

IDENTIFYING THE IMPACT OF IMMIGRATION ON FIRM ENTRY AND EXIT

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ABSTRACT

This paper investigates how local firms respond to immigration through capital investment in establishments. Using data from the American Community Surveys from 2002 to 2011, we find that immigration is positively associated with establishment entry level and negatively associated with exits. In particular, high-skill immigration is found to have a greater positive impact on establishment entries, which indicates the importance of considering skill heterogeneity in studying the effects of immigration. Our empirical method and robust data set provide a more comprehensive examination of how immigration impacts domestic firms than prior research to date. (F22, F66)

I. INTRODUCTION

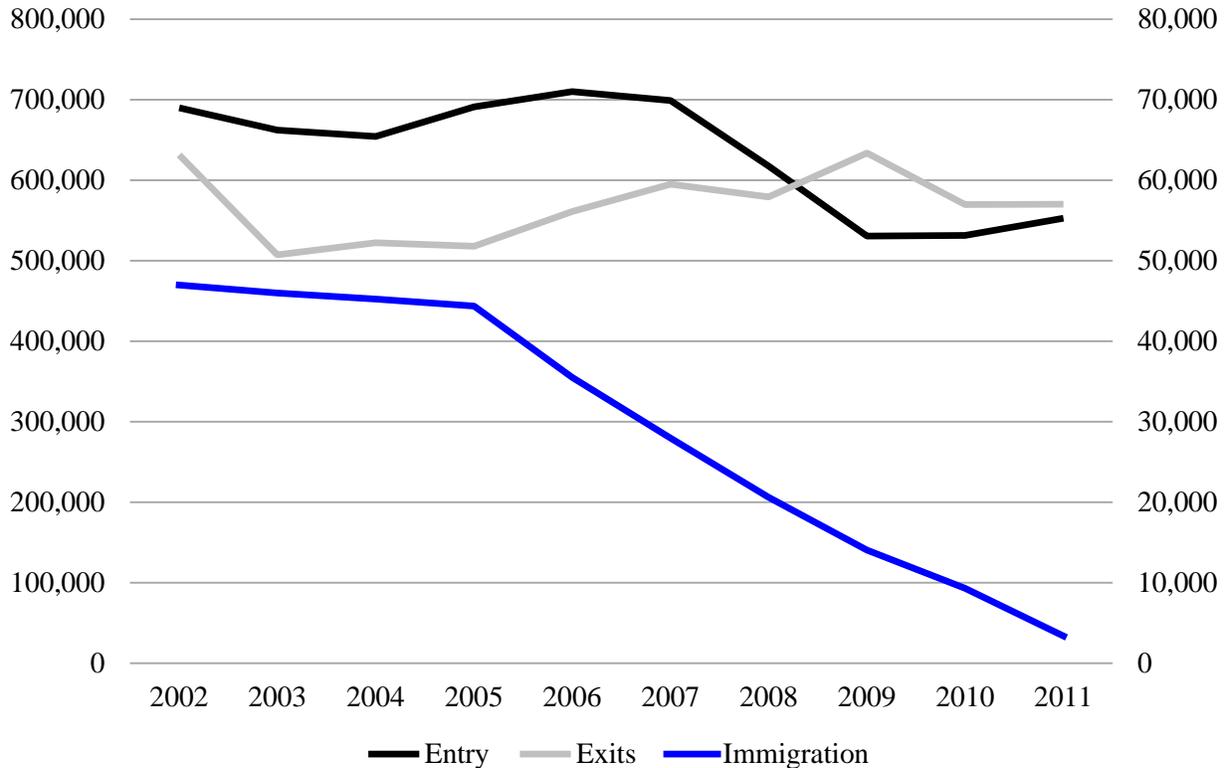
Prior research on immigration has primarily focused the impact to native wages in the labor market by employing the neo-classical labor supply model. A rapid increase in labor supply holding demand constant predicts a lower equilibrium wage. In reality, however, labor demand does not stay constant. Instead, it shifts with labor supply leaving wages relatively constant. In order for this to occur, the capital-to-labor ratio must stay the same. Business establishments represent a form of capital that is indicative of how firms adjust to labor supply shocks from immigration. Building on extant literature, this paper examines the impact of immigration on the entry and exit levels of business establishments in the U.S. at the local level.

The simple general equilibrium approach helps us understand the negligible impact of immigration on wages through a compensatory shift in labor demand with labor supply. However, it does not explain how firms manage to absorb the additional workers. In order for wages to stay the same, capital must be increased to maintain a relatively constant capital-to-labor ratio. Some firms increase their capital stock by purchasing more machines for production while others will expand by opening new business location. Given that capital investment can be expensive, it is unlikely that a firm will expand unless it perceives there is sufficient demand.

The immigration literature often fails to take into account the consumption impact of immigration. Immigrants contribute more than just labor to the economy, they also purchase clothes, food, housing, and many other goods and services natives also consume. The new consumption generated by immigrants within the economy increases the demand for goods and services. A change in consumer demand also influences firm production and expansion. It also can influence a firm's exit decision from the market. Firms operating at the margin can become profitable again through an increase in demand.

A preliminary review of data collected for this research suggests a possible correlation between entry, exit, and immigration. Figure 1 presents the aggregate entry and exit levels and new immigrants across all metropolitan areas domestically from 2002 to 2011. Entry and exit are plotted on the left axis and immigrants on the right. The graph illustrates an informative trend between these variables. However, at this point, any perceived relationship is merely conjecture; especially once economic conditions are taken into consideration. According to the Minneapolis

FIGURE 1 – Aggregate Establishment Entry, Exit & Immigrants
Annual Trends



Federal Reserve Bank, as of 2002 the economy was still recovering from the recession of 2001.¹ The 2001 recession and subsequent slow recovery explain the moderate decline in new immigrants from 2002 to 2003. By 2006, entry level peaks at seven hundred before declining as recession hit in 2007. The exit level is also consistent with the business cycle but shows modest variation. Before the recession hit, the exit level trended downward through 2005 before peaking above 10 percent in 2009. The average level of new immigrants decreases sharply after 2007. Since then, we notice the decline has continued through 2011. The decreasing trend is likely attributable in large part to the recession as the level of immigration and establishments has long exhibited pro-cyclical behavior absent external shocks. But although these variables are inextricably correlated with the business cycle, Figure 1 illustrates an implicit correlation which may be illuminated provided an appropriate instrument is used.

The primary focus of this paper is the effect of immigration on annual establishment entry and exit levels. The expected outcome is a positive correlation with entry levels and a negative correlation with exit levels. The effect of immigration on firms occurs simultaneously through two primary channels, consumer demand and labor supply. The first order impact of immigration is an increase in population. The second order is an increase in consumption. Increased consumption motivates firms to expand the capital and labor stock in the market. Another impact

¹ Federal Reserve Bank of Minneapolis. The Recession and Recovery in Perspective. Publications, Special Studies. Updated February 27, 2015. Retrieved from <https://www.minneapolisfed.org/publications/special-studies/rip/recession-in-perspective>

is on the labor supply. The increase in the labor supply puts downward pressure on wages and allows firms to take advantage by expanding capital stock. These same two channels also impact establishment exits. Greater consumption can prevent establishments operating in the red from exiting the market. A cheaper labor supply can potentially do the same. However, firms operating below margin are more likely to be influenced by greater consumption than cheaper labor as it takes considerably time due to wage rigidity and gradual turnover. It is difficult to identify the separate impact of these two channels. To differentiate the consumption effects from the labor supply effects, we use Mexican and Indian immigrant groups as proxies for low-skill and high-skill workers, respectively. If the consumption channel has a greater impact than the labor supply, we should expect a generally higher correlation between Indian immigrants, who are predominately more educated and possess greater income potential, with entry and exit levels relative to Mexican immigrants.

This paper undertakes the challenge to empirically test these hypotheses and indeed the results do indicate that immigration is positively correlated with establishment entry and negatively correlated with exits. In addition, we find Indian immigrants to have a higher correlation with establishment entry across the country and a relatively higher correlation with exits in larger cities.

The remainder of this paper is structured as follows: Section II provides a literature review of past and recent research on immigration as well as a discussion of this paper's contribution to it. Section III presents our hypotheses and underlying assumptions for these results based on the extant literature. Section IV provides a walkthrough of the empirical approach and regression specifications used. Section V provides an overview of the data and its sources. Section VI presents the results of the regression. Finally we summarize and conclude in section VII.

II. LITERATURE REVIEW

The impact of immigration on the native labor markets has been the focus of research among labor economists for decades. Frequently cited examples from the literature include: [Borjas, Freeman and Katz \(1997\)](#); [Borjas \(2003\)](#); [Aydemir and Borjas \(2011\)](#); and [Card \(1990, 2005, and 2009\)](#). To date, the consensus of the literature is that the effect of immigration on native wages is negligible ([Borjas, 2013](#); [Peri and Sparber, 2011](#)). Considering this finding, many theories have been put forward to explain it. [Card \(1990\)](#) posits the effect of immigration on the labor supply might be offset by native outflows in response, known as the native displacement hypothesis, but [Card \(2001\)](#) finds no significant relationship between native outflows and immigrant inflows. [Borjas \(2006\)](#) seemingly confirms Card's hypothesis, but an analysis by [Peri and Sparber \(2011\)](#) find his empirical approach suffered from specification bias. Furthermore, [Hong and McLaren \(2015\)](#) find 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; which also disputes the native displacement hypothesis.

More recent studies have begun employing a general equilibrium approach, which takes into account the effect of immigration on labor demand as well as the supply. Re-examining the seminal Mariel Boatlift experiment from [Card \(1990\)](#), [Bodvarsson, Lewer, and Van den Berg \(2008\)](#) conclude 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. [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 rightward shift in consumer and labor demand. [Bodvarsson,](#)

Lewer, and Van den Berg (2008) observe a positive and significant increase in retail sales per capita after the Mariel Boatlift, consistent with a rightward shift in consumer demand. Another aspect is prices. An exogenous increase in local population should have the effect of increasing prices for many goods in the short-run. In response, firms expand to capitalize on the market until the price decreases back to equilibrium.

Demand effects from immigration on prices have proven difficult to isolate due to the countervailing channel of labor supply. Recent research in this area typically focuses on the impact of low-skill immigrants. Low-skill immigrants, whether assumed substitutable or complementary to natives, decrease prices due to the downward pressure on wages; especially for non-traded goods. Several papers find evidence for the labor supply channel through prices. Using price data, Cortes (2008) finds low-skill immigration decreases prices in the U.S. specifically for “immigrant-intensive” services (e.g. housekeeping, gardening) and non-traded goods and argues that her results are due to downward pressure from wages as immigrants in the U.S. have higher labor force participation rates. But for traded and non-traded sectors in which low-skill immigrants are not very substitutable or complementary to natives, we see the expected increase in prices. An interesting alternative finding for a decrease in prices is provided by Lach (2007), who studied monthly store level prices in cities across Israel after an immigration shock from the former Soviet Union. In tracking 915 products, the author finds no increase in sales of those products until after prices were decreased, implying that stores deliberately decreased prices to attract the new consumers. The author concluded this is because immigrants have higher price elasticity and lower search costs relative to natives. Another example is from Baghdadi and Jansen (2010), who study the effect on prices by temporary and permanent immigrant workers in the U.S. They find temporary immigrants significantly increase the prices of utility services, while low-skill permanent immigrants increase the price of transport and health services. The authors attribute the differences in price effects to immigrant consumption composition. Temporary immigrants consume utility services in the short-run while permanent immigrants are more frequent consumers of transportation and health services. The consumption composition of immigrants is an important factor of demand as it also affects the composition of firms.

Very few studies have examined the impact of immigration on firms and establishments. The closest related research on this relationship is by Olney (2013) who examines the effect of low-skill immigrants on establishments in an effort to understand how firms respond to an influx of low-skill labor at the extensive margin. Olney finds that a 10 percent increase in the share of low-skill immigrants is associated with an increase of 2.06 percent for all establishments and a 2.4 percent increase in establishments from smaller firms. More importantly, he shows that low-skill immigrants had only a significant impact on mobile industries which he interprets as evidence of the labor supply channel dominating effects from consumption. However, it is possible that a greater impact from consumption in other industries was not detected due to the omission of high-skill immigrants in his dataset.²

This paper contributes to the literature in a few significant ways. First, we incorporate all immigrants, not just low-skill. This is an important consideration since high-skill immigrants are expected to have differential impacts on local businesses relative low-skill due to higher income potential. If high-skill immigrants indeed consume more, then their impact on establishment

² Olney (2013) uses a similar data set constructed from IPUMS and U.S. Census Bureau Statistics on U.S. Businesses for firms which are divided into large, medium, and small. Olney primarily looks at changes in the aggregate of business establishments of all ages, which covers establishments in 30 major cities from 1998 to 2008.

entry and exit is expected to be greater as long as the rates of labor force participation and employment are not significantly different. Second, we define new immigrants as foreign born persons who have migrated to the U.S. *in the last three years*. Incorporating this lag is important to allow sufficient time for immigrants to settle, find employment or self-employ, as well as for any consumption and labor market changes to be perceived by firms. Finally, we use a comprehensive data set not found in any other research to date. Our panel data includes 251 metropolitan statistical areas located throughout the United States over a ten year period. This robust data set allows for a more comprehensive analysis of the impact of immigration on firm expansion and sustainability.

III. HOW IMMIGRATION INFLUENCES FIRMS

A. Consumption & Labor Supply

Firm entry into a given market is predicated on expected profitability and requires both capital and labor planning. A business establishment is a form of capital which requires considerable financial investment, so firms are unlikely to enter the market unless there is perceived demand. [Dellavigna and Pollet \(2013\)](#) have found a link between investment and changing demographics. Specifically, demand shifts due to changing demographics within a 5 to 10 year horizon are associated with higher investment. Therefore, an exogenous shock from immigration increases demand and alters the demographics of the local region, making new and existing firms more likely to invest in capital and expand. An increase in consumer demand puts upward pressure on prices further motivating firms to enter the market to capture producer surplus until prices return to equilibrium.

Firm exit is predicated on maintaining profitability. If an establishment is operating at the margin, it can choose to leave market or stay in the hopes of better conditions in the future. A consumer demand shock from immigration can improve market conditions and profitability, decreasing firm exits.

The general equilibrium model explains that a static labor market wage rate after a labor supply shock results from a compensatory shift in labor demand. Labor demand is influenced by production, and production is influenced by consumption and the labor supply. An increase in consumer demand can influence a firm to expand operations to capture economic profit from higher prices. Expansion can come in the form of purchasing additional equipment or machines. If economic conditions are favorable such that firm investment in expansion has foreseeably greater returns, then firms will expand capital and employment. An increase in labor demand from consumption puts upward pressure on wages holding labor supply constant. However, most migrants come to the U.S. to work, which increases the labor supply as well. This has the effect of putting downward pressure on wages. Since immigration moves both the labor demand and labor supply curve, they effectively cancel each other. In either case, firms make capital adjustments which allow it to absorb immigrant labor. As long as the capital to labor ratio stays relatively the same, so will wages.³

B. Diversification & Entrepreneurship

In addition to impacts on consumption and labor supply, immigration also engenders better economic conditions through diversification and entrepreneurship. Research has found a

³ If capital is unable to adjust, then wages will decrease. If capital outpaces labor supply, then an increase in wages will occur.

relationship between cultural diversity and the rate entrepreneurship. [Sobel, Dutta, and Roy \(2010\)](#) identify a positive correlation between cultural diversity and entrepreneurship in countries with strong formal institutions and the rule of law. When immigrants flourish, a local economy can become a melting pot where the exchange of mutually beneficial knowledge can encourage entrepreneurship in a given geographical area. And in cities where immigrants tend to succeed, so do natives. [Wang \(2010\)](#) finds white and black natives perform better in newer immigrant gateways (e.g. Miami, Los Angeles, Houston) relative to historic ones (e.g. Baltimore, Detroit, St. Louis); especially when the Hispanic share of immigrant population is higher. [Hong and McLaren \(2015\)](#) also find that in addition to raising total employment by 3 percent, a “shot in the arm effect” from immigration also increases native employment by 2 percent. The increased economic opportunity caused by immigrants is attractive to natives and contributes to a “virtuous cycle” of growth. Therefore, cultural diversity induced by immigration seems to encourage entrepreneurship in general leading to the creation of more firms.

Several studies have also looked at the patterns of immigrant business ownership and self-employment. Using 2010 Current Population Survey and 2007 Survey of Business Owners data, [Fairlie \(2008, 2012\)](#) statically shows that immigrants as a whole are more likely to own a business than natives and exhibit higher rates of business formation.⁴ This is also true of Mexican immigrants in certain parts of the country. [Mora and Davila \(2006\)](#) find that Mexican immigrants along the U.S.-Mexico border have higher rates of self-employment and business ownership than both natives and Mexican immigrants in non-border cities; likely attributable to a greater degree of import-export opportunities. Looking at historic immigrant “gateway” cities, [Wang \(2010\)](#) also finds this to be true of Hispanic immigrants as well as Asian. [Van Tubergen \(2005\)](#) finds immigrants from non-Christian source countries exhibit higher rate of self-employment, especially in high unemployment areas and among smaller immigrant communities. Given these findings, it is expected that immigration would have greater impact on the entry of firms and business establishments beyond their contributions to labor supply and consumer demand.

C. Hypotheses

Given the aforementioned theoretical channels through which immigration may impact firm expansion and contraction, we formulate the following hypotheses:

Hypothesis 1: *New immigrants are positively correlated with establishment entry levels.*

Hypothesis 2: *New immigrants are negatively correlated with establishment exit levels.*

IV. EMPIRICAL APPROACH

A. Baseline Specification

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

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

⁴ [Fairlie \(2012\)](#) also reports that immigrant owned businesses hire more frequently than native owned businesses.

The dependent variable (Est) is the entry and exit level of establishments in metropolitan area (m) in year (t). The independent variable (I) represents the new immigrant group. Our main results focus on immigrants who have migrated in the last three years. The incorporation of a three year lag permits time for new immigrants to settle, establish connections, attain employment or self-employ. This lag also allows time for any diversification effects from immigration on the native population and local economy.⁵ 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. Instrument Specification

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.⁶ 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 data. 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.⁷ The predicted inflow distribution is calculated in the first stage regression:

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

Where (AI) is the aggregate of new immigrant inflows from source county (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.

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).

A. New Immigrants

⁵ The main results do not vary much with alternative values for the time lag. The results are available upon request.

⁶ 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.

⁷ We consider the 17 dominant countries of origin, which are Brazil, Canada, China, Colombia, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, India, Japan, Korea, Mexico, Philippines, Puerto Rico, Vietnam, and all others.

The explanatory variable of new immigrant inflows was extracted from the ACS 1% samples provided by the Integrated Public Use Microdata Series (IPUMS) project created and maintained by the Minnesota Population Center of the University of Minnesota (Ruggles, Alexander, Gernadek, Goeken, Schroeder, and Sobek (2010)).⁸ 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 and migration destination for foreign born persons by metropolitan statistical area (MSA). ACS was not fully implemented by the Census Bureau until the early 2000s, so complete data was only available from 2002 to 2011 due to gaps in the samples in 2000 and 2001. However, this was sufficient to construct a robust dataset over a ten year period.

Table 1 presents the major source countries which contributed immigrants from 2001 to 2011. As mentioned prior, immigration has been in steady decline since the turn of the century. The largest numbers of immigrants still come from Mexico, but China and India have not been far behind in recent years.

ACS also provides educational attainment information for each immigrant in the survey. This information is useful for determining any differential impact between low-skill and high-skill immigrants. High-skill immigrants are generally defined as those with a bachelor's degree or higher and low-skill as having less than a high school degree. Examples of this method are used in Aydemir and Borjas (2011) and Card (2009). This method relies on the assumption that high-skill immigrants follow the same migrant patterns as their precursors. However, there is evidence to suggest that this is not the case. Gross and Schmitt (2012) find that settlement patterns vary across skill level in France. Low- and intermediate-skill immigrants were more likely to follow traditional settlement patterns due to network dependency as a result of a lack of proficiency in the French language. But high-skill immigrants were more likely to be proficient in French and, therefore, migrated based on financial incentives. Mexican and Indian immigrants are a prime example of this dichotomy given the significant difference in share of educational attainment and English proficiency.

Table 2 presents the distribution of educational attainment for the aggregate of immigrants who migrated between 2000 and 2011. Column two and three single out Mexican and Indian immigrants, respectively. Notice over half of the Mexican cohort have less than a high school degree while this education level makes up less than 10 percent of the Indian cohort. In what is considered the high-skill degree category – Doctorate, Professional, Masters and Bachelor – make up 75 percent of Indian skill distribution and only 6 percent of the Mexican skill distribution. Given the disparity in education and English proficiency, an alternative method to differentiate the impact between high- and low-skilled immigrants is to use these immigrant groups as proxies. Specifically, we utilize Mexican immigrants as a proxy for low-skill workers and Indian immigrants as a proxy for high-skill to determine their differential impact on establishment entry and exits.

B. Instrument

The “supply-push” 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. Source countries which provided less than 5,000 immigrants were

⁸ ACS data from IPUMS is available at <https://usa.ipums.org/usa>.

TABLE 1 – Immigrant Inflows by Source Country

Source Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Brazil	891	701	743	818	841	498	398	274	210	115	41
Canada	980	797	780	780	791	682	631	577	344	233	110
China	2,663	2,003	1,883	1,775	2,007	1,875	1,702	1,370	1,110	853	325
Colombia	1,540	951	813	635	650	573	405	288	191	101	43
Cuba	1,018	920	968	1,117	858	869	617	550	313	215	64
Dominican Republic	794	663	814	759	637	510	404	371	358	194	53
El Salvador	1,536	1,137	1,144	1,205	1,313	857	549	376	226	125	26
Guatemala	1,060	1,088	1,212	1,341	1,348	888	649	367	207	119	23
Honduras	698	581	696	837	922	500	368	214	131	69	15
India	3,688	2,819	2,926	3,082	3,234	3,289	2,829	2,048	1,236	894	341
Japan	554	549	598	715	695	661	538	448	305	224	75
Korea	1,383	1,153	1,152	1,246	1,228	1,075	932	621	427	330	157
Mexico	14,920	13,086	12,628	12,156	11,471	7,742	5,078	3,317	1,830	1,087	386
Philippines	2,674	2,456	2,453	2,247	1,981	2,001	1,509	940	724	402	128
Puerto Rico	1,036	962	947	909	972	991	801	495	324	301	91
Vietnam	1,192	1,099	984	967	927	741	708	518	347	238	57
Other	21,767	16,032	15,270	14,645	14,490	11,768	9,868	7,848	5,782	3,802	1,438

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. The same procedure was applied when constructing the “supply-push” instrument for the high and low-skill proxies.

C. Establishments

Data for the dependent variables of establishment entry and exit level were provided by the U.S. Census Bureau’s Business Dynamics Statistics (BDS) which includes annual measures of business dynamics for firms by age, size, and industry sector. An establishment is defined as a single physical location where business is conducted or where services or industrial operations are performed. 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. 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 for a business location. Therefore, establishment entry provides an indication of firm growth and consumer demand. However, if at some point the establishment becomes unprofitable, it will likely exit the market.

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

TABLE 2 – Aggregate Immigrant Education Distribution 2000-2011

Education level	All	Mexican	Indian	Other
Doctorate	2.5%	0.1%	1.8%	3.2%
Professional	2.7%	0.5%	4.3%	2.9%
Master	10.6%	1.0%	26.3%	10.5%
Bachelor	23.5%	4.3%	42.5%	25.0%
Associate	4.5%	2.7%	2.0%	5.5%
Other	24.4%	24.1%	10.4%	28.0%
High school	9.3%	10.6%	2.8%	8.6%
Less than high school	23.4%	56.6%	9.8%	16.3%

restricted to the same time period.⁹ In addition, 251 of the 365 MSAs were able to be matched from BDS with IPUMS data in terms of geographical definition providing a robust sample.

D. Descriptive Statistics

Table 3 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

The OLS and IV results are presented in Table 4 for the impact of new immigrants on establishment entry and exit levels. The top three sections present the results for one, two, and three year lagged independent variables to demonstrate the importance of allowing time for immigrants to settle in order for the instrument to be effective. Our primary assumption is that immigrants require approximately three years to establish themselves and for firms to perceive demographic and consumption changes. Results from section one of Table 4 confirm our suspicion that one year is not sufficient given that the coefficients have no significance. Additionally, the F-statistic is near zero. The F-statistic for immigrant groups who migrated in the prior two and three years are 53.97 and 247.50, respectively. These results validate our instrumentation strategy of predicting immigrant inflows based on the geographic distribution of earlier immigrants. After year and location fixed effects are 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, but a weaker F-statistic. Specifically, the results indicate a 10 percent increase in new immigrants increases the establishment entry level by 7.62 percent. The same increase reduces establishment exits by 0.72 percent. In section three of Table 4, 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 3.81 percent and decreases exits by 0.65 percent. The results are consistent our hypotheses. Given time to perceive demographic, consumption and

⁹ Data can be retrieved at <http://www.census.gov/ces/dataproducts/bds/>

TABLE 3 – Summary Statistics

Variable	Entry	Exit	Immigrants
Mean	2396.724	2175.705	55.339
Standard Error	117.986	108.035	4.046
Median	824	775.	12.000
Mode	580	288.000	1.000
Standard Deviation	5199.443	4760.880	178.316
Sample Variance	27034210.963	22665980.313	31796.444
Kurtosis	50.256	54.604	96.071
Skewness	6.150	6.424	8.566
Range	58805	55091	2756
Minimum	100	114	1
Maximum	58905	55205	2757
Sum	4654438	4225219	107468
Count	1942	1942	1942

labor supply changes, firms react by increasing capital to produce and service more consumers. In addition, the diversification and proclivity of immigrants to become entrepreneurs at higher rates relative natives also influences the entry level. Changes in consumption and labor supply help some businesses operating at the margin. Given immigrants distinct consumption composition, it is expected that immigrants would influence establishment entry more relative to exit, but the result is significant none-the-less.

B. Skill Differential by Proxy

Also presented in Table 4, section 4 and 5, is the differential impact by skill composition with Mexican immigrants as a proxy for low-skill workers and Indian immigrants as a proxy for high-skill. Both groups have positive and significant correlation with establishment entry and negative correlation with exits. The F-statistic for Mexican and Indian immigrants who migrated in the prior three years is 211.59 and 61.93, respectively. Both F-statistics are significant, but the Indian instrument is weaker. This is consistent with findings by [Gross and Schmitt \(2012\)](#). Since a greater share of Indian immigrants speak English proficiently and are more highly educated, they are more likely to migrate based on financial incentives, which makes their settlement pattern less predictable. Mexican immigrants, however, are unlikely to speak English proficiently and more likely to be low-skill, requiring them to rely on networks built within various settlement enclaves and makes their migrant patterns to be more predictable.

Despite the relative weakness of the instrument, Indian immigrants have greater correlation with entry. Specifically, a 10 percent increase in Indian immigrants who have migrated in last three years increase establishment entry level by 5.95 percent whereas the same increase in the Mexican cohort increase entry by 2.88 percent; a difference of 3.07 percent. This is consistent with the assumption that high-skill immigrants have greater earning potential and contribute more positively to consumption effects. The same consumption effects should contribute more to exits. However, both cohorts impact exits about the same: increasing Mexican and Indian immigration by 10 percent decreases exits by 0.97 and 0.94 percent, respectively.

TABLE 4 – Impact of Immigration on Establishment Entry & Exit

	Log Entry		Log Exit	
	OLS	IV	OLS	IV
Log of Immigrants lagged 1 year	0.604 (0.016)	9.130 (17.070)	0.597 (0.015)	0.787 (1.481)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	1150	1140	1150	1140
Adj. R-squared	0.570	-	0.583	-
F-stat., Instrument	-	0.29	-	0.29
Log of Immigrants lagged 2 years	0.578** (0.012)	0.762** (0.111)	0.566** (0.012)	-0.072** (0.018)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	1942	1942	1942	1942
Adj. R-squared	0.568	-	0.567	-
F-stat., Instrument	-	53.97	-	53.97
Log of Immigrants lagged 3 years	0.588** (0.010)	0.381** (0.028)	0.567** (0.010)	-0.065** (0.009)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	1942	1942	1942	1942
Adj. R-squared	0.568	-	0.567	-
F-stat., Instrument	-	247.50	-	247.50
Log of Mexican Immigrants lagged 3 years (low-skill proxy)	0.532** (0.020)	0.288** (0.023)	0.498** (0.020)	-0.097** (0.010)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	1303	1291	1303	1291
Adj. R-squared	0.360	-	0.319	-
F-stat., Instrument	-	211.59	-	211.59
Log of Indian Immigrants lagged 3 years (high-skill proxy)	0.714** (0.021)	0.595** (0.086)	0.707** (0.021)	-0.094** (0.022)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	1074	986.00	1074	986.00
Adj. R-squared	0.522	-	0.524	-
F-stat., Instrument	-	61.93	-	61.93

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

C. Robustness

To test the robustness of our results we have conducted a sensitivity analysis. The results are presented in Table 5. In order to check whether variation in city size plays a role in explaining the main results, we follow the example set in the literature (Card, 2001; Cortez, 2008; Olney, 2013) and limit the sample to larger cities.¹⁰ To ensure sufficient variation in the data, we limit the sample to the 50 largest cities by migrant population.¹¹ The point of excluding smaller cities is to guard against measurement error in the data. Despite the reduction, Table 5 shows that the impact still holds for all three immigrant groupings. Although the coefficients are reduced, they are still significant. In large cities, a 10 percent increase in the level of immigrants who have migrated in the last three years increases establishment entry level by 2.64 percent and decreases exits by 0.99 percent. Interestingly, the coefficient for entry level decreases moderately and the coefficient for exits increases. This indicates the consumption and labor supply impacts from immigration on establishment exits is greater in larger cities relative to small ones.

The robustness test also confirms our original assumption regarding skill differential impacts as the high-skill proxy has a larger coefficient relative to the low-skill. Specifically, a 10 percent increase in Indian immigrants is positively correlated with an increase in entry level of 3.54 percent and a decrease in exit level of 1.11 percent. The same increase in the Mexican group results in an increase in entry level of 1.53 percent and a decrease in exit level of 0.71 percent. The relative difference is 2.01 for entry and 0.40 for exits. This indicates consumption effects are more strongly felt in larger cities from high-skill immigrants due to greater earning potential.

VII. CONCLUSION

Research on immigration has primarily focused on the effect of low-skill immigrant labor on wages. Recent research has broadened the study to firm behavior. The contribution of this paper is to increase our understanding by examining both establishment entry and exits at the local level. We also expand the immigrant pool of study to all immigrants and 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 large sample of U.S. cities were captured over a ten year period providing, to our knowledge, the largest dataset to date.

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 robustness check confirms that even when the sample is limited to the 50 largest cities by migrant population in the sample, the results remained positive and significant for both groups.

In addition, we utilize Mexican and Indian immigrants as a proxy for low and high skill workers, respectively, as a means to test the differential impact of skill heterogeneity on establishment levels. As predicted, Indian immigrants have relatively greater impact on establishment entry levels relative to Mexican immigrants, but about the same impact on

¹⁰ These authors focus on the top 30 largest cities. We also find that the results still hold with 30 largest cities. The results are available upon request.

¹¹ The cities include: Atlanta, Austin, Bakersfield, Baltimore, Boston, Charlotte, Chicago, Cleveland, Columbus, Dallas-Ft. Worth, Denver-Boulder, Detroit, El Paso, Fresno, Green Bay, Hartford, Honolulu, Houston, Indianapolis, Jackson, Kansas City, Las Vegas, Los Angeles, McAllen, Miami, Minneapolis, Nashville, New Orleans, New York, Orlando, Philadelphia, Phoenix, Pittsburgh, Portland, Providence, Raleigh, Richmond, Riverside, Sacramento, St. Louis, Salt Lake City, San Antonio, San Diego, San Francisco, San Jose, Seattle, Syracuse, Tampa, Tucson, Washington D.C.

TABLE 5 – Impact on Entry & Exit in the 50 Largest Cities

	Log Entry		Log Exit	
	OLS	IV	OLS	IV
Log of Immigrants lagged 3 years	0.479** (0.028)	0.264** (0.039)	0.461** (0.029)	-0.099** (0.021)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	408	408	408	408
Adj. R-squared	0.667	-	0.631	-
F-stat., Instrument	-	60.18	-	60.18
Log of Mexican Immigrants lagged 3 years (low-skill proxy)	0.207** (0.034)	0.153** (0.014)	0.155** (0.035)	-0.071** (0.010)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	375	375	375	375
Adj. R-squared	0.046	-	0.046	-
F-stat., Instrument	-	169.75	-	169.75
Log of Indian Immigrants lagged 3 years (high-skill proxy)	0.451** (0.033)	0.354** (0.058)	0.448** (0.033)	-0.111** (0.026)
MSA FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	359	358	359	358
Adj. R-squared	0.344	-	0.343	-
F-stat., Instrument	-	59.01	-	59.01

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

establishment exits. When the sample is limited to the 50 largest cities, Indian immigrants had greater impact on exits as well.

In addition, we utilize Mexican and Indian immigrants as a proxy for low and high skill workers, respectively, as a means to test the differential impact of skill heterogeneity on establishment levels. As predicted, Indian immigrants have relatively greater impact on establishment entry levels relative to Mexican immigrants, but about the same impact on establishment exits. When the sample is limited to the 50 largest cities, Indian immigrants had greater impact on exits as well.

Much ado has been made about immigrant labor in the U.S. and its impact on wages and job availability for natives. These results serve to explain why the effect of immigration on native wages is negligible in the literature. Firms increase capital in response to changes in consumption and 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 and 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 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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