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Female Labor Supply Shocks in the United States: Southeast Asian Women's Impact on the US Female Labor Supply

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Abstract

Women in the workforce may be impacted by an increase in the influx of immigrants. This paper examines whether the migration of East Asian women affects the female labor supply of US women. Using the Current Population Survey (CPS) data from 1990-2018, this paper explores the geographic variations of labor supply shocks induced by East Asian women and studies the impacts on various labor market outcomes of native women across the United States. The paper finds that the highly skilled East Asian women are underemployed in low ranked occupations. The panel regression with state and year fixed results find that the data continues to reflect signs of the substitution effect between native workers and East Asian women in high skilled occupations.

1. Introduction

Developing countries create some of the greatest migration of people. In the United States female immigrants are largely responsible for helping high skilled women return to the workforce. Female immigrants often specialize in household careers such as cleaning and childcare. Women who have many household chores are less likely to return to work once they have had children. This decreases the supply of women that can work. This research aims to understand the relationship between East Asian women and the labor supply of US women. There is reason to believe that women are more likely to return to work if they have help at home, meaning there would be a positive connection between the two. Both the intensive and the extensive margin will be examined. The intensive margin will be dependent on hours worked, and the extensive margin will define the employment status. The results of this study will contribute to better understanding the female labor supply.

2. Background and literature

Barone and Mocetti help the reader understand the theoretical discussion behind low skilled immigrants, and their impact on the female labor supply during and before 2011. Their research focuses on women who work specifically in household production, and how that impacts the labor supply for Italian women. The contribution of this paper is examining how the highly skilled women who have a higher time opportunity cost can benefit. Researchers use two factors to determine the impact of migrant workers in terms of substitution and complements in production careers. To support the evidence, Barone and Mocetti used two topics to contribute. With all this in mind they also consider the alternative, meaning that natives may be substituted by immigrants in household production which could influence labor supply. The second supporting source deals with incentives and constraints in the labor market. Here the prices of services for children and families were examined. Another variable considered is care for the elderly. Barone and Mocetti found through empirical evidence that there is a positive relationship between attending school and

participating in the labor market. They also found that women with children of certain ages can change how a woman participates in the market supply. This also changes the outcome of the impact immigrants have due to women with children of certain ages returning to work or staying home. The study found that immigration does not directly affect the labor force of Italian women. Research states that there is minimal positive feedback on women in the workforce with education. This relationship gets stronger if the female specializes in a certain area. In the end, the research came to show that the higher number of immigrants you have in a household career, helps the native female have the freedom to be at work. The study shows that women in the labor market need substitutes for themselves rather than a compliment, so they can be at work. Baron and Mocetti also found specialized immigrants had a larger impact than those who are not specialized. In the end, the research shows there are some positive correlations that would need to be researched greater to help remove counterfactuals to the research question and help researchers greater understand the female labor market. Similarities between this study and the study of this paper complement the results showing a strong presence of the substitution effect.

Cortes and Tessada examine the impact low skilled immigration has on the female labor supply. A few ways they dive into the research are first through a time use variable. They use a time use variable to show the relationships between wage levels, decision to purchase household help, and the market price of household services in the labor supply. Second, they look at if women with more home tasks have a different reaction to prices, and how their careers can impact their decision. This variable is helpful to explain factors that go into a woman's decision to return to work. A woman could be sensitive to price changes depending on how much money she makes or how many children she cares for. Both above variables help the researchers determine what kind of groups or populations of people are more likely to change their time use variables, depending on these factors. Based on these variables they found that low skilled immigration into the US can generate effects on the labor supply of natives. Some of these decisions that impact this are women who are high skilled workers are now able to choose labor supply profiles that they could not afford before. The researchers argued that a simple model that describes the time use variable shows that lowering prices of services that are close substitutes of home production helps increase the labor supply of high skilled working women. This is so women can now afford help around the house and be able to return to work. In closing, the study found that the labor supply for women can depend on a few factors. They use time, market price and immigration numbers to determine how there can be a greater supply of women in the labor market. Women that are highly skilled are more likely to return to work if there is a higher supply of immigrants that can take over their household chores. This paper contributes to this literature by defining how the stated household careers can also impact the female labor supply. This paper differs in which origin of women is being researched as this paper is examining Southeast Asian women with the native women.

3. Data and Descriptive Statistics

To properly research the female labor market, the research starts by isolating the female labor supply. To do this a data set was selected that gave the research the flexibility to control for age, gender, household size, hours worked, wage, education, and employment status. A research file created by David Dorn was used to define occupational grouping data. These occupational groups are separated by low-ranked occupations and high skilled occupations. The low skilled service occupations include the industries such as, food, beauty, household work and childcare. The non-service occupations that are considered highly skilled occupations conclude data on, executives, management positions, sales and more. In this portion of the research data was collected for native women and SEA women separately. This was done to better understand the employment level for natives and SEA women to better examine their relationship to each other. For the regression analysis the research controlled for a few different variables. First the research started off by controlling for employment status. For all the regressions each equation controlled for SEA state share, age, education, household size, occupation, and skill level. For each control three regressions were run. The first regression included the skilled margin while the second was unskilled and the third does not control for skill level.

Looking into the descriptive statistics with data from the Current Population Survey (CPS) includes more countries in the SEA share. The countries include Nepal, Sri Lanka, India, Pakistan, and Bangladesh in addition to the other Southeast Asian countries. A major difference that has been seen in the statistics is India's contribution to the data. The data has found that India's high skilled workers drive the education results for college degrees. The data showed that 37% of Indian women have bachelor's degrees. Finding these results created a need to see how Indian women may be impacting the labor force. Occupational groups were created and divided into a low skilled group and high skilled group. These groups defined the share of native and SEA women per occupation and by employed or

unemployed. occupational groups to examine the impact these women have on female native workers. Once this variable is defined, the skilled and unskilled worker will be divided and compare their results through a scatter plot.

Native workers are represented at large in the occupational grouping operator in the high skilled category. The chart below describes each occupational group broken down into an employed and unemployed statistic. The research so far shows a trend in high unemployment for women qualified for these occupations. Native women are underemployed due to the competition with SEA women. This is an example of how the data starts to see how the substitution effect is applied to the job market. This statistic helps to understand that SEA women and Native women do not have a complementary relationship in the high skilled occupations. This could confirm research that claims women are less likely to return to work after having children. The substitution effect is how this becomes possible but is only seen in a complimentary way when discussing a relationship between a low skilled and high skilled worker.

Chart 1. Occupational Grouping Categories

Occupational Grouping Abbreviations	Description
Operator	Machine Operators & Assemblers
Tech	Technology Careers
Firepol	Firefighters & Police
Cleric	Retail Sales
Exec	Executives
Farmer	Farmers
Retsales	Retail Sales
Finsales	Finance
Mining	Mining
Prof	Professionals
Mechanic	Mechanics
Constr	Construction
Product	Production
Mgmtrel	Management
Transp	Transportation
Otheragr	Other
Janitor	Janitor
Protect	Protection Careers
Food	Food Industry
Guard	Guard
Clean	Cleaning Industry
Beauty	Beauty Industry
Shealth	Health Careers
Child	Child Care
Othpers	Other
Recreation	Recreation

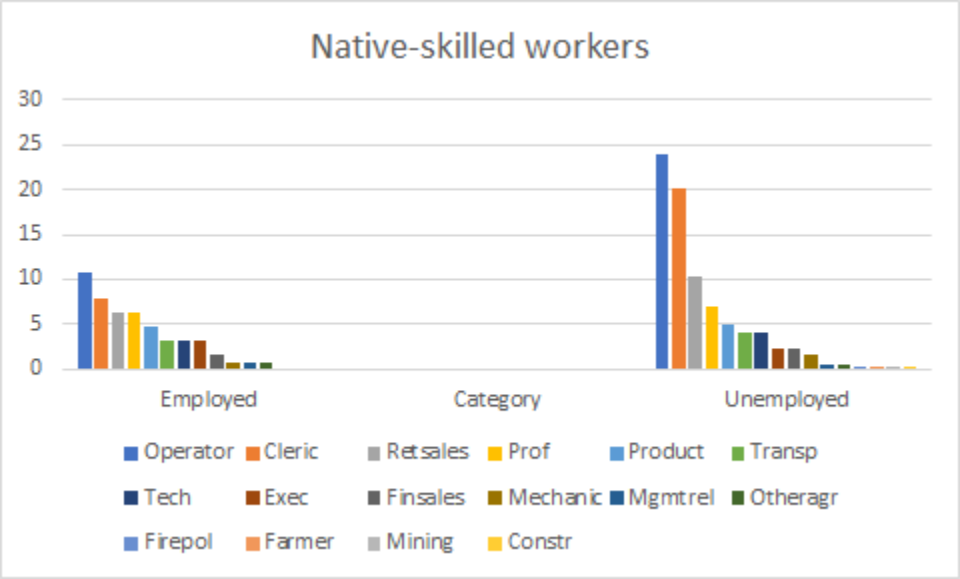

Figure 1. Native-skilled workers occupational grouping statistics for Employed Vs. Unemployed

Native women have been examined in the low ranked service occupations below. In these results the data shows that the occupational grouping for janitor obtains the highest share of native low skilled working women. Following this the food industry has the second highest share. In both groups most of the share is employed. From this chart it can be understood that natives in low skilled occupations are more likely to be employed than women in the higher ranked occupations. This could be due to the lack of supply of women in the workforce as well as the competition with men and less high skilled jobs being offered to women. Therefore, there is higher unemployment in the higher skilled occupations.

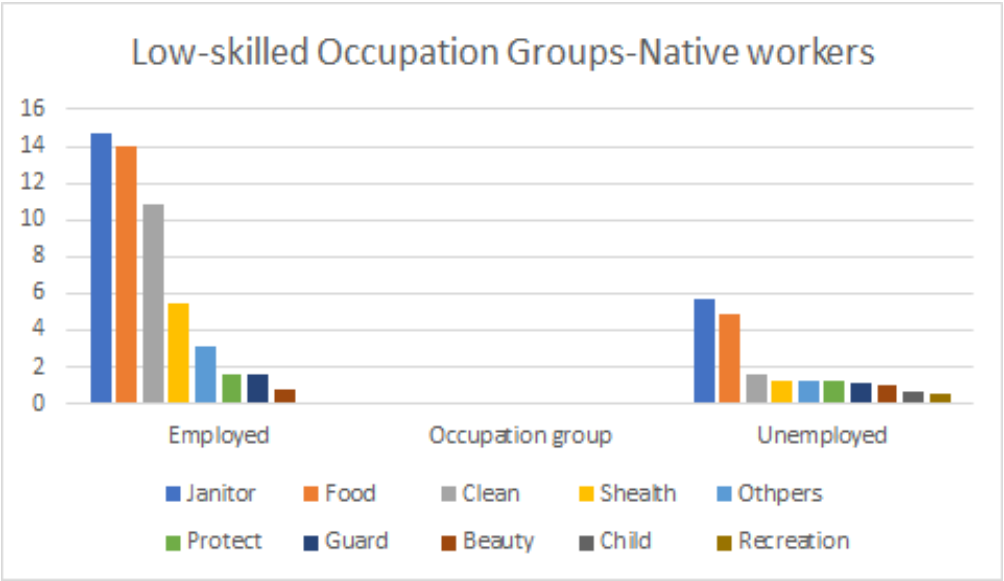

Figure 2. Native Women's Low-skilled Occupation Groups Employed Vs. Unemployed

In the occupational groups of low skilled SEA women, the greatest share is represented in the occupational group food. The data also shows that this group is not underemployed in this occupation due to the employment category having higher statistics. This cannot be said for some of the other occupations as shown in figure 2 that the beauty industry is underemployed. Prof is the highest occupational group in both employed and unemployed for the SEA share of women. In this occupational grouping the data shows that some careers have the same share in both employed and unemployed women.

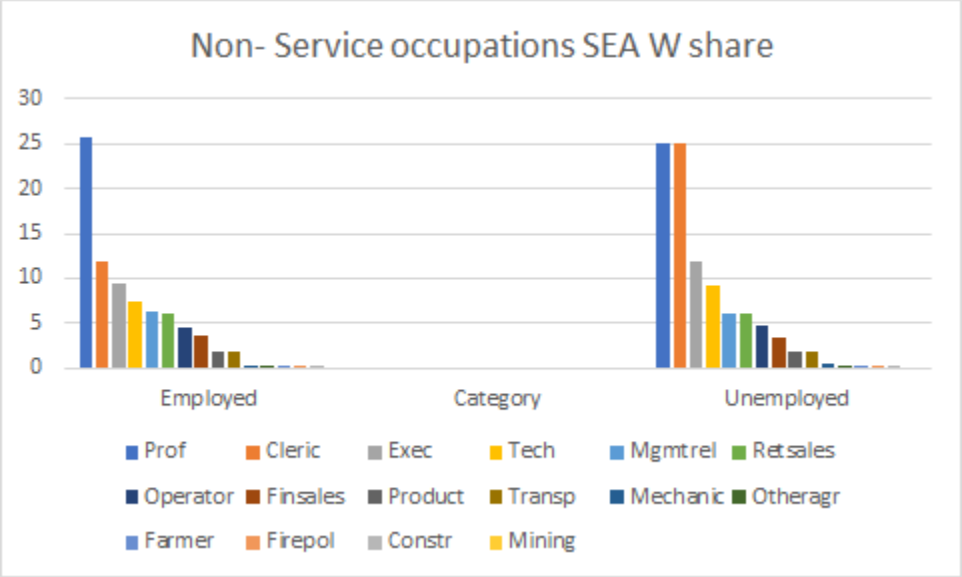

Figure 3. SEA Women's Skilled Workers Occupational Grouping Statistics for Employed Vs. Unemployed

Figure 3 demonstrates the high skilled service occupations for SEA women. This data shows that the occupational grouping Prof has the highest share of employment. Following this group, the next occupational grouping cleric shows a high unemployment rate. These groups define the women in high skilled careers. Overall, the data shows that employment and unemployment are even between SEA women in high skilled careers.

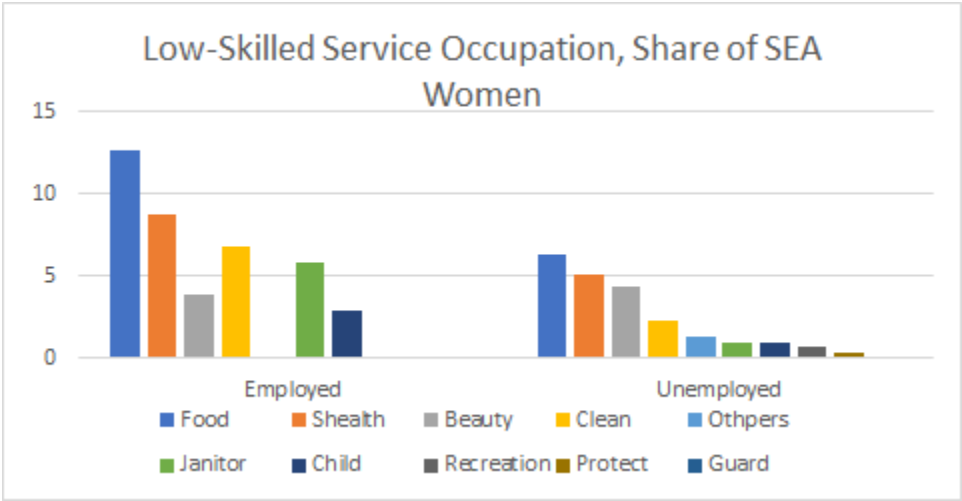

Figure 4. SEA Women's Low-skilled Occupation Groups Employed Vs. Unemployed

In the low skilled service occupations for SEA women, the results above show that the food industry dominates the low skilled service occupations for this group of women. The data shows that for the most part Women in this area have a high employment status and have a lower unemployment rate in these occupations. The data shows that the beauty industry may be the exception to this claim due to the unemployment rate being higher than the employment rate. There is a high share of women skilled in this occupation so this may be a result of supply and demand in the market.

4. Empirical Strategy

To identify the impact of immigrant women from Southeast Asia on native women, this paper explores the geographic variation across states. The regression model used defines many variables such as, household size, hours worked, income wage, employment status, year, age, and location. This list of variables helped the research to become more focused and come to a better understanding of the data. The first regression equation used is as follows:

$$y_{st}^{\square} = \beta_0 + \beta_1 SEA_{st} + X_{st}\gamma + \alpha_s + f_t + \epsilon_{st}$$

Chart 2. Regression Model Variables

Regression Variables	Description
s	States
t	Calendar Year
y	Outcome Variable
SEA	Share of Asian Women
ft	Year Fixed Effect
X	Children under 5, Education, Age, Age2, Occupation
1	Variable of Interest
St	State Fixed Effect

This research equation is broken down by, s representing states, t stands for calendar year. The outcome variable is defined by y. In each regression equation y will represent, employment status, total hours worked and hourly wage. The research's main variable of interest is SEA, the share of Southeast Asian women. This variable was formed through choosing countries in Asia that defined the research's share of women through high skilled and low skilled margins. After this age and immigration year were controlled for to create the share of SEA women. From here s is the state fixed effect. This variable controls for the non-random settlement patterns for immigrants. Both natives and immigrants migrate to states with higher labor market outcomes and high employment growth. Looking for states with these factors helps them in the long run through having higher employment opportunities and higher income growth. This could cause upward bias and underestimate the impact of immigrant women. The state fixed effect is included to control for the selection bias. The next variable ft is the year fixed effect. This effect controls for macroeconomic fluctuation. From this point the research controlled for other variables that the study believes may have an impact on the native women's labor market performance. The variable of interest is 1. If this variable is found positive, it means that there is a complementary relationship between native women and SEA women. If a negative effect is found this means that native women and SEA women are competitors and will be impacted by the substitution effect.

The non-random settlement of both natives and immigrant women is a threat to the identification. This is because both native and SEA women tend to move to states with higher wages for skilled groups. California is a state where this happens often. A simple OLS model suffers from a selection bias or omitted variable bias. To correct for the bias, a state fixed effect was added to control for time in variable state features. A time fixed effect was included as well to control for macroeconomic fluctuation.

5. Results

To better understand this data and to make a more well-rounded argument the regression results help explain the competition and substitution this labor market faces. In the first regression employment status was controlled. In the result for this regression, the research continues to get mostly negative impact. This is due to competition in the industry. Below is a chart showing significance as well as results per variable used:

Table 1. Impact on Native Women due to the SEA Labor Participation[1]

Variable	Total Native women	Skilled Native women	Unskilled native women
Seashare	-.200491***(.000)	-.1981093 ***(.001)	-5.361366 (.390)
Age	.0047488***(.000)	.0047488***(.000)	-.0281434(.248)
Age2	-.0000515***(.000)	-.0000516***(.000)	.0002794(.362)
Child5	-.0114185***(.000)	-.0114094***(.000)	.2112627(.451)
Occ Fixed Effect	X	X	X
Educ Fixed Effect	X	X	X
State Fixed Effect	X	X	X
Year Fixed Effect	X	X	X

First, the impact of SEA women on the employment status of native women was examined. These regressions are designed to get a closer look at the impact of SEA women on the extensive margin of native women employment. According to the estimator for every 1% increase in SEA women's employment status, there is a 20% decline in native women's employment share. In 2019 data released helps support this statistic. The Bureau of Labor Statistics on Foreign Born Workers stated that 54.8% of female immigrants were labor force participants. While 57% were native born workers. If the data continues to break down these numbers, the information available presents that Asian women make up a larger share of the female labor force in the United States. Then the sample is split into skilled vs unskilled women and the empirical specification separately for two subsamples. The estimator found using the unskilled women sample is not statistically significant. For the skilled sample, the results again find a negative impact that means that SEA women have a negative impact for skilled native women since SEA women are highly skilled. The estimates also show that employment share increases as female workers become senior and it increases at a decreasing rate with coefficients of age squared negative. The age profile of employment reaches a plateau. This is due to the sample showing that at age 50 and above women begin to retire from the work force, so the data reaches a decline in labor force participation, because less experienced women will be available to work. For the skilled sample, the research continues to show a negative impact that means that SEA women have a negative impact for skilled native women. The Child5 variable represents children under five in the household. For native women, the results show that there is a 1% decline in the labor force participation with children under 5 at home. This supports the research provided above from authors Barone and Mocetti that once women have children, they are less likely to return to work and immigrant women are more likely to take over these jobs or will act as a substitute for the native women when it comes to household chores and care. This idea can also support women coming back into the work force after they have completed their fertility. Women who are done having children that return to the work force start to face greater competition than before due to them now being more experienced. Native women and SEA women are in competition for the same jobs.

Table 2. Native Women's Hours Worked per Week

Variable	Total Native women	Skilled Native women	Unskilled native women
Seashare	-3.513161(.171)	-3.513093(.171)	10.96201(.968)
Age	.8995614***(.000)	.8987389***(.000)	2.845735***(.003)
Age2	-.0101326***(.000)	-.0101228***(.000)	-.0369574***(.002)
Child5	-1.733679***(.000)	-1.733605***(.000)	7.123783(.519)
Occ Fixed Effect	X	X	X
Educ Fixed Effect	X	X	X
State Fixed Effect	X	X	X
Year Fixed Effect	X	X	X

The second regression demonstrated the intensive margin and shows us that for a SEA woman works, native women work 3 ½ hours less. The unskilled category remains statistically insignificant for this variable. The age variable shows that for every year older a woman gets their hours worked per week declines by 1 hour. This is due to a concave effect of as people get older, they are less likely to continue working at the same rate. This supports the data that shows what happens in the labor force participation when workers begin to retire. Children play a role in hours worked as the results show that for every child at home there is a 2-hour decline in hours worked per week for women who have children under 5 at home. In the regression four fixed effects were used to rule out omitted variable bias. This was seen as an issue due to some states offering higher wages per hour and having larger populations which tend to drive up income wage. An example of a state where this is seen is California. Immigrants are more likely to migrate to California due to the opportunity to earn a higher wage.

Table 3. Regression 3 Control for Hourly Wage

Variable	Total Native women	Skilled Native women	Unskilled native women
hourlywage	52.0186***(.000)	51.98697***(.000)	-609.6621(.255)
Age	.5157525***(.000)	.5157807***(.000)	-.6549273(.311)
Age2	-.0044114***(.000)	-.0044118***(.000)	.0096583(.257)
Child5	1.244741***(.000)	1.244715***(.000)	Omitted
Occ Fixed Effect	X	X	X
Educ Fixed Effect	X	X	X
State Fixed Effect	X	X	X
Year Fixed Effect	X	X	X

Finally hourly wage is the control variable. For the SEA variable the results show an hourly wage with a $.52 increase in hourly wage (52*1%). The skilled group also shows an increase of $.51 per hour. The unskilled variable shows that there will be a $6 decrease in wage per hour. These results also show that for every child at home there is a $1 increase in pay for native women.

5. Conclusion

In closing, these empirical strategies helped the research reach a conclusion to the main question of, how the US female labor supply is impacted by the influx of Southeast Asian immigrants? In this research there was an understanding that there may be selection bias in some states which helped determined, Hawaii is an outlier and may

make the data biased. For this reason, the researcher calculated the regression excluding Hawaii. The following empirical data will help to support the first regression as adding a fixed effect can help us address the issues of selection bias. The researcher believes that this data can help contribute to the narrow literature provided about the female labor supply. By observing wage, employment status, hours worked, and participation will help readers gain better understanding of what may impact the labor supply. The research found that there is a negative relationship between native women and SEA women. The regression results confirmed this due to a strong support of negative results with low significance. Native women and SEA women in the US labor market are in competition with each other and face the reality of the substitution effect. The control changed to help fight against selection bias in hopes to find a positive relationship between the two groups. Variables used in the research helped confirm this claim of the substitution effect. These variables are important in the women's labor market and will always be a factor of how a woman may return to work and how she is treated in the workforce. Variables such as childcare, hours worked, education, age and population size all play a heavy role in the women's labor market supply and demand. This regression helped define labor force participation of the individual. In the end this research will continue to grow and change as more women get educated and enter the workforce. Women must find a way to become complements to promote higher supply and demand of female workers in all industries.

6. References

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7. Endnote

1.*** Shows that the data is at a 1% significance level. The parentheses following the starts define the P-value from the data set.