ISOLATING THE CONSUMPTION EFFECT OF IMMIGRATION ON FIRM EXPANSION

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ABSTRACT

This paper investigates how local firms respond to immigrant consumption at the extensive margin. We use an innovative approach to isolate the consumption channel by using only non-labor force participating immigrant inflows from the American Community Surveys from 2002 to 2011. As would be expected, we find that non-labor force participating immigrant inflows are highly correlated with establishment entry level and negatively so with exits indicating a strong influence on firm expansion from immigrant consumption. (F22, F66)

I. INTRODUCTION

What is often left out of the public debate on immigration is that immigrants are just as much consumers as migrant workers. Immigrants after all buy homes, buy cars, clothes, groceries, and generally consume just like natives. While prior research on immigration has primarily focused on the impact on native wages in the labor market, little attention has been paid to the benefits from the increased consumption immigrants bring, and more specifically, how that consumption contributes to the growth of firms. Building on extant literature, this paper endeavors to isolate the consumption channel of immigration through changes in the entry and exit levels of business establishments in cities across the United States.

Basic supply and demand predicts a rapid increase in labor supply holding demand constant will lower wages. But the fact that the consensus of the literature finds the effect of immigration on native wages to be negligible (Borjas, 2013; Peri and Sparber, 2011), suggests there is more to the story. Some interesting explanations have been put forth to explain this finding. For example, Card (1990) posited the impact on the labor supply might be offset by native outflows in response, known as the native displacement hypothesis, but Card (2001) himself found no significant relationship between native outflows and immigrant inflows. Borjas (2006) seemingly confirmed Card's hypothesis, but an analysis by Peri and Sparber (2011) find his empirical approach suffered from specification bias. Hong and McLaren (2015) further disputes the native displacement by finding that immigration leads to an increase in native employment. The increased economic opportunity caused by immigrants is attractive to natives and contributes to a "virtuous cycle" of growth.

A better model is the general equilibrium approach. A static wage rate can be explained by a compensatory shift in labor demand with labor supply. Even in the event of a large influx of immigrants such as during the Mariel Boatlift, Card (1990) found no evidence of a wage decrease. Re-examining the seminal experiment, Bodvarsson, Lewer, and Van den Berg (2008) concluded that the rightward shift on the labor supply curve was met with an equal shift in the demand curve effectively neutralizing any labor substitution effects from immigration and leaving wages the same. More recently, Hong and McLaren (2015) provide evidence of positive wage gains and employment from immigration in the non-traded goods sector. The authors

interpret these findings to be consistent with a greater increase in labor demand. What the general equilibrium doesn't explain is how firms are able to absorb the additional labor. The answer: An increase in capital.

In order for firms to hire more labor, they have to expand their operations at the extensive margin, which means greater investment in capital may be needed. And as long as the capital-to-labor ratio stays relatively the same, so will wages. For some firms, this may be a matter of more machinery. For many more, especially in a growing service economy, it means more establishment capital. The impact of immigration on firm expansion comes from two primary channels, labor supply and consumption.

Immigrants naturally migrate across borders to improve their economic wellbeing by working in the destination country. An increase in the supply of labor from immigration does put downward pressure on wages. Firms take advantage of the decreasing wage rate by expanding their capital stock of establishments, and demanding more labor until the wage rate reaches equilibrium again. Olney (2013) finds some evidence for this by separating establishments into mobile and non-traded industries. Firms within the mobile industry can theoretical relocate production easily to take advantage of lower wages. He finds that a 10 percent increase in low-skilled immigrants share was positively correlated with a 3.08 percent increase in mobile industry establishments, which he interprets to be evidence of the labor supply channel. However, this analysis does not appear to account for actual industry movement from one location to another as opposed to just expansion into a new market where wages may be lower and suggests this movement can be done within in the span of one year after an immigration shock.

The consumption channel can be broken down into two parts, the demand price effect and consumption diversification effect. An increase in the population from immigration will increase demand. Basic supply and demand for goods and services predicts a rightward shift in demand from a population increase, which puts upward pressure on prices. Cortes (2008) and Baghdadi and Jansen (2010) find evidence of price increases after immigration for non-immigrant intensive industries, this direct evidence of the consumption channel at work. Higher prices motivate new firms to enter the market and existing firms to expand. We will term this the demand price effect. The other motivation for firms is a demand for new products by immigrants. Typically being from diverse array of ethnic backgrounds and cultures, immigrant consumption preferences are different relative to natives. As aggregate consumption preferences change, there is likely to be more investment in new firms to provide new products or services specifically demanded by substantial immigrant populations, this is what we have termed the consumption diversification effect. Mazzolari and Neumark (2009) support this assumption as they find immigration to be positively correlated with a greater number of ethnic restaurants. In addition, Lach (2007) finds immigrants to have lower search costs and relatively higher price elasticity relative to natives, which means they will search longer and harder for specific goods and services they desire and drive up demand for those products. The combination of changes in consumption preferences and upward price pressure would theoretically incentivize new firms to enter the market and existing firms to expand to capture producer surplus until equilibrium is achieved. Both new and existing firms will make investments in equipment, land and establishment capital. And establishment capital is where we capture firm activity in response to an immigration shock.

However, it is difficult to disentangle the impact of the consumption channel from the labor supply channel. Going back to Olney (2013), his approach found little evidence of the consumption channel at work based on his industry comparison between mobile and non-traded

industry establishments. He found a positive but insignificant coefficient in growth of non-traded industry establishments after an increase in the share of low-skilled immigration. However, the use of low-skilled immigrants is likely to fail to capture the consumption channel due to higher remittance rates. Education is a predictor of remittance behavior (Soltero, 2009; Unheim and Rowlands, 2013). Since low-skilled immigrants are typically defined by their lower education level, they are more likely to remit back to their home country, which reduces the consumer base and therefore wages per Olney (2015).

An alternative approach to isolate the consumption channel is by employment status. Theoretically, an immigrant who reported to be in the labor force, whether employed or unemployed, would presumably exert wage pressure in the labor market obfuscating the detection of the consumption channel. We can avoid this by focusing on immigrant inflows who are not participating in the labor force. Since non-labor force participating immigrants are not seeking a job, they are not exerting pressure on wages, and nor does their hire at a cheaper wage rate exert any downward pressure on prices in immigrant intense industries. In addition, if they are not working, they are unlikely to send remittances back to their home country. Despite not being employed, these immigrants may have income from other sources such as relatives already established in the U.S. or from their home country; immigrant students are one example. Using this cohort would, theoretically, isolate the consumption channel for prices, wages, and firms. The focus of this paper is on firm activity. This leads us to our first hypothesis:

Hypothesis 1: *New non-labor force participating immigrants are positively correlated with a change in establishment entry level.*

Firm exit from a particular market is predicated on maintaining profitability. If an establishment is operating at the margin, it can choose to leave the market or stay in the hopes of better conditions in the future. A consumer demand shock from immigration can improve market conditions and profitability, deceasing firm exits. This leads us to our second hypothesis:

Hypothesis 2: *New non-labor force participating immigrants are negatively correlated with a change in establishment exit level.*

This paper undertakes the challenge to empirically test these hypotheses, with the most significant contribution to the literature being the isolation of the consumption channel by using non-labor force participating immigrant inflows. And, as expected, our results do indicate that non-labor force participating immigrants are positively and significantly correlated with establishment entry and negatively and significantly correlated with establishment exits.

The remainder of this paper is structured as follows: Section II provides a walkthrough of the regression specification and instrument variable employed to isolate the endogeneity issues of immigrant self-selection bias. Section III provides an overview of the data obtained from American Community Survey and Business Dynamic Statistics. Section IV presents the results of the regression. Section V provides a summarization of our findings and conclusion.

IV. EMPIRICAL APPROACH

A. <u>Baseline Specification</u>

To test our proposed hypotheses, we conduct a simple regression analysis. The baseline specification takes the following form:

$$\text{Log}(Est_{m,t}) = \alpha + \beta \text{Log}(NLPI_{m,t}) + \mu_m + \gamma_t + \varepsilon_{m,t} \tag{1}$$

The dependent variable (*Est*) is the entry and exit level of establishments in metropolitan area (*m*) in year (*t*). The independent variable (*NLPI*) represents non-labor force participating immigrant inflows. This paper focuses on immigrants who have migrated in the last two and three years. The incorporation of the lag permits time for new immigrants to settle as well as any diversification effects to influence the aggregate consumption preference mix in the local economy. Firms will also likely take a year or more to perceive demographic and consumption preference changes before they can act on them by expanding capital. Therefore, newly created establishments will be influenced in part by immigrants who have been in the country for a while. In order to account for any unobserved metropolitan area characteristics which may influence firm decision to open a new establishment, we include location fixed effects variable (μ). Similarly, a year fixed effects variable (γ) is added to the equation to control for yearly variations such as recessions, booms, shocks, etc. which may bias the results if omitted. Finally, (ε) represents the random error term that captures any other concurrent factors that might affect the linear relationship between the dependent and explanatory variables.

B. <u>Instrument Specification</u>

One major econometric concern in studying the impacts of immigration is the potential endogeneity associated with immigrants' location decisions. New immigrant inflows to a particular metro area are correlated with the number of new establishments through unobserved local demand shocks. Immigrants also tend to gravitate towards regions with greater employment opportunities; among other miscellaneous factors captured in the error term.[1] Following Card (2009), we address this issue by constructing predicted values of immigrant inflows into each city in the United States based on the historical distribution of earlier immigrants from the same source country observed in the 2000 census. The key insight is that the location decisions of immigrants from the same source country are highly persistent over time due to the functioning of migration networks. Therefore, the adopted "supply-push" instrument assumes that new immigrants to the United States in the following years after 2001 are distributed according to the initial settlement distribution of immigrants in 2000, independent of the concurrent economic conditions. The predicted inflow distribution is calculated in the first stage regression:

$$\text{Log}(I_{m,t}) = \alpha + \beta \, \text{Log}\left(\sum_s AI_{s,t} \, \lambda_{s,m}^{2000}\right) + \varepsilon_{m,t} \tag{2}$$

Where (*AI*) is the aggregate of new immigrant inflows from source country (*s*) in year (*t*); (λ) is the fractional distribution of immigrants from source country (*s*) in metro area (*m*) from the census of 2000. The instrument is then deployed into a two-stage least squares regression.

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[1] In his micro theory choice model, Borjas (1990) predicts rational actors decide to migrate based on a cost-benefit analysis of expected future returns. Cadena and Kovak (2013) have confirmed this theory in their findings showing immigrants are attracted to locations with increasing labor demand and avoid ones with decreasing or limited employment opportunities.

V. DATA

Data for this research were extracted from two surveys conducted by the U.S. Census Bureau, the Business Dynamics Statistics (BDS) and the American Community Survey (ACS). Both surveys provide annual data by metropolitan statistical area (MSA).

A. Establishments

Dependent variable data for establishment entry and exit level were obtained from the Business Dynamics Statistics. BDS was constructed from the Census Longitudinal Business Database (LBD) across a range of annual measures based on age, size, and industry sector for both firms and establishments. BDS defines an establishment as a single physical location where business is conducted or where services or industrial operations are performed. Establishment entry is defined as the first year the establishment reports positive employment in the LBD. Establishment exit is counted when the establishment reports zero employment within the year counted in the LBD. Establishment data is attractive for several reasons: 1) Establishments are the smallest unit of recoded economic activity available. 2) Although establishments are owned by firms, they can be thought of as miniature firms required to maintain profitability to continue to exist in a given market. 3) The level of establishments is an indication of consumer demand for the product or service it provides. Firm decision makers and entrepreneurs typically conduct a considerable amount of market research and planning before putting forth the substantial investment required creating a new business location. Therefore, establishment entry provides an indication of consumer demand. 4) Establishments also provide an indication of firm growth at the extensive margin. An additional establishment means more capital and more labor has been invested by the firm, which can account for the ability of firms to absorb labor supply shocks from immigration. Establishments operating at the margin are unlikely to expand at the extensive margin, but a demand shock from immigration may result in an establishment waiting to exit the market due to improved conditions, thereby reducing the exit level.

BDS annual data is available from 1976 to 2012 for 365 MSAs, but since ACS only provided annual data from 2002 through 2011, with some years missing, entry and exit level data was restricted to the same time period.[2] MSAs were carefully matched between ACS and BDS samples by geographical definition; 251 of the 365 MSAs were a match.

B. New Immigrants Not in the Labor Force

The explanatory variable of non-labor force participating immigrant inflows was extracted from ACS 1% samples provided by the Integrated Public Use Microdata Series (IPUMS) project produced by the Minnesota Population Center of the University of Minnesota (Ruggles, Alexander, Gernadek, Goeken, Schroeder, and Sobek, 2010).[3] An immigrant is conventionally defined as a foreign born individual that is either a non-citizen or naturalized citizen of the country they have migrated to. ACS was used because it provides annual statistics which include year of entry, source country, migration destination and employment status for foreign born persons by MSA. ACS was not fully implemented by the Census Bureau until the early 2000s, so complete data was available only from 2002 to 2011 due to gaps in the samples in 2000 and 2001. In addition, some MSAs within our sample also have gaps for incoming immigrants for certain years, but these gaps do not impact the main results of this exercise.

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[2] Data can be retrieved at http://www.census.gov/ces/dataproducts/bds/

[3] ACS data from IPUMS is available at https://usa.ipums.org/usa.

TABLE 1 - Summary Statistics			
	Immigrants not in Labor Force	Establishment exit	Establishment entry
Count	1942	1942	1942
Kurtosis	82.36	54.60	50.26
Maximum	916	55205	58905
Mean	20.73	2175.70	2396.72
Median	5	775.50	824
Minimum	0	114	100
Mode	1	288	580
Sample Variance	4121.55	22665980.31	27034210.96
Skewness	8.02	6.42	6.15
Standard Deviation	64.20	4760.88	5199.44
Standard Error	1.46	108.03	117.99

C. Instrument

The "supply-push," or "Card," instrument was constructed using the 2000 Census and ACS samples. The distribution of immigrants was based on the number of immigrants from each source country. The 2000 Census data was used to calculate the fractional distribution of immigrants by MSA. Source countries which provided over 5,000 immigrants from 2001 to 2011 were aggregated into independent groups.[4] Source countries which provided less than 5,000 immigrants were aggregated into a default group. The fractional distribution, which is fixed, was then multiplied by the aggregate new immigrant population from each source country which migrated in the last three years. The resulting new variable was then regressed on the new immigrant population to produce weighted estimates and ensure the independent variable was exogenous for the second stage of the regression.

E. Descriptive Statistics

Table 1 presents summary statistics for each variable constructed from ACS and BDS. The summary shows a significant variation in new immigrants to the U.S. New immigrants also appear to be highly concentrated in certain MSAs based on the mean value being greater than the median, which is consistent with the positive skewness value provided in the table. This is not the case for the entry and exit level variables, indicating an uneven entry and exit level across our MSA sample.

VI. RESULTS

A. Baseline Specification

Table 2 presents the results of our regressions of non-labor force participating immigrants on establishment entry and exits. Column one and two are the main results across 251 MSAs in the sample. Column one provides results of third year immigrants, meaning foreign born individuals

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[4] There were 16 major source countries which contributed over 5000 migrants. These countries include Brazil, Canada, China, Columbia, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, India, Japan, South Korea, Mexico, Philippines, Puerto Rico and Vietnam.

	TABLE 2 - Immigrants Not in the Labor Force			
	251 MSA		50 Largest MSA	
	2nd year Immigrants	3rd year Immigrants	2nd year Immigrants	3rd year Immigrants
Entry	1.333***	0.653***	0.921	0.375***
Exit	-0.217***	-0.134***	-0.23	-0.140***
MSA fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	1185	1747	361	383
Adj. R-Squared				
F-stat, Instrument	20.114	82.71	7.339	39.031

Note: Robust standard errors in parentheses; * and ** indicate significance at the 5% and 1% levels, respectively.

who entered the country two years ago. Column two is immigrants who entered the country three years ago.

The first item to note is the F-statistic for immigrant groups who migrated in the prior two and three years are 20.11 and 82.71, respectively. In both cases the F-statistic is greater than 10, validating our instrument of predicting immigrant settlement patterns based on the geographic distribution from the 2000 census. After year and location fixed effects have been taken into account, both two and three year immigrants are positively and significantly correlated with establishment entry as well as negatively and significantly correlated with exits. Two year lagged results show higher coefficients. Specifically, the results indicate a 10 percent increase in new immigrants increases the establishment entry level by 13.3 percent. The same increase reduces establishment exits by 2.17 percent. In column two, the F-statistic is significantly higher. A 10 percent increase in the level of immigrants who migrated in the past three years increases establishment entry by 6.53 percent and decreases exits by 1.34 percent. These results are consistent with our hypotheses.

Given adequate time for immigrants to settle and firms perceive demand shifts, firms react to the consumption effect by increasing capital to build more establishments. The increase in capital allows firms to absorb the surplus in the labor supply. And as an additional benefit, establishment exits from the market also reduce. This result demonstrates that the additional consumption has significant impact on the behavior of firms relative to the labor supply channel found in Olney (2013). The large coefficient is interesting considering the sample of non-labor force participating immigrants is smaller relative to the fraction in labor force.

C. Sensitivity Analysis
To test the resiliency of our results, we have conducted a sensitivity analysis. The results are also presented in Table 2, column three and four. In the literature (Card, 2001; Cortes, 2008; Olney, 2013), samples have been limited to the 30 largest cities. However, to ensure a sufficient sample due to gaps, we limit the sample to the 50 largest cities defined by the largest migrant population observed in ACS.[5] The purpose of limiting the sample in this way is to guard against measurement error since immigration may have a disproportionate effect in smaller cities.

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[5] Atlanta, Austin, Bakersfield, Baltimore, Boston, Buffalo, Charlotte, Chicago, Cleveland, Columbus, Dallas, Denver, Detroit, El Paso, Fresno, Honolulu, Houston, Indianapolis, Kansas City, Las Vegas, Los Angeles, McAllen,

The resulting coefficients are smaller, but in larger cities an increase in immigration is unlikely to have as high an impact relative to smaller cities. Second year immigrants had a positive but insignificant impact on establishment entry. The negative effect on exits was also insignificant. It difficult to conclude there is no consumption effect from this result due to the weakness of the instrument. Since the F-statistic is below 10, the instrument is a poor predictor of second year immigrant settlement patterns based on prior settlement distribution. However, for third year immigrants, the F-statistic is much stronger at 39.03 and the results are significant. A 10 percent increase in immigrants who have migrated in the last three years yield a positive and significant increase in establishment entry by 3.75 percent. The same increase will decrease exits by 1.4 percent. This result indicates the consumption effect from immigration has a significant impact on the firm expansion at the extensive margin even in larger cities

VII. CONCLUSION

Research on immigration has primarily focused on the effect of low-skill immigrant labor on wages. Recent studies have broadened this focus to firm behavior to explain how firms might absorb surplus labor supply from immigration. Firms which expand at the extensive margin in the wake of an immigration shock are able to absorb immigrant labor. The increase of capital through establishments explains a relatively unchanged wage rate since the capital to labor ratio is also unchanged by the expansion. The contribution of this paper is to increase our understanding by examining specifically the consumption effect of immigration on establishment entry and exits at the local level. We also incorporate a two and three year lag to provide sufficient time for the impact of immigration to take root in the local economy. Using ACS and BDS, a sample of U.S. cities were captured over a ten year period.

New immigrants who had migrated in the prior two and three years were positively correlated with establishment entry and negatively correlated with exits. Immigrants who migrated within the prior two years were more highly correlated relative to immigrants in the prior three years. And a sensitivity analysis confirms that even when the sample is limited to the 50 largest cities by migrant population, the results remained positive and significant for immigrants who have migrated in the past three years, but not in the last two. However, we cannot rule out the consumption effect of two immigrants in this analysis given the weakness of the instrument.

Much ado has been made about immigrant labor in the U.S. and its impact on wages and job availability for natives. These results partially explain why the effect of immigration on native wages is negligible in the literature. Firms increase capital in response to changes in consumption as well labor supply. The additional capital, such as establishments, allows firms to absorb the additional labor supply from immigration leaving equilibrium wage unchanged. This also explains why in some cases wages have been found to increase over time as more business locations mean more technicians, supervisors, etc. are needed meaning more jobs for natives. As the establishment level increases, the labor market tightens eventually increasing wages as well.

This paper contributes the mounting body of evidence that immigrants improve economic conditions, which should be taken into consideration when it comes to both immigration and economic policy. However, more research in this area is warranted. Understanding how firms

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Miami, Minneapolis, Nashville, New York, Oklahoma, Orlando, Philadelphia, Phoenix, Pittsburgh, Portland, Raleigh, Richmond, Riverside, Sacramento, San Angelo, San Jose, San Francisco, Santa Barbara, Salt Lake City, Seattle, Springfield, St. Louis, Syracuse, Tampa, Tucson, Washington D.C.

respond to changes in consumption and the labor market are crucial for making effective policy, especially in times of downturn or exogenous shocks. Making conditions easier for firms of all sizes and industries to expand capital can help alleviate concerns about immigration and allow labor market tightening to result in wage growth. During downturns and periods of deleveraging by businesses, theory suggests that immigration would decrease wages since capital is hindered from expansion unless interest rates are low enough to encourage further investment. Immigration can improve our economy but only in so far as firms have the space and resources to grow.

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