry outcomes in the treated unit with those of a carefully constructed synthetic counterpart. For the details of SCM, refer to the appendix.

Figure 2.5 presents the analysis results. The first graph confirms that working for foreign investing firms increased after Samsung’s entry. The gap between the treatment and control provinces widens after 5 years. The other three figures show that the positive employment and income impacts, shown in the TWFE analysis results, appear five years after Samsung’s entry, which coincides with the immense job creation for young females. Note that the treated unit and its synthetic counterpart exhibit parallel trends leading up to Samsung's market entry. Nevertheless, after the establishment of Samsung's manufacturing facilities, substantial disparities in the key variables of interest became evident between the treated provinces and their respective synthetic controls.

Figure 2.5. SCM Analysis for the Number of HH Members Working and HH's Income



It is also notable that Bac Ninh and Thai Nguyen show different magnitude, with the former exhibiting a more substantial influence (See Figures B5 for SCM analysis for Thai Nguyen). This divergence may be attributed to Samsung's prolonged investment duration in Bac Ninh. Additionally, it is discernible that the expansion in the number of household members employed by foreign-invested firms is most pronounced and exhibits a continuous upward trajectory over time, thereby underscoring a clear trend towards increased labor engagement with FDI enterprises.

Regional disparities reveal a larger income gap between treated units and the control group in Bac Ninh than in Thai Nguyen, mirroring differences in household work decisions. Wage income from primary jobs increased, likely reflecting Samsung's economic impact, while

income from secondary jobs declined, indicating shifts in labor market structure and work patterns. Although Bac Ninh and Thai Nguyen show similar effects, differences arise due to variations in investment duration, amount, and employment scale.

To assess the reliability of the SCM results, we conduct a placebo test following the approach of Abadie et al. (2010). This method examines the mean squared prediction error (MSPE) for each unit *before* and *after* the treatment, calculating the ratio $MSPE_{after}/MSPE_{before}$. Based on this ratio, we rank units according to the extent of their *change* following the intervention. If the treated unit exhibits the largest change, it receives the first rank. The placebo test results, presented in Figure B2, show that Bac Ninh (province code 27) has the most significant change, thereby confirming the reliability of the SCM results.

2.6. Robustness Check

To ensure the reliability of our results, we conducted additional robustness tests. First, we re-ran regressions using different outcome variables, including primary outcomes in level form (Appendix 2A) and average values per household member (Appendix 2C) or per working-age household member (Appendix 2D). We also performed regressions on a sample excluding households from Hanoi and Ho Chi Minh City, Vietnam's two largest cities (Appendix 2E), and used standard errors clustered at the province-year level (Appendix 2F). The results consistently align with those presented in the previous sections.

2.7. Conclusions

This study examines the impact of foreign direct investment by multinational corporations, focusing on Samsung's investment in Vietnam and its effects on household employment choices. Using Vietnam as a case study, we highlight the transformative effects of large-scale investments in developing economies, where Samsung's presence has notably shifted labor dynamics and household income structures.

Our findings indicate that Samsung's entry drives a shift from informal to formal employment, increasing household incomes primarily through wage-based work. In regions directly impacted by Samsung's investment, households show a clear reallocation of labor, with formal employment replacing informal one, and primary employment replacing secondary jobs, which suggests improved welfare through higher spending on healthcare, education, and durable goods. While similar effects may apply to other foreign-invested firms, Samsung's impact is exceptionally large, particularly benefiting young female labor participation and facilitating labor supply adjustment in the affected households.

By exploring intra-household labor supply responses to FDI, this paper adds to the broader literature on FDI's impact on developing economies. It underscores the need for future research to investigate how large foreign investments influence diverse aspects of human welfare and social dynamics. Such insights are vital for designing policies that maximize FDI benefits while addressing potential challenges."

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Chapter 3
Job Creation And Firm Size:
Evidence From A Developing Country

Abstract: This study focuses on job creation and its gender aspect in Vietnam, utilizing extensive firm-level data from 2006 to 2018. The structure of enterprises in Vietnam reveals that the firm size distribution has increasingly shifted toward micro and small firms, including self-employed and household businesses, becoming more right-skewed over time. In addition, the empirical results indicate that given the same number of years in operation, large enterprises exhibit a higher job creation rate, and the difference in job creation rates between small and large firms is even more pronounced for female employment. In terms of the number of jobs, large enterprises again outweigh small ones. Moreover, this study highlights the gender-based hiring trends of firms. Large enterprises tend to hire more female workers than male workers. In contrast, firms with less than 50 employees prefer males to females, especially new entrants. Sectors with high female labor demand include education, healthcare, entertainment, manufacturing, accommodation, and restaurant services.

JEL Codes: J01, J16, J21, D22, M13, M51

Keywords: Job creation, job destruction, firm size, firm age, female labor.

3.1. Introduction

Developing countries tend to evolve toward a structure dominated by an increasing number of micro, small, and medium-sized enterprises, while large firms remain scarce (Ciani et al., 2020). As a result, the question of whether small or large enterprises create more jobs becomes crucial in addressing employment issues and designing appropriate support for small and medium-sized enterprises (SMEs).

Vietnam ranks among the countries with the lowest unemployment rates globally, consistently below 3%. The high labor force participation rate, which is relatively balanced between men and women, makes Vietnam a compelling case for studying employment and job creation. Utilizing the most extensive firm-level dataset available, which includes one-person businesses (i.e., registered self-employed individuals) and 1-4 persons (likely to be household business), this study adds to the body of knowledge regarding the correlation between firm size and job creation in Vietnam from 2006 to 2018. The article aims to elucidate employment growth among various firm sizes and identify which organizations generate the most jobs in developing nations. The significance of firm size in employment growth is central to the discourse on addressing unemployment.

This study makes notable contributions in two primary aspects. First, it distinguishes itself from the initial research in Vietnam, which explores the intricate relationship between firm size, firm age, and job creation. While prior studies have indeed delved into employment in Vietnam, their primary focus has revolved around the consequences of trade and investment liberalization and institution reform on employment (Fukase, 2013; Jenkins, 2004; Jenkins, 2006; Malesky, 2009; McCaig et al., 2018; McCaig et al., 2022).

Secondly, in addition to the overarching job creation rate, this research extends its purview to encompass the net job creation rate among women, effectively shedding light on

the disparities between male and female job creation concerning firm size and firm age. The Vietnam War resulted in a significant reduction of the male population in comparison to the female population, particularly within the prime-age demographic 25 to 54. With the economic growth initiated by the Doi Moi reforms in 1986, the labor supply was primarily female, increasing women's participation in the workforce. Goldin & Olivetti (2013) indicate that the Vietnam War significantly stimulated female labor force participation, akin to the increase observed in the United States after World War II (Work, 2018). The female labor force participation rate in Vietnam is about 75%, higher than the world and regional rate, surpassing the leading advanced Western economies. The conflict renders Vietnam a unique instance, and female job creation is crucial for a country with a young population and two-thirds of working-age women participating in the labor market.

The results show that without controlling for firm age, we see a strongly negative decrease in net job creation when firm size increases, regardless of firm size measurement. However, when we control for firm age, the inverse relationship observed before is no longer clear when we use base year firm size. In contrast, a strongly positive relationship is observed using the average firm size method. These results are consistent with those of Haltiwanger et al. (2013) and Neumark et al. (2012) in the U.S. In both relative and absolute terms, given firms of the same age, large firms generate more new jobs than small ones. However, since micro and small enterprises account for a significant and increasing share of the economy, the number of jobs created is substantial despite their high job destruction rate, especially in recent years.

This paper additionally offers a further understanding of employment dynamics focusing on female job creation within business dimensions. We find that micro and small firms prefer males to females. In contrast, businesses with more than 50 employees hire more females. This characteristic can disadvantage female employees when the proportion of firms with less than 50 employees sharply increases. In addition, empirical results indicate that the

disparity in job creation rates for women between young and mature enterprises is greater than the overall job creation rate, particularly in the manufacturing and service sectors, as well as in foreign-invested enterprises. Moreover, a similar trend is also observed in job destruction. This may indicate that female workers are more vulnerable to adverse impacts during labor fluctuations within enterprises, particularly in younger firms, which is consistent with ILO (2021).

The paper is structured as follows: Section 3.2 shows some literature review related to this study. Section 3.3 summarises the labor market and the participation of females in Vietnam. Section 3.4 describes the measurement of the key independent variables and the data sources used. Section 3.5 explains the model employed to explore the relationship between job creation, firm size, and firm age. Section 3.6 presents the empirical results, and Section 3.7 provides a summary and recommendations.

3.2. Literature Review

Our paper relates to the literature on whether small or large enterprises generate more jobs. The inquiry into whether small businesses contribute more to job creation than large firms gained prominence with David Birch's seminal works in 1979, 1981, and 1987, underscoring small businesses' significant role in job generation. In contrast to prevailing assumptions, ongoing research is actively investigating the extent to which firm size is genuinely associated with elevated net job growth rates. While specific studies have indicated a negative correlation between firm size and net job growth rates, other scholarly inquiries have not definitively established this negative relationship.

Birch (1979, 1981) conducted research in the United States and demonstrated that a substantial proportion of new job opportunities generated between 1968 and 1976, amounting to 66%, originated from firms with fewer than 20 employees. Additionally, a remarkable 81.5% of these new jobs were created by firms with less than 100 employees. To further emphasize the pivotal role of small firms, Birch (1987) articulated that during the period spanning from 1981 to 1985, an impressive 82% of the total employment growth was attributed to firms employing fewer than 20 individuals. Conversely, larger firms typically exhibit more consistent employment patterns, resulting in less volatile net job growth (as noted in Davis and Haltiwanger, 1992).

While examining the relationship between firm size and net job creation, several papers emphasize the importance of measurement methods to deal with the problem of "regression to the mean". Friedman (1992) and Davis et al. (1996) proposed that firm size should be assessed not by utilizing the preceding period's firm dimensions, as Birch advocated, but by considering the average firm size throughout the two periods. In their study, utilizing Swedish data, Davidson and colleagues (1998) concluded that small businesses exhibit a higher net job growth rate. This finding remains valid even when considering the influence of regression to the mean. Likewise, Broersma and Gautier (1997), Picot and Dupuy (1998), and Voulgaris et al. (2005) all reported that small businesses displayed a superior net job growth rate compared to large firms, with only Hohti (2000) reporting contrasting results.

Recent studies in developed countries such as the United States and South Korea suggest that firm age, rather than firm size, is a more significant factor in job creation. Young firms, especially startups, play a crucial role (Haltiwanger et al. 2013; Pyo et al., 2016).

Haltiwanger et al. (2013) observed that, although small businesses play a substantial role in overall job creation, they also display a heightened propensity for job displacement. Moreover, in their research, underlining the significance of the age of a firm rather than its size,

they underscore the outsized impact of new businesses, especially startups, on net job growth. Nevertheless, it is imperative to recognize their vulnerability to failure. This assertion is corroborated by data from the U.S. Bureau of Labor Statistics in 2019, demonstrating that emerging enterprises, those within their inaugural year of operation, played a substantial role in net job creation, even though their survival rates remained relatively modest. This underscores job creation's dynamic and fluctuating character linked to fledgling businesses. Similar to the observations made by Neumark et al. (2011), the researchers noted a negative relationship between the firm size in the prior period and the growth rate in the current period, mainly when firm age was not considered a controlling variable. Nevertheless, they did not observe this negative correlation when they included firm age and the interaction term between firm age and size as control variables in their analysis.

Pyo, Hong, and Kim (2016) conducted an analysis employing data from the Census on Establishments spanning 2003 to 2012. Initially, without controlling for firm age, an adverse correlation between firm size and net job growth rate was evident regardless of which method they used to measure firm size. However, the previously observed negative correlation between firm size and net job growth rate dissipated with the introduction of firm age as a controlling variable. In some instances, a positive correlation emerged.

However, Aya et al. (2014) thoroughly examine statistical data about the role of Small and Medium-sized Enterprises (SMEs) in total employment and their impact on job creation and growth within the formal sector across 104 developing economies. The findings indicate that small firms consistently exhibit the most substantial contributions to job creation and the highest sales and employment growth rates. Notably, these trends persist even when accounting for variations in firm age.

This paper, however, emphasizes the crucial role of firm age, as initially highlighted by Haltiwanger et al. (2013), while affirming the significant contribution of large enterprises to

job creation in developing countries. Additionally, this study extends the understanding of employment trends among women by using evidence from a country with a consistently high and persistent female labor force participation rate.

3.3. Labor Market and Female Labor Force Participation in Vietnam

Vietnam is a developing country, ranking Southeast Asia's third most populous nation and 15th globally. Table 3.1 shows that from 2006 to 2018, Vietnam consistently maintained a high economic growth rate, with an annual GDP growth rate of 6.4%. Vietnam's labor force participation rate exceeded 85% for men and 75% for women, significantly higher than the global average of around 53%. Vietnam's unemployment rate has remained consistently low, staying below 2%.

Table 3.1. Economic Indicators in Vietnam

	2006	2007	2008	2009	2010	2011	2014	2015	2016	2017	2018
Growth (%)											
GDP	6.98	7.13	5.66	5.4	6.42	6.41	6.42	6.99	6.69	6.94	7.47
GDP per capita	5.95	6.11	4.63	4.32	5.29	5.28	5.29	5.88	5.62	5.91	6.47
Labor force participation rate											
MLFP	80.75	81.73	82.78	83.81	84.45	84.61	85.24	85.64	85.09	85.08	85.46
FLFP	75.15	76.13	76.63	77.12	77.06	77.05	78.32	78.18	77.82	77.72	77.27
World average	54.47	54.4	54.14	53.95	54.61	53.44	53.15	53.22	53.28	53.31	53.29
Unemployment rate											
Male	2.01	2.11	2.01	1.89	1.15	1.09	1.40	1.98	1.99	2.04	1.28
Female	2.08	1.93	1.93	1.58	1.08	0.90	1.11	1.71	1.70	1.70	1.03
World average	2.05	2.03	2.03	1.74	1.11	0.999	1.256	1.849	1.848	1.874	1.161
Population											
Population growth	0.97	0.97	0.99	1.03	1.07	1.07	1.07	1.05	1.01	0.97	0.94
Population structure											
Male	49.14	49.17	49.21	49.23	49.25	49.27	49.32	49.33	49.35	49.36	49.37
Female	50.86	50.83	50.83	50.77	50.75	50.73	50.68	50.67	50.65	50.64	50.63

Source: World Bank Open Data

Vietnamese women participate in the labor force at a rate higher than the global and regional averages. In 2018, 77.27% of Vietnamese working-age women were active in the labor market, significantly higher than the global average of 53.29% and the Asia-Pacific region's average of 43.9%. Moreover, the female labor force participation (FLFP) rate is not only high in absolute terms but also notable when compared to the participation rate of men. The gender gap in labor force participation in Vietnam has averaged 6.94 percentage points from 2006-2018, while the regional average for the Asia-Pacific during the same period exceeds 30 percentage points (ILO, 2021).

Table 3.2. The Labor Market in Vietnam

Year	2007	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Employment to population ratio (15+) (%)											
Total	75.50	75.40	75.30	75.50	75.40	77.50	77.50	77.40	76.80	75.20	75.30
Male	80.30	80.40	80.10	80.30	80.00	82.07	82.12	82.43	81.66	80.10	80.70
Female	70.50	70.60	70.80	70.90	71.10	73.23	73.19	72.69	72.13	70.50	70.10
Employment share of industry (15+) (%)											
Total	18.90	20.00	21.00	21.30	21.20	21.20	21.50	22.80	24.70	25.80	26.70
Employment share of the agricultural sector (15+) (%)											
Total	52.20	51.50	49.50	48.40	47.40	46.80	46.30	44.00	41.90	40.20	37.70
Employment share of the service industry (15+) (%)											
Total	28.10	28.40	29.50	30.30	31.40	32.00	32.20	32.20	33.40	34.00	35.60
Wage employment (%)											
Total	30.50	33.40	33.80	34.60	34.70	34.80	35.60	39.30	41.20	42.80	43.90
% Female	40.40	40.10	40.20	40.00	40.60	41.10	41.90	42.20	42.10	42.40	42.80
Self-employment (%)											
Total	53.00	44.60	43.30	43,9	45.10	45.50	40.80	40.60	39.90	39.50	39.00
% Female	53.90	51.10	48.60	48,8	49.50	49.60	49.70	48.50	49.00	48.50	47.80
Household employment (%)											
Total	12.80	16.90	19.40	18,6	17.50	17.20	21.40	17.20	16.10	15.60	14.90
% Female	53.50	64.10	65.40	64,7	64.20	64.00	60.40	65.70	66.60	66.30	65.40
Average monthly income of wage employees (Thousand VND)											
Total	1,399	2,395	2,519	3,105	3,757	4,120	4,473	4,716	5,066	5,451	5,867
Male	1,464	2,562	2,668	3,277	3,923	4,287	4,654	4,925	5,304	5,715	6,183
Female	1,280	2,175	2,297	2,848	3,515	3 884	4,235	4,430	4,739	5,094	5,446

Sources: Labor and Employment Survey Report 2007-2018

The high labor force participation rates for both men and women in Vietnam might lead some to assume that gender equality is well-balanced. However, a closer examination of employment structure and occupational roles reveals significant differences between men and women. In the wage-earning workforce, men make up the majority, whereas over 60% of family labor unpaid and socially disadvantaged workers are women, as demonstrated in Table 3.2. Furthermore, according to the ILO (2021), even within the wage-earning sector, women earn less than men, about 10%, despite working similar hours and the narrowing of the educational attainment gap between genders. Women also hold fewer decision-making positions compared to men. there was also a gap between urban and rural workers, with urban workers earning more, and a gap between sectors. These disparities reflect broader trends in labor market inequality, including gender wage gaps and industrial and regional economic imbalances.

3.4. Data and Measurement Issue

3.4.1. Data Source

In this research, we utilize data from the Vietnamese Enterprise Survey spanning 2006 to 2018. This annual survey is carried out under the auspices of the General Statistics Office of Vietnam. It encompasses a comprehensive spectrum of enterprises, including state-owned, foreign, and private entities. The latter are included if they exceed a certain threshold of employees. For those firms falling below this employment threshold, a representative 30% sample is drawn to ensure a well-rounded dataset. It is important to note that this dataset represents the most extensive and detailed firm-level information available in the context of Vietnam. Over the study period, the survey's coverage has expanded significantly, encompassing 131,000 enterprises in 2006 and culminating in 622,000 firms in 2018.

Each enterprise in the dataset is assigned a unique identification number associated with essential attributes such as location, industry classification, employment figures, financial situation, and operational outcomes for the year under examination. However, it is worth noting that, in certain instances, information about the year of establishment is not consistently reported across all survey years. To address this challenge, we employ a method of merging firms with data available in the year prior and the year after the survey year, thereby ensuring the completeness of establishment-year information. For those firms that do not report information from the establishment year, we decided to drop them from the sample. Two percent of observations were removed from the sample.

Companies participating in the study categorized their operational sectors according to the Vietnam Standard Industry Classification (VSIC). We segmented data collected from 2006 to 2016 based on the VSIC 5-digit level from 2007. Conversely, data collected in 2017 and 2018 were categorized using the VSIC 5-digit level from 2018. As a result, we standardized the entire dataset to align with the VSIC 5-digit level from 2018 for consistency.

Furthermore, during the data preparation phase, we focus on several large sectors, including manufacturing, wholesale, and retail services, and excluding several sectors that primarily fall under the categories of public services or self-contained private services, such as activities of households as employers, undifferentiated goods- and services-producing activities of household for own use; communist party, socio-political organizations activities; public administration and defense; compulsory social security. There are 15.2 percent of observations dropped. In addition, even though VES was designed and collected by Vietnam General Statistics Office, there is missing and abnormal data reported. Therefore, during the data preparation, we removed all observations with abnormal values, such as a negative number of employees, and negative fixed assets. Finally, we have 2,797,473 observations remaining in

the dataset from 2006 to 2018, with the number of observations increasing from 75,252 in 2006 to 393,036 in 2018.

Table 3. 3. Descriptive Table

	2006 (N=2.7)	2008 (N=3.6)	2010 (N=5.7)	2012 (N=6.9)	2014 (N=8.6)	2016 (N=12.3)	2018 (N=14.0)
Firm age							
0	15.6	18.9	23.6	16.6	20.8	36.2	16
1-2	28.3	23.5	26.8	30.6	23.6	22.8	40.8
3-5	27.1	26.3	20.4	23.2	25.8	16.9	19.2
6-9	15.6	18.2	17	15.7	14.4	12.4	12
10-13	7.7	6.4	6.5	8.2	8.8	5.9	5.5
14-17	2,5	3.7	3.2	2.8	3.4	3.3	3.6
18-21	0.7	0.9	1.1	1.6	1.7	1.2	1.5
>21	2.5	2.1	1.4	1.3	1.4	1.3	1.4
Firm average size							
1-4	13.2	22.8	30.5	40.4	46.8	52.9	53.7
5-9	36.1	31.2	33.8	28.2	25.1	22.6	25.3
10-19	18.5	20.6	16.9	15.1	14	12.1	11
20-49	14.6	13.3	10.3	9.4	8.2	7.2	6.0
50-99	5.9	5.1	3.7	3.1	2.7	2.4	1.8
100-249	4.9	4	2.8	2.2	1.8	1.6	1.3
250-499	2.0	1.5	1.0	0.8	0.7	0.6	0.5
>=500	4.7	1.5	0.9	0.8	0.7	0.6	0.5
Industry							
Agriculture, forestry and fishing	2.5	2.0	1.4	1.3	1.5	1.8	2.3
Mining and quarrying	1.4	1.4	1.0	0.8	0.7	0.6	0.7
Manufacturing	26	24.5	19.9	19.2	18.4	16.8	17.8
Wholesale and retail trade	47	47.1	48.9	47.5	47.5	46.7	45.7
Transportation and storage	6.3	5.8	6.4	6.7	6.6	7.2	6.9
Accomodation and food service	4.7	4.4	4.1	3.8	3.8	3.9	3.8
IT; Financial and insurance	1.3	1.6	1.8	2.1	2.5	2.5	2.4
Education, health, entertainment	1.1	1.3	1.5	1.7	2.2	2.6	2.7
Others	9.7	12.1	15	16.9	16.9	17.9	17.7
Ownership							
Public majority	3.2	2.2	1.2	0.9	0.6	0.4	0.3
Public minority	49.5	51.9	59	62.9	65.1	68.2	70.7
Private	43	42.2	37.2	33.9	31.9	29	27.1
100% FIs	3.4	3.0	2.1	1.9	2.0	2.0	1.6
Joint venture with foreign investor	0.9	0.7	0.5	0.4	0.4	0.4	0.3

Total sample: N = 2,797,473

3.4.2. Measurement of Key Variables

- **Firm Size**

In this study, we employ the average firm size as our metric for assessing firm size. This approach, introduced by Davis, Haltiwanger, and Schuh (1996), mitigates the potential biases associated with both the base year size classification, which tends to yield a negative bias, and the end year size classification, which tends to yield a positive bias. By taking the average of firm sizes in years t and t-1, we aim to eliminate these biases.

There is a fact that every method has its limitations. The limitation of the average firm size method arises when dealing with firms that undergo rapid labor growth, causing them to transition across multiple size categories between year *t-1* and year *t.* The average size method places such firms in a size category that falls between their initial and final size categories. An alternative approach known as dynamic size classification methodology (as discussed by Butani et al., 2006) can be employed to address this limitation. It's worth noting that Haltiwanger, Jarmin, and Miranda (2013) have observed that average firm size and dynamic classification methodologies yield very similar patterns. Therefore, in this paper, we are confident that we can use average firm size as our primary measurement method. To ensure the robustness of our findings, we also conduct sensitivity analyses using the base year size classification, and the results from this additional analysis align closely with our primary findings.

All firms are classified into eight size groups based on the average number of employees: 1-4, 5-9, 10-19, 20-49, 50-99, 100-249, 250-499, and 500 and above. For the firm that appears the first time in the dataset, we use the number of laborers in that year to classify the firm. The group of firms with 500 and above employees is the comparison group when we

examine the relationship between net job growth and its composition and firm size.

- **Firm Age**

Firm age is identified by the difference in the year of the survey and the year reported by the firm from the question "year of starting production and business". Firm birth is assigned for firms with age equal to zero, and firm exit is identified for the one that exists in year t but not in year t+1. Notably, in 2006, 2011, 2014, and 2015, the year of starting production and business is not reported. We overcome this challenge by using information from other years for the same firm *id*. All firms with no age information are removed from the sample.

We categorize firms into seven age groups: 1-2, 3-5, 6-9, 10-13, 14-17, 18-21, and 21 and above. The firms aged 21 and above are used as the base group to analyze net job growth and firm age.

- **Job Growth Rate and Female Job Growth Rate**

To measure firm-level job growth and female firm-level growth rate, we follow the standard measurement methodology in the analysis of firm dynamic, which was employed by a large number of papers; typical examples are researched by Haltiwanger et al., 2013; Pyo et al., 2016. Firm-level employment growth is measured by:

$$g_{it} = \frac{(E_{it} - E_{it-1})}{\frac{1}{2} * (E_{it} + E_{it-1})}$$

Where E_{it}, E_{it-1} are the number of employees of firm i in year t and t-1, respectively. By applying this formula, we can easily calculate the employment growth rate of new firms, exiting firms, and continuing firms.

Firm-level job creation and destruction rate are identified based on the employment growth rate of the firm. A firm is said to have job creation rate equal to g_{it} if g_{it} in the year is greater than zero and no job creation if g_{it} is equal to or less than zero. The reverse is applied to job destruction rate. The firm has no job destruction if g_{it} is equal to or higher than zero, and job destruction rate equals to ($-g_{it}$) if g_{it} is negative.

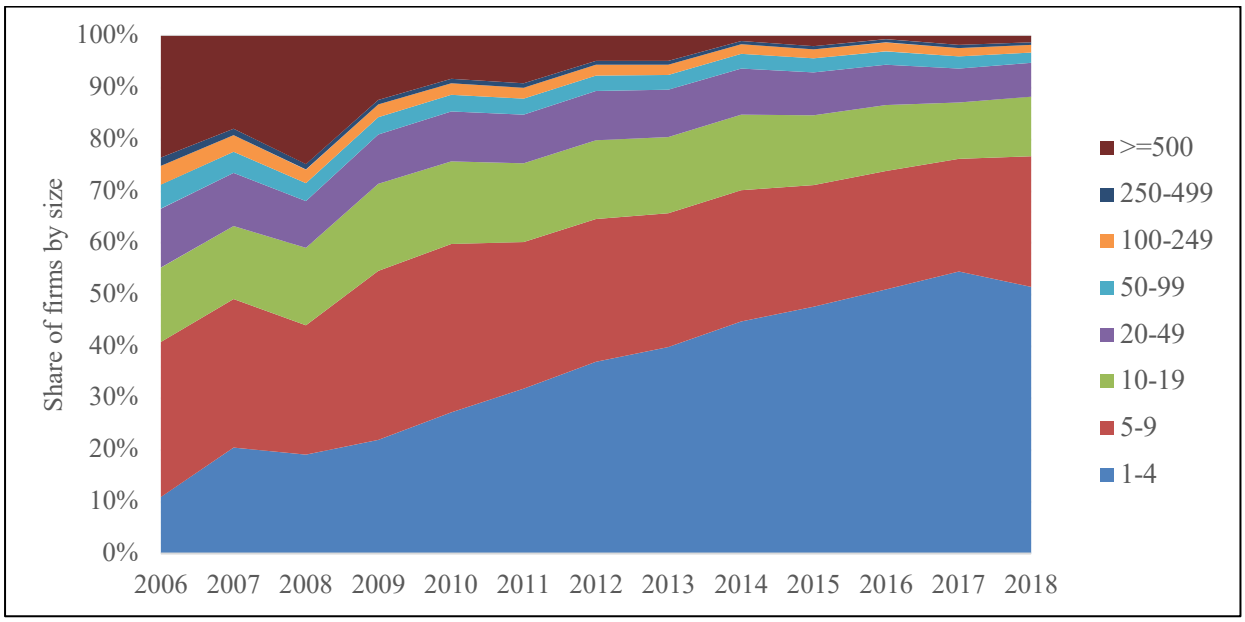
Using information on the number of female laborers in the firm, we calculate female job growth, female job creation, and female job destruction to investigate the difference in job growth by gender in Vietnam.

3.4.3. Descriptive Statistics

As demonstrated in Figure 3.1, the distribution has become increasingly right-skewed due to the rising proportion of micro-firms with less than five employees, likely resulting from the more accelerated growth of self-employment or household employment coverage relative to wage employment. The chart clearly illustrates the scarcity of large enterprises as Ciani et al. (2020) mentioned, with the proportion of firms employing over 500 workers steadily decreasing over time, the rate is even lower for larger ones.

This reflects a decline in the diversification of business types, with the dominance of micro and small enterprises. While this may benefit the economy in the short term, it could be harmful in the long run, as micro and small businesses operate on a limited scale, with low technology, and rarely produce high-quality, technology-driven products. Furthermore, they tend to have less impact on other businesses and contribute less to overall economic development. In addition, micro and small firms are more likely to exit due to inefficient operations. Their limited resources and scale make it harder for them to withstand economic fluctuations or invest in innovation, which further weakens their long-term sustainability.

Figure 3.1. Evolution of Firm Size by Distribution, 2006-2018



Looking at the job creation and destruction rate from 2006 to 2018 in Figure 3.2, it is evident that across all years, the job creation rate is higher than the job destruction rate, increasing the number of jobs created. In addition, we observe a similar trend for females, with higher rates for both employment creation and destruction rate. Moreover, the gap between job creation and destruction rates for women appears to be larger than the total job, indicating more significant fluctuations in employment for females. These patterns highlight the dynamic nature of female participation in the labor market, which may be influenced by factors such as maternity leave, caregiving responsibilities, and sectoral employment trends. Understanding these shifts is crucial for addressing women's specific challenges in the workforce.

Figure 3.3 shows the number of jobs created by firm size. Overall, firms of all sizes contribute to job creation; however, micro-enterprises generate relatively modest jobs, especially before 2014. As mentioned in section 3.3.1, it is essential to note that for micro-enterprises, the survey only randomly sampled 30% of the firms, so the results do not fully reflect the total number of jobs created by these enterprises. Nevertheless, the general trend indicates that the larger the firm, the more jobs it creates, although there are significant

fluctuations across the years.

Figure 3. 2. Job Creation and Job Destruction Rate, 2006-2018

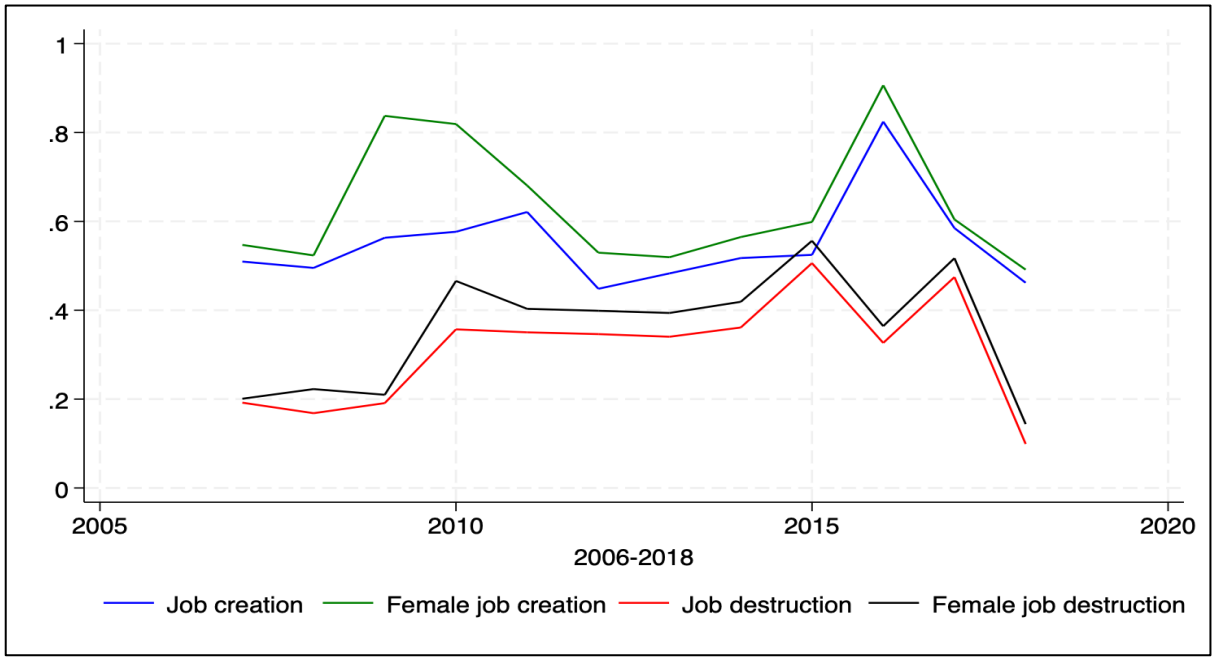
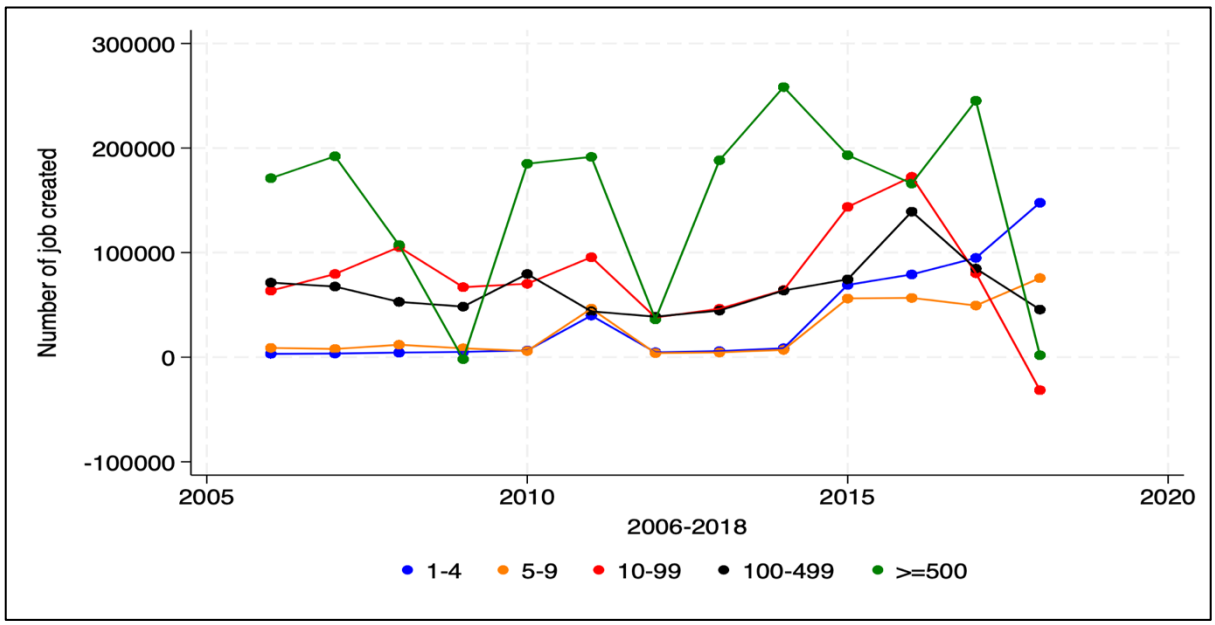


Table 3.4 presents the trend in gender-based employment. Micro and small enterprises tend to employ more male workers than female workers, while larger firms hire more female workers. Manufacturing, education, accommodation, and food services are female labor-intensive sectors with significant employment levels. However, regarding a shift in the business structure, with an increasing number of micro and small enterprises employing fewer than 50 workers, this shift could potentially pose challenges for women in the future in terms of finding employment opportunities

Tables 3.5 and 3.6 present a comprehensive overview of net job creation and net female job creation in 2018 across various industries, categorized by firm size and age. Notably, distinct trends emerge when examining firms based on their age. For firms under 5, a discernible pattern emerges in net job creation, where positive values indicate a higher job creation rate, particularly pronounced in younger firms. However, for businesses aged 5 and

above, a shift occurs, manifesting in negative net job creation. This trend is mirrored in net female job creation, highlighting an analogous pattern across both metrics.

Figure 3. 3. Number of Jobs Created by Firm Size



Upon further analysis of net female job creation about female job creation, a noteworthy observation emerges: the proportion of new female jobs exhibits a notable surge for firms aged 0 to 5. Specifically, the ratio exceeds 50% for firms within the 1 to 3 age bracket. Intriguingly, start-ups demonstrate a lower ratio at 31.7%, implying a preference for male labor at the inception phase. Nevertheless, a discernible shift occurred over the subsequent three years, with female employees becoming increasingly favored, marking a noteworthy evolution in hiring preferences within this temporal framework.

Examining the data through the lens of firm size reveals that entities characterized by fewer than ten employees exhibit the highest job creation rates. This trend is consistently mirrored in the realm of net female job creation. Noteworthy is the observation that the percentage of net female job creation relative to total net job creation is comparatively modest for nascent and diminutive enterprises but demonstrates an upward trajectory for more extensive and more established firms.

Table 3. 4. Female to Male Labor Ratio by Firm Size

Size	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1-4	0.87	0.88	0.77	0.99	0.76	0.91	0.74	0.69	0.65	0.74	0.86	0.77	0.73
5-9	0.74	0.81	0.74	0.87	0.77	0.89	0.74	0.72	0.71	0.82	0.91	0.87	0.79
10-19	0.83	0.80	0.71	0.72	0.75	0.87	0.74	0.72	0.71	0.81	0.91	0.92	0.88
20-49	0.92	0.97	0.90	0.89	0.87	1.05	0.90	0.86	0.87	0.91	1.08	1.14	1.12
50-99	1.16	1.28	1.23	1.27	1.26	1.35	1.29	1.17	1.26	1.21	1.36	1.37	1.34
100-249	1.77	1.82	1.63	1.61	1.61	1.93	1.64	1.63	1.75	1.60	1.76	1.61	1.65
250-499	2.51	2.38	2.47	2.61	2.25	2.15	2.17	2.39	2.55	2.24	2.48	2.09	2.19
>=500	2.14	1.29	0.89	1.65	1.06	1.23	1.20	1.15	2.94	1.97	3.52	1.99	1.84

Source: Author's calculation based on VES 2006-2018

However, a nuanced perspective emerges when evaluating the aggregate net job creation across firm age categories. In instances where labor is reduced within mature firms (those aged five and above), the decline in the female job sector surpasses the corresponding decline in overall job creation. This implies a heightened susceptibility of female employment to contractions in mature firms, underscoring a potential vulnerability in female job security.

Table 3. 5. Vietnam Net Employment, 2018

Firm age	Average firm size												Total
	1-4	5-9	10-19	20-49	50-99	100-249	250-499	500-999	1,000-2,499	2,500-4.999	5,000-9,999	>=10,000	
0	94,347	109,305	65,770	48,481	28,665	29,662	23,405	13,442	28,197	12,528	14,819	-	**468,618**
1	20,960	7,445	4,918	9,387	6,761	19,070	9,123	13,097	15,160	1,028	-402	-3,263	**103,281**
2	13,344	5,363	-1,699	-6,334	57	9,066	7,592	16,237	6,903	10,894	11,419	10,440	**83,280**
3	6,190	3,017	-912	-3,239	-726	2,624	-232	6,204	1,589	4,333	5,405	-	**24,252**
4	3,863	2,273	-1,307	-3,130	-11	1,012	1,896	1,938	1,349	654	5,078	1,360	**14,974**
5	1,878	1,723	-988	-3,133	-699	324	411	-1,961	-444	-1,195	994	-	**-3,091**
6-10	3,779	-412	-9,274	-14,016	-5,145	-2,669	1,512	6,780	697	2,250	4,921	-1,751	**-13,329**
11-15	-212	-841	-5,099	-9,675	-5,205	-4,214	1,016	4,153	3,416	3,173	8,127	-10,284	**-15,643**
16-20	-167	-204	-1,743	-2,865	-2,022	-2,281	-1,183	-933	-480	-1,615	13,830	-720	**-381**
21-25	-204	-77	-76	-758	-610	-1,553	-2,145	-2,079	-1,186	-453	3,017	-288	**-6,410**
>=26	-40	-6	-53	-254	-740	-2,214	-887	-5,287	-5,366	-1,784	301	1,693	**-14,635**
Total	**143,736**	**127,586**	**49,539**	**14,466**	**20,327**	**48,827**	**40,507**	**51,592**	**49,835**	**29,813**	**67,507**	**-2,813**	**640,918**
Firm age	**Base year size**												
0	94,347	109,305	65,770	48,481	28,665	29,662	23,405	13,442	28,197	12,528	14,819	-	**468,618**
1	68,673	14,194	2,612	-1,462	1,195	3,320	2,733	10,668	4,205	810	-402	-3,263	**103,281**
2	49,705	12,959	-866	-16,130	-6,485	6,651	5,943	5,853	5,254	6,926	9,813	3,658	**83,280**
3	21,056	3,883	-2,998	-5,412	-2,622	404	418	1,175	870	2,968	4,511	-	**24,252**
4	12,570	3,285	-1,681	-5,494	-2,622	137	-218	1,372	534	1,682	4,050	1,360	**14,974**
5	7,526	2,207	-2,132	-4,173	-1,599	-804	-876	-827	-1,438	-1,970	994	-	**-3,091**
6-10	18,097	3,046	-8,998	-18,328	-7,639	-1,588	-2,301	1,254	4,707	441	2,291	-4,312	**-13,329**
11-15	4,299	1,078	-3,563	-5,977	-6,289	-1,219	-2,449	-668	2,299	15,250	2,240	-20,643	**-15,643**
16-20	1,798	878	14,435	-3,925	-2,552	-2,790	-1,736	-1,118	-1,167	-2,090	-1,394	-720	**-381**
21-25	460	121	249	-845	-775	-1,068	-1,953	887	-3,558	-1,610	2,525	-844	**-6,410**
>=26	241	179	1,101	-300	307	-1,587	-1,044	-3,204	-6,906	-3,984	-1,132	1,693	**-14,635**
Total	**278,769**	**151,132**	**63,928**	**-13,562**	**-413**	**31,118**	**21,922**	**28,834**	**32,998**	**30,950**	**38,314**	**-23,071**	**640,918**

Table 3. 6. Vietnam Female Net Job Creation, 2018 (% of net job creation)

Firm age	Average firm size												Total
	1-4	5-9	10-19	20-49	50-99	100-249	250-499	500-999	1000-2499	2500-4999	5000-9999	>=10000	
0	30.5	22.2	33.1	37.6	42.5	44.2	38.6	38.3	31.6	36.1	18.9	0	31.7
1	40.2	35.7	38.9	41.2	42.7	47.2	56.1	71.1	82.2	8.7	6.5	11	53.6
2	38.4	35.1	-29.6	11.7	2054.4	62.4	39	65.4	76.7	34.4	41.5	103.2	62.1
3	43	40.5	-12.7	2.2	-75.8	32.5	211.4	47.8	124.8	79.7	88.1	0	74.2
4	36.5	47.3	11.2	31.3	-3122.7	68.8	31.4	23.6	28.8	66.9	39.6	58.9	47.3
5	34	50.1	15.5	20.5	4.4	198.1	39.5	105.2	249.2	23.9	35.4	0	52.5
6-10	51.7	-118.1	23.9	25.7	21.3	6.6	115.1	61	175.3	85.8	34.9	173.1	-23
11-15	-4.7	27.9	27.2	22.6	23.1	27.1	25.5	41.7	14	65.3	-96.2	67	104.3
16-20	81.7	35	37.9	32	34.7	46.1	127.6	-58.8	148	98.9	49.9	231.8	411.2
21-25	54.7	13.6	18.4	35.3	10	13.9	53.5	68.6	112.6	510	51	917.4	124.9
>=26	271.3	0	23.6	39.6	19.5	37.3	-25.9	45.2	38.5	-11.8	-74.4	106.8	24.8
Total	33.8	25.2	39.8	86.9	68.4	54.4	41.8	56.3	51.2	41.2	24.8	42.9	39.4
Firm age	**Base year size**												
0	30.5	22.2	33.1	37.6	42.5	44.2	38.6	38.3	31.6	36.1	18.9	0	31.7
1	39.6	43.2	91.4	-106.9	148.5	93.2	72.9	77.1	78.6	1.5	6.5	11	53.6
2	35.9	36.9	-175.1	20.8	14.9	52	55.2	96.3	90.5	21.1	81.8	145	62.1
3	34.5	34.6	11	8.6	-0.8	183.2	92	52.7	186.8	93.2	89.7	0	74.2
4	35.7	37.6	5.1	26.2	21	241.2	-23.4	-0.4	-34.6	43.3	42.4	58.9	47.3
5	34.3	41.5	17.2	21.4	5.6	-56	82.4	116.1	128.7	53	35.4	0	52.5
6-10	38.1	43.6	26.5	28.4	17	-60.5	-32.9	134.4	66.4	584.6	-14.8	116.5	-23
11-15	32.1	22.3	26.4	29.2	23.1	21.5	27.4	-74.3	106.1	-2	-14.7	73.5	104.3
16-20	35.2	30.5	54.7	28.2	33.2	40.2	96.8	13.5	30.4	94	105.1	231.8	411.2
21-25	22.3	30.2	29.5	23.7	11.7	14.6	26.2	13.9	84.1	100.1	17	379.6	124.9
>=26	24.5	51.7	31.9	43.5	51.1	26.9	35	22.9	32.7	39.4	54	106.8	24.8
Total	34.9	26.9	46.8	-38.6	-2140.7	64.9	52.7	69.7	50.1	18	38.1	75.9	39.4

3.5. Model Specifications

In this paper, our primary model specification centers around the concept of a fully saturated model, where the key explanatory variables of interest are firm age and firm size. Through this model specification, we aim to shed light on the intricate dynamics between firm characteristics and growth outcomes, contributing to the ongoing discourse in the field. The selection of this model framework is grounded in prior research, particularly notable works such as Angrist and Pischke (2009) and Haltiwanger, Jarmin, and Miranda (2013). These prominent studies have underscored the appropriateness of the fully saturated model for our analysis due to its unique characteristics and advantages.

$$g_{it} = \beta_0 + \beta_1 firm_size_{it} + \beta_1 firm_age_{it} + \beta_3 firm_size_{it} * firm\ age_{it} + \alpha_t + \gamma_p + \theta_j + \epsilon_{it} \quad (1)$$

The fully saturated model is characterized by its comprehensiveness, as it accounts for all possible combinations and interactions of the explanatory variables, in this case, firm age and firm size. This level of inclusiveness is essential because it allows us to estimate coefficients representing the cell means for each saturated cell within the dataset. By capturing the nuances of every combination of firm age and size, we gain a more comprehensive understanding of the relationships under investigation. Additionally, as a developing country, Vietnam hosts numerous large foreign direct investment (FDI) enterprises, such as Samsung, LG, and Intel. Concerns have been raised that it may be inappropriate to classify these firms in the same category as other young enterprises when they first enter the market, given their fundamental differences in nature and scale. Employing a fully saturated model that includes firm size, firm age, and a full set of interaction terms makes it possible to account for every combination of firm age and size effectively.

Another noteworthy benefit of the fully saturated model is that it provides a bounded range for net growth rate estimates. Specifically, the net growth rate, a crucial outcome variable in our analysis, is constrained within the range of (-2) to 2 when using this model. This bounded nature of the net growth rate estimates ensures that the results remain within a realistic and interpretable range, making them more suitable for practical applications and policy considerations.

Furthermore, our analytical framework incorporates controls to ensure a robust and comprehensive examination of the factors influencing our study. Specifically, we include controls for year-specific effects, 5-digit level industry effects, and province-specific effects. The rationale behind including these control variables is to meticulously account for any factors that exhibit variation across firms but remain constant within specific periods, industries, and provinces.

By controlling for year-specific effects, we effectively capture temporal variations that may impact the outcome of interest. This is essential as economic conditions, regulations, and external shocks fluctuate yearly, potentially affecting our data's observed patterns. By isolating these temporal effects, we aim to disentangle the underlying dynamics related to firm age, firm size, and net growth rate, which constitute the core focus of our study.

Incorporating 5-digit level industry effects adds another layer of control to our model. Industries can have distinct characteristics and operating conditions influencing firms' growth trajectories. Additionally, it is a fact that certain industries, such as textiles, footwear, and handicrafts, tend to employ more female workers than male workers, while other sectors, such as mining, employ more male workers than female workers. By including industry-specific effects, we aim to account for these variations and ensure that our analysis remains robust across diverse sectors. This allows us to discern whether the relationships we observe between

firm age, size, and net growth rate hold across different industries. This is also beneficial when examining the relationship concerning female labor.

Similarly, we introduce province-specific effects as control variables to address regional disparities affecting firms' growth patterns. Notably, Vietnam has 63 provinces and cities stretching from north to south, from high mountainous areas to coastal zones, each characterized by diverse weather conditions, topography, ethnic groups, and economic conditions that impact firms operating within their boundaries. By controlling for these province-specific factors, we aim to ascertain the broader applicability of our findings and whether the relationships we uncover are consistent across various geographic locations.

3.6. Empirical Results

In this section, we illustrate all findings through figures. It's important to note that the reference group across all specifications consists of firms comprising a minimum of 500 employees or firms aged 21 and above. We aim to juxtapose the results of other groups with this reference group and assess outcomes with and without controlling for firm age (or firm size).

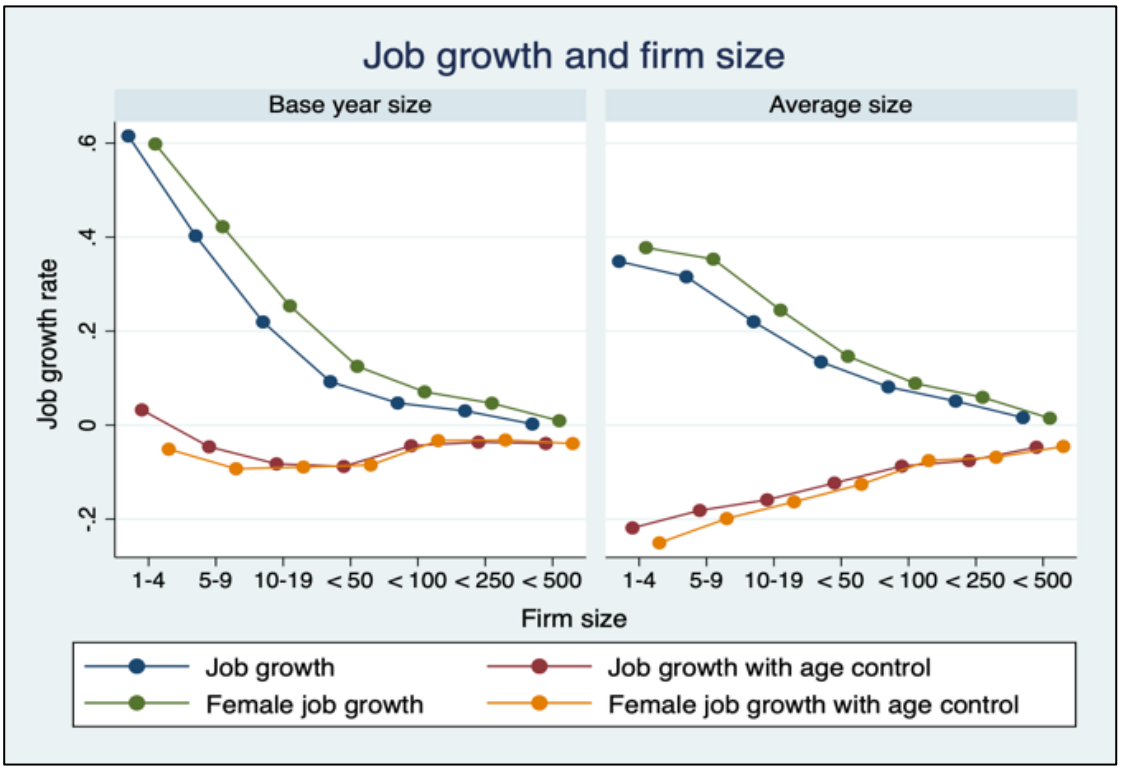
3.6.1 Net Employment Growth Rate and Firm Size

Figure 3.4 illustrates the empirical relationship between employment growth rate and firm size by employing two distinct metrics: base year firm size and average firm size. In Figure 3.4, where base year firm size is considered, the results of a one-way regression model reveal a discernible pattern. It is observed that an increase in firm size is associated with a decrease

in net job growth. Specifically, for firms falling within the size category of 1-4 employees, the net growth rate is notably higher, approximately 60%, when compared to firms characterized by a workforce of at least 500 employees. As firm size escalates, this gap in net job growth gradually diminishes. Notably, the findings concerning female job growth mirror the broader job growth analysis patterns. The growth rate of female jobs surpasses the job growth rate across the entire spectrum of firm sizes compared to the growth rate in firms with more than 500 employees, except for the smallest firms.

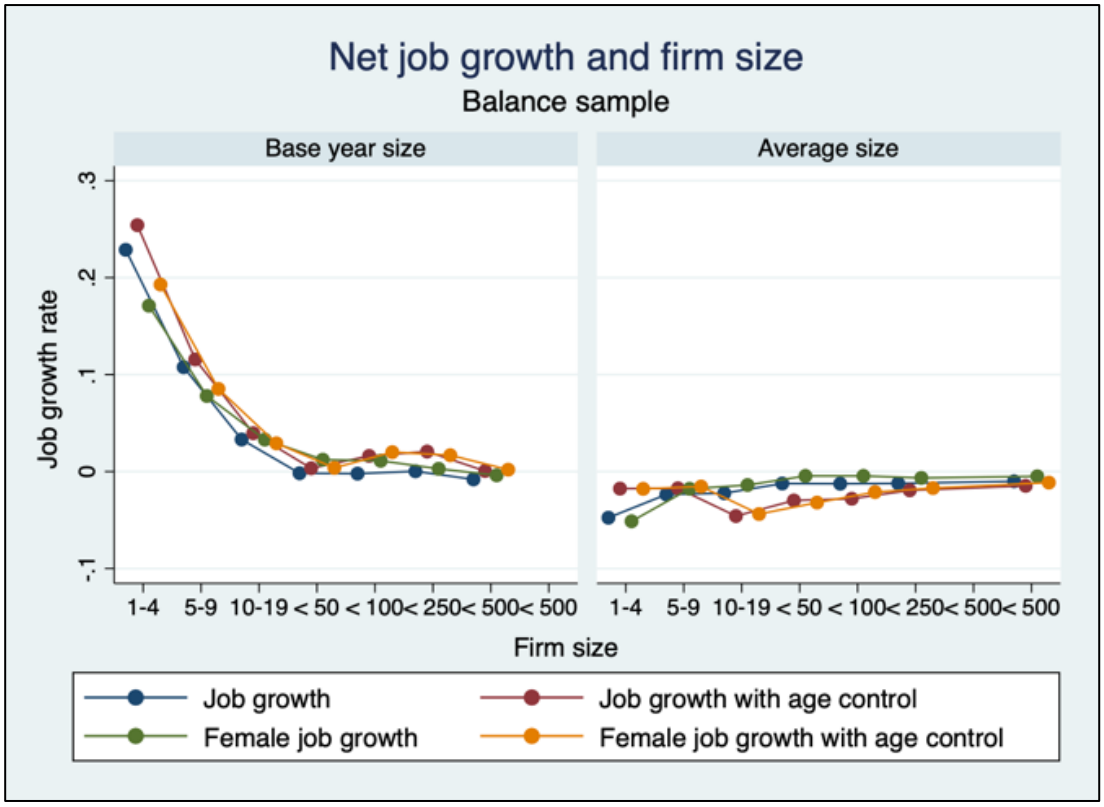
A parallel pattern emerges when average firm size is utilized as the metric. In this context, the disparity in job growth between firms having 1-4 employees and the reference group remains significant, albeit at a slightly reduced magnitude, standing at approximately 38%. Using average firm size, the difference in female job growth with the largest firms is always higher than that of job growth.

Figure 3.4. Job Growth Rate and Firm Size



Nevertheless, upon introducing a control variable for firm age through implementing a full dummy saturated model, the previously observed inverse relationship dissipates for both overall job and female job growth rates. For job growth, we find a pronounced and statistically significant positive association with firm size when average firm size is considered a metric. In contrast, a positive relationship exists for female job growth regardless of firm size methodology. This noteworthy shift in the relationship underscores the pivotal role that firm age plays in the context of job growth, aligning with and substantiating the findings of prior research studies (Haltiwanger, Jarmin, and Miranda, 2013; Ayyagari, Demirgüç-Kunt, and Maksimovic, 2011; and Adelino, Ma, and Robinson, 2017).

Figure 3.5. Net Job Growth Rate and Firm Size in A Balanced Sample

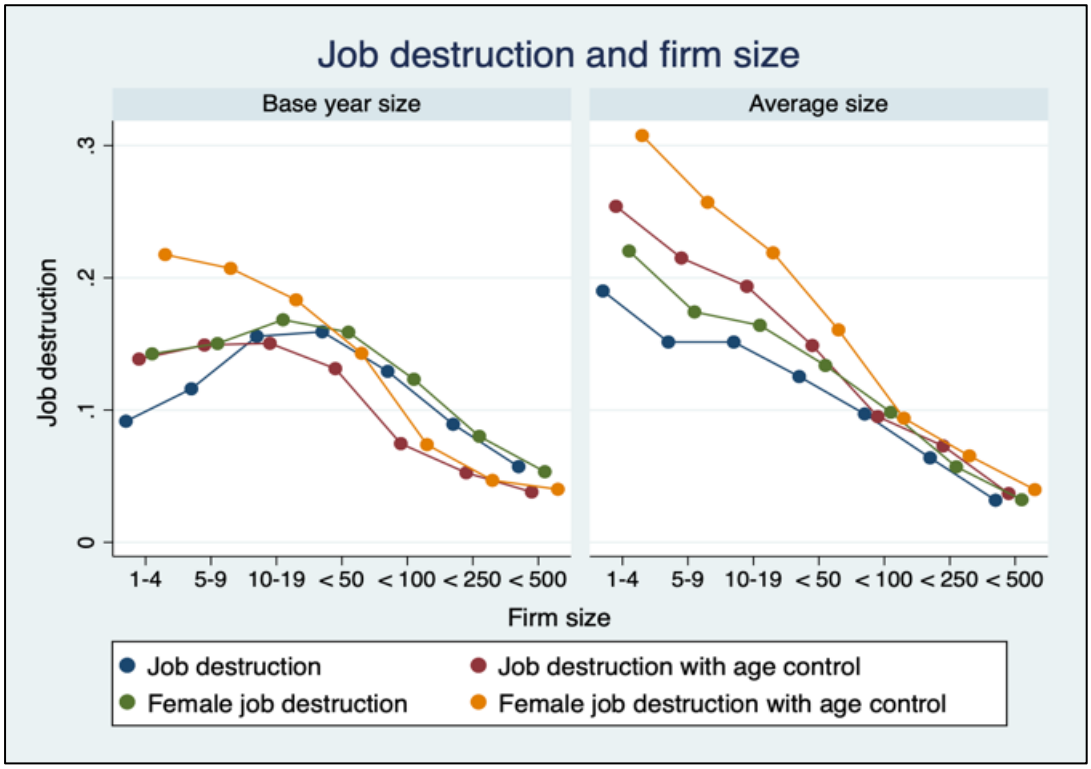


When we narrow our analysis to include only established firms that have been operational throughout the entire 13-year research period, the dramatic change in the relationship between net job growth and firm size with and without firm age control is not the

case (Figure 3.5). We still see a negative relationship between job growth and firm size for the base year method. In contrast, a positive relationship across firm size classes is observed for the average firm size method. The observed distinctions in the outcomes for small continuing firms between base year size and average size align with the well-documented phenomenon of robust regression-to-the-mean effects that characterize these particular firms.

The disparity patterns evident in Figures 3.4 and 3.5 can be attributed to the influence of exiting firms within the analysis. A pivotal observation that can be gleaned from Figure 3.6 is the propensity of smaller firms to exhibit elevated levels of job destruction, often resulting in their exit from the market. By amalgamating the findings derived from the three figures, it becomes evident that net employment growth rates exhibit a robust and positive trajectory as average firm size is considered, a phenomenon that holds while controlling for the factor of firm age.

Figure 3.6. Job Destruction Rate and Firm Size



Notably, Figures 3.4 and 3.5 reveal job growth rates that are either higher or on par

with those of net female job growth rates compared to the rates of the base group across varying firm sizes. However, a distinct pattern emerges upon closer examination of job destruction rates. Specifically, the rate of female job destruction markedly exceeds that of job destruction within smaller firms, and this disparity diminishes as firm size increases, regardless of the metric used to measure the size of the enterprise. This finding underscores the vulnerability of female employment relative to male jobs within the context of firm dynamics.

3.6.2. Net Job Growth Rate and Firm Age

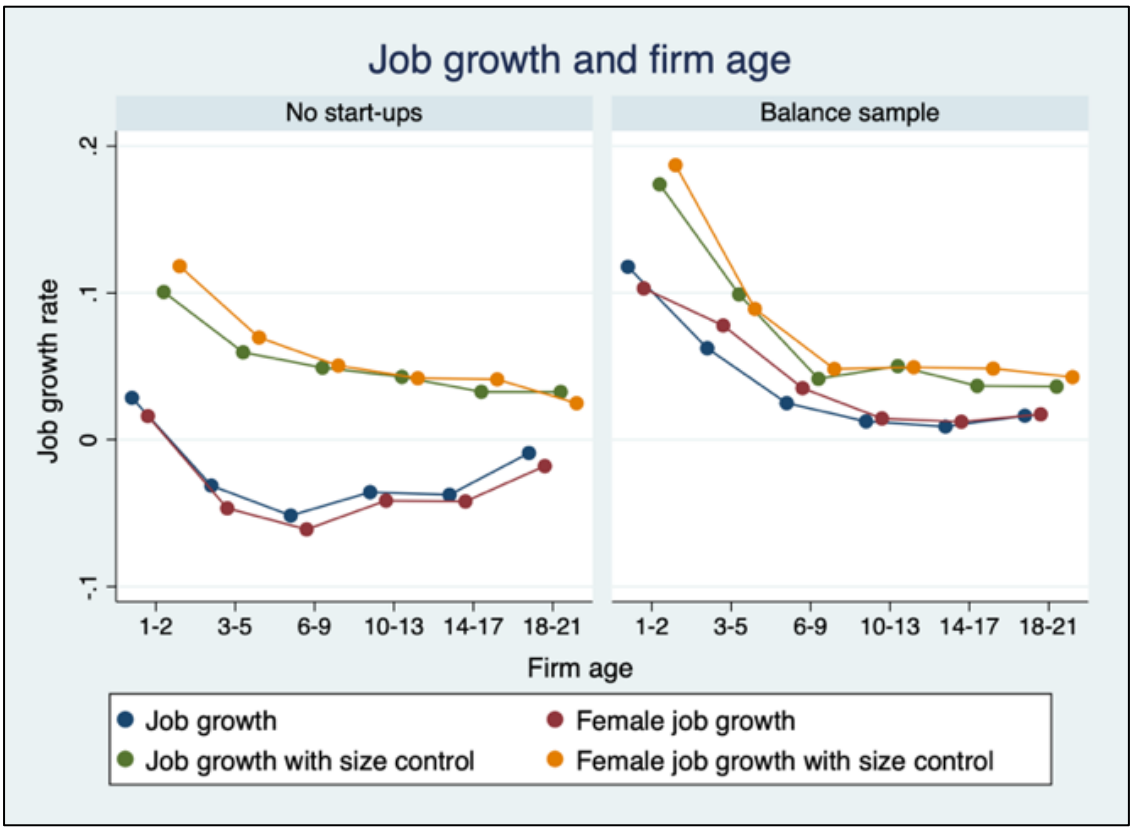
In this section, we delve into the nexus between employment growth rate and the age of firms while accounting for firm size as a covariate, and the full set of interaction term between firm size and firm age. We exclude start-ups from the analysis due to their high job growth rate.

Figure 3.7 elucidates that, without controlling for firm size, except for 1 to 2-year-old firms, there is a positive relationship between firm age and net job growth. However, when we control for firm size, younger enterprises consistently manifest higher job expansion levels than their more mature counterparts. This phenomenon becomes notably pronounced when we scrutinize the balanced sample regardless of controlling for firm size or not, where firms aged 1 to 2 years exhibit a remarkable 18% increase in job creation compared to firms with a tenure exceeding 21 years. This divergence in net employment growth rate is even more apparent when we assess gender-specific job growth for both samples.

In Section 3.4.3, we observe that smaller firms (typically young enterprises) tend to prefer hiring male workers over female workers. However, as these firms expand, they increasingly hire more female workers. Given the initially low number of female employees, hiring even one additional female worker can result in a significant net job growth. This

partially explains why the disparity in job creation rates for female workers between young and older firms is greater compared to the overall labor force.

Figure 3.7. Job Growth Rate and Firm Age

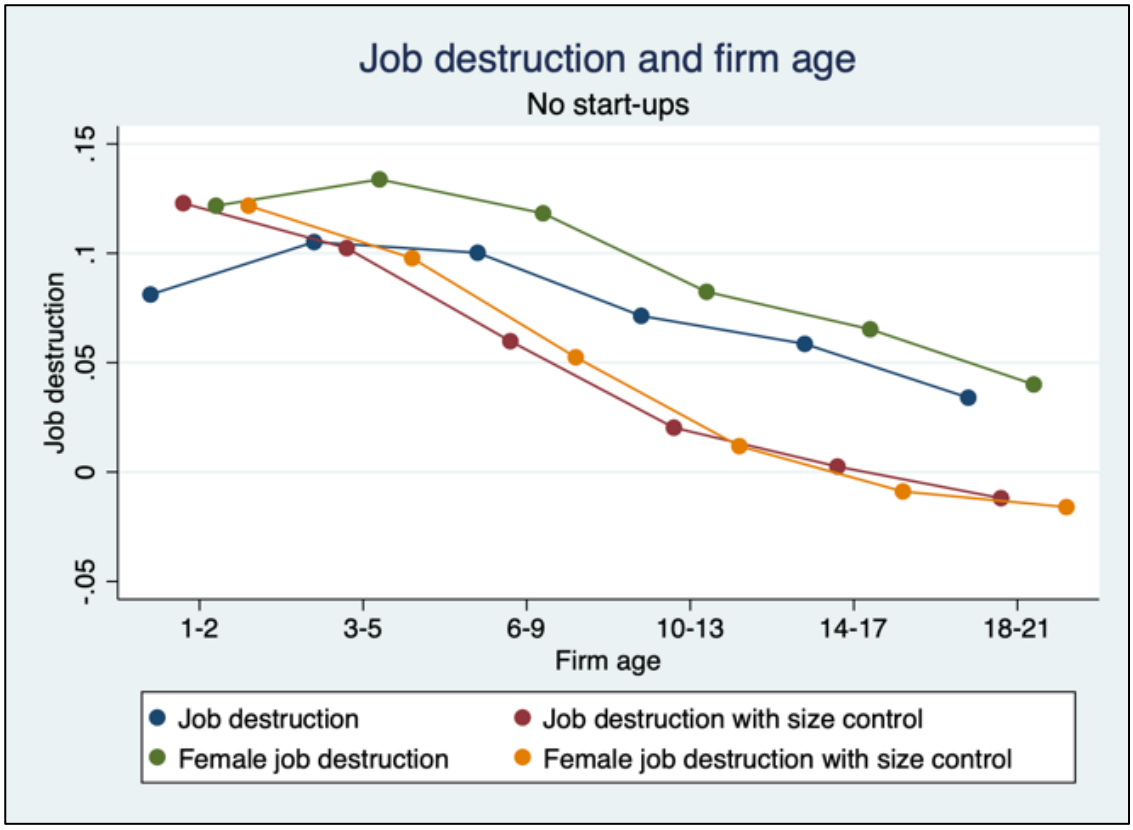


Nevertheless, it is crucial to acknowledge that a corresponding rise in job destruction rates accompanies this tendency towards increased job creation among emerging companies (see Figure 3.8). In this regard, it is pertinent to observe that, unlike the distinct patterns observed about firm size, there is a relatively diminished contrast in job destruction rates and female-specific job destruction rates when juxtaposing young firms against their more mature counterparts across all age categories of firms.

Similar to job creation rates for female workers, gender-based hiring patterns also help explain the larger disparity in job destruction rates for female workers between young and older firms compared to overall job destruction rates. When a firm lays off a female worker,

the relatively small number of female employees in the firm means that even a single layoff can result in a disproportionately higher job destruction rate.

Figure 3.8. Job Destruction Rate and Firm Age

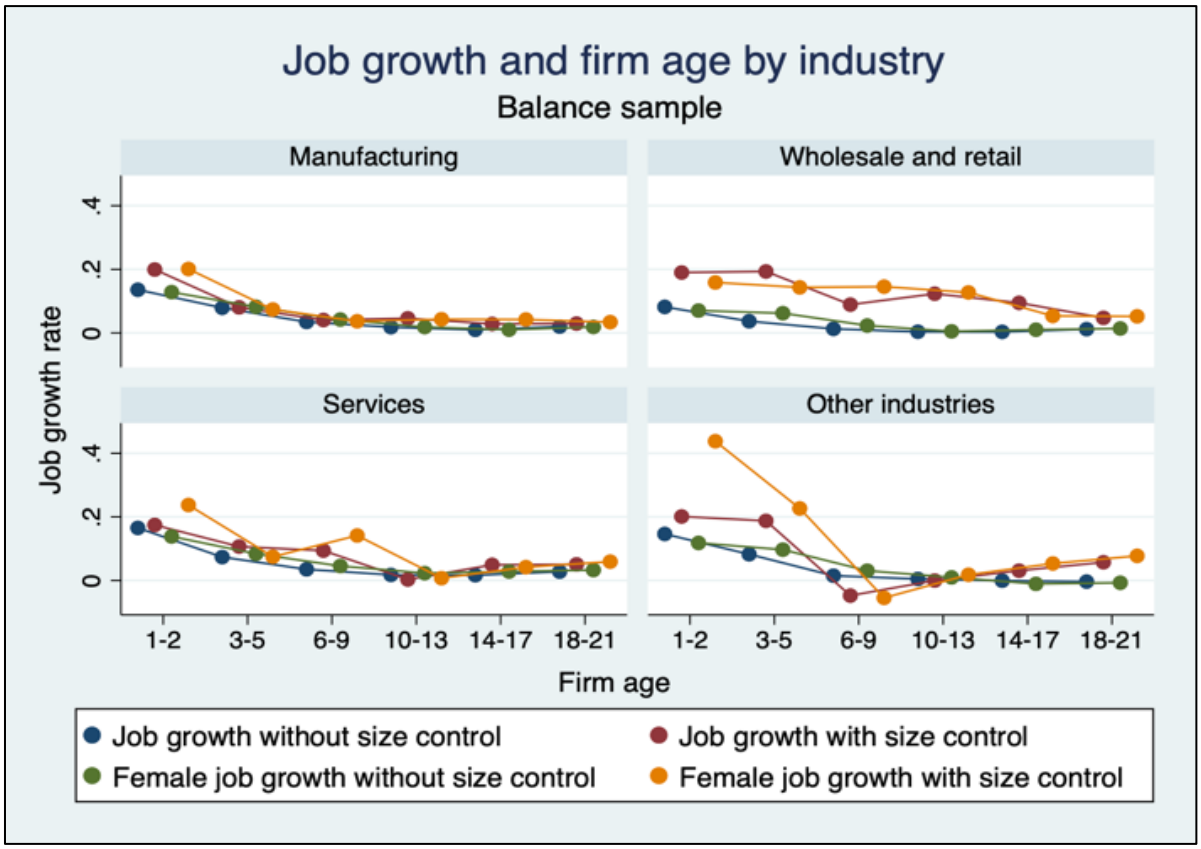


3.6.3. Net Employment Growth Rate for Selected Industries

From this point, we focus on examining the relationship between job creation and firm age, controlling for firm size using both the whole and balanced samples. Figure 3.9 illustrates the complex relationship between firm age and job creation rate, shedding light on the dynamics within different sectors of the economy for balanced sample. The discernible pattern from this analysis demonstrates that younger firms exhibit higher job growth rates than their more established counterparts. This phenomenon is particularly evident in firms aged 1-2 years in the manufacturing and wholesale and retail sectors, as well as in firms aged 1-2 and 6-9

years in the services sector, where net job growth rate consistently surpasses that of firms with over 21 years of existence.

Figure 3.9. Job Growth and Firm Age for Selected Industries



A conspicuous trend of diminishing job growth in manufacturing becomes apparent as firm age increases. Conversely, the wholesale and retail sector displays a unique characteristic wherein younger firms consistently maintain relatively stable levels of net job growth rate throughout their early years of operation. Meanwhile, marked by volatility, the services sector witnessed a fluctuating net job growth pattern. It experiences a surge in net job growth during specific periods, followed by a sharp decline in subsequent periods, only to recover again. Nevertheless, the overarching trend across these fluctuations remains a gradual decrease in net job growth as firms age.

This pattern remains remarkably consistent between the balanced sample (Figure 3.9)

and the whole sample (Figure C3). This underscores the robustness and reliability of the observed relationship between firm age and job growth in Vietnam, highlighting its significance in economic analysis.

Transitioning to the female job growth rate, we find that it mirrors the patterns observed in the total job. However, there is a notable distinction in that the disparity between younger firms and the base group in female job growth rate is more pronounced than in job growth, particularly in the manufacturing and services sectors. This divergence suggests an intriguing interpretation: younger firms in manufacturing and services, despite being of similar size to their more mature counterparts, exhibit a stronger inclination to hire female labor over male labor, possibly indicating evolving workforce preferences or gender-related dynamics within these sectors. This nuanced observation adds complexity to the interplay between firm age and employment dynamics, warranting further exploration and investigation in future research endeavors.

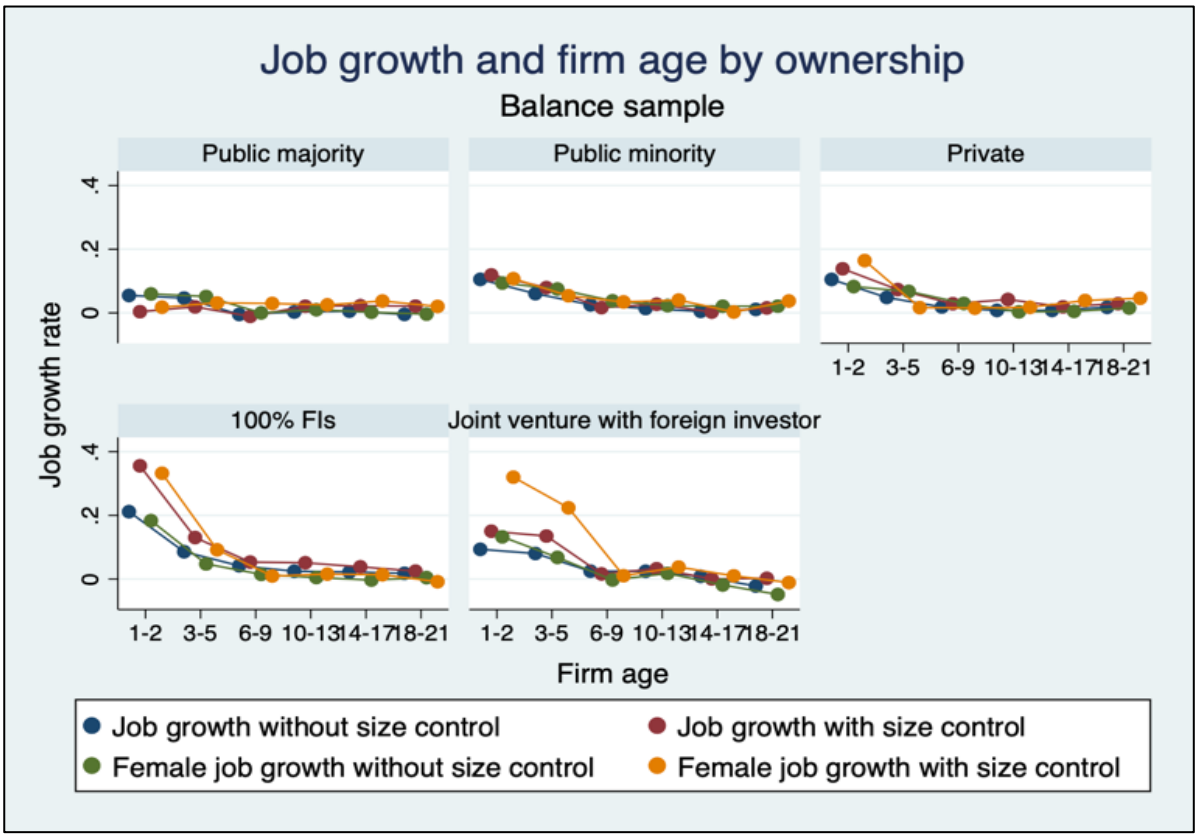
3.6.4. Net Employment Growth Rate by Ownership

By ownership, Figure 3.10 illustrates that young foreign enterprises exhibit a significantly higher net job growth rate than their more established counterparts. This phenomenon is particularly pronounced in the initial stages of their operation. A plausible explanation for this heightened net job growth rate during the early years of foreign investment in Vietnam is rooted in the primary motivation for many foreign firms to establish a presence in the region. Namely, these firms are often drawn to Vietnam due to the availability of a cost-effective and abundant labor force. As such, they are compelled to recruit and expand their workforce, resulting in a surge in net job growth during the early phases of their operations.

This trend is heightened net job growth during the early years is further compounded

when we consider the dynamics of female employment within these foreign enterprises. It becomes evident that the discrepancy in net job growth rates between younger and older firms is even more pronounced when viewed through the lens of gender-specific employment. This observation aligns with the prevailing practice among foreign firms operating in Vietnam, which frequently hire a more significant proportion of female employees, particularly in the initial stages of their presence in the country.

Figure 3.10. Job Growth Rate and Firm Age by Ownership



For young enterprises with 100% foreign capital, net job growth and net female job growth rates in the first two years are 28% and 30% higher than firms aged over 21 years (Figure C2). These discrepancies are even higher for a balanced sample, at 38% and 35% (Figure 3.10). For joint ventures with foreign investors, the negative relationship between net job growth and firm age is more pronounced for females, with the difference between 1-2-year-old firms and mature firms being 22% for all samples and 35% for the balanced sample. In

contrast, the net growth rate is 8% and 18%. This observation demonstrates the discernible pattern of substantial scale expansion during the initial five years of foreign direct investment (FDI) enterprises' inception in Vietnam, followed by sustained stability from the sixth year onward.

The increasing attraction of FDI creates numerous job opportunities for women in Vietnam; however, most of these positions are in manufacturing roles that do not require formal qualifications or advanced technical skills. While FDI can be a positive driver to encourage greater female participation in the labor market, particularly in wage employment, the quality of these jobs is a critical concern that needs more attention.

In the context of public firms, while a positive relationship between young firms and the base group persists, it is notable that this relationship manifests more stably than foreign firms. Within the subset of balanced samples, net job growth across all firm age groups remains relatively consistent in public majority enterprises. This stability suggests that irrespective of firm age, firms with over 50% of state capital maintain a steady trajectory of job creation rate over time. These results supplement our finding when we observe the number of jobs created by ownership that firms with 100% state capital do not create new jobs. Instead, they reduce the number of jobs provided. However, when we shift our focus to public minority firms, a distinct pattern emerges. There is an inverse relationship between firm age and net job growth, with 1-2 year-old firms generating a noteworthy 10% higher job creation rate than their counterparts over 21 years. This pattern within public minority firms underscores the divergent dynamics within the public sector, further highlighting the intricate relationship between firm age and employment outcomes.

Turning our attention to private firms, in a sample of all firms in Figure C 2, we see that younger firms have a higher job growth rate than the base group, especially for firms aged

1-2, 10-13, and 18-21. In the balanced sample, we discern the trend wherein younger firms exhibit a 15% and 18% higher job creation and female job creation rate than their more mature counterparts. This observation underscores the resilience and dynamism that younger private firms bring to the employment landscape, contributing to heightened job creation and bolstering the overall vitality of the private sector.

In the comprehensive analysis of firm types, it becomes apparent that foreign firms demonstrate the most substantial variations in job creation rates among different firm age groups, while public firms exhibit a relatively stable pattern of net job growth across the spectrum of firm ages. This observation aligns coherently with our broader investigation into firm dynamics, which hinges on understanding the diverse motivations that drive profit-seeking behaviors among distinct categories of enterprises.

Another key finding regarding job creation is that while state-owned enterprises reduce their workforce, FDI firms and private enterprises have become the main contributors to job creation, as demonstrated in Figure 3.4. Wholely foreign-owned enterprises consistently generated the most new jobs over the years, followed by private firms and enterprises with less than 50% state ownership. This highlights the success of Vietnam's FDI attraction in driving economic growth and as a crucial solution to employment challenges. However, it also reflects the economy's increasing dependence on the FDI sector.

3.7. Conclusions and Implications

This study contributes to the existing body of knowledge regarding the correlation between firm size and job creation in Vietnam newby utilizing the most extensive firm-level dataset currently available. The findings indicate that larger firms create more new jobs among

enterprises of the same age than their smaller counterparts. Nevertheless, given that micro and small firms constitute a considerable and growing portion of the economy, the volume of employment generated is significant, notwithstanding their elevated job destruction rate, particularly in recent years. In addition, foreign firms create many jobs in terms of the number of jobs and the growth rate, particularly female jobs. This emphasizes the role of foreign firms in economic growth and employment in a developing country like Vietnam.

This research further elucidates employment dynamics, concentrating on female job creation within corporate contexts. Micro and small enterprises exhibit a preference for males over females. Conversely, enterprises with over 50 employees employ a more significant number of females. This trait may disadvantage female employees as the number of enterprises with fewer than 50 employees significantly rises. Moreover, empirical findings demonstrate that the variance in job creation rates for women between newly established and mature organizations exceeds the aggregate job creation rate, especially within the industrial and service industries and in foreign-invested firms. Additionally, a comparable pattern is evident in job destruction. This suggests that female employees are more susceptible to adverse effects during business labor fluctuations, especially in younger firms, aligning with ILO (2021).

The findings of this study underscore the critical significance of incorporating business age as a pivotal variable within the domain of enterprise statistics. Future statistical endeavors and reporting mechanisms should consider the temporal dimension of businesses, as this can provide invaluable insights into the dynamics of business operations and their correlation with job creation.

This examination primarily centers on measurement rather than policy formulation. Nonetheless, it is imperative to recognize that this analysis will invariably influence policymaking decisions and supply essential information that should be considered when

formulating strategies to promote job creation. For instance, relying solely on the firm size as the basis for compensating small businesses without considering firm age could significantly impact the rate of job creation. Similarly, policies aimed at job creation that exclusively prioritize firm size without addressing firm age are more likely to encounter challenges. Consequently, to optimize effective job creation, policies should be crafted with due regard to both firm age and size.

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Appendix A

Appendix Chapter 1

Table A 1. Samsung Spillovers on New Entrants (2006-2018)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.09**	0.02**	0.09***	0.07***	-0.07	-0.04	0.04
	(0.04)	(0.01)	(0.03)	(0.03)	(0.07)	(0.07)	(0.10)
Neighboring provinces	0.05	-0.00	0.04	0.02	0.01	0.04	0.08
	(0.04)	(0.02)	(0.05)	(0.05)	(0.03)	(0.04)	(0.10)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.08*	0.01*	0.08**	0.06**	-0.08	-0.04	0.04
	(0.04)	(0.01)	(0.03)	(0.02)	(0.07)	(0.07)	(0.10)
Samsung-invested provinces × same industry	0.31***	0.29***	0.20	0.34***	0.22	0.28	-0.10
	(0.07)	(0.06)	(0.13)	(0.11)	(0.16)	(0.17)	(0.20)
Neighboring provinces	0.06	-0.00	0.04	0.03	0.00	0.04	0.08
	(0.04)	(0.02)	(0.05)	(0.05)	(0.03)	(0.04)	(0.10)
Neighboring provinces × same industry	-0.16**	-0.01	-0.10	-0.22*	0.17	0.20	-0.21
	(0.07)	(0.05)	(0.14)	(0.11)	(0.18)	(0.22)	(0.20)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	94,364	94,364	94,364	94,364	94,364	94,364	94,364

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 2. Samsung Spillovers on Incumbents (2006-2018)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.07***	0.01*	0.14***	0.10***	-0.06	-0.04	0.15**
	(0.02)	(0.01)	(0.05)	(0.02)	(0.09)	(0.08)	(0.07)
Neighboring provinces	0.08*	0.01	0.08	0.06	-0.01	0.04	0.18***
	(0.04)	(0.01)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.07***	0.01	0.13***	0.10***	-0.07	-0.05	0.14*
	(0.02)	(0.01)	(0.05)	(0.02)	(0.09)	(0.08)	(0.07)
Samsung-invested provinces × same industry	0.28***	0.04***	0.77***	0.22**	0.40**	0.61***	0.86**
	(0.07)	(0.01)	(0.14)	(0.09)	(0.18)	(0.18)	(0.34)
Neighboring provinces	0.08*	0.01	0.08	0.07	-0.01	0.03	0.18***
	(0.05)	(0.01)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
Neighboring provinces × same industry	-0.15***	-0.00	-0.32***	-0.25***	0.01	0.13	-0.14
	(0.05)	(0.03)	(0.11)	(0.07)	(0.12)	(0.13)	(0.19)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	56,514	56,514	56,514	56,514	56,514	56,514	56,514

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 3. Samsung Spillovers on New Entrants (2006-2014)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.02	0.00	0.05	0.00	-0.11**	-0.08*	-0.01
	(0.06)	(0.01)	(0.04)	(0.02)	(0.05)	(0.05)	(0.12)
Neighboring provinces	0.02	-0.01	-0.04	0.01	-0.04	0.02	-0.06
	(0.04)	(0.02)	(0.06)	(0.04)	(0.04)	(0.03)	(0.05)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.01	-0.00	0.04	-0.00	-0.12**	-0.10*	-0.01
	(0.06)	(0.01)	(0.04)	(0.02)	(0.05)	(0.05)	(0.12)
Samsung-invested provinces × same industry	0.24***	0.23***	0.13	0.25**	0.41**	0.57***	-0.08
	(0.06)	(0.05)	(0.12)	(0.11)	(0.17)	(0.18)	(0.26)
Neighboring provinces	0.03	-0.01	-0.04	0.02	-0.04	0.01	-0.06
	(0.04)	(0.02)	(0.06)	(0.04)	(0.04)	(0.03)	(0.05)
Neighboring provinces × same industry	-0.12*	-0.06	-0.03	-0.10	0.07	0.09	-0.12
	(0.07)	(0.05)	(0.18)	(0.11)	(0.25)	(0.26)	(0.25)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	50,629	50,629	50,629	50,629	50,629	50,629	50,629

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 4. Samsung Spillovers on Incumbents (2006-2014)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.03*	0.01	0.09	0.06***	-0.10**	-0.08*	0.03
	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.05)	(0.04)
Neighboring provinces	0.07*	0.01	0.09	0.06*	-0.02	0.02	0.14***
	(0.04)	(0.01)	(0.06)	(0.04)	(0.04)	(0.04)	(0.04)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.03	0.00	0.08	0.06**	-0.11**	-0.09*	0.02
	(0.02)	(0.01)	(0.06)	(0.02)	(0.05)	(0.05)	(0.04)
Samsung-invested provinces × same industry	0.36***	0.05***	0.61***	0.27**	0.37*	0.61***	0.47
	(0.08)	(0.01)	(0.17)	(0.11)	(0.20)	(0.19)	(0.36)
Neighboring provinces	0.08*	0.01	0.10	0.07*	-0.02	0.02	0.15***
	(0.04)	(0.01)	(0.06)	(0.04)	(0.04)	(0.04)	(0.05)
Neighboring provinces × same industry	-0.19***	-0.01	-0.43***	-0.36***	0.04	0.13	-0.30
	(0.05)	(0.05)	(0.10)	(0.07)	(0.13)	(0.11)	(0.20)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	44,104	44,104	44,104	44,104	44,104	44,104	44,104

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 5. Samsung's Spillovers on Domestic Firms, 2006-2018

(With Control of Firm Size and Age)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.10***	0.02***	0.10*	0.11***	-0.07*	-0.04	0.04
	(0.02)	(0.01)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Neighboring provinces	0.08*	0.01	0.05	0.04	0.02	0.05*	0.14**
	(0.04)	(0.01)	(0.04)	(0.05)	(0.03)	(0.03)	(0.06)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.09***	0.01**	0.10*	0.10***	-0.08**	-0.04	0.04
	(0.02)	(0.00)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Samsung-invested provinces × same industry	0.34***	0.26***	0.23**	0.35***	0.28**	0.38***	-0.04
	(0.05)	(0.04)	(0.10)	(0.07)	(0.12)	(0.13)	(0.05)
Neighboring provinces	0.09**	0.01	0.05	0.05	0.01	0.04	0.13**
	(0.04)	(0.01)	(0.04)	(0.06)	(0.03)	(0.03)	(0.06)
Neighboring provinces × same industry	-0.11**	-0.01	-0.06	-0.17**	0.27*	0.31*	0.05
	(0.05)	(0.04)	(0.07)	(0.07)	(0.14)	(0.16)	(0.08)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	150,892	150,892	150,892	150,892	150,892	150,892	150,892

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 6. Samsung's Spillovers on Domestic Firms, 2006-2014

(With Control of Firm Size and Age)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Basic Regression							
Samsung-invested provinces	0.04*	0.00	0.08*	0.05**	-0.08***	-0.05**	0.00
	(0.02)	(0.01)	(0.05)	(0.02)	(0.02)	(0.02)	(0.03)
Neighboring provinces	0.07*	0.01	0.03	0.04	0.01	0.06***	0.11***
	(0.04)	(0.01)	(0.05)	(0.03)	(0.02)	(0.02)	(0.03)
Panel B. Heterogeneity Effects by Industry							
Samsung-invested provinces	0.03	-0.00	0.08*	0.05**	-0.09***	-0.07***	0.01
	(0.02)	(0.01)	(0.05)	(0.02)	(0.02)	(0.02)	(0.03)
Samsung-invested provinces × same industry	0.29***	0.21***	0.19**	0.26***	0.33***	0.55***	-0.15***
	(0.04)	(0.03)	(0.08)	(0.07)	(0.09)	(0.11)	(0.03)
Neighboring provinces	0.07**	0.01	0.03	0.05	0.01	0.05**	0.10***
	(0.04)	(0.01)	(0.05)	(0.03)	(0.02)	(0.02)	(0.03)
Neighboring provinces × same industry	-0.10***	-0.03	-0.07	-0.14**	0.17	0.20	0.06
	(0.03)	(0.03)	(0.10)	(0.05)	(0.11)	(0.14)	(0.06)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	94,737	94,737	94,737	94,737	94,737	94,737	94,737

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 7. Samsung's Spillovers on Upstream Industries

(With Control of Firm Size and Age)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Heterogeneity Effects for Upstream Industries (2006-2018)							
Samsung-invested provinces	0.10***	0.02**	0.04	0.11**	0.03	0.07**	0.04
	(0.02)	(0.01)	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)
Samsung-invested provinces × upstream industries	-0.01	0.00	0.13***	-0.01	-0.22***	-0.22***	-0.01
	(0.02)	(0.01)	(0.03)	(0.02)	(0.06)	(0.06)	(0.03)
Neighboring provinces	0.09**	0.01	0.04	0.05	0.04	0.07**	0.15**
	(0.04)	(0.02)	(0.05)	(0.05)	(0.03)	(0.03)	(0.06)
Neighboring provinces × upstream industries	-0.01	-0.01	0.03	-0.01	-0.05	-0.04	-0.04
	(0.02)	(0.01)	(0.05)	(0.02)	(0.04)	(0.04)	(0.03)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	150,619	150,619	150,619	150,619	150,619	150,619	150,619
Panel B. Heterogeneity Effects for Upstream Industries (2006-2014)							
Samsung-invested provinces	0.05***	-0.00	0.01	0.07**	0.06*	0.10***	-0.01
	(0.02)	(0.01)	(0.05)	(0.03)	(0.04)	(0.04)	(0.03)
Samsung-invested provinces × upstream industries	-0.03	0.00	0.15***	-0.04	-0.31***	-0.33***	0.02
	(0.03)	(0.01)	(0.03)	(0.03)	(0.05)	(0.06)	(0.02)
Neighboring provinces	0.06	0.01	0.01	0.04	0.05	0.09**	0.12***
	(0.04)	(0.02)	(0.06)	(0.04)	(0.03)	(0.04)	(0.03)
Neighboring provinces × upstream industries	0.03	-0.00	0.06	0.02	-0.10*	-0.09	-0.03
	(0.02)	(0.02)	(0.06)	(0.02)	(0.05)	(0.06)	(0.02)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	94,614	94,614	94,614	94,614	94,614	94,614	94,614

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

Table A 8. Samsung's Spillovers on Upstream Industries Receiving SCP

(With Control of Firm Size and Age)

	Wage	TFP	Revenue per worker	VA per worker	Labor	Female labor	FA
Panel A. Heterogeneity Effects for Upstream Industries (2006-2018)							
Samsung-invested provinces	0.08***	0.01**	0.07	0.10***	-0.05	0.01	0.00
	(0.02)	(0.00)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)
Samsung-invested provinces × upstream industries	0.07***	0.02***	0.25***	0.04	-0.21***	-0.35***	0.26***
	(0.02)	(0.01)	(0.03)	(0.05)	(0.06)	(0.09)	(0.02)
Neighboring provinces	0.09**	0.01	0.06	0.05	0.01	0.04	0.14**
	(0.04)	(0.01)	(0.04)	(0.05)	(0.03)	(0.03)	(0.06)
Neighboring provinces × upstream industries	-0.04	-0.01	-0.05	-0.02	0.06	0.04	0.02
	(0.03)	(0.01)	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)
Number of provinces	52	52	52	52	52	52	52
Number of years	13	13	13	13	13	13	13
Observations	149,954	149,954	149,954	149,954	149,954	149,954	149,954
Panel B. Heterogeneity Effects for Upstream Industries (2006-2014)							
Samsung-invested provinces	0.02	-0.00	0.03	0.04**	-0.05**	0.01	-0.05
	(0.04)	(0.01)	(0.04)	(0.02)	(0.02)	(0.02)	(0.05)
Samsung-invested provinces × upstream industries	0.10**	-0.00	0.32***	0.04	-0.19***	-0.37***	0.26***
	(0.04)	(0.01)	(0.04)	(0.07)	(0.06)	(0.10)	(0.03)
Neighboring provinces	0.07**	0.01	0.04	0.05	0.00	0.05**	0.11***
	(0.04)	(0.01)	(0.05)	(0.03)	(0.02)	(0.02)	(0.03)
Neighboring provinces × upstream industries	-0.03	-0.02**	-0.05*	-0.00	0.14***	0.09	-0.02
	(0.02)	(0.01)	(0.03)	(0.04)	(0.04)	(0.07)	(0.04)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	94,320	94,320	94,320	94,320	94,320	94,320	94,320

*Note: Standard errors are clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All dependent variables are in log form.*

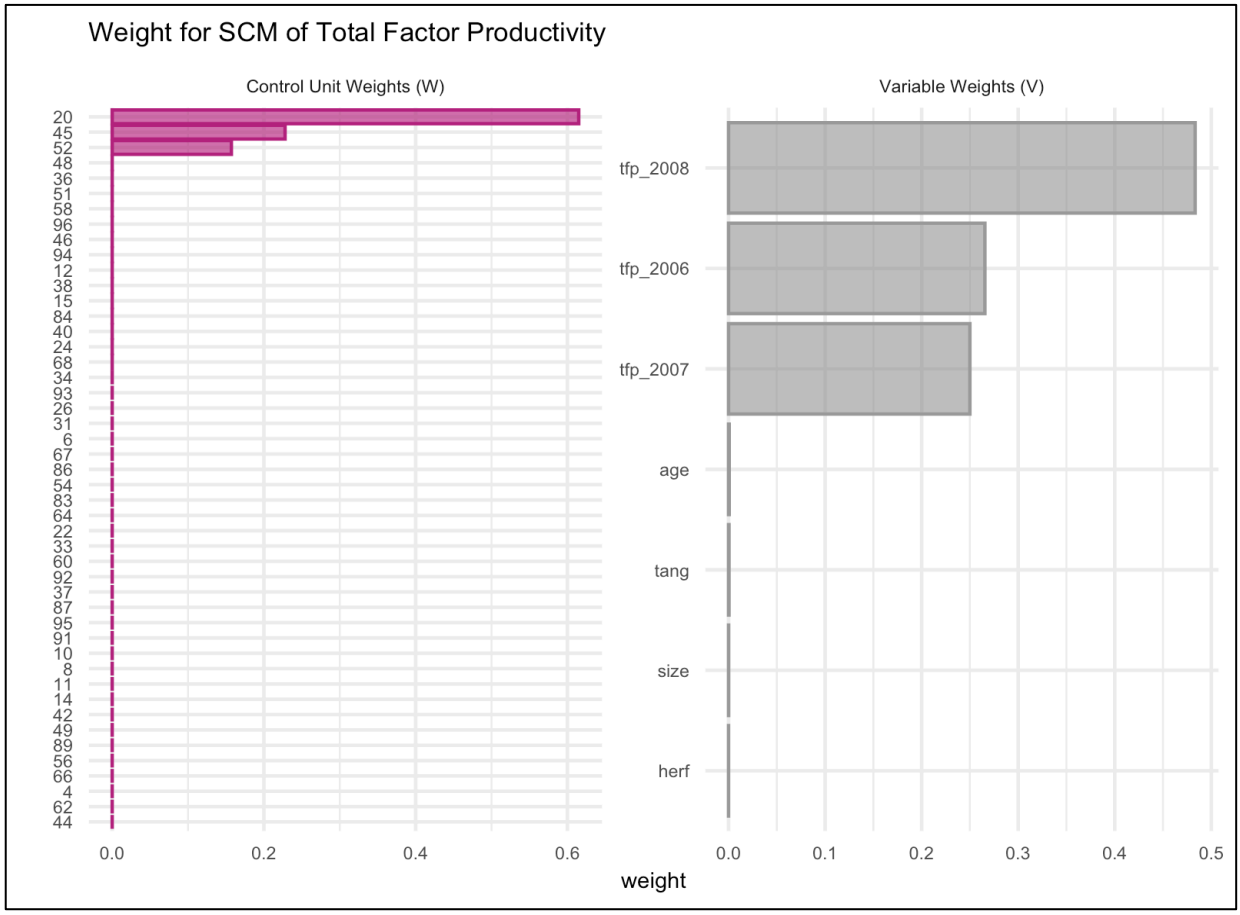
Table A 9. Upstream Industries

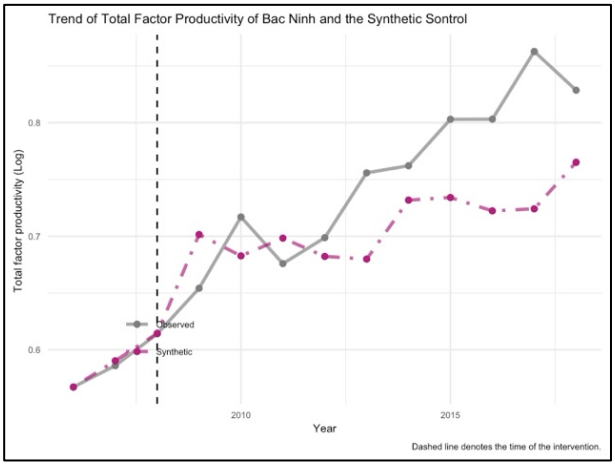
of Manufacture and Communication Equipment (26300) and Batteries and Accumulators (27200)
(Based on Vietnam Input-Output Table 2012)

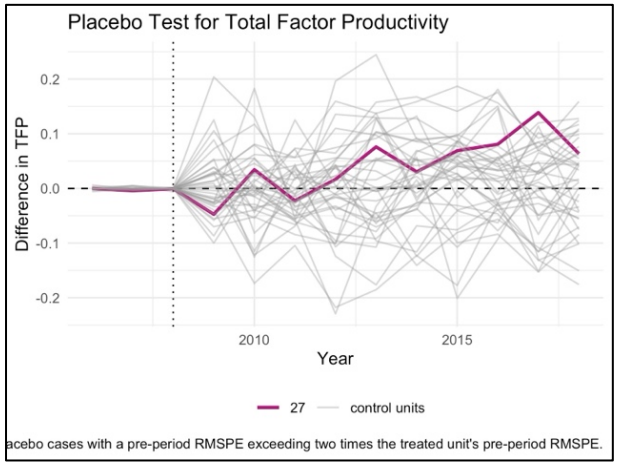
Manufacture Industry	Industry Code	26300	27200
Paper and paper product	17010-17090	0.39	**0.28**
Basic chemicals	20110	0.15	**0.72**
Plastic & synthetic rubber	20131, 20132	0.28	**0.01**
Other chemical products & man-made fibres	20210 - 20300	0.11	**0.34**
Rubber and plastic products	22110- 22209	0.46	**0.39**
Basic precious and other non-ferrous metals	24200	0.23	**8.65**
Structural metal products, tanks, steam generators	25110, 25120, 25130	0.33	**39.52**
Wiring and wiring devices	27310-27330	0.35	**0.00**
Other electrical equipment	27900	0.12	**0.00**
Repair ans installation of machinery and quipment	33110-33190	0.26	**0.36**
Electronics components, computers and peripheral equipment	26100, 26200	65.58	**0.01**
communication equipment	26300	22.77	**0.00**
Batteries and accumulators	27200	0.07	**37.93**
All manufacture	10101 - 33200	91.36	**91.56**
Total		**160,625,450**	**36,326,098**

Source: Authors' calculation based on Vietnam Input-output table 2012

Figure A 1. Synthetic Control Method Analysis of Total Factor Productivity of Bac Ninh (Treatment year 2008)

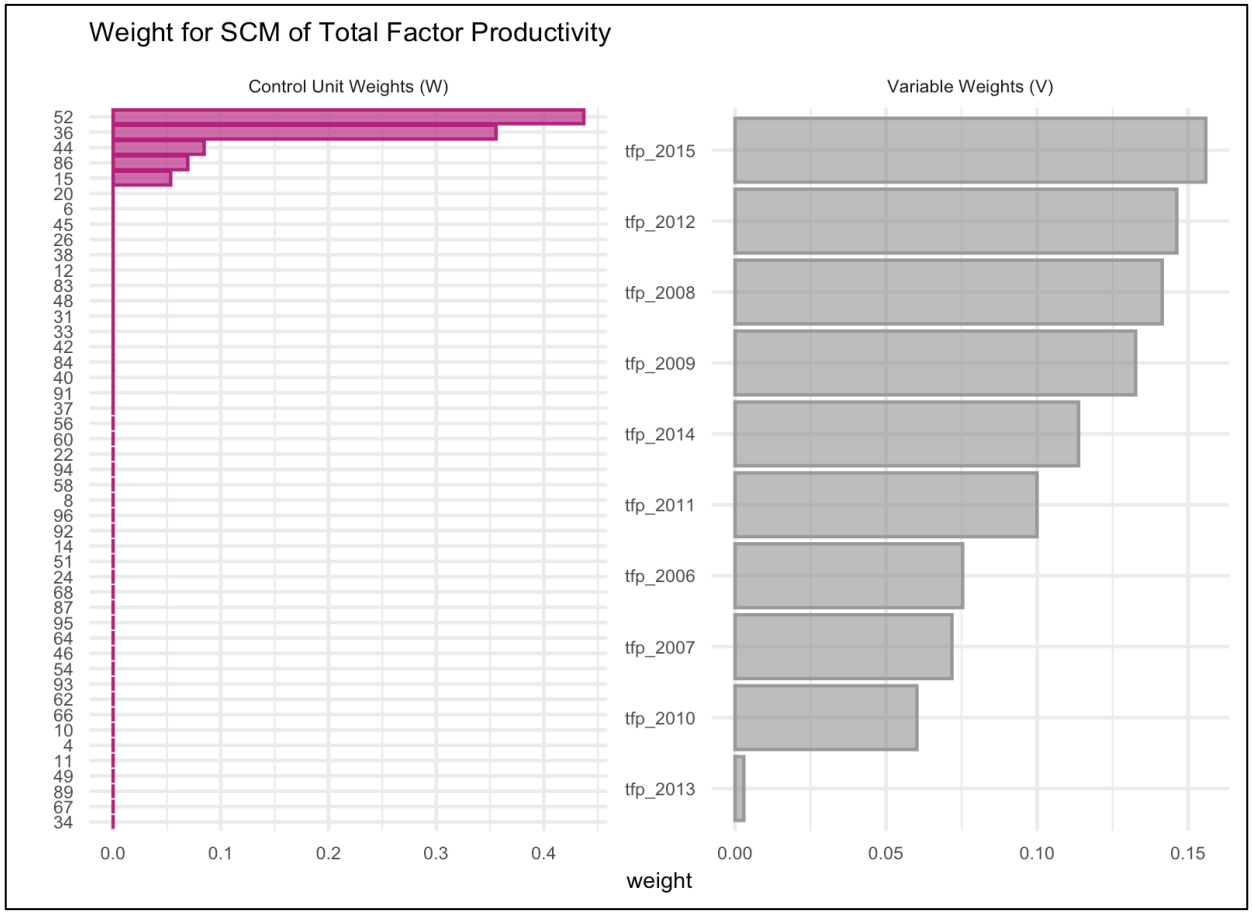


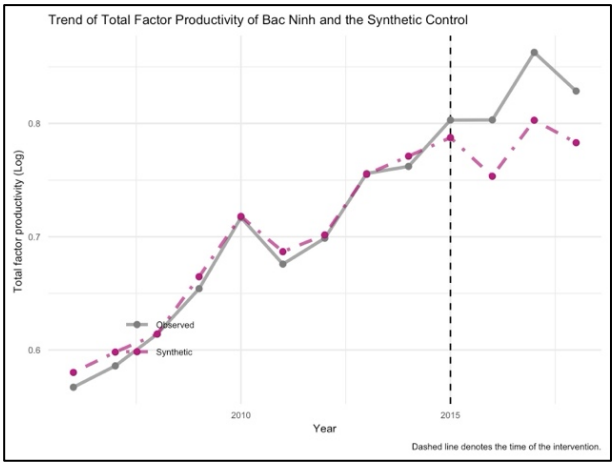


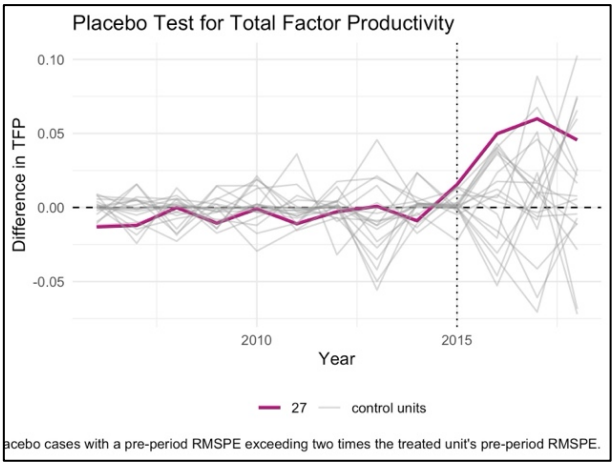


Note: The placebo test prenued all placebo cases with a pre-period RMSPE exceeding two times the treated unit pre-period RMSPE

Figure A 2. Synthetic Control Method Analysis of Total Factor Productivity of Bac Ninh (Treatment year 2015)

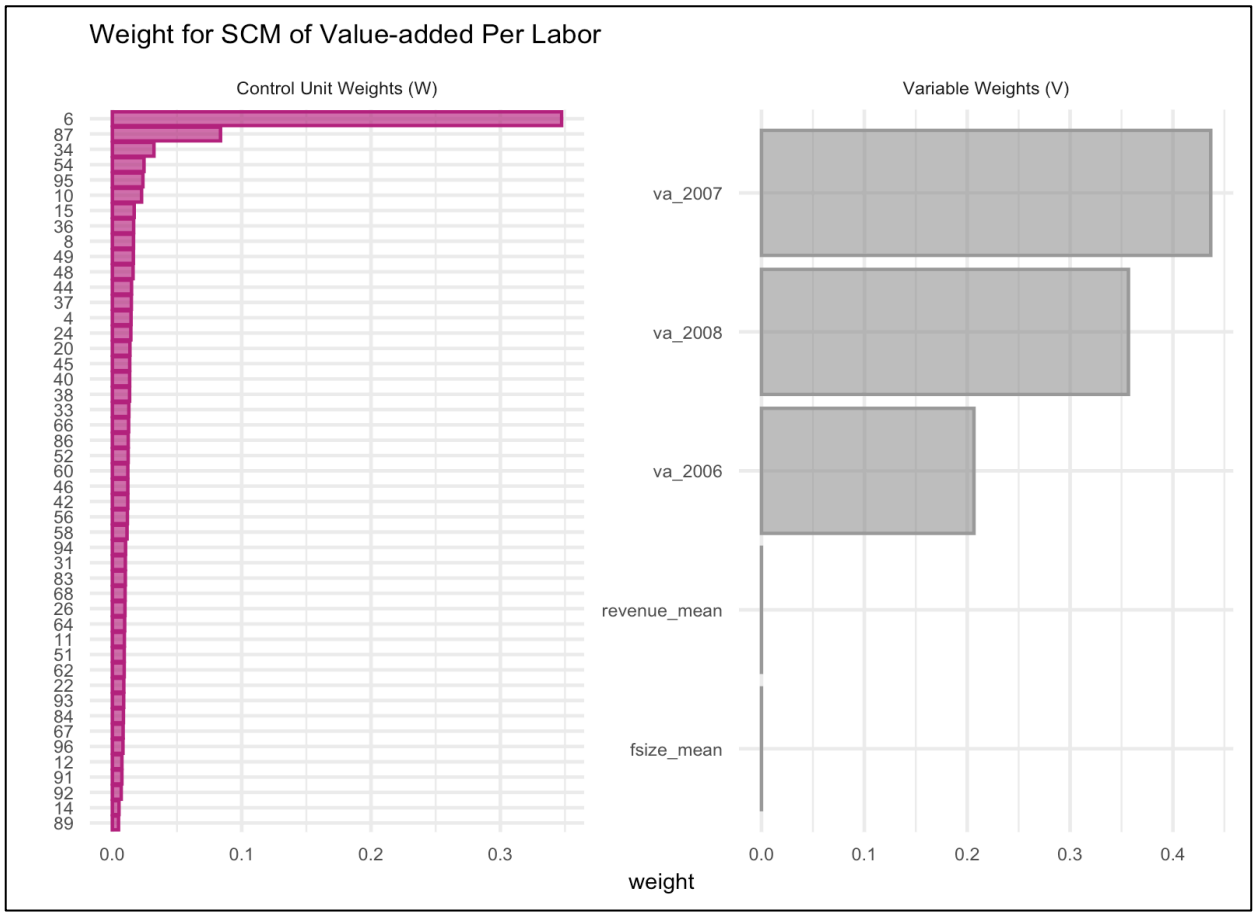


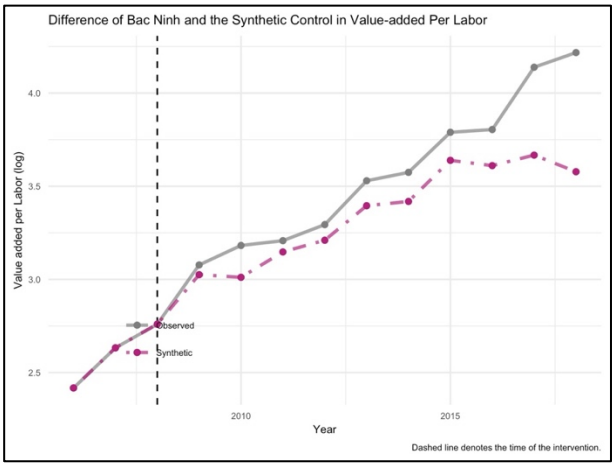


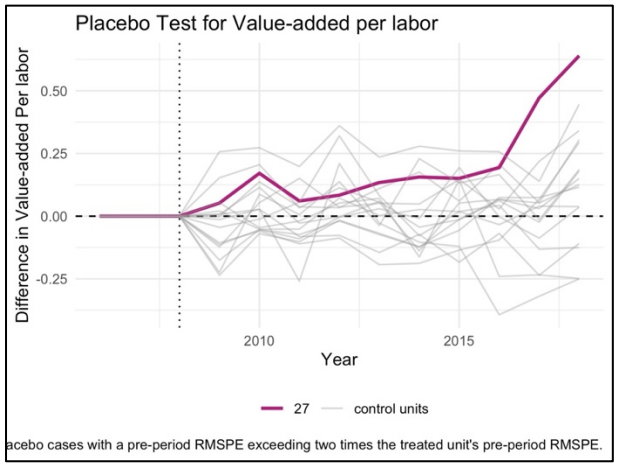


Note: The placebo test prenued all placebo cases with a pre-period RMSPE exceeding two times the treated unit pre-period RMSPE

Figure A 3. Synthetic Control Method Analysis of Value-added Per Labor of Bac Ninh







Note: The placebo test prenued all placebo cases with a pre-period RMSPE exceeding two times the treated unit pre-period RMSPE

Appendix B

Appendix Chapter 2

Appendix 2A: Main Tables with Level Form Dependent Variables

Table B 1. Number of Hours HH Members Worked in The Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	30.60	37.18**	-6.58	33.18***	-49.10***	-16.94	-32.16***
	(20.58)	(15.13)	(5.63)	(11.28)	(9.26)	(12.71)	(8.80)
Neighboring provinces	23.28*	28.00**	-4.73	21.99***	-52.50***	-30.67***	-21.83
	(12.84)	(11.14)	(3.69)	(6.82)	(15.41)	(10.91)	(14.78)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	4.82	13.11*	-8.29**	10.94	-49.51***	-21.56***	-27.96***
	(11.06)	(7.45)	(3.97)	(6.71)	(8.01)	(7.43)	(8.52)
Samsung-invested province × having female 18-35	53.24***	49.71***	3.52	45.98***	0.65	9.33	-8.68***
	(16.05)	(12.91)	(3.27)	(6.84)	(11.36)	(11.16)	(1.89)
Neighboring provinces	2.88	8.35	-5.47*	6.00*	-36.69***	-17.47	-19.22
	(12.34)	(9.81)	(3.17)	(3.34)	(12.51)	(12.29)	(13.05)
Neighboring provinces × having female 18-35	44.37***	42.73***	1.63	34.48***	-33.81*	-28.15***	-5.66
	(11.66)	(13.00)	(2.52)	(7.36)	(18.08)	(9.96)	(9.16)
Sum of the first two coefficients	58.06	62.82	-4.76	56.92	-48.86	-12.23	-36.63
P value	0.03	0.00	0.51	0.00	0.00	0.49	0.00
Sum of the last two coefficients	47.25	51.08	-3.84	40.48	-70.50	-45.62	-24.88
P value	0.00	0.00	0.41	0.00	0.00	0.00	0.17
Control mean	125.61	109.03	16.58	7.14	528.19	418.91	109.29
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 2. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	6.06**	5.49**	-0.09	3.52***	7.40	-0.19	7.60	6.04
	(2.70)	(2.10)	(0.10)	(1.19)	(8.85)	(3.09)	(10.42)	(3.63)
Neighboring provinces	3.82***	3.43***	-0.01	2.13***	3.14	2.30	0.42	4.25***
	(1.22)	(1.07)	(0.04)	(0.70)	(2.72)	(1.74)	(2.51)	(1.44)
Observations	118577	118577	118577	118577	118577	118577	118577	118577
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	2.95	2.76*	-0.03	1.49	0.59	3.78	-2.61	2.37
	(2.03)	(1.58)	(0.10)	(0.92)	(2.10)	(2.98)	(2.10)	(2.80)
Samsung-invested province × having female 18-35	6.45***	5.64***	-0.11***	4.21***	14.00	-8.21***	21.06	7.60***
	(1.00)	(0.74)	(0.02)	(0.34)	(16.40)	(1.54)	(16.29)	(1.27)
Neighboring provinces	1.19	1.11	-0.05**	0.79*	5.01	5.26**	-0.10	1.04
	(0.83)	(0.72)	(0.03)	(0.41)	(3.16)	(2.45)	(2.03)	(0.98)
Neighboring provinces × having female 18-35	5.68***	5.02***	0.09	2.89***	-3.95	-6.35*	1.16	6.92***
	(1.39)	(1.30)	(0.06)	(0.60)	(5.38)	(3.18)	(3.76)	(1.42)
Sum of the first two coefficients	9.39	8.40	-0.14	5.69	14.59	-4.44	18.45	9.97
P value	0.00	0.00	0.15	0.00	0.39	0.16	0.32	0.02
Sum of the last two coefficients	6.87	6.13	0.04	3.68	1.05	-1.09	1.06	7.96
P value	0.00	0.00	0.59	0.00	0.81	0.62	0.79	0.00
Control mean	7.68	6.87	0.18	0.48	43.93	27.48	10.74	13.40
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 3. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.02	0.01**	0.34***	0.09	-0.18	0.69	2.73***	4.01***
	(0.04)	(0.00)	(0.04)	(0.14)	(0.31)	(0.57)	(0.38)	(0.59)
Neighboring provinces	0.00	0.00	0.31***	0.08	-0.08	0.24	0.55	1.13
	(0.02)	(0.00)	(0.10)	(0.11)	(0.39)	(0.20)	(0.82)	(0.97)
Observations	118577	118577	118577	118577	118577	118577	118577	118577
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	-0.01	0.00	0.19*	-0.02	-0.11	0.50	2.94***	3.49***
	(0.02)	(0.00)	(0.11)	(0.06)	(0.23)	(0.52)	(0.99)	(0.66)
Samsung-invested provinces × having female 18-35	0.07	0.01**	0.31*	0.23	-0.13	0.41***	-0.44	1.08
	(0.06)	(0.00)	(0.18)	(0.14)	(0.28)	(0.10)	(1.48)	(1.80)
Neighboring provinces	-0.01	0.00	0.07	0.07	-0.01	0.15	0.34	0.42
	(0.03)	(0.00)	(0.07)	(0.06)	(0.43)	(0.21)	(0.84)	(0.96)
Neighboring provinces × having female 18-35	0.04*	0.00*	0.51**	0.03	-0.13	0.19	0.46**	1.54***
	(0.02)	(0.00)	(0.24)	(0.13)	(0.16)	(0.13)	(0.22)	(0.42)
Sum of the first two coefficients	0.06	0.01	0.50	0.21	-0.24	0.91	2.50	4.57
P value	0.34	0.00	0.00	0.30	0.58	0.14	0.00	0.00
Sum of the last two coefficients	0.02	0.00	0.59	0.10	-0.15	0.34	0.80	1.96
P value	0.35	0.34	0.01	0.57	0.69	0.09	0.33	0.05
Control mean	0.51	0.07	0.62	0.93	2.73	3.42	6.71	21.85
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Appendix 2B: Main Tables for Households with Female Members and with Members Aged 18-35

Table B 4. Number of HH Members Worked In The Past 12 Months.

	Number of HH members worked past 12 months for						
	Formal Job				Informal job		
	Total	Primary job	Second job	Foreign firm	Total	Agriculture	Production
Panel A. Basic Regressions							
Samsung-invested provinces	0.12**	0.16***	-0.03***	0.14***	-0.28***	-0.35***	0.05
	(0.06)	(0.05)	(0.01)	(0.04)	(0.02)	(0.03)	(0.06)
Neighboring provinces	0.10**	0.12***	-0.01	0.10***	-0.17***	-0.20***	-0.01
	(0.04)	(0.04)	(0.01)	(0.03)	(0.05)	(0.06)	(0.02)
Panel B. Heterogeneity for Households With Female Members of Age 18-35							
Samsung-invested provinces	-0.05	0.01	-0.06***	-0.02***	-0.90***	-0.89***	-0.31***
	(0.05)	(0.05)	(0.01)	(0.01)	(0.06)	(0.04)	(0.11)
Samsung × Female	-0.04	-0.06	0.02***	0.02	0.51***	0.50***	0.26*
	(0.04)	(0.04)	(0.00)	(0.01)	(0.09)	(0.05)	(0.13)
Samsung × Age 18-35	0.43*	0.44*	-0.00	0.59***	0.46***	0.35**	0.20
	(0.23)	(0.23)	(0.00)	(0.13)	(0.13)	(0.17)	(0.18)
Samsung × Female × Age 18-35	-0.11	-0.12	0.02**	-0.37***	-0.28	-0.28	-0.04
	(0.16)	(0.15)	(0.01)	(0.09)	(0.18)	(0.24)	(0.12)
Neighboring provinces	-0.03	0.01	-0.04***	-0.03**	-0.78***	-0.91***	0.04
	(0.05)	(0.04)	(0.01)	(0.01)	(0.08)	(0.10)	(0.09)
Neighboring × Female	-0.09*	-0.11**	0.02***	0.02	0.56***	0.71***	-0.08
	(0.05)	(0.05)	(0.01)	(0.02)	(0.09)	(0.10)	(0.07)
Neighboring × Age 18-35	0.10	0.11	-0.02***	0.07	0.29*	0.28*	-0.13
	(0.07)	(0.07)	(0.00)	(0.04)	(0.16)	(0.15)	(0.08)
Neighboring × Female × Age 18-35	0.26***	0.23***	0.03**	0.11***	-0.20	-0.26	0.20***
	(0.05)	(0.06)	(0.01)	(0.03)	(0.18)	(0.16)	(0.06)
Control mean	0.45	0.40	0.05	0.03	2.11	1.58	0.53
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table B 5. Number of Hours HH Members Worked in the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.16	0.18	-0.19**	0.60***	-0.35***	-0.29***	-0.61***
	(0.12)	(0.12)	(0.09)	(0.17)	(0.09)	(0.10)	(0.21)
Neighboring provinces	0.31**	0.32***	-0.02	0.44***	-0.23**	-0.22***	-0.24
	(0.12)	(0.12)	(0.12)	(0.13)	(0.09)	(0.07)	(0.26)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	-0.66***	-0.62***	-0.46***	-0.12***	-2.41***	-2.36***	-1.59***
	(0.24)	(0.23)	(0.17)	(0.02)	(0.12)	(0.09)	(0.40)
Samsung × Female	0.14	0.13	0.08	0.13**	1.72***	1.72***	0.81***
	(0.21)	(0.19)	(0.25)	(0.05)	(0.21)	(0.17)	(0.23)
Samsung × Age 18-35	1.33***	1.33***	-0.67***	2.35***	1.12***	1.10***	0.28***
	(0.30)	(0.37)	(0.21)	(0.40)	(0.08)	(0.07)	(0.05)
Samsung × Female × Age 18-35	-0.28*	-0.29	0.98***	-1.44***	-0.55***	-0.53***	0.00
	(0.16)	(0.21)	(0.21)	(0.24)	(0.07)	(0.06)	(0.08)
Neighboring provinces	-0.37*	-0.33*	-0.38**	-0.17**	-2.17***	-2.01***	-1.65***
	(0.19)	(0.18)	(0.15)	(0.06)	(0.52)	(0.50)	(0.36)
Neighboring × Female	-0.02	-0.05	0.26**	0.13	1.87***	1.73***	1.39***
	(0.11)	(0.11)	(0.11)	(0.09)	(0.49)	(0.48)	(0.33)
Neighboring × Age 18-35	0.72	0.74	-0.24**	0.40*	2.18***	2.07***	1.22***
	(0.48)	(0.48)	(0.10)	(0.24)	(0.48)	(0.48)	(0.26)
Neighboring × Female × Age 18-35	0.39	0.36	0.40***	0.35**	-2.04***	-1.93***	-1.17***
	(0.42)	(0.41)	(0.12)	(0.16)	(0.45)	(0.45)	(0.28)
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 6. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	0.31***	0.33***	-0.09*	0.36***	-0.15*	-0.32**	0.19	0.05
	(0.11)	(0.09)	(0.05)	(0.10)	(0.08)	(0.15)	(0.16)	(0.09)
Neighboring provinces	0.26***	0.26***	-0.02	0.25***	-0.21***	-0.26***	0.01	-0.04
	(0.08)	(0.08)	(0.06)	(0.08)	(0.06)	(0.09)	(0.03)	(0.04)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	-0.08	0.02	-0.02	-0.05***	-1.36***	-1.12***	-0.29	-1.19***
	(0.11)	(0.12)	(0.04)	(0.01)	(0.27)	(0.25)	(0.19)	(0.27)
Samsung × Female	-0.02	-0.07	-0.06***	0.08**	1.02***	0.78***	0.34	1.01***
	(0.13)	(0.14)	(0.01)	(0.04)	(0.29)	(0.18)	(0.22)	(0.28)
Samsung × Age 18-35	0.97***	0.79*	0.08	1.37***	-0.06	0.35***	-0.57**	1.22***
	(0.27)	(0.42)	(0.17)	(0.20)	(0.15)	(0.11)	(0.27)	(0.40)
Samsung × Female × Age 18-35	-0.33*	-0.19	-0.09	-0.87***	0.40***	-0.29	0.82***	-0.84***
	(0.17)	(0.35)	(0.18)	(0.12)	(0.09)	(0.22)	(0.07)	(0.30)
Neighboring provinces	-0.13	-0.05	0.08	-0.07**	-0.92***	-0.97***	0.11	-0.77***
	(0.13)	(0.13)	(0.06)	(0.03)	(0.26)	(0.23)	(0.11)	(0.25)
Neighboring × Female	-0.07	-0.12	-0.10***	0.07	0.64**	0.73***	-0.18	0.51**
	(0.12)	(0.12)	(0.02)	(0.05)	(0.25)	(0.21)	(0.12)	(0.25)
Neighboring × Age 18-35	0.54**	0.52**	-0.10***	0.22*	0.78***	0.45***	-0.02	0.90***
	(0.24)	(0.23)	(0.02)	(0.13)	(0.23)	(0.15)	(0.30)	(0.32)
Neighboring × Female × Age 18-35	0.18	0.16	0.09***	0.19**	-0.66***	-0.48***	0.14	-0.56*
	(0.18)	(0.18)	(0.02)	(0.09)	(0.22)	(0.17)	(0.29)	(0.29)
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 7. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.02	0.01**	0.07**	0.02	0.09***	0.08	0.09	0.10***
	(0.01)	(0.00)	(0.03)	(0.02)	(0.02)	(0.05)	(0.10)	(0.04)
Neighboring provinces	0.02**	0.00	0.06***	0.02	0.07***	0.07***	0.05	0.06**
	(0.01)	(0.00)	(0.02)	(0.03)	(0.02)	(0.02)	(0.06)	(0.03)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.31***	0.03***	-0.18***	0.01	0.28	0.05	0.17	0.76*
	(0.08)	(0.01)	(0.02)	(0.09)	(0.22)	(0.19)	(0.12)	(0.41)
Samsung × Female	-0.31***	-0.03***	0.27***	-0.01	-0.22	-0.05	-0.08	-0.69
	(0.08)	(0.01)	(0.05)	(0.08)	(0.21)	(0.21)	(0.19)	(0.42)
Samsung × Age 18-35	-0.33***	-0.06***	-0.10***	-0.21***	-0.17	-0.12	-0.36*	-0.78**
	(0.02)	(0.01)	(0.01)	(0.04)	(0.30)	(0.34)	(0.18)	(0.39)
Samsung × Female × Age 18-35	0.36***	0.07***	0.09***	0.24***	0.21	0.25	0.35***	0.83**
	(0.02)	(0.02)	(0.02)	(0.01)	(0.26)	(0.30)	(0.13)	(0.34)
Neighboring provinces	0.27***	0.01**	-0.06	0.21***	0.03	0.01	-0.09	0.27***
	(0.07)	(0.00)	(0.04)	(0.04)	(0.03)	(0.07)	(0.16)	(0.09)
Neighboring × Female	-0.27***	-0.01**	0.11**	-0.24***	0.04	-0.02	0.11	-0.27**
	(0.06)	(0.01)	(0.04)	(0.03)	(0.02)	(0.08)	(0.13)	(0.11)
Neighboring × Age 18-35	-0.23***	0.00	-0.10***	-0.26**	0.04	0.19***	0.16	-0.09
	(0.08)	(0.00)	(0.04)	(0.11)	(0.03)	(0.06)	(0.12)	(0.13)
Neighboring × Female × Age 18-35	0.25***	0.00	0.11***	0.33**	-0.03	-0.06	-0.11	0.19
	(0.07)	(0.00)	(0.04)	(0.13)	(0.04)	(0.06)	(0.12)	(0.13)
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Appendix 2C: Main Tables for Average Outcomes (over the Total Number of Household Members)

Table B 8. Number of HH Members Worked in the Past 12 Months

	Number of HH members worked past 12 months for						
	Formal Job				Informal job		
	Total	Primary job	Second job	Foreign firm	Total	Agriculture	Production
Panel A. Basic Regressions							
Samsung-invested provinces	0.03***	0.04***	-0.01***	0.03***	-0.07***	-0.09***	0.01
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)
Neighboring provinces	0.02**	0.03***	-0.00	0.02***	-0.04***	-0.04**	-0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.02***	0.03***	-0.01***	0.02*	-0.06***	-0.08***	0.02**
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Samsung-invested province × having female 18-35	0.03***	0.03***	-0.00	0.04***	-0.01	-0.01	-0.02
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Neighboring provinces	0.01	0.01*	-0.00**	0.01**	-0.02**	-0.02*	-0.00
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Neighboring provinces × having female 18-35	0.03***	0.03***	0.00	0.03***	-0.03**	-0.04***	-0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Sum of the first two coefficients	0.05	0.06	-0.01	0.05	-0.08	-0.10	0.01
P value	0.00	0.00	0.01	0.00	0.00	0.00	0.76
Sum of the last two coefficients	0.04	0.04	-0.00	0.04	-0.06	-0.06	-0.00
P value	0.00	0.00	0.49	0.00	0.01	0.01	0.70
Control mean	0.11	0.10	0.01	0.01	0.53	0.39	0.13
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table B 9. Number of Hours HH Members Worked in the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.12	0.15	-0.14**	0.45***	-0.29***	-0.24***	-0.46***
	(0.09)	(0.09)	(0.06)	(0.13)	(0.07)	(0.08)	(0.16)
Neighboring provinces	0.24**	0.25***	-0.03	0.33***	-0.20***	-0.18***	-0.19
	(0.09)	(0.09)	(0.09)	(0.10)	(0.07)	(0.06)	(0.20)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	-0.05	-0.03	-0.17***	0.18**	-0.33***	-0.28***	-0.40***
	(0.05)	(0.05)	(0.04)	(0.08)	(0.08)	(0.09)	(0.14)
Samsung-invested provinces × having female 18-35	0.36***	0.37***	0.06*	0.55***	0.08**	0.08***	-0.13***
	(0.11)	(0.11)	(0.04)	(0.06)	(0.03)	(0.02)	(0.04)
Neighboring provinces	0.09	0.10	-0.02	0.13**	-0.14**	-0.12**	-0.13
	(0.09)	(0.09)	(0.08)	(0.06)	(0.07)	(0.06)	(0.18)
Neighboring provinces × having female 18-35	0.32***	0.33***	-0.03	0.44***	-0.14*	-0.13*	-0.13**
	(0.09)	(0.10)	(0.04)	(0.09)	(0.07)	(0.07)	(0.06)
Sum of the first two coefficients	0.31	0.34	-0.11	0.74	-0.25	-0.20	-0.52
P value	0.02	0.01	0.16	0.00	0.00	0.01	0.00
Sum of the last two coefficients	0.41	0.42	-0.05	0.56	-0.27	-0.25	-0.26
P value	0.00	0.00	0.65	0.00	0.01	0.00	0.23
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 10. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	0.23***	0.23***	-0.04	0.22***	-0.08	-0.21**	0.14	0.07
	(0.08)	(0.06)	(0.03)	(0.06)	(0.08)	(0.09)	(0.12)	(0.09)
Neighboring provinces	0.18***	0.17***	-0.01	0.15***	-0.13***	-0.16***	0.01	-0.01
	(0.06)	(0.05)	(0.03)	(0.05)	(0.04)	(0.05)	(0.02)	(0.03)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.12**	0.14***	-0.01	0.11**	-0.12***	-0.15**	0.07*	0.01
	(0.05)	(0.05)	(0.03)	(0.05)	(0.04)	(0.06)	(0.04)	(0.04)
Samsung-invested provinces × having female 18-35	0.22***	0.19***	-0.04***	0.24***	0.09	-0.11*	0.13	0.13
	(0.04)	(0.02)	(0.01)	(0.02)	(0.08)	(0.06)	(0.16)	(0.09)
Neighboring provinces	0.07	0.07*	0.01	0.07**	-0.11***	-0.11***	-0.00	-0.05
	(0.04)	(0.04)	(0.03)	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)
Neighboring provinces × having female 18-35	0.24***	0.21***	-0.03**	0.18***	-0.03	-0.10*	0.02	0.08**
	(0.05)	(0.05)	(0.01)	(0.04)	(0.04)	(0.05)	(0.03)	(0.03)
Sum of the first two coefficients	0.35	0.33	-0.06	0.34	-0.04	-0.26	0.21	0.14
P value	0.00	0.00	0.14	0.00	0.75	0.04	0.30	0.28
Sum of the last two coefficients	0.31	0.28	-0.02	0.24	-0.15	-0.21	0.02	0.03
P value	0.00	0.00	0.59	0.00	0.02	0.01	0.48	0.51
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 11. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.01	0.00**	0.03*	0.01	0.04***	0.07*	0.06	0.10***
	(0.01)	(0.00)	(0.02)	(0.01)	(0.01)	(0.04)	(0.05)	(0.03)
Neighboring provinces	0.01	0.00	0.02***	0.01	0.02**	0.04**	0.02	0.06**
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.01***	0.00***	0.04***	0.00	0.05***	0.08***	0.06	0.11***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)
Samsung-invested provinces × having female 18-35	-0.00	-0.00***	-0.02***	0.01	-0.03***	-0.01	-0.00	-0.04
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.03)	(0.02)	(0.04)
Neighboring provinces	0.01	0.00	0.02**	0.01	0.03**	0.05***	0.00	0.05**
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)
Neighboring provinces × having female 18-35	0.00	-0.00***	0.00	0.01	-0.02**	-0.02*	0.03*	0.01
	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Sum of the first two coefficients	0.01	0.00	0.02	0.02	0.02	0.06	0.06	0.08
P value	0.56	0.62	0.35	0.39	0.01	0.22	0.32	0.17
Sum of the last two coefficients	0.01	-0.00	0.03	0.01	0.01	0.03	0.04	0.06
P value	0.16	0.85	0.00	0.58	0.14	0.09	0.35	0.01
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Appendix 2D: Main Tables for Average Outcomes (over the Total Number of Household Members in Working Age)

Table B 12. Number of HH Members Worked in the Past 12 Months

	Number of HH members worked past 12 months for						
	Formal Job				Informal job		
	Total	Primary job	Second job	Foreign firm	Total	Agriculture	Production
Panel A. Basic Regressions							
Samsung-invested provinces	0.04**	0.06***	-0.01***	0.05***	-0.12***	-0.15***	0.01
	(0.01)	(0.01)	(0.00)	(0.02)	(0.02)	(0.02)	(0.01)
Neighboring provinces	0.05**	0.05***	-0.01	0.04***	-0.06***	-0.07***	-0.00
	(0.02)	(0.02)	(0.00)	(0.01)	(0.02)	(0.03)	(0.01)
Observations	118577	110311	110311	118577	118577	118577	118577
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.02**	0.05***	-0.02***	0.02**	-0.13***	-0.15***	0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Samsung-invested province × having female 18-35	0.04***	0.03**	0.00	0.06***	0.02	0.00	0.01
	(0.02)	(0.01)	(0.00)	(0.01)	(0.02)	(0.03)	(0.02)
Neighboring provinces	0.02	0.03*	-0.01**	0.02**	-0.05**	-0.05**	-0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.02)	(0.01)
Neighboring provinces × having female 18-35	0.06***	0.05***	0.00	0.05***	-0.03	-0.05*	0.00
	(0.02)	(0.02)	(0.00)	(0.01)	(0.03)	(0.02)	(0.01)
Sum of the first two coefficients	0.06	0.07	-0.01	0.09	-0.11	-0.15	0.01
P value	0.00	0.00	0.06	0.00	0.00	0.00	0.68
Sum of the last two coefficients	0.08	0.08	-0.00	0.07	-0.08	-0.10	0.00
P value	0.00	0.00	0.45	0.00	0.01	0.00	0.96
Control mean	0.18	0.17	0.02	0.01	0.85	0.64	0.22
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	110,311	110,311	118,577	118,577	118,577	118,577

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table B 13. Number of Hours HH Members Worked in the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.14	0.17	-0.16*	0.54***	-0.32***	-0.27***	-0.54***
	(0.13)	(0.12)	(0.09)	(0.15)	(0.06)	(0.07)	(0.18)
Neighboring provinces	0.30***	0.31***	-0.02	0.40***	-0.19**	-0.17***	-0.21
	(0.11)	(0.10)	(0.10)	(0.12)	(0.08)	(0.06)	(0.23)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	-0.02	0.01	-0.19**	0.25**	-0.41***	-0.35***	-0.50***
	(0.08)	(0.08)	(0.08)	(0.11)	(0.09)	(0.10)	(0.14)
Samsung-invested provinces × having female 18-35	0.31***	0.31***	0.05**	0.55***	0.16**	0.16**	-0.09
	(0.08)	(0.08)	(0.02)	(0.05)	(0.07)	(0.06)	(0.09)
Neighboring provinces	0.15	0.16	-0.01	0.18**	-0.13**	-0.12**	-0.13
	(0.11)	(0.10)	(0.10)	(0.07)	(0.07)	(0.06)	(0.21)
Neighboring provinces × having female 18-35	0.31***	0.31***	-0.03	0.44***	-0.11	-0.11	-0.16**
	(0.09)	(0.10)	(0.04)	(0.09)	(0.09)	(0.08)	(0.07)
Sum of the first two coefficients	0.29	0.32	-0.14	0.80	-0.24	-0.19	-0.58
P value	0.05	0.03	0.14	0.00	0.00	0.00	0.01
Sum of the last two coefficients	0.46	0.47	-0.04	0.62	-0.24	-0.22	-0.29
P value	0.00	0.00	0.73	0.00	0.03	0.01	0.26
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	110,311	110,311	110,311	110,311	110,311	110,311	110,311

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 14. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	0.26***	0.27***	-0.06	0.28***	-0.11	-0.25*	0.16	0.07
	(0.09)	(0.08)	(0.04)	(0.08)	(0.07)	(0.13)	(0.14)	(0.08)
Neighboring provinces	0.23***	0.22***	-0.01	0.20***	-0.15***	-0.19***	0.02	-0.00
	(0.07)	(0.07)	(0.05)	(0.06)	(0.05)	(0.07)	(0.03)	(0.04)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.16**	0.18***	-0.04	0.15**	-0.17***	-0.22***	0.11**	0.01
	(0.07)	(0.07)	(0.03)	(0.07)	(0.05)	(0.08)	(0.04)	(0.05)
Samsung-invested provinces × having female 18-35	0.19***	0.17***	-0.04***	0.26***	0.12**	-0.06	0.11	0.12*
	(0.04)	(0.02)	(0.02)	(0.01)	(0.06)	(0.09)	(0.18)	(0.06)
Neighboring provinces	0.10*	0.11*	-0.00	0.10**	-0.12***	-0.13**	0.00	-0.03
	(0.06)	(0.06)	(0.04)	(0.04)	(0.03)	(0.05)	(0.02)	(0.04)
Neighboring provinces × having female 18-35	0.26***	0.23***	-0.01	0.20***	-0.06	-0.14**	0.02	0.06**
	(0.05)	(0.05)	(0.01)	(0.04)	(0.06)	(0.07)	(0.03)	(0.03)
Sum of the first two coefficients	0.35	0.35	-0.08	0.41	-0.05	-0.28	0.22	0.12
P value	0.00	0.00	0.07	0.00	0.63	0.10	0.33	0.27
Sum of the last two coefficients	0.36	0.34	-0.02	0.30	-0.18	-0.26	0.03	0.03
P value	0.00	0.00	0.72	0.00	0.02	0.01	0.47	0.54
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	110,311	110,311	110,311	110,311	110,311	110,311	110,311	110,311

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 15. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.01*	0.00	0.02	0.01	0.03***	0.06	0.06	0.06***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.04)	(0.05)	(0.02)
Neighboring provinces	0.01	0.00	0.03***	0.01	0.03**	0.05***	0.04	0.06*
	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.02)	(0.04)	(0.03)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.00	0.00	0.01	-0.00	0.02**	0.03	0.06	0.04**
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)
Samsung-invested provinces × having female 18-35	0.01	0.00	0.01	0.03*	0.01*	0.05*	0.01	0.05
	(0.02)	(0.00)	(0.01)	(0.02)	(0.01)	(0.03)	(0.03)	(0.05)
Neighboring provinces	0.01	0.00	0.02**	0.00	0.03**	0.04**	0.03	0.04
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.03)
Neighboring provinces × having female 18-35	0.01	-0.00	0.02**	0.02	0.00	0.02	0.02	0.03
	(0.01)	(0.00)	(0.01)	(0.03)	(0.01)	(0.02)	(0.02)	(0.04)
Sum of the first two coefficients	0.01	0.00	0.03	0.03	0.03	0.09	0.06	0.08
P value	0.26	0.20	0.12	0.26	0.00	0.09	0.36	0.04
Sum of the last two coefficients	0.01	0.00	0.04	0.02	0.04	0.06	0.05	0.07
P value	0.08	0.76	0.00	0.43	0.04	0.01	0.24	0.04
Control mean	0.17	0.03	0.16	0.22	0.37	0.67	0.85	1.95
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Appendix 2E: Main Tables (Excluding only Hanoi and Ho Chi Minh City)

Table B 16. Number of HH Members Worked in the Past 12 Months

	Number of HH members worked past 12 months for						
	Formal Job				Informal job		
	Total	Primary job	Second job	Foreign firm	Total	Agriculture	Production
Panel A. Basic Regressions							
Samsung-invested provinces	0.10*	0.14***	-0.03***	0.12***	-0.26***	-0.34***	0.05
	(0.06)	(0.05)	(0.01)	(0.05)	(0.02)	(0.02)	(0.06)
Neighboring provinces	0.09**	0.10***	-0.01	0.08**	-0.15***	-0.18***	-0.01
	(0.04)	(0.04)	(0.01)	(0.03)	(0.05)	(0.06)	(0.02)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.02	0.06**	-0.03***	0.04	-0.21***	-0.28***	0.02
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)	(0.03)	(0.03)
Samsung-invested province × having female 18-35	0.17***	0.17***	-0.00	0.17***	-0.10***	-0.11**	0.05
	(0.06)	(0.05)	(0.01)	(0.03)	(0.02)	(0.05)	(0.06)
Neighboring provinces	0.02	0.04	-0.02***	0.03*	-0.11***	-0.15***	0.00
	(0.04)	(0.03)	(0.01)	(0.02)	(0.04)	(0.04)	(0.03)
Neighboring provinces × having female 18-35	0.15***	0.14**	0.01	0.12***	-0.09	-0.07	-0.02
	(0.05)	(0.05)	(0.01)	(0.04)	(0.07)	(0.09)	(0.03)
Sum of the first two coefficients	0.19	0.23	-0.04	0.21	-0.31	-0.39	0.07
P value	0.01	0.00	0.00	0.00	0.00	0.00	0.42
Sum of the last two coefficients	0.17	0.18	-0.01	0.15	-0.20	-0.22	-0.02
P value	0.01	0.00	0.61	0.00	0.02	0.02	0.50
Control mean	0.48	0.44	0.05	0.06	2.06	1.51	0.53
Number of provinces	61	61	61	61	61	61	61
Number of years	9	9	9	9	9	9	9
Observations	140,488	140,488	140,488	140,488	140,488	140,488	140,488

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table B 17. Number of Hours HH Members Worked in the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.15	0.17	-0.16*	0.54***	-0.31***	-0.26**	-0.59***
	(0.12)	(0.11)	(0.09)	(0.17)	(0.09)	(0.10)	(0.20)
Neighboring provinces	0.30**	0.31***	0.00	0.38***	-0.20**	-0.19**	-0.22
	(0.12)	(0.11)	(0.12)	(0.14)	(0.09)	(0.07)	(0.25)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested province	-0.07	-0.05	-0.21***	0.22**	-0.37***	-0.33***	-0.53***
	(0.06)	(0.06)	(0.06)	(0.11)	(0.10)	(0.11)	(0.18)
Samsung-invested province × having female 18-35	0.44***	0.44***	0.11*	0.65***	0.12***	0.13***	-0.13***
	(0.14)	(0.14)	(0.06)	(0.11)	(0.04)	(0.03)	(0.05)
Neighboring provinces	0.13	0.13	0.00	0.15**	-0.14*	-0.13*	-0.17
	(0.12)	(0.12)	(0.11)	(0.07)	(0.08)	(0.07)	(0.23)
Neighboring provinces × having female 18-35	0.39***	0.39***	0.01	0.50***	-0.13	-0.12	-0.11
	(0.13)	(0.13)	(0.06)	(0.14)	(0.09)	(0.08)	(0.09)
Sum of the first two coefficients	0.37	0.40	-0.11	0.87	-0.25	-0.20	-0.66
P value	0.02	0.01	0.35	0.00	0.00	0.03	0.00
Sum of the last two coefficients	0.52	0.53	0.01	0.65	-0.27	-0.25	-0.28
P value	0.00	0.00	0.95	0.00	0.03	0.01	0.32
Number of provinces	61	61	61	61	61	61	61
Number of years	9	9	9	9	9	9	9
Observations	140,488	140,488	140,488	140,488	140,488	140,488	140,488

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 18. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	0.28**	0.30***	-0.05	0.31***	-0.15**	-0.32**	0.18	0.01
	(0.11)	(0.09)	(0.05)	(0.11)	(0.07)	(0.15)	(0.16)	(0.09)
Neighboring provinces	0.23***	0.23***	0.02	0.21**	-0.22***	-0.27***	0.00	-0.08**
	(0.08)	(0.08)	(0.07)	(0.08)	(0.06)	(0.09)	(0.03)	(0.04)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.13**	0.16**	0.01	0.13*	-0.22***	-0.27***	0.07	-0.05
	(0.06)	(0.06)	(0.05)	(0.07)	(0.03)	(0.10)	(0.05)	(0.04)
Samsung-invested province × having female 18-35	0.32***	0.30***	-0.11***	0.37***	0.14	-0.11	0.23	0.13
	(0.07)	(0.04)	(0.02)	(0.05)	(0.09)	(0.10)	(0.23)	(0.10)
Neighboring provinces	0.07	0.09	0.05	0.08*	-0.21***	-0.22***	-0.02	-0.12***
	(0.06)	(0.06)	(0.06)	(0.05)	(0.04)	(0.06)	(0.02)	(0.04)
Neighboring provinces × having female 18-35	0.35***	0.32***	-0.07***	0.27***	-0.02	-0.10	0.05	0.08*
	(0.08)	(0.08)	(0.02)	(0.08)	(0.07)	(0.08)	(0.04)	(0.04)
Sum of the first two coefficients	0.44	0.46	-0.10	0.50	-0.08	-0.38	0.30	0.08
P value	0.00	0.00	0.09	0.00	0.49	0.06	0.28	0.54
Sum of the last two coefficients	0.42	0.40	-0.02	0.35	-0.23	-0.32	0.03	-0.03
P value	0.00	0.00	0.81	0.00	0.01	0.01	0.58	0.51
Number of provinces	61	61	61	61	61	61	61	61
Number of years	9	9	9	9	9	9	9	9
Observations	140,488	140,488	140,488	140,488	140,488	140,488	140,488	140,488

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 19. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.02	0.01***	0.07**	0.02	0.07***	0.08	0.12	0.11***
	(0.01)	(0.00)	(0.03)	(0.02)	(0.02)	(0.05)	(0.11)	(0.04)
Neighboring provinces	0.02**	0.00	0.06***	0.02	0.06***	0.07***	0.09	0.07***
	(0.01)	(0.00)	(0.02)	(0.03)	(0.02)	(0.02)	(0.06)	(0.03)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.01**	0.00	0.07***	-0.00	0.06***	0.05*	0.12	0.12***
	(0.01)	(0.00)	(0.02)	(0.01)	(0.01)	(0.03)	(0.09)	(0.02)
Samsung-invested province × having female 18-35	0.02	0.01***	0.01	0.05	0.03**	0.06	0.00	-0.02
	(0.03)	(0.00)	(0.02)	(0.04)	(0.01)	(0.05)	(0.04)	(0.05)
Neighboring provinces	0.01	0.00	0.04**	0.02	0.06***	0.05***	0.07	0.06**
	(0.01)	(0.00)	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.03)
Neighboring provinces × having female 18-35	0.01	0.00**	0.04***	0.02	0.00	0.03	0.03	0.03
	(0.01)	(0.00)	(0.01)	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)
Sum of the first two coefficients	0.03	0.01	0.08	0.05	0.08	0.11	0.12	0.10
P value	0.29	0.00	0.06	0.18	0.00	0.12	0.33	0.09
Sum of the last two coefficients	0.03	0.00	0.08	0.03	0.06	0.09	0.10	0.09
P value	0.01	0.13	0.00	0.51	0.02	0.00	0.09	0.00
Number of provinces	61	61	61	61	61	61	61	61
Number of years	9	9	9	9	9	9	9	9
Observations	140,488	140,488	140,488	140,488	140,488	140,488	140,488	140,488

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

Appendix 2F: Main Tables (Standard Errors Clustered at Province-Year Level)

Table B 20. Number of HH Members Worked in the Past 12 Months

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.12**	0.16***	-0.03***	0.14***	-0.28***	-0.35***	0.05
	(0.05)	(0.05)	(0.01)	(0.03)	(0.08)	(0.08)	(0.06)
Neighboring provinces	0.10***	0.12***	-0.01*	0.10***	-0.17***	-0.20***	-0.01
	(0.03)	(0.03)	(0.01)	(0.02)	(0.03)	(0.03)	(0.02)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	0.02	0.06	-0.03***	0.04*	-0.22***	-0.28***	0.03
	(0.04)	(0.04)	(0.01)	(0.03)	(0.07)	(0.08)	(0.07)
Samsung-invested province × having female 18-35	0.20***	0.21***	-0.00	0.20***	-0.12***	-0.14*	0.05
	(0.04)	(0.04)	(0.01)	(0.04)	(0.04)	(0.08)	(0.05)
Neighboring provinces	0.02	0.04*	-0.02**	0.03*	-0.12***	-0.15***	0.00
	(0.02)	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)
Neighboring provinces × having female 18-35	0.18***	0.17***	0.01	0.15***	-0.11**	-0.10*	-0.02
	(0.04)	(0.04)	(0.01)	(0.02)	(0.05)	(0.05)	(0.02)
Sum of the first two coefficients	0.22	0.26	-0.04	0.25	-0.34	-0.43	0.08
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Sum of the last two coefficients	0.20	0.21	-0.01	0.18	-0.23	-0.25	-0.02
P value	0.00	0.00	0.46	0.00	0.00	0.00	0.49
Control mean	0.45	0.40	0.05	0.03	2.11	1.58	0.53
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: Standard error clustered at province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01.*

Table B 21. Number of Hours HH Members Worked in the Past Month

	Number of hours HH members worked in the past month for						
	Formal Job				Informal Job		
	Total	Primary job	Second job	Foreign firms	Total	Primary Job	Second job
Panel A. Basic Regressions							
Samsung-invested provinces	0.16	0.18	-0.19*	0.60***	-0.35***	-0.29***	-0.61***
	(0.16)	(0.16)	(0.11)	(0.11)	(0.10)	(0.10)	(0.19)
Neighboring provinces	0.31***	0.32***	-0.02	0.44***	-0.23***	-0.22***	-0.24*
	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)	(0.06)	(0.12)
Panel B. Heterogeneity for Households with Female Members of Age 18-35							
Samsung-invested provinces	-0.09	-0.07	-0.24**	0.23**	-0.40***	-0.35***	-0.53***
	(0.14)	(0.14)	(0.11)	(0.11)	(0.09)	(0.09)	(0.18)
Samsung-invested provinces × having female 18-35	0.51***	0.52***	0.10	0.78***	0.10	0.11*	-0.17
	(0.13)	(0.13)	(0.09)	(0.14)	(0.07)	(0.07)	(0.13)
Neighboring provinces	0.10	0.11	-0.02	0.16**	-0.17***	-0.15***	-0.18
	(0.09)	(0.09)	(0.08)	(0.07)	(0.06)	(0.05)	(0.12)
Neighboring provinces × having female 18-35	0.47***	0.47***	0.00	0.62***	-0.14	-0.13	-0.14
	(0.11)	(0.11)	(0.06)	(0.08)	(0.09)	(0.09)	(0.09)
Sum of the first two coefficients	0.42	0.45	-0.14	1.01	-0.29	-0.24	-0.70
P value	0.05	0.03	0.24	0.00	0.02	0.04	0.00
Sum of the last two coefficients	0.57	0.58	-0.02	0.78	-0.31	-0.29	-0.32
P value	0.00	0.00	0.83	0.00	0.00	0.00	0.03
Number of provinces	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are the total number of hours household members worked for the past 30 days, all in log form*

Table B 22. Household's Real Income in the Past 12 Months

	HH's real income past 12 months (Million VND)							
	Formal Job				Informal Job			Total Income
	Total	Primary Job	Second Job	Foreign Firms	Total	Agriculture	Production	
Panel A. Basic Regressions								
Samsung-invested provinces	0.31***	0.33***	-0.09**	0.36***	-0.15**	-0.32***	0.19*	0.05
	(0.10)	(0.10)	(0.04)	(0.07)	(0.06)	(0.10)	(0.12)	(0.05)
Neighboring provinces	0.26***	0.26***	-0.02	0.25***	-0.21***	-0.26***	0.01	-0.04
	(0.05)	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.03)	(0.03)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested provinces	0.13	0.16*	-0.04	0.15**	-0.21***	-0.26***	0.08	-0.02
	(0.08)	(0.08)	(0.04)	(0.06)	(0.07)	(0.09)	(0.11)	(0.05)
Samsung-invested provinces × having female 18-35	0.37***	0.36***	-0.11***	0.44***	0.12**	-0.13	0.23	0.15***
	(0.09)	(0.07)	(0.03)	(0.08)	(0.06)	(0.08)	(0.14)	(0.05)
Neighboring provinces	0.08*	0.09**	0.01	0.09**	-0.19***	-0.21***	-0.01	-0.09***
	(0.04)	(0.05)	(0.03)	(0.04)	(0.04)	(0.05)	(0.03)	(0.04)
Neighboring provinces × having female 18-35	0.40***	0.37***	-0.07***	0.34***	-0.04	-0.12**	0.05	0.11***
	(0.07)	(0.07)	(0.02)	(0.05)	(0.06)	(0.06)	(0.04)	(0.04)
Sum of the first two coefficients	0.50	0.52	-0.14	0.59	-0.08	-0.39	0.31	0.13
P value	0.00	0.00	0.00	0.00	0.23	0.00	0.04	0.05
Sum of the last two coefficients	0.48	0.46	-0.06	0.44	-0.23	-0.33	0.03	0.01
P value	0.00	0.00	0.09	0.00	0.00	0.00	0.46	0.71
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

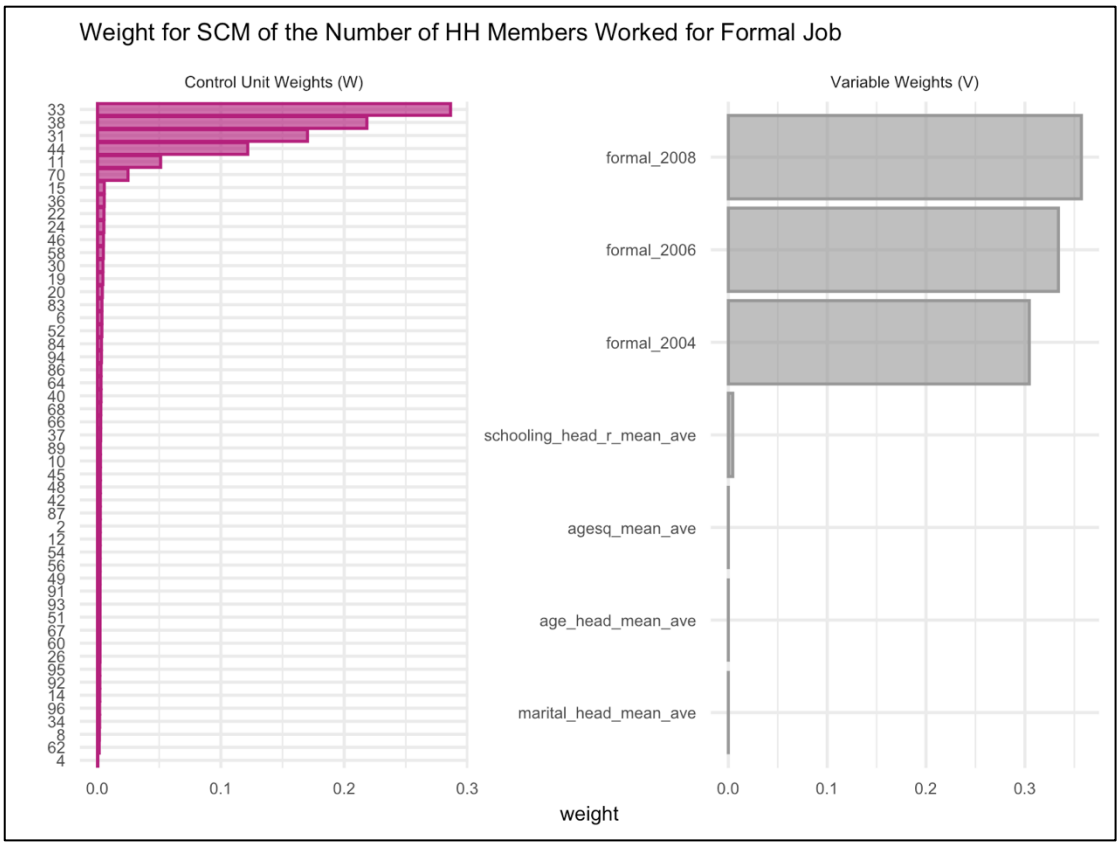
*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Income values are deflated by the national consumer price index (CPI) (base year is 2000).*

Table B 23. Household's Real Expenditure

	Household's real expenditure (Million VND)							
	Past 30 days		Past 12 months					Total
	Daily foods	Holiday foods	Health	Education	Housing	Other	Durables	
Panel A. Basic Regressions								
Samsung-invested provinces	0.02	0.01*	0.07***	0.02	0.09**	0.08*	0.09	0.10**
	(0.02)	(0.00)	(0.02)	(0.03)	(0.03)	(0.05)	(0.07)	(0.05)
Neighboring provinces	0.02*	0.00	0.06***	0.02	0.07***	0.07***	0.05	0.06***
	(0.01)	(0.00)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Panel B. Heterogeneity for Households with Female Members of Age 18-35								
Samsung-invested province	0.01	0.00	0.07**	-0.00	0.07*	0.05	0.09	0.11**
	(0.03)	(0.00)	(0.03)	(0.03)	(0.04)	(0.05)	(0.06)	(0.05)
Samsung-invested province × having female 18-35	0.02	0.01**	0.00	0.05	0.03	0.07*	0.00	-0.02
	(0.02)	(0.00)	(0.02)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Neighboring provinces	0.01	0.00	0.04**	0.01	0.07***	0.05**	0.04	0.05**
	(0.01)	(0.00)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Neighboring provinces × having female 18-35	0.01	0.00*	0.03**	0.02	0.01	0.04**	0.03	0.03*
	(0.01)	(0.00)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)
Sum of the first two coefficients	0.03	0.01	0.07	0.04	0.10	0.12	0.09	0.09
P value	0.22	0.02	0.00	0.24	0.01	0.02	0.28	0.10
Sum of the last two coefficients	0.03	0.00	0.07	0.03	0.08	0.09	0.06	0.07
P value	0.01	0.21	0.00	0.26	0.00	0.00	0.07	0.00
Number of provinces	52	52	52	52	52	52	52	52
Number of years	9	9	9	9	9	9	9	9
Observations	118,577	118,577	118,577	118,577	118,577	118,577	118,577	118,577

*Note: The standard error is clustered at the province level in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Dependent variables are in log form. Expenditure values are deflated by the national consumer price index (CPI) (base year is 2000).*

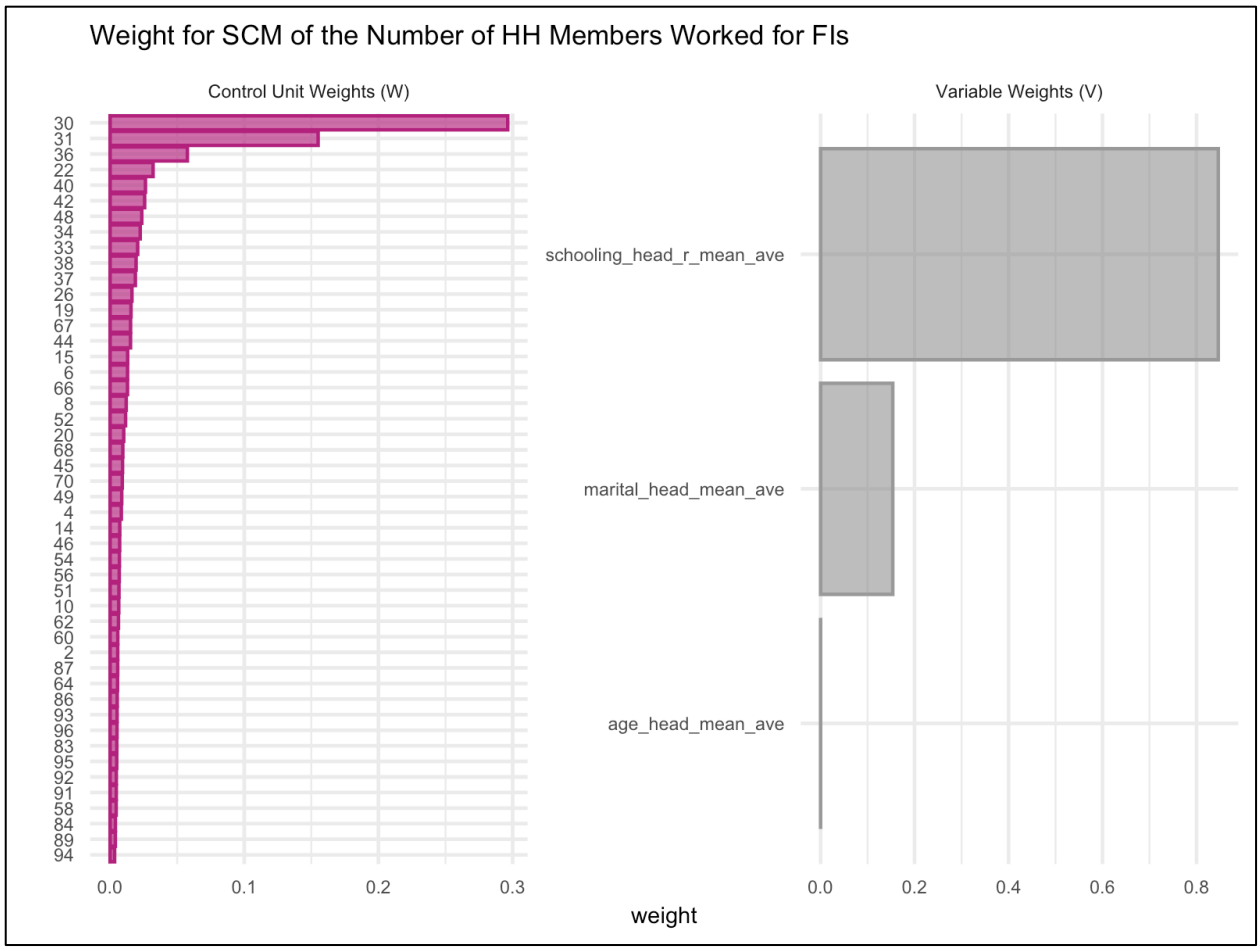
Figure B 1. Weight and Placebo Test for Synthetic Control Method Analysis of the Number of HH Members Worked for Formal Job of Bac Ninh



Placebo Test

Province	Type	Pre_Mspe	Post_Mspe	Mspe_Ratio	Rank	Fishers_Exact_Pvalue	Z_Score
Bac Ninh	Treated	0.000	0.015	18602.211	1	0.019	6.5523210
Lam Dong	Donor	0.000	0.068	7401.838	2	0.038	2.4848755
Hai Phong	Donor	0.000	0.019	388.304	3	0.077	-0.0621085
Quang Tri	Donor	0.000	0.030	298.105	4	0.096	-0.0948645
Phu Yen	Donor	0.001	0.063	123.582	5	0.115	-0.1582429

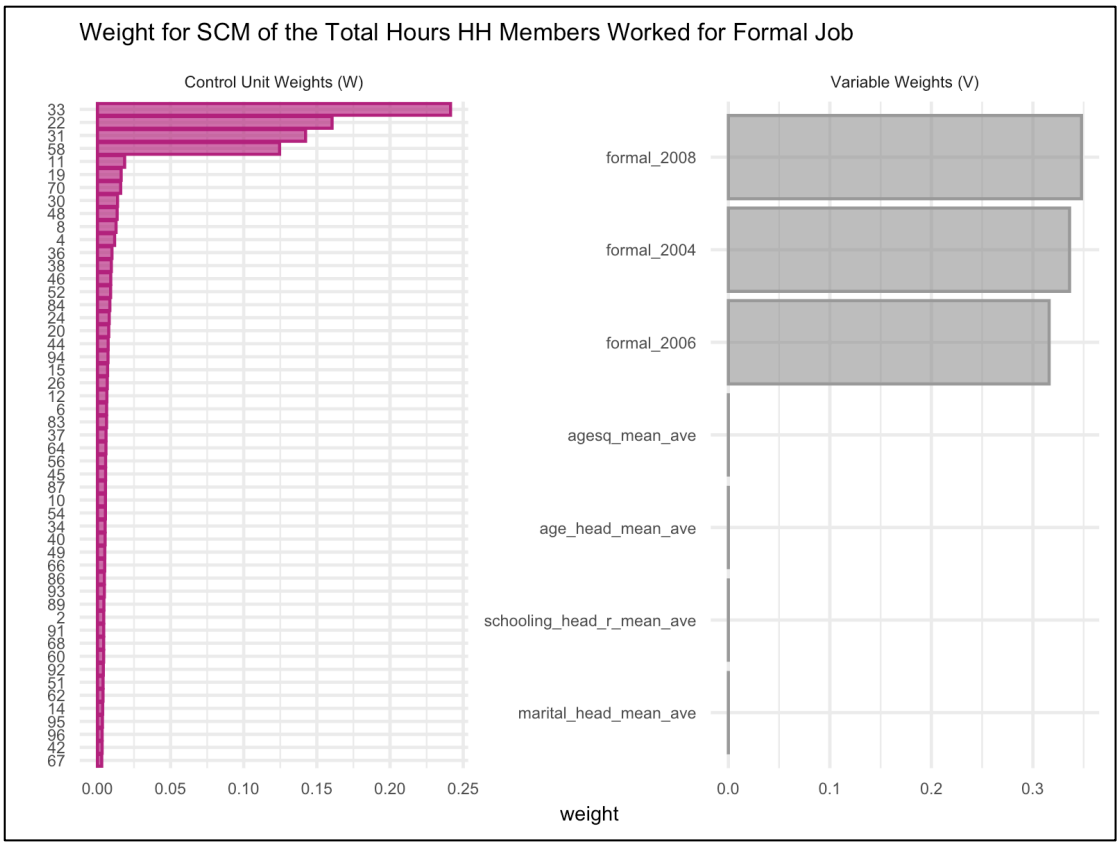
Figure B 2. Weight and Placebo Test for Synthetic Control Method Analysis of the Number of HH Members Work for Foreign Firms of Bac Ninh



Placebo test

Province	Type	Pre_Mspe	Post_Mspe	Mspe_Ratio	Rank	Fishers_Exact_Pvalue	Z_Score
Bac Ninh	Treated	0	0.010	4.618393e+09	1	0.019	7.0724275
Cao Bang	Donor	0	0.023	1.266078e+03	2	0.038	-0.1386732
Nghe An	Donor	0	0.005	6.522580e+02	3	0.058	-0.1386742
Vinh Long	Donor	0	0.010	5.565150e+02	4	0.077	-0.1386743
Khanh Hoa	Donor	0	0.017	4.063630e+02	5	0.096	-0.1386746

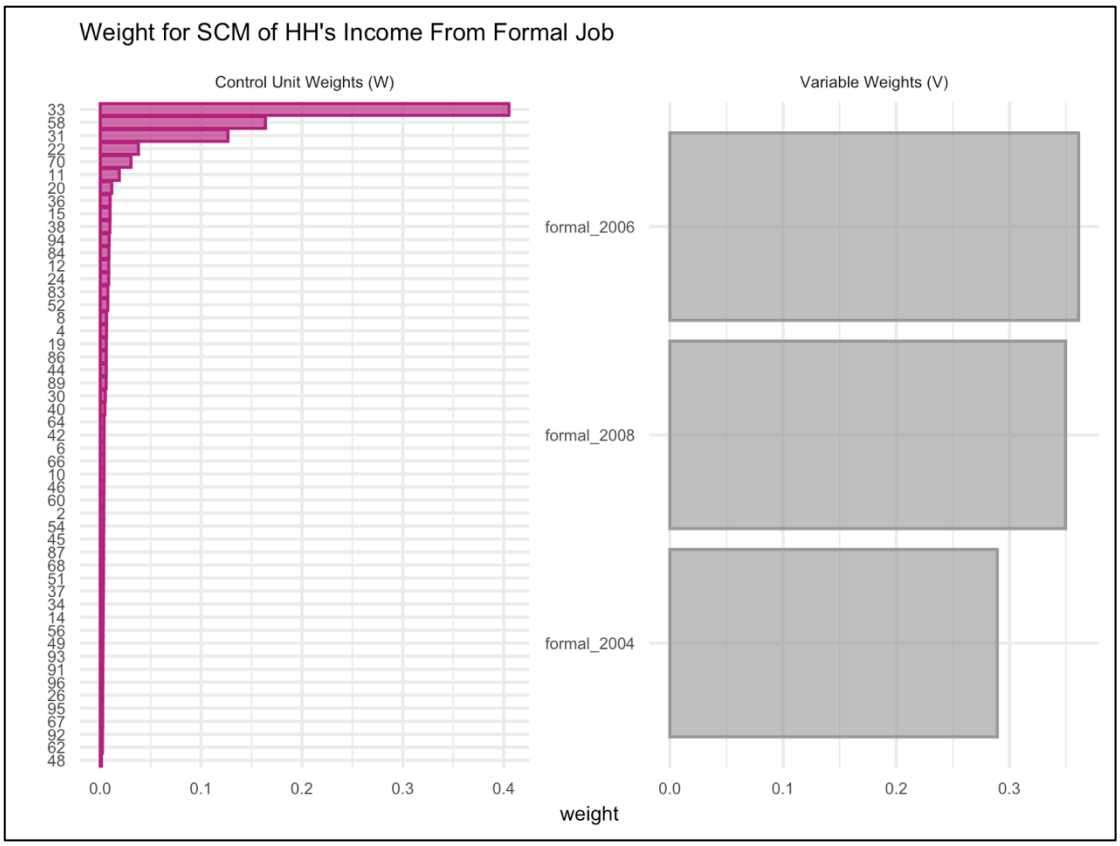
Figure B 3. Weight and Placebo Test for Synthetic Control Method Analysis of Total Working Hours for Formal Job of Bac Ninh



Placebo Test

Province	Type	Pre_Mspe	Post_Mspe	Mspe_Ratio	Rank	Fishers_Exact_Pvalue	Z_Score
Bac Ninh	Treated	0	0.028	1.159592e+13	1	0.019	7.0020600
Dong Thap	Donor	0	0.007	1.526366e+12	2	0.038	0.7774968
Lam Dong	Donor	0	0.007	7.965953e+10	4	0.077	-0.1167945
Khanh Hoa	Donor	0	0.020	5.750513e+10	5	0.096	-0.1304894
Thua Thien Hue	Donor	0	0.008	4.108155e+10	6	0.115	-0.1406418

Figure B 4. Weight and Placebo Test for Synthetic Control Method Analysis of HH's Income from Formal Job of Bac Ninh

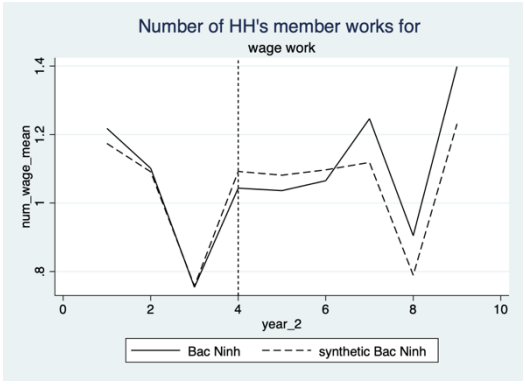


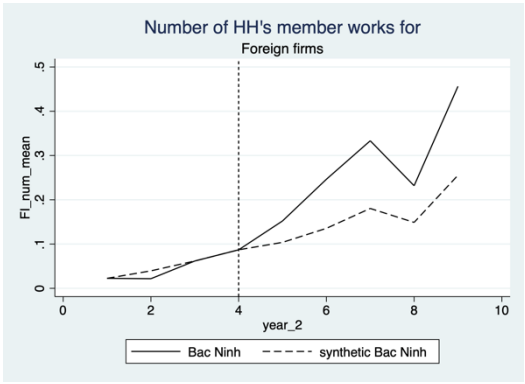
Placebo Test

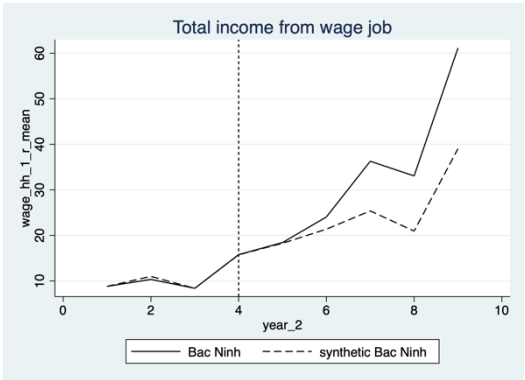
Province	Type	Pre_Mspe	Post_Mspe	Mspe_Ratio	Rank	Fishers_Exact_Pvalue	Z_Score
Bac Ninh	Treated	0	0.208	3.539487e+12	1	0.019	5.6426584
Bac Giang	Donor	0	0.143	2.531696e+12	2	0.038	3.9680586
Dong Nai	Donor	0	0.006	6.487853e+11	3	0.058	0.8393130
Ninh Binh	Donor	0	0.046	3.994659e+11	4	0.077	0.4250304
An Giang	Donor	0	0.035	1.116496e+11	5	0.096	-0.0532206

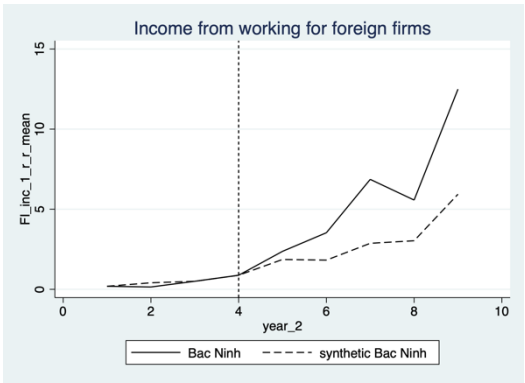
Figure B 5. Additional SCM Analysis for the Number of HH Members Working and HH's Income for Bac Ninh and Thai Nguyen

Bac Ninh

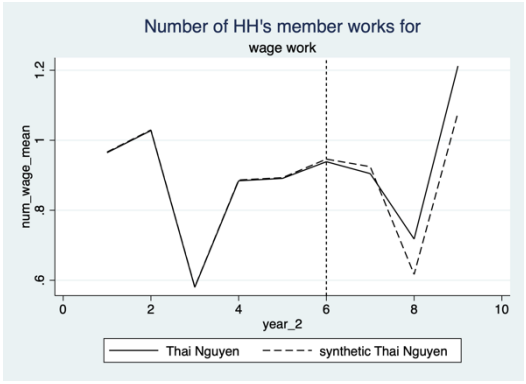


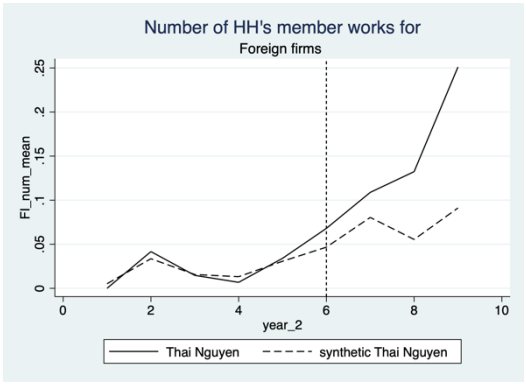


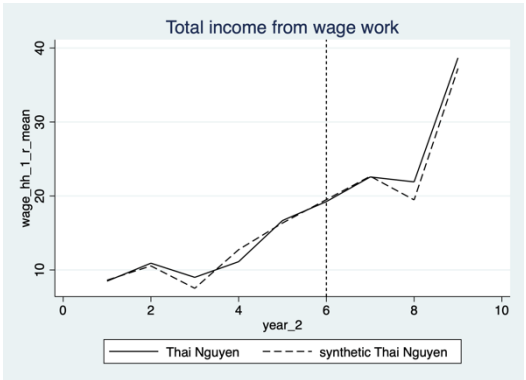




Thai Nguyen







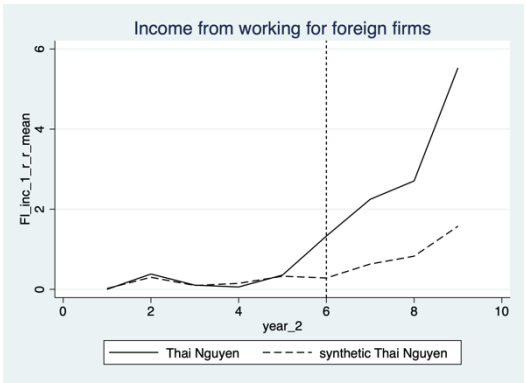


Table B 24. Samsung Electronics Vietnam Thai Nguyen (SEVT)'S Recruitment Announcement

Thông báo mới

Gửi Email | In trang | Lưu | Chia sẻ 0

CÔNG TY SAMSUNG THÁI NGUYÊN TUYỂN LAO ĐỘNG NỮ PHỔ THÔNG

04/11/2014 11:00

Trung tâm Dịch vụ việc làm tỉnh Hà Giang phối hợp với Công ty TNHH Samsung Electronics Việt Nam, có địa chỉ tại: Khu công nghiệp Yên Bình I - Đồng Tiến - Phổ Yên - Thái Nguyên tuyển dụng lao động nữ làm việc tại các dây chuyền chuyên sản xuất, lắp ráp linh kiện điện tử, điện thoại di động, cụ thể như sau:

1. Vị trí tuyển dụng: Công nhân.
2. Đối tượng tuyển: Lao động nữ; độ tuổi từ 18 - 35.
Trình độ văn hóa: Tốt nghiệp THPT (trong vòng 13 năm, từ năm 2002 - 2014).
3. Mô tả công việc: Sản xuất, lắp ráp linh kiện điện tử, điện thoại di động.
4. Chỗ ăn, ở: Công ty có ký túc xá, được trang bị đầy đủ tiện nghi cho lao động ở tỉnh xa. Miễn phí ăn ca tại Công ty.
5. Chế độ:
- Thu nhập = Lương cơ bản + Phụ cấp + Lương làm thêm giờ.
- Thu nhập thực tế: 6.500.000 vnđ/tháng.
- Thưởng tết: 100% lương cơ bản.
- Thưởng năng xuất: 02 lần/năm (100% - 150% lương cơ bản/lần).

6. Hồ sơ gồm có:
- Bản sao chứng minh thư công chứng: 03 bản.
- Giấy khai sinh bản sao công chứng: 02 bản.
- Sơ yếu lý lịch có dán ảnh, dấu giáp lai: 01 bản.
- Bản sao hộ khẩu công chứng: 01 bản.
- Bản sao bằng tốt nghiệp cấp 3: 02 bản.
- Ảnh thẻ kích thước 3x4: 04 ảnh.
- Đơn xin việc theo mẫu của Samsung (nhận khi nộp hồ sơ).

7. Địa điểm, thời gian: Địa điểm, ngày, giờ phỏng vấn, cách làm hồ sơ liên hệ trực tiếp với Trung tâm Dịch vụ việc làm tỉnh Hà Giang.
*** Chi tiết liên hệ tại:** Trung tâm Dịch vụ việc làm tỉnh Hà Giang.
Địa chỉ: Số 224, Tổ 13, phường Nguyễn Trãi, TP Hà Giang, tỉnh Hà Giang.
Điện thoại: (0219) 3 864.387 - 0913.299.775 (A.Trường), 0987.621.888 (C.Vân).
Website: www.vieclamhagiang.vn hoặc www.vlhagiang.vieclamvietnam.gov.vn
Ghi chú: *Trung tâm không thu bất kỳ một khoản phí nào của người lao động.*

Ngọc Duy-Trung tâm DVVL

Appendix C

Appendix Chapter 3

Table C 1. Distribution of Firm Age and Firm Size

Firm age	Average firm size								
	1-4	5-9	10-19	20-49	50-99	100-249	250-499	>=500	**Total**
0	12.55	6.35	2.42	0.97	0.26	0.15	0.04	0.03	**22.78**
1-2	15.69	8.75	3.72	1.70	0.46	0.28	0.09	0.10	**30.80**
3-5	9.20	6.22	3.50	1.99	0.56	0.34	0.10	0.11	**22.03**
6-9	4.69	3.56	2.52	1.83	0.62	0.41	0.14	0.13	**13.90**
1-=13	1.67	1.28	1.08	0.97	0.41	0.30	0.12	0.13	**5.96**
14-17	0.70	0.48	0.41	0.43	0.23	0.19	0.08	0.10	**2.61**
18-21	0.26	0.15	0.12	0.15	0.09	0.09	0.04	0.06	**0.95**
>21	0.15	0.09	0.09	0.14	0.12	0.17	0.10	0.13	**0.98**
	Base year size								
0	12.55	6.35	2.42	0.97	0.26	0.15	0.04	0.03	**22.78**
1-2	15.33	9.09	3.81	1.70	0.45	0.27	0.08	0.06	**30.80**
3-5	8.66	6.62	3.61	2.05	0.56	0.34	0.10	0.09	**22.03**
6-9	4.28	3.79	2.62	1.90	0.64	0.41	0.14	0.12	**13.90**
1-=13	1.50	1.36	1.12	1.01	0.42	0.30	0.12	0.12	**5.96**
14-17	0.63	0.51	0.43	0.44	0.23	0.19	0.08	0.10	**2.61**
18-21	0.24	0.16	0.13	0.15	0.09	0.09	0.04	0.06	**0.95**
>21	0.14	0.09	0.09	0.14	0.12	0.17	0.10	0.13	**0.98**
Total	**43.33**	**27.97**	**14.22**	**8.36**	**2.79**	**1.92**	**0.71**	**0.70**	**100**

Table C 2. Female to Male Labor Ratio by Industry

Industry	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Agriculture, forestry and fishing	0.58	0.52	0.28	0.42	0.42	0.46	0.36	0.38	0.38	0.53	0.58	0.58	0.54
Mining and quarrying	0.42	0.38	0.32	0.34	0.36	0.41	0.37	0.35	0.37	0.36	0.43	0.40	0.37
Manufacturing	1.50	1.44	1.30	1.64	1.21	1.34	1.16	1.11	1.10	1.12	1.22	1.14	0.98
Wholesale and retail trade; repair of motorbiked	0.73	0.79	0.70	0.79	0.72	0.89	0.71	0.69	0.68	0.75	0.89	0.83	0.80
Transportation and storage	0.39	0.44	0.41	0.45	0.46	0.59	0.44	0.43	0.42	0.48	0.60	0.59	0.56
Accomodation and food service activities	1.77	1.81	1.75	1.73	1.63	1.68	1.65	1.60	1.53	1.54	1.54	1.41	1.34
Information and telecommunication; Finan	0.71	0.89	0.70	0.79	0.75	0.81	0.80	0.77	0.73	0.67	0.78	0.69	0.68
Education, health, arts & entertainment	1.59	1.70	1.57	2.01	1.63	1.78	1.62	1.52	1.45	1.77	1.86	1.60	1.56
Others	0.86	0.88	0.73	0.84	0.77	0.90	0.75	0.66	0.65	0.77	0.88	0.81	0.79

Figure C 1. Number of Jobs Created by Ownership

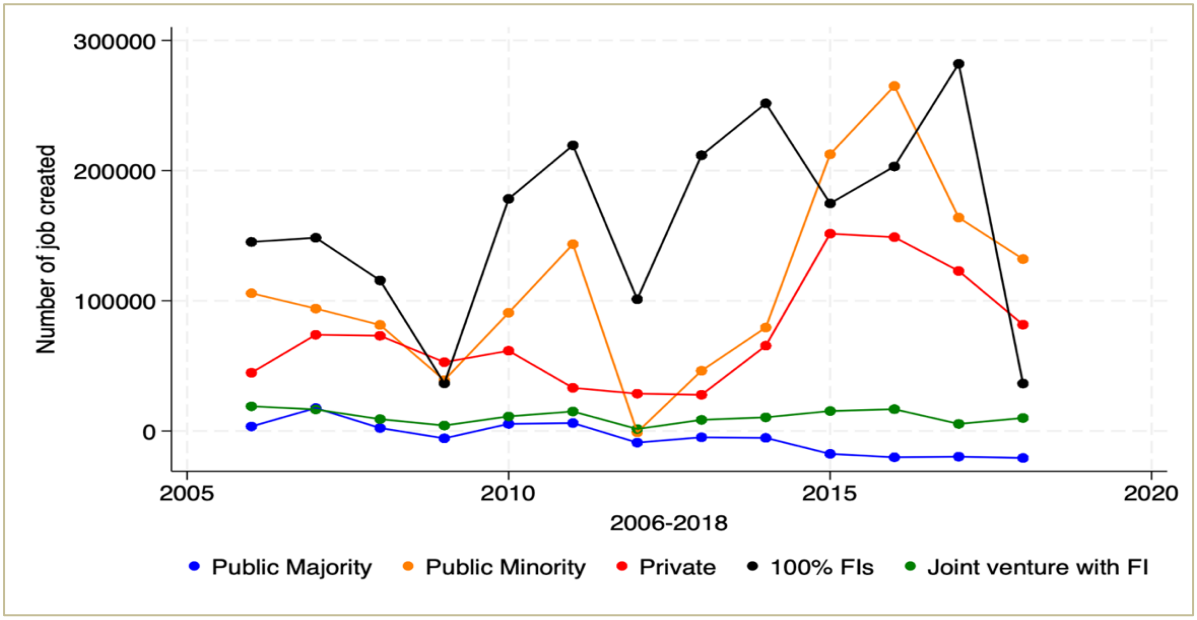
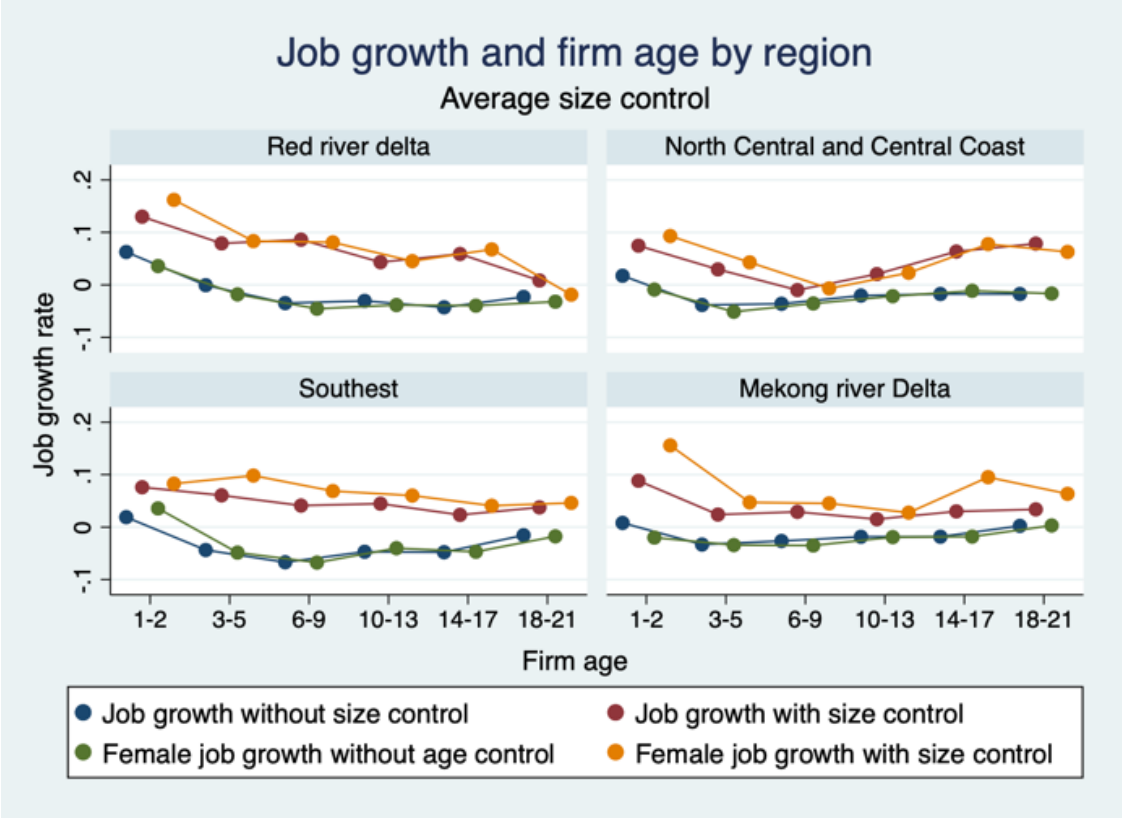


Figure C 2. Job Growth Rate and Firm Age by Regions



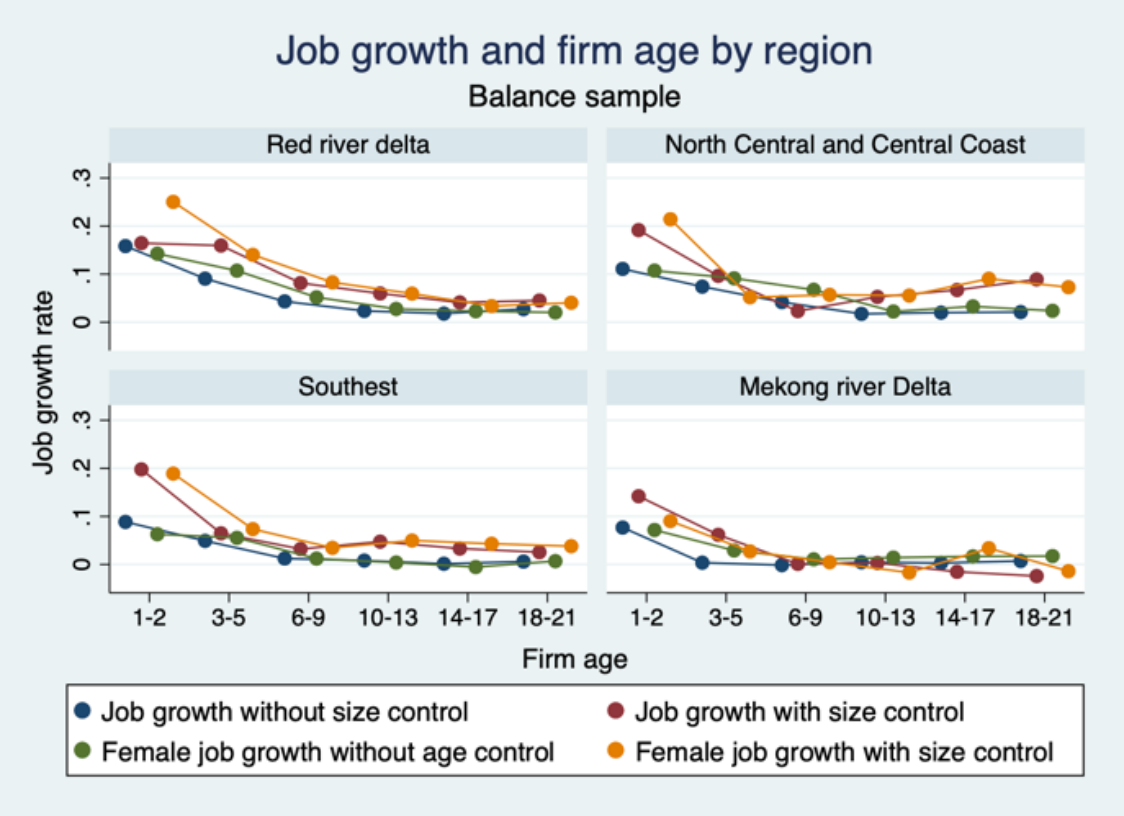


Figure C 3. Job Growth Rate and Firm Age by Ownership – Full Sample

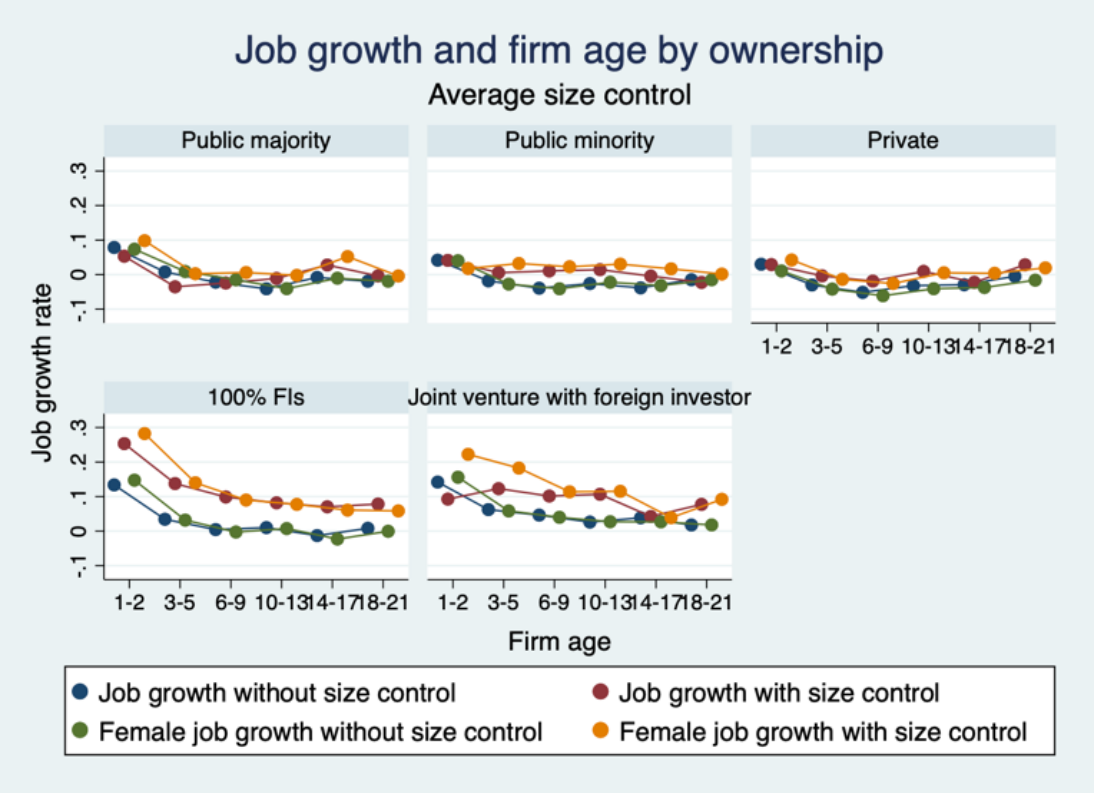
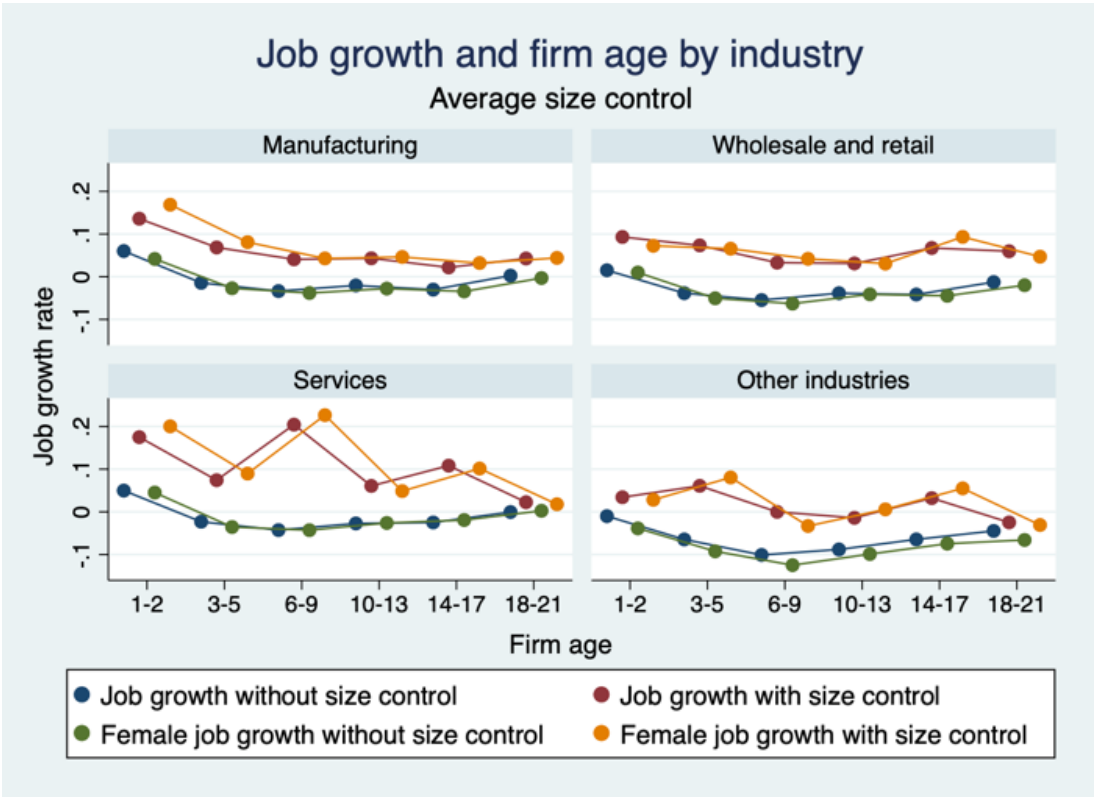



Figure C 4. Job growth rate and firm age by industry – Full sample