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Nebraska's Immigrant Population: Economic and Fiscal Impacts - OLLAS Report No. 5

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NEBRASKA'S IMMIGRANT POPULATION

ECONOMIC AND FISCAL IMPACTS



OLLAS



NEBRASKA'S IMMIGRANT POPULATION ECONOMIC AND FISCAL IMPACTS



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The Office of Latino/Latin American Studies (OLLAS, pronounced “oy-yas”) at the University of Nebraska at Omaha is a transnational center located in the College of Arts and Sciences. OLLAS’ mission is to combine academic excellence with real-world engagement in order to contribute to the understanding of Latino/Latin American issues. OLLAS’ main goals are: 1) to develop and implement a policy-oriented and community-relevant research and publication agenda; 2) to create and expand learning spaces beyond the classroom for students, corporate actors, policy-makers and the public at large; and 3) to establish partnerships with community organizations in order to strengthen Latino and Latin American populations’ capacity to exercise their rights to equal and active citizenship within and across borders. Our work is informed by a deep understanding of the dynamic interaction of global and local forces. We are grateful for the support provided by private foundations, government grants, private donors and the University of Nebraska. For more information, visit our website: www.unomaha.edu

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Table of Contents

Executive Summary	1
Measuring the Economic Impact of Migration – An Introduction	3
Major Elements and Regional Scope of Impact Study	5
Data Sources and Model Platform Utilized for Immigration Analysis.....	6
Geographic Scope of Impact Study	7
Expenditure Impacts of First-Generation Foreign-Born Immigrants	10
State-Level Impacts	10
Regional Impacts	13
Alternative Expenditure Estimates.....	14
The Impact of the Immigrant Labor Force on State Production	15
State-Level Impacts	15
Regional Impacts	17
Alternative Employment Impact Scenarios	18
Fiscal Contributions and Social Cost Pressures from the Immigrant Population in Nebraska.....	20
Fiscal Contributions.....	21
Public Costs	22
Conclusion and Future Research	23
Bibliography	27
Appendix A: American Community Survey Public Use Microdata Sample	29
Appendix B: Calculation of After-Tax and Remittances Income	31
Appendix C: Calculations of Public Contributions and Costs Estimates	33
Appendix D: Basic Input-Output (IO) Modeling and Derivation of IO Multipliers.....	35

Executive Summary

Immigration issues have once again assumed center stage in policy circles at every level of government in the United States, as the number of new immigrants, many undocumented and many from Latin American nations, has risen markedly in recent years. This is certainly true in Nebraska. According to US Census figures for 2000, the total immigrant population in Nebraska was estimated to be 74,638. By 2006, this figure had risen to 99,500, a 33.3 percent increase. By comparison, the total native-born population in the state grew less than 2.0 percent over the same six-year period. This study attempts to quantitatively measure the impact of the state's immigrant population on the Nebraska economy, with some attention paid to Latin American immigrant groups. In this summary, a few key findings are highlighted. (See executive summary table).

- In 2006, immigrant spending resulted in \$1.6 billion worth of total production (or output) to Nebraska's economy, with a possible range from \$1.5 to \$1.7 billion. Moreover, this spending generated between 11,874 and 12,121 jobs in total for the state.
- The 2006 total production impact of Central and South American immigrant *spending* was \$717 million, with a possible range between \$653 million and \$792 million, accounting for between 4,923 and 5,971 jobs in the state.
- The total value of production impact of immigrant spending in Nebraska's Omaha and Lincoln areas was \$1.14 billion in 2006, resulting in 8,331 jobs. The impact of immigrant spending on total production in Nebraska's Eastern region (excluding the Omaha and Lincoln areas) was \$204 million, resulting in 1,275 jobs. Finally, the impact of immigrant spending on total production in Nebraska's Western region was \$238 million, resulting in 1,896 jobs.
- Nebraska's immigrant population makes a substantial contribution to the labor force in some of the state's key economic sectors: construction, hotel and food services, and meat, poultry, and fish processing. The immigrant labor force accounted for 9.65 percent of total employment in construction in 2006, 7.3 percent of total employment in the services sector, and 80.4 percent in meat processing.
- In this study, we conducted experiments addressing what would happen if the immigrant portion of the labor force were unavailable in these key sectors. We found that total state production would fall by \$13.5 billion if these immigrants were not present in these sectors, about 8.75 percent of total state production. If just the Central and South American immigrant population were removed from these sectors, the resulting loss to the state would be \$11.4 billion, or 7.9 percent of total state production.
- Total production losses in the state's main, densely populated areas would be \$5.4 billion. Losses would amount to \$3.9 billion and \$2.8 billion in the state's Eastern and Western regions, respectively. These would represent significant losses to these regions' employment as well. For instance, in the state's densely populated regions, total job losses could be as high as 35,140, or about 6.5 percent of total jobs in the regions.
- The state's immigrant population contributed about \$154 million in the form of property, income, sales, and gasoline tax revenue in 2006. This amounts to about \$1,554 in per capita contributions. By contrast, the state's corresponding per capita contribution from the native-born population is about \$1,944.
- In terms of government costs, the immigrant population in Nebraska accounted for \$144.78 million from food stamps, public assistance, health, and educational expenditures in 2006. This amounts to about \$1,455 per capita. By contrast, the corresponding per capita costs from the native-born population are about \$1,941.
- While the contribution to cost ratio is 1.0 for the native population, the corresponding ratio for the immigrant group is 1.07, indicating that this group "pays in" about 7 percent more of what it uses in terms of governmental support.

Executive Summary Table.

Economic Impacts:	Production Generated (\$ millions)	Employment Generated (# jobs)
<i>Impact of Immigrant Spending</i>		
State of Nebraska	\$1,643.32	12,447.5
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$1,138.34	8,330.7
Eastern Region of Nebraska	\$203.94	1,275.4
Western Region of Nebraska	\$238.32	1,895.7
<i>Impact of Removing Immigrant Employment</i>		
State of Nebraska	-\$13,461.60	-78,070.7
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$5,432.65	-35,139.3
Eastern Region of Nebraska	-\$3,852.79	-18,372.3
Western Region of Nebraska	-\$2,802.28	-15,648.2
<hr/>		
Fiscal Contributions and Costs to Nebraska:	Foreign Born	Native Born
Contributions per capita (\$)	\$1,554.27	\$1,943.53
Costs per capita (\$)	\$1,455.11	\$1,941.05
Ratio of contributions to costs	1.07	1.00

Source: See text.

Technical Note about the foreign born included in this report. For purposes of this report, Mexico, Cuba, Jamaica and the Dominican Republic, among others, are included under the “Central and South American” category. The total foreign born category includes both those from Central and South America as well as the rest of the world. Table A1, in Appendix A, identifies the country of origin for the delineations used in this study.



Measuring the Economic Impact of Migration An Introduction

Immigration as a national and local issue has been present in our nation's history from its very beginning. While its prominence in national debates has ebbed and flowed in the past, it has without doubt again assumed center stage in policy circles at every level of government as the number of new immigrants, many undocumented and many from Latin American nations, has risen markedly in recent years. This is certainly true in Nebraska. According to US Census figures, in 2000, the total immigrant population was estimated to be 74,638. By 2006, this figure had risen to 99,500, a 33.3 percent increase. By comparison, between 2000 and 2006, the total native-born population in the state grew less than 2.0 percent. Thus, the share of foreign-born residents in the state has increased markedly in recent years.

This trend has occurred in other states as well. Not surprisingly, the various social and economic effects

of immigration have once again piqued the interest of many economists, sociologists, political scientists, and policymakers. The recent academic literature in economics has focused on the impact of immigration on the labor market, with little consensus. Borjas (2003), for instance, found evidence that increased immigration places significant downward pressure on wages in a variety of sectors. Indeed, his analysis suggests that a 10 percent increase in immigration can reduce wages by as much as 4 percent in lower-skilled occupations. However, Card's (2005) analysis suggests that Borjas's conclusion is too pessimistic, finding little evidence of any substantive link between wages and immigration. Indeed, this lack of consensus in the literature highlights a significant complexity in labor market dynamics that makes it difficult at best to conclude that immigrants necessarily pressure wages downward in the long run. This is a debate that will not be settled any time soon.¹

¹ For a recent summary and critical assessment of the evidence on the impact of immigrants on native wages and job displacement, see Murray, Batalova, and Fix (2006) and Pedace (2006). The latter study is of particular note. The author argues that most studies fail to account for the segmented nature of the US labor market. Labor market segmentation mitigates competition among those groups of workers, including African Americans, who tend to occupy different employment niches (e.g., public sector versus manufacturing employment). Additionally, native workers often transition more easily to primary sector jobs, exiting jobs in the lesser-skilled, lower-wage secondary sector where immigrants are more likely to concentrate. Moreover, Pedace's statistical analysis suggests that Hispanic women may benefit least from immigration. Gouveia (2006) examines the issue of occupational niches for immigrants and, to some extent, African Americans in Nebraska. Her analysis, based in part on census data, suggests that competition between these two groups is indeed minimal, but much remains to be known about the root causes of economic and educational disadvantages of all low-income workers in Nebraska; most of such causes preceded the arrival of large numbers of immigrants.

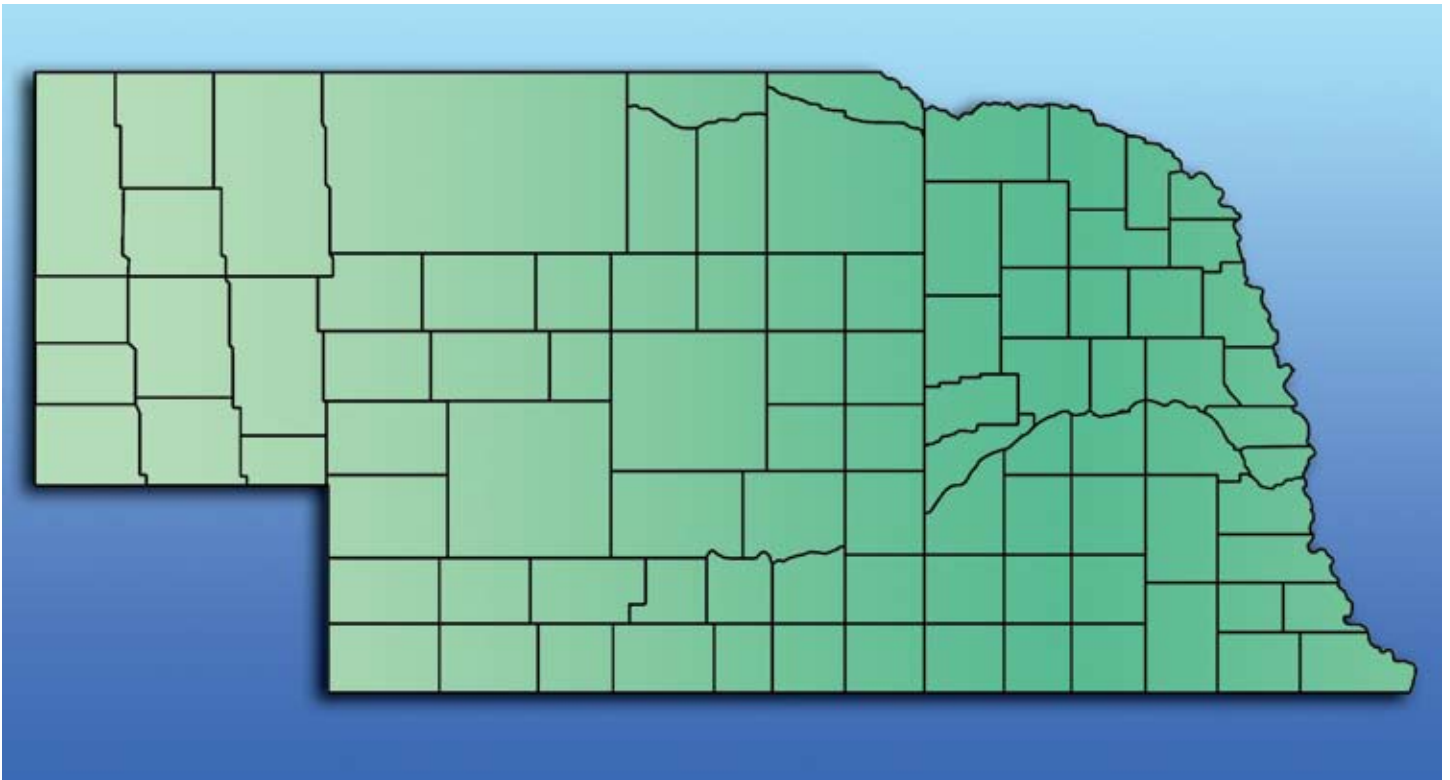
Perhaps as a consequence of the general inability to conclusively demonstrate a wage-immigration link by sector or demographic group, some studies have taken a broader view of immigration's impact on an economy. For instance, James, Romine, and Zwanzig (1998) find that immigrant inflow has buoyed housing markets and local business in a number of major US cities that had been experiencing economic declines in the 1970s and 1980s. Finally, a major issue is the degree to which increased immigration places greater pressure on local communities' ability to supply public services such as education and health services relative to these groups' ability to contribute in the form of property, income, and sales taxes. Here evidence is scant. Recently, however, Garvey, Espenshade, and Scully (2002) found that in New Jersey the state's immigrant population tended to "pay in" more than they received from state and local services relative to their native-born counterparts. Kasarda and Johnson, Jr. (2006) found some evidence indicating a reverse situation for North Carolina.

Many studies have looked more broadly at the economic impact of immigration, rather than taking an isolated view of unskilled labor markets or public benefits and costs. In a study of the Arizona economy, Gans

(2007) found that immigrants in that state accounted for \$44 billion worth of total production in 2004. Also, the Fiscal Policy Institute (2007) in New York found that immigrants accounted for \$229 billion worth of total production in 2004. Finally, while focusing mostly on North Carolina's Hispanic population, a large percentage of which are foreign born, Kasarda and Johnson, Jr. (2006) indicated that this population generated a substantial amount of employment and economic activity within that state.

This broader view of immigration's impact on an overall economy is the focus of this analysis. To that end, this report attempts to quantitatively assess the economic impact of international migrant population movements into the state of Nebraska. To date, no such comprehensive study has been undertaken for this state, in spite of the substantial increase in immigrant population flows in recent history, especially over the last decade. While the report considers the economic impact of all immigrants to the state, particular attention will be directed toward immigrants coming from Central and South American countries since the majority of immigrants to Nebraska are from these regions.²

² While another important issue is the economic impact of state-to-state net migration within the United States, this report does not consider such dynamics. Our focus is on international migration. Moreover, we do not address issues of when or why such migration took place. We are interested in measuring the effects of immigration rather than their cause. Indeed, our specific focus is on providing a "snapshot" of the impact that first-generation immigrants who have settled in the state are having on the Nebraska economy. For studies analyzing the causes of migration to the United States, there are a number of useful references, many drawn from the sociological literature. Interested readers should see, for instance, Portes and Rumbaut (2006), Waldinger and Lee (2001), and Massey, Durand, and Malone (2002). For a regional analysis, see Gouveia and Saenz (2006). For an examination of the global forces behind world and US migration, see Castles and Miller (2003). For a more detailed explanation about how countries of origin were aggregated see Appendix A.



Major Elements and Regional Scope of Impact Study

To conduct an economic impact study, most researchers employ an Input/Output (IO) model. An IO model, originally developed by Wesley Lontief (1936) and therefore often called Lontief models, describes an economy as a series of interlinked industries or sectors. A stimulus to one sector, such as an increased wage-earning labor force, then impacts all other sectors, to varying degrees, through a “multiplier effect.” This is illustrated in Figure 1 below.

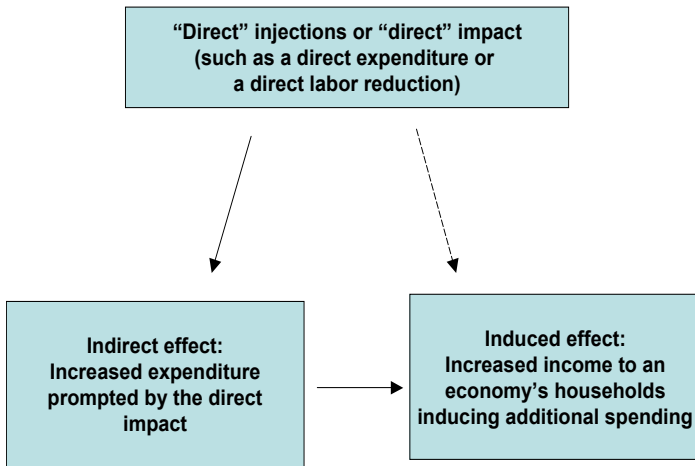
The multiplier effect measures the “indirect” and “induced” impact or effect of a direct injection. As a matter of technical exposition, “indirect” effects are those re-spending effects that filter through other industries in an economy as a result of the direct injection. For instance, suppose a direct impact on hotel expenditures boosts demand for cleaning services at those hotels (a first indirect effect). This stimulates demand for cleaning capital and products (a second indirect effect). This second indirect effect stimulates demand in other sectors, and so on. The sum of all these effects on other industries is the “indirect” effect. The “induced” effect is the effect on final demand in an economy. Final demand can be characterized in the following way. All of these sectors employ people locally. Increased demand for production (output)

from these sectors induces additional labor inputs, paid for via wages and salaries. The resulting increase in employee incomes induces additional spending locally. This additional spending is the “induced” effect. The continual “re-spending” of the original direct injection accumulates all through the local economy.

The total impact, then, is the sum of the direct, indirect, and induced effects. From these figures, we obtain economic multipliers, which measure the impact of one dollar’s worth of direct injections. For instance, if an additional \$100 of direct expenditure is spent on groceries, this would stimulate spending by the grocery sector to source grocery items from suppliers. This spending might be \$40. In turn, there may be a need for additional labor in the grocery sector, generating additional income and thus additional spending of perhaps \$15. Taken together, the aggregate impact of the initial \$100 injection was \$155 to the economy.

As is generally done, these effects are normalized to one dollar, meaning that, in our example, one dollar of direct spending results in an addition of 55 cents to the economy; the overall impact is \$1.55. This figure is commonly referred to as the final demand multiplier. The overall dollar impact on an economy is often called

Figure 1.
The Multiplier Effect

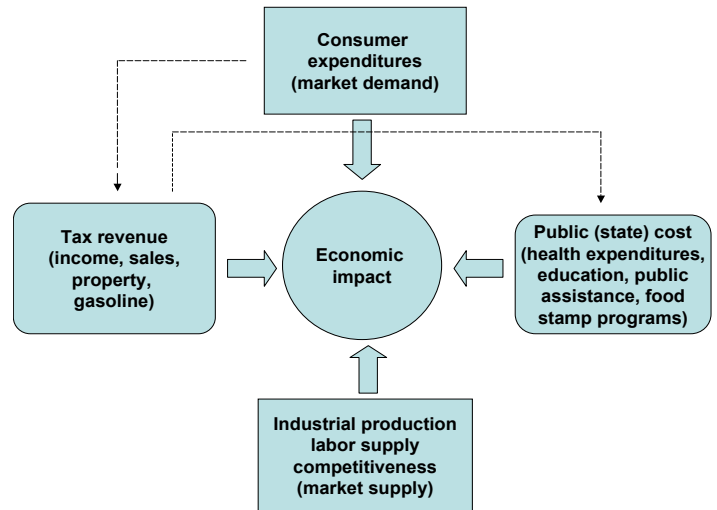


the “multiplier effect.”

Following Kasarda and Johnson, Jr. (2006), most impact studies of this nature generally have four basic elements. These elements, depicted in Figure 2, are as follows:

- **Consumer expenditures impact:** This effect focuses attention on the demand side of an economy. A given group, such as first-generation immigrants, will be income earners and will spend income on a variety of locally provided goods and services in certain sectors of the economy. These expenditures are our “direct” injection expenditures. These expenditures will in turn stimulate further “indirect” spending increases and increased labor earnings, generating the “induced effect.” Taken together, these direct, indirect, and induced expenditures provide a measure of total expenditure impact on an economy.
- **Production impact:** The production impact measures the effect of an increase/decrease in labor on an economy. This, too, will have a multiplier effect associated with it. For instance, a reduction in the meat processing industry of 100 workers will result in lower production in the meat processing sector. Moreover, as a result of reduced production and incomes, there will be lower demand for other goods and services in an economy, thus creating an adverse indirect effect on other sectors of the economy. Moreover, lower household incomes create an adverse induced effect. The total impact is, again, measured by a total multiplier effect.

Figure 2.
The Major Elements of an Economic Impact



- **Fiscal contributions:** Increases in employment, immigrant or otherwise, generate income tax revenue for the state. Moreover, to the extent that these populations own homes, property tax revenue is generated. Finally, sales tax revenue is generated on spending, and excise tax revenue is generated on the sale of gasoline. These fiscal contributions to state and local economies support education, health services, road construction and repair, and so on. These effects must also be considered as part of the overall impact on an economy.
- **Public sector costs:** Increased population, immigrant or otherwise, will place increased pressure on public goods and services. Hence, part of the impact on the economy needs to address this increased demand. As discussed in detail below, in this study we consider expenditures on food stamps, public assistance support supplied by the state of Nebraska, cost of supplying educational services, and state support for health care expenditures. There may be other public sectors to consider; however, in Nebraska these categories tend to be the major sources of public expenditure.

Data Sources and Model Platform Utilized for Immigration Analysis

Throughout this report, data sources are referenced. However, the primary data source is the American Community Survey Public Use Microdata Sample (PUMS) data system available from the US Census Bureau. For additional details regarding these data, see Appendix A. These data offer researchers the most recent and comprehensive secondary statistical data

source of demographic and economic information at the state and county geographic levels. From this data source we obtain information on population and income by demographic group as well as employment by industrial sector and demographic group. To these data we apply a number of other sources of information to obtain estimates of necessary economic variables.

In terms of model platform, the key to a complete impact study is to employ an IO model measuring both direct injections and the resulting indirect and induced effects that result from the multiplier effect. Creating multipliers requires an IO model that can be costly and data-intensive to create. Fortunately, there are many sources of such models and multipliers. One of the most common models used is IMPLAN, developed by the Minnesota IMPLAN Group, Inc. (MIG, Inc.).³ The IMPLAN model provides substantial industry detail (a desirable characteristic as multipliers will vary from industry to industry), provides substantial detail on direct injections and indirect effects, and is quite flexible in that it allows users to input a variety of market characteristics that may be unique to a particular area of the country. IMPLAN is used throughout this analysis.⁴

Geographic Scope of Impact Study

This study focuses primarily on state-level impacts. However, in Nebraska, characteristic of only a few US states, there is a significant dichotomy between its more densely populated and less densely populated economies. The counties that comprise the Omaha and

Lincoln Metropolitan Statistical Areas account for nearly 50 percent of the state's population. Moreover, there are significant differences between Nebraska's Western regions, roughly west of the 100th meridian, just to the west of Grand Island and Hastings, Nebraska, and its Eastern regions.⁵

Several common measures are used to describe the industrial composition of a regional economy for comparative purposes. One measure is a location quotient (LQ). These measures compare the employment share of a given industry in a particular region with the employment share of the same industry for a broader region (in this case, the state of Nebraska as a whole). An LQ exceeding the value 1 for a given industry indicates that a given region has a larger share of employment in that industry than the state as a whole, suggesting the industry is of particular importance to the economic base, or foundation, of the region.

Another measure is a regional Herfindahl Hirshman Index (HHI). This is a measure of industrial diversity within a given regional economy. It is calculated by summing up the squared industrial shares for all industries within a region.⁶ The more diverse an economy's industrial structure is, the smaller the HHI value.⁷ The more concentrated an economy is in a given set of industries, the higher the associated HHI value.

For this study, we constructed three regions: a "Tri-County" region comprised of Douglas (the densely

³ For details regarding IMPLAN, visit <http://www.implan.com>.

⁴ This program essentially includes, for a given user-defined geographic economy, a mathematical matrix of data that measure the industrial structure of the defined economy. This matrix (this so-called IO matrix) accounts for the fact that each sector in an economy depends on inputs supplied by other sectors in an economy. Hence, any external factor that directly impacts one sector will have the "ripple effects" that filter through the rest of the economy, as described above. This, then, generates the multipliers discussed above. MIG updates the data used in the model periodically, the latest measures of expenditure and employment data representing information for 2006. The primary data sources IMPLAN uses come from survey data and estimates generated by the US Bureau of Economic Analysis. In Appendix D, we provide a brief overview of IO models. However, for more detail, readers are referred to Raa (2005), Yan (1969), and Hewings (1985). Each provides an excellent overview. Note further that the IMPLAN model produces several different types of effects. The main effect is the dollar value impact on total economy-wide production or output. Once these figures are obtained from direct, indirect, induced, and total effects, IMPLAN will calculate other economic measures. One such measure of interest to this study is the employment effect, i.e., the number of jobs added to (or subtracted from) an economy as a result of some direct impact.

⁵ One major difference is climate. There is substantial difference in rainfall amounts east and west of the 100th meridian.

⁶ Specifically, let the employment share of industry i be defined as s_i for an economy's n different industrial sectors. The HHI is then calculated as follows: $HHI = \left(\sum_{i=1}^n s_i^2 \right) * 10,000$. The 10,000 value in this calculation is a scaling factor and has no meaningful impact on the interpretation of the HHI values.

⁷ Recent research tends to conclude that diversity is generally a desirable characteristic of regional economies because it acts as an "insulating" characteristic beneficial to weathering economic downturns. Since different sectors are impacted to varying degrees by economic downturns, the more diverse an economy, the less impacted such an economy will be by national or statewide recession.

TABLE 1. Regional Breakdown

	Tri-County	Eastern Nebraska			Western Nebraska		
County:	Douglas	Antelope	Merrick	Adams	Frontier	Kimball	
	Lancaster	Boone	Nance	Arthur	Furnas	Lincoln	
	Sarpy	Burt	Nemaha	Banner	Garden	Logan	
		Butler	Nuckolls	Blaine	Garfield	Loup	
		Cass	Otoe	Box Butte	Gosper	McPherson	
		Cedar	Pawnee	Boyd	Grant	Morrill	
		Clay	Pierce	Brown	Greeley	Perkins	
		Colfax	Platte	Buffalo	Hall	Phelps	
		Cuming	Polk	Chase	Harlan	Red Willow	
		Dakota	Richardson	Cherry	Hayes	Rock	
		Dixon	Saline	Cheyenne	Hitchcock	Scotts Bluff	
		Dodge	Saunders	Custer	Holt	Sheridan	
		Fillmore	Seward	Dawes	Hooker	Sherman	
		Gage	Stanton	Dawson	Howard	Sioux	
		Hamilton	Thayer	Deuel	Kearney	Thomas	
		Jefferson	Thurston	Dundy	Keith	Valley	
		Johnson	Washington	Franklin	Keya Paha	Wheeler	
		Knox	Wayne			York	
		Madison	Webster				

Source: Author's delineation

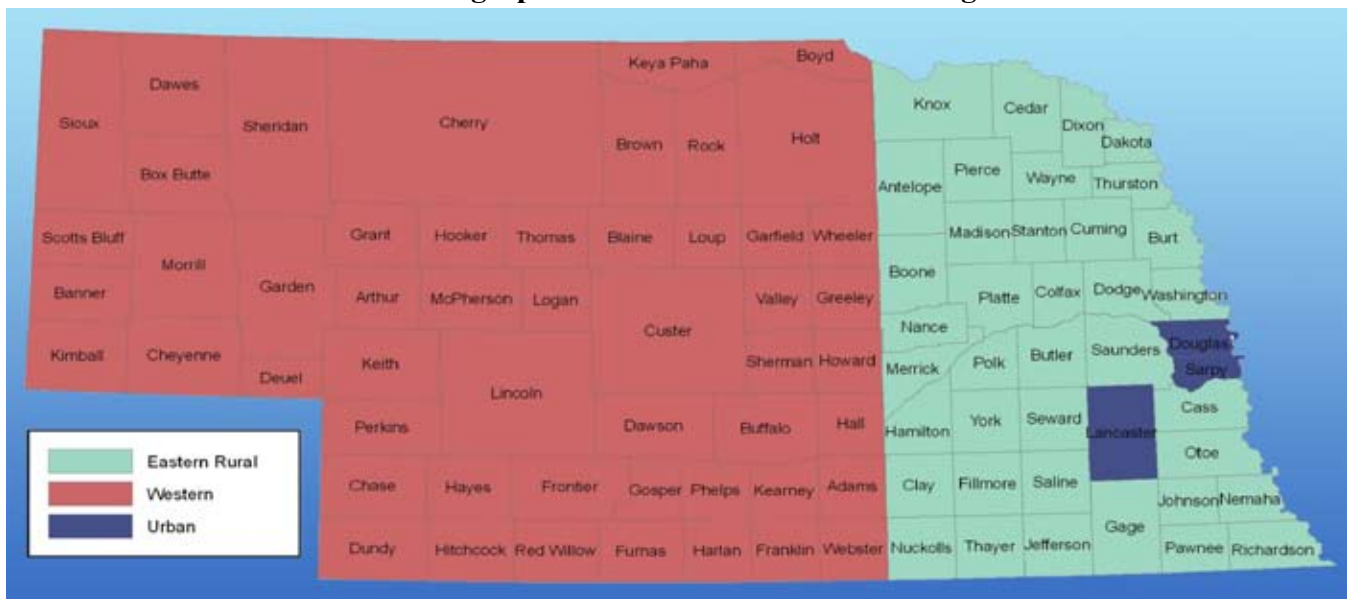
populated portions), Sarpy, and Lancaster counties (essentially Omaha and Lincoln), an “Eastern” Nebraska region comprising counties in the eastern part of the state (excluding the Tri-County area), and a “Western” Nebraska region.

Table 1 provides a specific county-by-county breakdown of these regional delineations.⁸ Figure 3 provides a geographic depiction of these regional breakdowns as well.

The LQ and HHI figures were calculated based on employment data available from the US Bureau of Economic Analysis (BEA).⁹ Table 2 shows the LQs and HHIs for the three regions of interest in this report. In terms of the HHIs, the data suggest that, characteristic of many, more densely populated economies, the Tri-County area of Nebraska has a more diverse economy than does the state’s Western and Eastern regions.

Eastern Nebraska has a very high concentration of

Figure 3.
Geographic Breakdown of Nebraska Regions



⁸ For largely pragmatic reasons, we did not break the data down into further subregions. The PUMS data are based on a sampling of residents in locations throughout the state. To further refine these geographic areas would have resulted in severe small sample biases in the data, making any inferences regarding population characteristics much more unreliable.

⁹ BEA’s Regional Economic Information Services (REIS) provide such employment data currently through 2005. These figures were thus based on the 2005 estimates. These data are available at <http://www.bea.gov/regional/reis/>. Note that some of these industry data are subject to disclosure issues, indicating several missing variables. The authors generated estimates for these missing variables utilizing state-level shares of employment data as well as other information sources. Details regarding these estimates are available upon request from the authors.

Table 2. Locations Quotients and Herfindahl Hirshman Indexes

	LQs		
	Tri-County	Eastern Nebraska	Western Nebraska
Farm employment	0.09	1.46	2.29
Mining	0.44	1.94	0.77
Utilities	0.83	1.68	0.31
Construction	1.19	0.64	1.15
Manufacturing	0.88	1.04	1.20
Wholesale trade	1.02	0.73	1.38
Retail trade	1.11	0.59	1.38
Transportation and warehousing	0.64	1.80	0.55
Information	1.45	0.50	0.79
Finance and insurance	1.41	0.48	0.89
Real estate and rental and leasing	1.29	0.60	0.98
Professional and technical services	1.50	0.41	0.81
Management of companies and enterprises	1.71	0.32	0.49
Administrative and waste services	1.41	0.54	0.81
Educational services	1.48	0.64	0.49
Health care and social assistance	1.20	0.74	0.97
Arts, entertainment, and recreation	0.71	1.78	0.43
Accommodation and food services	0.61	1.79	0.64
Other services, except public administration	0.99	0.86	1.24
HHI	727.29	1121.89	845.38

Source: Author's calculations based on data from the Regional Economic Accounts, Bureau of Economic Analysis, US Department of Commerce. Retrieved January 25, 2008 (<http://www.bea.gov/regional/reis/>).

transportation and warehousing service jobs (accounting for about 18 percent of employment in this region), as well as food service establishments (accounting for about 22 percent of employment). In Western Nebraska, farm employment accounts for about 11 percent of employment, and retail trade and health services account for 16 and 10 percent, respectively.

The LQ data demonstrate that, while the Tri-County region of the state is more diverse, many service-oriented jobs are concentrated there. In particular, information services (with an LQ of 1.45), financial services (with

an LQ of 1.41), management services (1.71), and educational services (1.48) appear to be concentrated in this region. These sectors tend to generate higher-paying jobs than many other sectors more prominent in less densely populated regions of the state. For instance, in Eastern Nebraska, farm employment, jobs in mining, utilities, transportation and warehousing, and food services tend to have very high LQs. In Western Nebraska, the LQs are relatively large in agriculture and wholesale and retail trade. Again, these sectors do not necessarily carry as high a level of compensation as those sectors concentrated in the Tri-County region.



Expenditure Impacts of First-Generation Foreign-Born Immigrants

As stated above, the primary data source used is the US Census's PUMS data system. Table 3 provides a summary picture of the demographic and earnings figures for the state as a whole as well as the three subregions described earlier.

The data reflect a few essential elements. While the total immigrant population represents about 5.6 percent of the total population (and about 6.7 percent of the total population of income earners aged 16 and over), as we show below, the impact on overall state expenditures tends to be less than these population percentages because these groups tend to earn less (\$26,195 per year for the immigrant population versus \$31,297 for the total population).¹⁰

State-Level Impacts

To obtain a measure of consumer expenditures, we used the income data from the 2006 PUMS data system. From these figures, we deducted federal and state income taxes as well as payroll taxes. This provided a

reasonable measure of after-tax personal income.¹¹ For the immigrant populations, we deducted a percentage of income remitted (i.e., sent or transferred) to immigrants' country of origin. In particular, for Central and South American remittances (by far the group with the greatest propensity to send earned income to their home country), we employed data from the Inter-American Development Bank, which found that an estimated \$154 million was remitted to country of origin in 2006, representing about 23 percent of after-tax income for the immigrant population from Central and South American countries.¹² The total estimated after-tax and remittances income for the state of Nebraska in 2006 was \$1.188 billion for total foreign-born immigrants and \$516.1 million for immigrants from Central and South American countries. These figures were put into IMPLAN to generate the overall impact of such spending on the state; they are presented in Table 4.¹³

As shown in Table 4, the direct expenditure by the state's income-earning, foreign-born population aged 16 and

¹⁰Also, the Central and South American immigrant populations tend to send a substantial portion of their take-home pay to family still residing in their respective countries of origin. We will discuss this issue below.

¹¹For details on this procedure, see Appendix B.

¹²For details on how these remittances figures were obtained and implemented, again see Appendix B.

¹³With aid from MIG, a set of figures was developed that estimated, for a given income range, the share of one dollar's (continued on next page)

Table 3. Summary of Population and Income Characteristics for 2006

	Total	Native Born	Foreign Born	Central & South American Born
Nebraska				
Population	1,768,331	1,668,831	99,500	57,172
Population 16 and over - wage and salaried plus self-employed	1,050,028	980,184	69,844	40,382
Mean Income (\$)	\$31,297.35	\$31,660.92	\$26,195.10	\$21,825.02
Total Income (\$ millions)	\$32,863.10	\$31,033.52	\$1,829.57	\$881.34
Tri-County (Douglas, Sarpy, and Lancaster Counties)				
Population 16 and over - wage and salaried plus self-employed	536,522	491,180	45,342	
Mean Income (\$)	\$34,938.21	\$35,571.85	\$28,074.14	
Total Income (\$ millions)	\$18,745.12	\$17,472.18	\$1,272.94	
Eastern Nebraska				
Population 16 and over - wage and salaried plus self-employed	256,979	244,296	12,683	
Mean Income (\$)	\$27,644.88	\$27,993.98	\$20,920.59	
Total Income (\$ millions)	\$7,104.15	\$6,838.82	\$265.34	
Western Nebraska				
Population 16 and over - wage and salaried plus self-employed	256,527	244,708	11,819	
Mean Income (\$)	\$27,341.46	\$27,471.62	\$24,646.54	
Total Income (\$ millions)	\$7,013.82	\$6,722.52	\$291.30	

Source: U.S. Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

Table 4. Economic Impact of Immigrant Spending on the State of Nebraska

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact (\$ millions)				
Total Foreign Born	\$1,188.38	\$228.08	\$226.87	\$1,643.32
Central & South American Origin	\$516.10	\$100.97	\$99.50	\$716.57
Employment Impact (# jobs)				
Total Foreign Born	8,161.1	1,953.9	2,332.5	12,447.5
Central & South American Origin	3,527.4	854.6	1,023.0	5,405.0

Source: Author's estimates using IMPLAN 2.0

over of \$1.188 billion in 2006 resulted in \$228.1 million in indirect and \$226.9 million in induced expenditures, a total impact of \$1.643 billion to Nebraska's economy. By dividing the total impact by the direct impact, we obtain our impact multipliers. The production multiplier in this case is 1.38, indicating that for every dollar spent by the state's immigrant population, 38 additional cents are created through indirect and induced effects. This \$1.643 billion figure represents about 1.1 percent of total production in the state of Nebraska.¹⁴

The employment effect is larger. The direct spending by the state's immigrant population aged 16 and over required 8,161 jobs. This direct impact then generated an additional 1,954 jobs and 2,333 jobs to cover the indirect and induced effects, respectively. The overall effect of 12,448 jobs thus indicates an employment multiplier of 1.52, indicating that for every 10 jobs created as a result of direct expenditures, a little over five additional jobs are generated through the indirect and induced effects. The total 12,448 jobs created represent about 1.2 percent of the total 1.05 million

worth of expenditure on each of a set of 395 industrial sectors. For instance, individuals earning between \$25,000 and \$50,000 per year spent 2.2 percent of their disposable income in the motor vehicle and parts sector. These expenditure shares were derived from Consumer Expenditure Survey publications provided by the US Bureau of Labor Statistics (see <http://www.bls.gov/cex/home.htm>). We then modified some of these shares to better reflect the spending habits exhibited by the primary immigrant population in the state, those from Central and South America. For instance, a recent UCLA study found that Latin American foreign-born immigrants are 50 percent less likely to use emergency rooms than are US-born Latin Americans (see http://www.pnhp.org/news/2007/november/study_finds_immigran.php). Moreover, evidence from the US Department of Health and Human Services' Medical Expenditure Panel Survey indicates that in 2000 Hispanic Americans spent only about 61 percent per capita on health expenditures relative to other citizens (see http://meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml). Since the data suggest that such immigrants spend less on health services and more on food consumed at home and home repair and maintenance, we increased these shares of expenditures within IMPLAN.

¹⁴According to data supplied by MIG, total state output was \$153.8 billion in 2006.

income earners in Nebraska as of 2006 (see Table 3).

For the immigrant population from the Central and South American regions, the initial \$516.1 million in direct spending resulted in \$716.6 million of total production, resulting in a production multiplier of 1.39. The overall impact from an initial set of 3,527 jobs needed to cover the direct spending from this group ultimately generated a total of 5,405 jobs, an employment multiplier effect of 1.53. This total employment impact represents about 0.51 percent of total income earners in the state.

The figures in Table 5 show the top 15 industrial sectors (as measured by total production generated) most impacted by Nebraska's immigrant spending.

Most of the total production generated is taken up by the retail trade and owner-occupied dwellings sector, with wholesale trade, health expenditures, food services, and motor vehicles and parts sectors also being impacted. It is important to note that these sectors do not represent spending by the immigrant populations only. These production effects are the result of the total effects on the state's economy (including indirect and induced effects). With that in mind, it is interesting to note that a few of these sectors, such as health services, appear to benefit from increased immigrant spending patterns even though there is evidence that many immigrant populations tend to have lower home ownership rates and spend proportionately less on health services than their native-born counterparts.

Table 5. Top 15 Industries Impacted by Immigrant Spending

Industry	Total Production (\$ millions)
Total Foreign Born	
1 Domestic retail trade	\$343.96
2 Owner-occupied dwellings	\$118.82
3 Foreign retail trade	\$80.77
4 Wholesale trade	\$71.40
5 Real estate	\$59.67
6 Food services and drinking places	\$59.53
7 Offices of physicians, dentists, and other health	\$55.39
8 Hospitals	\$45.53
9 Monetary authorities and depository institutions	\$40.71
10 Pharmaceutical and medicine manufacturing	\$35.09
11 Insurance carriers	\$31.07
12 Motor vehicle and parts dealers	\$30.85
13 State and local government electric utilities	\$27.22
14 Nursing and residential care facilities	\$24.00
15 General merchandise stores	\$22.66
Central/South American Born	
1 Domestic retail trade	\$146.95
2 Owner-occupied dwellings	\$52.98
3 Foreign retail trade	\$32.31
4 Wholesale trade	\$31.32
5 Real estate	\$26.24
6 Offices of physicians, dentists, and other health	\$24.13
7 Food services and drinking places	\$23.66
8 Pharmaceutical and medicine manufacturing	\$20.07
9 Hospitals	\$19.84
10 Monetary authorities and depository institutions	\$15.42
11 Motor vehicle and parts dealers	\$13.20
12 State and local government electric utilities	\$13.01
13 Insurance carriers	\$12.66
14 Nursing and residential care facilities	\$12.01
15 Other ambulatory health care services	\$9.85

Source: Author's estimates using IMPLAN 2.0

Table 6. Economic Impact of Immigrant Spending by Region

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact (\$ millions)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$823.44	\$157.29	\$157.60	\$1,138.34
Eastern	\$174.17	\$16.19	\$13.58	\$203.94
Western	\$189.71	\$24.31	\$24.30	\$238.32
Employment Impact (# jobs)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	5,461.3	1,336.7	1,532.7	8,330.7
Eastern	963.2	160.4	154.9	1,275.4
Western	1,336.9	249.6	299.2	1,895.7

Source: Author's estimates using IMPLAN 2.0

Regional Impacts

Table 6 summarizes the production and employment impacts of total foreign-born spending by region. In the Tri-County area that includes most of Omaha and all of Lincoln, the state’s foreign-born population aged 16 and above spent an estimated \$823.4 million in 2006. This translated into a total production effect of \$1.138 billion, indicating a multiplier of 1.38, largely mimicking the state multiplier impact. Moreover, this direct spending prompted a labor need of 5,461, which ultimately generated a total of 8,331 jobs, implying an employment multiplier of 1.53. This final employment figure represents about 1.6 percent of total income earners in these counties.

For Nebraska’s less densely populated economies, direct spending from the state’s immigrant population is relatively small, owing in large measure to fewer such individuals living in these areas as well as smaller per capita incomes. The Eastern immigrant population spent

an estimated \$174 million in 2006, generating a total impact of \$204 million, a multiplier of 1.17. Economic activity among immigrants in the Western region of the state was marginally better. The \$190 million in direct spending in 2006 by this group generated a total production effect of \$238 million, a multiplier of 1.26 (see Figure 4).

The employment impacts follow a similar pattern. The 963 jobs needed to meet increased immigrant spending demands in Eastern Nebraska ultimately generated a total employment multiplier effect of 1.32. This total employment figure of 1,275 represents about 0.50 percent of total income earners in this region.

In Western Nebraska, the employment multiplier is 1.42. Hence, initial employment needs ultimately created a total of 1,896 jobs. This represents about 0.74 percent of total income earners in this region.

Figure 4. Expenditure Effects: Production and Employment Multipliers by Region

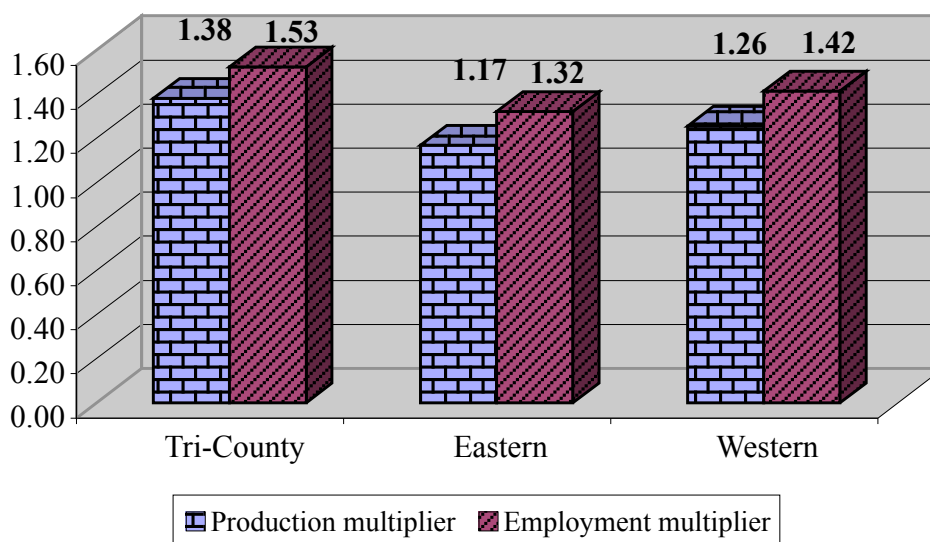


Table 7. Alternative Total Economic Impact of Immigrant Spending: High and Low Remittances

	High Remittance	Low Remittance
Production Impact (\$ millions)		
State:		
Total Foreign Born	\$1,567.61	\$1,732.20
Central & South American Origin	\$652.70	\$791.54
Regions:		
Tri-County (Douglas, Sarpy, and Lancaster Counties)	\$1,085.89	\$1,199.90
Eastern	\$194.55	\$214.97
Western	\$227.34	\$251.21
Employment Impact (# jobs)		
State:		
Total Foreign Born	11,874.0	13,120.7
Central & South American Origin	4,923.2	5,970.5
Regions:		
Tri-County (Douglas, Sarpy, and Lancaster Counties)	7,946.9	8,781.2
Eastern	1,216.6	1,344.4
Western	1,808.3	1,998.2

Source: Author's estimates using IMPLAN 2.0

Alternative Expenditure Estimates

While the expenditure figures provided above represent the most likely picture of immigrant expenditure impacts on Nebraska, it is worth remembering that these estimates are derived from sample data. For instance, the remittances figure of \$154 million for 2006 was based on a sampling survey. Hence, it can be beneficial to provide a range of impacts assuming alternative direct expenditure figures. To this end, alternative direct expenditure figures were constructed using alternative estimates for Central and South American remittances. Specifically, we assumed, while the best estimate for these remittances in 2006 is still the \$154 million figure, a high remittance level of \$200 million (about 30 percent of the Central and South American group's after-tax income), and a low remittance level of \$100 million (about 15 percent of after-tax income).¹⁵

Table 7 reports the total production and employment impacts (i.e., the direct, indirect, and induced impacts) from these high and low remittance scenarios on the state of Nebraska and the three regions considered in this study. Based on these estimates, the total production impact of expenditures by the foreign-born population ranges from \$1.568 billion to \$1.732 billion. In terms of employment, expenditures by immigrants in the state generated between 11,874 and 13,121

jobs. Isolating just direct expenditures from those immigrants of Central and South American origin, the total production impact ranges from \$653 million to \$792 million, with employment generation between 4,923 and 5,971.

Regionally, the Tri-County area experienced between 7,947 and 8,781 new jobs due to immigrant spending in 2006 and increased production between \$1.086 and \$1.200 billion. The Eastern region saw an increase of 1,217 to 1,344 new jobs, and between 1,808 and 1,998 new jobs were generated in the Western region.

¹⁵Admittedly, this range is somewhat arbitrary since no information was provided by the Inter-American Development Bank as to the margin of error in their 2006 survey. This same group conducted a similar survey in 2004 and indicated a margin of error of +/-5 percent in that survey. If a similar margin of error exists in the 2006 survey, then the upper and lower bounds provided above are well outside such a +/-5 percent range. The alternative results provided in this section, then, can reasonably be viewed as offering a more-than-generous upper and lower expenditure impact bandwidth of the immigrant population in the state.



Photo courtesy of David Bacon from the book Communities Without Borders

The Impact of the Immigrant Labor Force on State Production

The foreign-born population aged 16 and over in the state of Nebraska accounted for 6.65 percent of total population aged 16 and over in the state. Immigrants of Central and South American origin accounted for nearly 4 percent of the state's total population aged 16 and over. These groups' labor force contributions are considerably higher in certain key sectors of the state's economy. This labor has allowed the state to expand production, particularly in less densely populated regions where labor force availability would otherwise be quite limited. In their absence, it is quite likely that substantial reductions in Nebraska's economic production would occur.

In this section we estimate the likely impact on state and regional economies if this labor force were, in effect, unavailable. In doing this experiment, we identified three sectors that tend to rely heavily on immigrant labor (primarily from Central and South America): construction, food and hotel accommodation services, and meat, poultry, and fish processing. Table 8 summarizes these employment figures.

In the construction sector, 7,089 immigrants were employed in 2006, accounting for 9.7 percent of total construction employment (Central and South American immigrants account for nearly all of this, making up 8.6 percent of total construction employment).¹⁶ In the services sector, most of which is food and hotel accommodations services, immigrants accounted for 4,969 jobs in 2006, or 7.3 percent of total employment. Finally, in meat, poultry, and fish processing occupations, historically one of the most important manufacturing sectors in Nebraska, 11,282 immigrants were employed in 2006, accounting for 80.4 percent of total employment in this sector. Immigrants from Central and South America accounted for 9,731 of these jobs, or 69.4 percent of the total.

State-Level Impacts

With these employment figures in place, we used IMPLAN to generate estimates of what would be lost from the various state and regional economies from a hypothetical removal of these laborers.¹⁷ Table 9 summarizes the impact on the state of Nebraska. If a

¹⁶Within IMPLAN, the construction sector is comprised of 13 different subsectors, broadly comprising residential, nonresidential, and non-building (e.g., highway and utility network) construction, as well as residential, nonresidential, and non-building repairs. However, the PUMS data is available only for the aggregate category. To implement the impact within IMPLAN, we divided up the PUMS immigrant employment data, based on the total employment shares of each of these 13 subsectors, as reported within the IMPLAN model.

¹⁷This experiment ignores the potential that some of the native population may have been employed in the absence of (continued on next page)

Table 8. Employment Summary Data for 2006

	Total	Native Born		Foreign Born		Central & South American	
	<i>Employed</i>	<i>Employed</i>	<i>Percent</i>	<i>Employed</i>	<i>Percent</i>	<i>Employed</i>	<i>Percent</i>
Nebraska							
Construction	73,439	66,350	90%	7,089	9.65%	6,320	8.61%
Services	158,461	146,890	93%	11,571	7.30%	6,602	4.17%
Butchers and other meat, poultry, and fish processing	14,032	2,750	20%	11,282	80.40%	9,731	69.35%
Tri-County (Douglas, Sarpy, and Lancaster Counties)							
Construction	37,658	31,729	84.26%	5,929	15.74%		
Services	80,956	73,395	90.66%	7,561	9.34%		
Butchers and other meat, poultry, and fish processing	4,937	595	12.05%	4,342	87.95%		
Eastern Nebraska							
Construction	19,114	18,828	98.50%	286	1.50%		
Services	35,984	34,275	95.25%	1,709	4.75%		
Butchers and other meat, poultry, and fish processing	5,458	1,258	23.05%	4,200	76.95%		
Western Nebraska							
Construction	16,667	15,793	94.76%	874	5.24%		
Services	41,521	39,220	94.46%	2,301	5.54%		
Butchers and other meat, poultry, and fish processing	3,637	897	24.66%	2,740	75.34%		

Source: U.S. Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

total of 29,242 immigrant jobs were removed from the economy, the resulting direct impact on the dollar value of state production in 2006 would be a loss of \$6.4 billion. Furthermore, there is a reduction in indirect and induced benefits since the initial labor reduction causes less production from the three sectors—construction, services, and meat processing—resulting in less demand for inputs from other sectors of the economy (the indirect effect) and lower spending by households due to fewer income earners (the induced effect).

Thus, the value of total production lost is \$13.5 billion and total employment reduction is 78,071. To place these figures in context, according to data supplied by

MIG, in 2006 the value of total production in the state of Nebraska was \$153.8 billion. Hence, the total lost production from removing immigrant workers from the economy alone represents about 8.75 percent of total state production. The total reduction in employment of 78,071 accounts for 7.4 percent of total income earners in Nebraska (see Table 3).

Note the substantial multiplier effect here as well (2.11).¹⁸ For every one dollar of production directly lost, an additional \$1.11 is lost through indirect and induced spending reductions. Moreover, the employment multiplier is relatively large as well (2.61). For every direct job lost, an additional 1.6 jobs

Table 9. Economic Impact of Removing Immigrant Employment in Construction, Food and Hotel Services, and Meat, Poultry, and Fish Processing on the State of Nebraska

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact, 2006 (\$ millions)				
Total Foreign Born	-\$6,366.18	-\$5,499.67	-\$1,595.75	-\$13,461.60
Central & South American Origin	-\$5,363.56	-\$4,684.53	-\$1,337.58	-\$11,385.67
Employment Impact (# jobs)				
Total Foreign Born	-29,942.0	-31,720.2	-16,406.4	-78,070.7
Central & South American Origin	-22,653.0	-26,955.2	-13,752.0	-63,360.2

Source: Author's estimates using IMPLAN 2.0

immigrant labor. The issue of labor substitution is a complex issue and is addressed later in this report. Since the estimates provided by this experiment do not consider substitution of native for immigrant labor, they can reasonably be considered a type of “upper bound” effect on the total impact on production and employment.

¹⁸These multipliers can be easily calculated by dividing the total impact measures by the direct impact data. For instance, the output multiplier for the total foreign-born category is simply $\$13,461.60/\$6,366.18 = 2.11455$.

Table 10. Industries Impacted by Removing Immigrant Employment

	Industry	Total Production (\$ millions)
Total Foreign Born		
	1 Meat processed from carcasses	-5,295
	2 Animal (except poultry) slaughtering	-1,239
	3 Cattle ranching and farming	-1,038
	4 Wholesale trade	-594
	5 Food services and drinking places	-563
	6 Truck transportation	-290
	7 New residential 1-unit structures	-257
	8 Animal production (except cattle and poultry)	-234
	9 Management of companies and enterprises	-219
	10 Commercial and institutional buildings	-215
	11 Owner-occupied dwellings	-209
	12 Real estate	-154
	13 Monetary authorities and depository credit intermediaries	-119
	14 Maintenance and repair of nonresidential buildings	-108
	15 Hotels and motels- including casino hotels	-95
Central/South American Born		
	1 Meat processed from carcasses	-4,564
	2 Animal (except poultry) slaughtering	-1,066
	3 Cattle ranching and farming	-891
	4 Wholesale trade	-504
	5 Food services and drinking places	-351
	6 Truck transportation	-248
	7 New residential 1-unit structures- all	-229
	8 Animal production (except cattle and poultry)	-201
	9 Commercial and institutional buildings	-192
	10 Management of companies and enterprises	-187
	11 Owner-occupied dwellings	-175
	12 Real estate	-127
	13 Monetary authorities and depository credit intermediaries	-101
	14 Maintenance and repair of nonresidential buildings	-94
	15 Telecommunications	-79

Source: Author's estimates using IMPLAN 2.0

are also lost through indirect and induced impacts. These three sectors are thus critical sectors to the Nebraska economy.

Table 10 illustrates the top 15 industries hit hardest by the reduction in labor force (as measured by the total economic impact). Given the relative size of the impact associated with hypothesized reductions in the meat, poultry, and fish processing sectors, it seems reasonable that the major industries impacted would be those involved in these businesses, such as ranching and farming, wholesale trade, food services, and transportation. Also, associated reductions in many construction industries are expected as

well, particularly in new single-family residential construction.

Regional Impacts

Table 11 summarizes the regional impacts of immigrant employment in construction, food and hotel accommodations, and meat, poultry, and fish processing. Total immigrant employment in these sectors was 17,832 in the Tri-County area of Nebraska, 6,195 in Eastern Nebraska, and 5,914 in Western Nebraska as of 2006. According to the data presented in Table 10, removal of these employees would result in a direct loss of \$3.0 billion worth of production in the Tri-County area, \$1.94 billion in Eastern Nebraska,

Table 11. Economic Impact of Removing Immigrant Employment by Region

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Production Impact, 2006 (\$ millions)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$3,018.70	-\$1,683.45	-\$730.50	-\$5,432.65
Eastern	-\$1,937.03	-\$1,681.10	-\$234.66	-\$3,852.79
Western	-\$1,386.82	-\$1,172.42	-\$243.03	-\$2,802.28
Employment Impact (# jobs)				
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-17,832.0	-10,202.1	-7,104.2	-35,139.3
Eastern	-6,195.0	-9,491.5	-2,675.1	-18,372.3
Western	-5,914.0	-6,752.0	-2,991.9	-15,648.2

Source: Author's estimates using IMPLAN 2.0

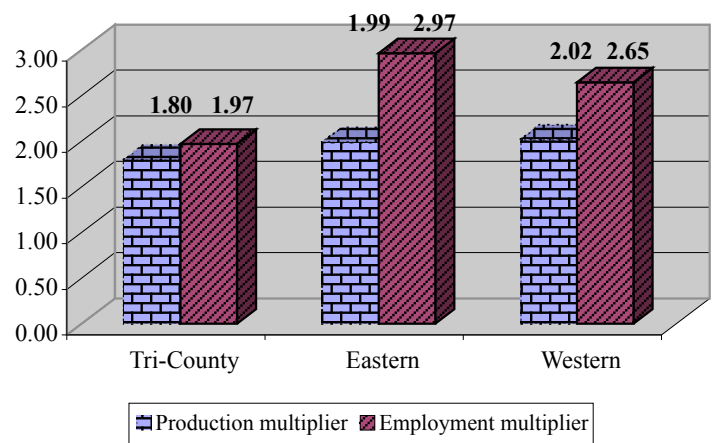
and \$1.39 billion in Western Nebraska. Once these direct reductions in expenditures filter through the rest of these economies through the associated indirect and induced effects, the total loss to this economy is estimated to be \$5.43 billion. Aggregate losses to the Eastern and Western Nebraska economies would be \$3.85 billion and \$2.80 billion, respectively, in 2006. In terms of total employment losses, the Tri-County region would have lost 35,139 jobs, about 6.5 percent of total income earners in that economy (see Table 3); 18,372 jobs in Eastern Nebraska, representing about 7.1 percent of total income earning positions in that region; and 15,648 jobs in Western Nebraska, or 6.1 percent of total income earners.

The regional employment multipliers are particularly significant. In the Tri-County economy, the employment multiplier is 1.97 and in the Eastern and Western economies the associated multipliers are much larger, registering 2.97 and 2.65 respectively (see Figure 5).

The implication is that the industrial sectors in which immigrant workers tend to be employed are of critical importance to these regional economies, particularly in Eastern Nebraska where meat, poultry, and fish processing are vital to this region's economy. For instance, for every job lost in any one of the three identified industries in Eastern Nebraska, an additional 1.97 jobs are also lost through indirect and induced effects.

Similarly, in Western Nebraska, for every job lost in one of the three identified industries, an additional 1.65 jobs disappear through indirect and induced effects. It is also of interest to note that in the more economically diversified Tri-County region, where we would expect a

Figure 5. Production Impacts: Production and Expenditure Multipliers by Region



smaller overall multiplier effect, we observe a substantial multiplier. The Tri-County multiplier implies that a job lost in construction, meat processing, or food and hotel services results in 0.97 jobs lost through indirect and induced impacts.

Alternative Employment Impact Scenarios

The above experiments ignore the potential for labor substitution. That is, in the absence of this immigrant labor, some of the native population may have been employed. Assuming no labor substitution is an important limitation of the above analysis; however, a couple of points are germane. First, Nebraska's unemployment rates are substantially lower than many other states, as well as the nation as a whole. This is largely due to a relatively limited labor force. Hence, prospects for substituting away from an immigrant pool of labor are limited. Moreover, a more limited labor force might result in higher wages (an effect that, as the existing literature suggests, is illusive to measure at best).

Labor substitution and market dynamics are very complex issues, and estimating such substitution effects precisely would require a substantial amount of analysis far beyond the scope and intent of this study. In this section alternative impacts are presented based on assumptions regarding the degree to which jobs held by the economy's immigrant population in the construction, food and hotel accommodations, and meat, poultry, and fish processing sectors might be absorbed by the native-born labor force, as well as other key assumptions.¹⁹

Three different absorption rates are considered. The first is where 25 percent of immigrant jobs are filled by the native-born labor force; the second where 50 percent of immigrant jobs are filled by domestic workers; and the third where 75 percent of immigrant jobs are filled by the native born.²⁰ These figures, shown in Table 12, provide a range

of possible impacts from the removal of immigrant labor from the state and regional economies.

One can see that there are still substantial adverse impacts on the state and regional economies from the hypothetical removal of the immigrant labor force. Assuming a 25 percent absorption rate, the state loses \$10.097 billion worth of production and 58,553 jobs. The Tri-County region still suffers the most, losing \$4.075 billion in production and over 26,000 jobs.

Under the more favorable condition, in which 75 percent of the missing immigrant labor force is replaced with domestic labor, the state loses \$3.366 billion in production and 19,518 jobs. Again, the Tri-County economy suffers the most, losing \$1.358 billion in production and 8,785 jobs.

Table 12. Alternative Total Economic Impact of Removing Immigrant Employment

	Percent of Immigrant Jobs Absorbed by Native Workers		
	25 percent	50 percent	75 percent
Production Impact (\$ millions)			
State:			
Total Foreign Born	-\$10,096.66	-\$6,730.26	-\$3,365.98
Central & South American Origin	-\$8,539.21	-\$5,693.35	-\$2,846.69
Regions:			
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-\$4,074.49	-\$2,716.33	-\$1,358.16
Eastern	-\$2,889.59	-\$1,926.39	-\$963.20
Western	-\$2,101.71	-\$1,401.14	-\$700.57
Employment Impact (# jobs)			
State:			
Total Foreign Born	-58,553.0	-39,035.3	-19,517.7
Central & South American Origin	-47,520.2	-31,680.1	-15,840.1
Regions:			
Tri-County (Douglas, Sarpy, and Lancaster Counties)	-26,354.4	-17,569.6	-8,784.8
Eastern	-13,779.2	-9,186.1	-4,593.1
Western	-11,738.1	-7,825.4	-3,912.7

Source: Author's estimates using IMPLAN 2.0

¹⁹Two such assumptions are made in this section, largely due to the basic structure of IO models. First, it is assumed that native-born surplus labor is sufficient to absorb these vacated jobs. Second, closely related to the first, it is assumed that the native-born labor force would take those jobs at prevailing wages. By their very construction, IO models treat prices, including wages, as fixed, essentially assuming that there are sufficient resources in an economy to meet any changes in final demand for goods and services.

²⁰Adverse economic impacts will obviously get smaller with larger absorption rates. If 100 percent of all immigrant jobs were replaced by domestic labor, then there would be no adverse impact on the economy. With such a tight labor force, such an outcome would be highly unlikely in Nebraska.



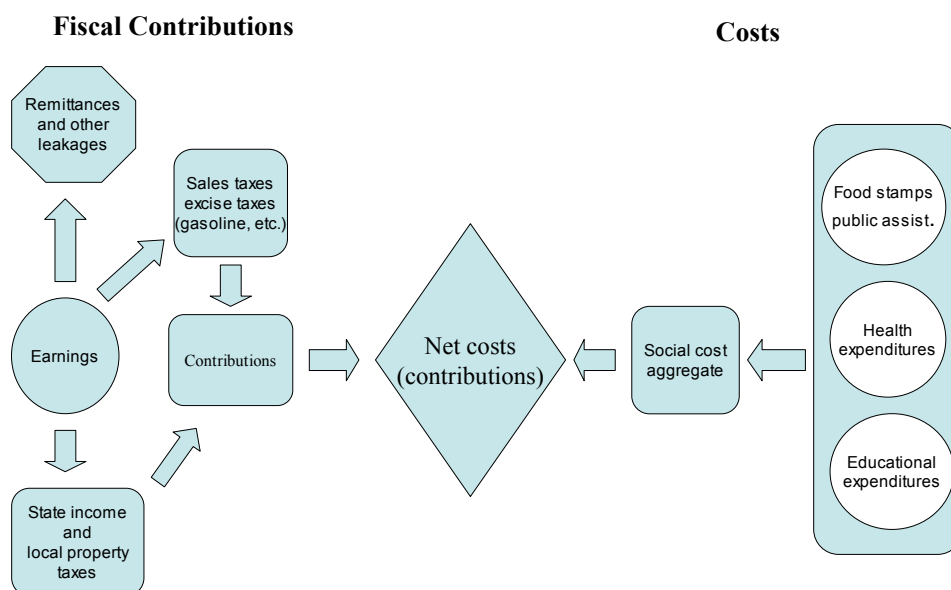
Fiscal Contributions and Social Cost Pressures from the Immigrant Population in Nebraska

The analysis above suggests that Nebraska’s immigrant population does contribute substantially to the state’s economy in meaningful ways. First, through their spending activity, jobs are created for both immigrants and native-born groups. Second, the sectors in which these immigrant groups are largely employed are critical to the state’s economic well-being, particularly in its Eastern and Western regions.

In order to assess more completely the impact of the immigrant population on the state, however, some

detailed analysis of the fiscal contributions and social pressures this group has on Nebraska is necessary. Many concerns have been expressed suggesting that immigrant populations place more pressure on publicly supplied services, such as educational and health services, than they contribute in the form of tax revenue. In this section, we attempt, to the extent possible, to estimate these public costs and tax revenue figures for both immigrant and native populations in the state.²¹ The focus of these estimates is depicted in Figure 6.

Figure 6. Fiscal Contributions and Social Costs



²¹In what follows, we focus on the total immigrant population rather than attempting estimates of the Central and South American immigrant population in particular. This is in large measure due to small sample difficulties associated with highlighting particular immigrant groups in the PUMS data system. However, since most of the immigrant population does come from Central and South America, the total numbers presented here are likely reasonably close to those of the specific immigrant group.

Table 13. Fiscal Contributions and Costs

	Foreign born	Native born
Contributions (\$ millions)		
Property taxes ¹	\$39.80	\$1,055.38
Income taxes (state) ¹	\$73.57	\$1,393.74
Sales taxes ²	\$34.07	\$661.65
Gasoline taxes ²	\$7.21	\$132.67
Total	\$154.65	\$3,243.43
Share	4.55%	95.45%
Costs (\$ millions)		
Food stamps ¹	\$6.83	\$66.06
Public Assist. ¹	\$6.25	\$163.85
Health Exp. ³	\$38.73	\$403.85
Education ⁴	\$92.97	\$2,605.53
Total	\$144.78	\$3,239.29
Share	4.28%	95.72%
Contributions per capita (\$)¹	\$1,554.27	\$1,943.53
Costs per capita (\$)¹	\$1,455.11	\$1,941.05
Ratio of contributions to costs	1.07	1.00

¹Source: US Census Bureau, Census 2006 Public Use Microdata Sample (PUMS), Nebraska.

²Source: Author's calculations based on data from *Consumer Expenditures in 2005*, Report 998, U.S. Department of Labor, US Bureau of Labor Statistics.

³Source: Author's calculations based on PUMS demographic data as well as from the Medial Expenditure Panel Survey for the year 2000, US Department of Health and Human Services. Retrieved on February 26, 2008 (http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml).

⁴Source: Author's calculations based on PUMS demographic data as well as from the Annual Financial Report, Education Support Services, Nebraska Department of Education. Retrieved March 5, 2008 (<http://ess.nde.state.ne.us/SchoolFinance/AFR/StatwidePPC.htm>).

Fiscal Contributions

The primary source of state (and local) fiscal contributions come from income taxes paid to the state, property taxes paid to local governments, sales taxes paid to the state, and energy (gas) excise taxes paid to the state (see Table 13). The property tax data from the PUMS data system indicate that in 2006, the total foreign-born group paid \$39.8 million to local governments. The corresponding native-born group paid \$1.055 billion; the difference can largely be attributed to a greater number of households whose

head of household is native born.²² Foreign-born wage earners contributed an estimated \$73.6 million to the state of Nebraska in the form of state income tax, as compared to \$1.39 billion for the corresponding native-born population; again the difference reflects the larger number of wage and salary earning native-born workers in the state.²³

Sales tax estimates are based on expenditure data available from the US Bureau of Labor Statistics' Consumer Expenditure Survey, 2005, the latest

²²According to the PUMS, in 2006 the number of foreign-born heads of households who paid property taxes in Nebraska was 18,933. By contrast, the total number of native-born heads of households in the state who paid property taxes in 2006 was 453,305.

²³These figures were based on the income data supplied in the PUMS data system, where an average state tax rate of 4.02 percent was applied (see Appendix B). It should be noted that these income tax figures likely understate the impact of immigrants' overall income (and sales) tax revenue since these figures are based only on direct income. They do not include the tax benefits from the increase in income generated through the indirect and induced expenditure effects.

estimates available. These data provide a breakdown of expenditures on various consumer items such as food, clothing, gasoline, and so forth. From these data, we identified those consumption categories subject to a state (and local) sales tax and calculated this group's share of total expenditures.²⁴ We then applied this share to our estimate of after-tax and remittances income data from the PUMS. These figures suggest that the immigrant population paid \$34.1 million in sales taxes in 2006.²⁵ Using a similar procedure for gasoline consumption, and applying an excise tax of 25 cents per gallon, we estimate gasoline tax contributions of \$7.2 million. These figures compare to \$661.6 million in sales tax revenue and \$132.7 million in gasoline tax revenue generated by the native-born population.²⁶

The total native-born contribution based on these measures is estimated to be \$3.24 billion for 2006 (about 95.4 percent of total estimated contributions). The corresponding contribution from immigrant groups is \$154.7 million (about 4.6 percent of total estimated contributions). Again, the dollar difference is largely reflective of the greater number of native born in the state's population. The percentage figures indicate that while the immigrant population comprises about 6 percent of the working age population in the state, they contribute less in percentage terms. This is primarily because the average immigrant's income level is less than that of the native-born group.

Public Costs

Table 13 also shows estimates for public cost categories. These categories include funding for the state's food stamp program, state expenditures for public assistance and supplementary security income, the state cost of providing health services, and the state cost of kindergarten through high school (K-12) education.

The food stamp and public assistance data come from the PUMS system. The estimates indicate that in 2006,

the state spent \$6.8 million and \$6.3 million on food stamps and public assistance to the state's immigrant population, respectively. For the larger native-born population these estimates are \$66.1 million and \$163.9 million, respectively.

Furthermore, estimates of state-supported health services for 2006 are \$38.7 million for the state's immigrant population and \$403.9 million for the native population.²⁷ Moreover, educational expenditures for the immigrant population are estimated to be \$93.0 million as of 2006, as compared to expenditures for the larger native population of \$2.61 billion.

Based on these categories, the total native-born costs are estimated to be \$3.24 billion for 2006 (about 96.0 percent of total estimated costs). The corresponding cost figure for the immigrant group is \$136.4 million (about 4.0 percent of total estimated costs). Again, this 4 percent is less than the immigrant working age population share of roughly 6 percent. This in large measure reflects the fact that such groups tend to spend proportionately less of their income on health care.

An alternative way of viewing these figures is to consider costs and contributions on a per capita basis.²⁸ As shown in Table 11, the average contribution per capita for immigrants is \$1,554.27. For the native population, this average is \$1,943.53. The average cost per capita for the immigrant group is \$1,455.11 as compared to \$1,941.05 for the native group. The ratio of contributions to costs is 1.07 for the immigrant group as compared to 1.00 for the native group. This indicates that while there is some balance between contributions and costs on the native-born side, on the immigrant side, contributions exceed costs by about 7 percent. This result is consistent with other published work for immigrant populations in other states.²⁹

²⁴See Appendix C for additional information.

²⁵The state sales tax is 5.5 percent. In addition, we added, for expenditures occurring in Douglas and Sarpy counties, an additional municipal (Omaha) sales tax of 1.5 percent.

²⁶See Appendix C for details.

²⁷These data were constructed using demographic data from the PUMS and data from the US Department of Health and Human Services' Medical Expenditure Panel Survey for the year 2000. These data can be found at http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml. We used a medical services expenditures price deflator from the US Bureau of Labor Statistics to calculate the 2006 estimates. For details, see Appendix C.

²⁸To construct these per capita terms, we divided the total costs (expenditures) for each group by their corresponding total population count as estimated in PUMS.

²⁹See, for instance, Garvey, Espenshade, and Scully (2002).



Photo by Rudy Smith, Babe Gomez Heritage Elementary School

Conclusion and Future Research

This study has attempted to quantitatively measure the impact of the state's immigrant population on Nebraska, with some attention paid to Latin American immigrant groups. Several key results arise from this analysis.

First, on the demand or expenditure side of the state's economy, in 2006, immigrant spending resulted in \$1.6 billion worth of total production to Nebraska's economy, with a possible range between \$1.5 billion to \$1.7 billion. Moreover, this spending generated between 11,874 and 12,121 jobs in total for the state. The 2006 total production impact of Central and South American immigrant spending was \$717 million (with a possible range between \$653 million and \$792 million), accounting for between 4,923 and 5,971 jobs in the state. The total value of production impact of immigrant spending in Nebraska's Omaha and Lincoln areas was \$1.14 billion in 2006, resulting in 8,331 jobs. The impact of immigrant spending on total production in Nebraska's Eastern region was \$204 million, resulting in 1,275 jobs. Finally, the impact of immigrant spending on total production in Nebraska's Western region was \$238 million, resulting in 1,896 jobs.

On the supply or production side of the state's economy, Nebraska's immigrant population makes substantial contributions to the labor force in some of the state's key economic sectors: construction, hotel and food services, and meat, poultry, and fish processing. The immigrant labor force accounted for 9.65 percent of total employment in construction in 2006, 7.3 percent of total employment in the services sector, and 80.4 percent in meat processing.

To measure these contributions, we conducted counterfactual experiments by addressing what would happen were this labor force unavailable in these key sectors. We found that total state production would fall by \$13.5 billion if the total immigrant population were not present in these three key sectors (and with no absorption by domestic labor), about 8.75 percent of total state production. If just the Central and South American immigrant population were removed from these sectors, the resulting loss to the state would be \$11.4 billion, or 7.9 percent of total state production. Total production losses in the state's Tri-County area would be \$5.4 billion. Losses would amount to \$3.9 billion and \$2.8 billion in the state's Eastern and Western regions. These losses would represent

significant declines in these regions' employment as well. For instance, in the state's Tri-County region, total job losses could be as high as 35,140, or about 6.5 percent of total jobs in the region.

Losses to the state and regional economies would be smaller if sufficient job replacement occurred. Even so, losses would be nontrivial. For instance, if 75 percent of the jobs vacated by immigrant labor were replaced by domestic labor, this would result in \$3.366 billion in lost production and 19,518 jobs would disappear.

Finally, on the fiscal side of the equation, we found that the state's immigrant population does not necessarily place more pressure on public goods than it offers in terms of tax revenue. The state's immigrant population contributed about \$154 million in the form of property, income, sales, and gasoline tax revenue in 2006. This amounts to about \$1,554 in per capita contributions. By contrast, the state's corresponding per capita contributions from the native-born population are about \$1,944. In terms of government costs, the immigrant population in Nebraska accounted for \$144.78 million from food stamps, public assistance, health, and educational expenditures in 2006. This amounts to about \$1,455 per capita. By contrast, the corresponding per capita costs from the native-born population are about \$1,941.

While the contribution to cost ratio is 1.0 for the native population, the corresponding ratio for the immigrant group is 1.07, indicating that that this group "pays in" about 7 percent more of what it uses in terms of governmental support. This result appears in line with some recent evidence suggesting that immigrant populations can in fact generate a fiscal surplus to state and local governments.

While this study has utilized the most recent and reliable data available and one of the most detailed and commonly employed modeling platforms (i.e., IMPLAN) to measure the economic impact of immigrant populations on the state of Nebraska, the study has some limitations that suggest a number of fruitful avenues for future research. Several such extensions are discussed below.

First, the fiscal surplus generated by immigrant populations, while consistent with existing literature, is worth further investigation. Much of this surplus

can be attributed to the fact that these populations place less pressure on health services. Indeed, many studies have documented that in the United States the foreign born are much more likely to go without health insurance and, as a consequence, are less likely to seek such services than the native-born population. The reason for this appears to go beyond income and occupation. A recent study by Pol, Adidam, and Pol (2002) found that immigrant populations are twice as likely to go without health insurance as are their native-born counterparts—*even after controlling for income and employment status*. Hence, there may be other social and cultural factors at play that might help guide a more complete understanding of the fiscal evidence presented in this report.

Second, the issue of documented versus undocumented immigrant populations is an important, and quite heated, political and legal debate, both regionally and nationally. From an economic impact perspective, the issue is, at best, difficult to address. First, reliable data are hard to come by, particularly at a substate level. Second, numerical information on income, expenditures (for both public and private goods and services), and occupation is generally not available. Hence, constructing an economic impact is hard to conceptualize. Moreover, even if reliable estimates were available, it is questionable whether the existing modeling platform (i.e., the IO model structure) would provide any additional insight relative to what is already presented here. For instance, in a 2005 Pew Hispanic Center report titled "Estimates of the Size and Characteristics of the Undocumented Population," between 2002 and 2004 Nebraska is estimated to have had between 20,000 and 35,000 undocumented immigrants in the state (between 28 and 49 percent of the foreign-born population from the PUMS data). Assuming that these immigrants have similar incomes and exhibit the same spending habits as the immigrant population investigated in this report, then the expenditure multipliers will be the same. Hence, the total dollar impacts will largely reflect a simple percentage of the figures presented in Table 4. Similarly, if this undocumented group is employed in jobs similar to those of documented immigrants, then again, the multipliers will be the same and the total employment impacts will largely reflect a percentage of those figures presented in Table 11. In short, from the economic impact perspective, there may be little to gain from focusing on the undocumented immigrant

group unless more reliable detailed income and expenditure data can be found to refine any direct effect measurements.

The fiscal impact may be a useful avenue for future research; however, even here the fiscal estimates presented earlier in this study might still reasonably reflect the undocumented immigration experience. As Pearson and Sheehan (2007) articulate, undocumented immigrants do pay property, sales, and income taxes. Moreover, like their documented counterparts, these populations also tend to access the medical care system at rates much lower than native-born citizens. Hence, the fiscal picture presented in Table 13 may be illustrative of the undocumented population as well. Nevertheless, there are still too many unknowns about the nature and extent of the undocumented immigrant population to draw any definitive conclusions, thus more research may be in order.

Third, the nature of this study and the modeling platform employed are such that the results provide only a “snapshot” of the immigrant population’s impact on the state of Nebraska in 2006. The analysis is thus static in nature and does not offer a dynamic picture of how this population may change over time or how occupational mobility or production processes may evolve.

Input/Output (IO) models are often referred to as “fixed proportion” production models, meaning that production requires a fixed proportion of a set of inputs to generate a given level of production. For instance, to produce one dollar’s worth of processed meat, fish, or poultry requires 35 cents worth of labor, 3 cents worth of electricity, etc. There are two important characteristics of these models. First, the proportions will not respond to changes in factor input prices. Hence, if the production of a dollar’s worth of processed meat, fish, or poultry requires 35 cents’ worth of labor, that proportion (i.e., 35 percent) is fixed and will not change as labor costs change. Second, these proportions do not change over time. In short, there is no input substitution in IO models. This can be a limiting factor in a dynamic impact analysis. For instance, if there were sufficient increases in automation in the meat, fish, and poultry processing industries over time, resulting in lower labor demand, the IO model would not adjust to this new production mix. The resulting production and employment multipliers

would thus tend to overstate labor’s contribution to production. This could have significant implications for the future direction of immigrant labor in certain sectors. Indeed, increased automation in meat, fish, and poultry processing is quite prevalent, as evidenced by a new, highly automated meat processing plant in northeast Nebraska near Sioux City, Iowa. To account for such input substitution would require a much more complex model in which such substitution is possible.

Fourth, IO models, by their very construction, assume fixed prices, including factor prices such as wage rates. This in effect implies that there are no meaningful resource constraints in an economy. Hence, if there is an increase in final demand for some good or service, it is assumed that sufficient resources (including labor) are available to meet that additional demand. In an environment with limited resources, then one would expect a corresponding change in price. For example, if demand for meat, fish, and poultry increased, then there would be a corresponding increased labor demand in this sector. If a significant amount of surplus labor were available, then one would anticipate no change in wages and thus no upward pressure on meat, fish, and poultry prices. However, if only a limited amount of surplus labor were available, then one would expect an increase in wages and thus some inflationary pressure on meat, fish, and poultry goods and, in turn, inflationary pressure further down the supply chain as well.

As indicated earlier in this report, the existing literature linking wage increases/decreases to immigration flows is largely inconclusive, and therefore there may be little bias in the results generated by the IO model in this study. However, as also indicated earlier, labor market dynamics are quite complex and the Nebraska experience may differ markedly from results published in the literature. It may, then, still be fruitful to investigate specific labor markets within the state to see if wages are sensitive to immigrant population levels. In addition, if such a link does exist, it would be worth investigating how much changes in wages impact consumer prices for goods and services in the Nebraska economy. Moreover, with such labor market adjustments, one could also construct reasonable projections for the Nebraska economy and the role immigration will likely play. These and other considerations are left for future research.

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Appendix A: American Community Survey Public Use Microdata Sample

The Public Use Microdata Samples (PUMS) are a sample of the actual responses to the US Census Bureau's annual American Community Survey (ACS) and include most population and housing characteristics found in ACS as well as the ten-year censuses. These files provide users with the flexibility to prepare customized reports and datasets useful for geographically and demographically detailed research and analysis.

The ACS is a nationwide survey designed to provide current and accurate information every year about demographic, socioeconomic, and housing characteristics. There are more than 60 questions on the ACS, and they are comparable to those on the Census 2000 long form. PUMS files from the American Community Survey show the full range of responses made on individual questionnaires, including income, occupation, and industry of employment. The files contain records for a sample of all housing units and group quarters, with information on the characteristics of each housing unit and the people in the housing unit or group quarter.

Nationally, the American Community Survey is mailed to about 250,000 housing units each month, totaling 3 million annually. This comes to about a 1 in 40 sample of all the housing units in the nation. In addition to the housing units, the ACS includes approximately 1 in 40 persons living in group quarters. For Nebraska in 2006, the Census Bureau received completed interviews from 18,307 housing units and 1,036 people living in group quarters

The records selected for the PUMS are a sample of those housing units and group quarter persons that completed the questionnaire. The sample consists of approximately 1 percent of the housing units and 1 percent of the persons residing in group quarters. In 2006, the PUMS for Nebraska included 7,749 housing units and 521 persons in group quarters. Combining the persons in housing units and those in group quarters,

the total number of persons in the sample was 18,063. Individual responses are given a weight so that the weighted values will estimate the characteristics of the total population.

As is the case for every sample survey, the PUMS is subject to two types of error: sampling error and nonsampling error. Sampling error results from using a sample of persons to estimate the characteristics of a population. Probability sampling allows us to conduct statistical analyses of sample data. All other things being equal, the larger the number of people included in the sample, the smaller the sampling error. Therefore, in this report, our analyses were limited if the unweighted number of persons included in the sample was too small.

Nonsampling errors are unknown and may affect the data in two ways. Some non-sampling errors are introduced randomly because of data entry or editing errors. These errors increase the variability of the data. Systematic errors, which are in one direction, introduce bias into the results of a sample survey and may result from the failure to obtain measurements from sampled housing units (nonresponse). The Census Bureau tries to minimize the effect of these systematic errors on survey estimates through sampling techniques, questionnaire design, and data collection and processing procedures. For more information, the reader is referred to the US Census Bureau's web page at http://factfinder.census.gov/home/en/acs_pums_2006.html.

The PUMS includes detailed country of origin information within its sample. We used this information to aggregate foreign born Nebraska residents who came from Central and South American countries, including, among others, Mexico, Cuba, Jamaica, and the Dominican Republic. Our total foreign born group includes both those from Central and South America as well as the rest of the world. Table A1 identifies the country of origin for the delineations used in this study.

Table A1: Place of Birth - Country Breakdown

Central & South American Origin		Rest of World			
		Europe & Canada		Asia & Middle East	Africa, Australia and Pacific Islands
Mexico	St. Kitts-Nevis	Canada	Spain	Afghanistan	Algeria
Bermuda	St. Lucia	Albania	Sweden	Bangladesh	Cameroon
Belize	St. Vincent & the Grenadines	Austria	Switzerland	Myanmar	Cape Verde
Costa Rica	Trinidad & Tobago	Belgium	England	Cambodia	Egypt
El Salvador	West Indies	Bulgaria	Scotland	China	Ethiopia
Guatemala	Argentina	Czechoslovakia	Northern Ireland	Hong Kong	Eritrea
Honduras	Bolivia	Denmark	Yugoslavia	India	Ghana
Nicaragua	Brazil	Finland	Czech Republic	Indonesia	Guinea
Panama	Chile	France	Slovakia	Iran	Kenya
Antigua & Barbuda	Colombia	Germany	Bosnia & Herzegovina	Iraq	Liberia
Bahamas	Ecuador	Greece	Croatia	Israel	Morocco
Barbados	Guyana	Hungary	Macedonia	Japan	Nigeria
Cuba	Paraguay	Iceland	Estonia	Jordan	Senegal
Dominica	Peru	Ireland	Latvia	Korea	Sierra Leone
Dominican Republic	Uruguay	Italy	Lithuania	Kazakhstan	Somalia
Grenada	Venezuela	Netherlands	Armenia	Kuwait	South Africa
Haiti		Norway	Azerbaijan	Laos	Sudan
Jamaica		Poland	Belarus	Lebanon	Tanzania
		Portugal	Georgia	Malaysia	Uganda
		Azores Islands	Moldova	Nepal	Zimbabwe
		Romania	Russia	Pakistan	Fiji
			Ukraine	Philippines	Micronesia
				Saudi Arabia	New Zealand
				Singapore	Tonga
				Sri Lanka	Samoa
				Syria	
				Taiwan	
				Thailand	
				Turkey	
				Uzbekistan	
				Vietnam	
				Yemen	

Appendix B: Calculation of After-Tax and Remittances Income

After-Tax Income

To calculate after-tax income, we generated an effective federal and state income tax rate by using mean income measures for our demographic groups and applied various marginal tax rates as supplied by a variety of sources on marginal tax rates. We obtained data on federal marginal tax rates from the following web site: http://www.moneychimp.com/features/tax_brackets.htm, verified through US Internal Revenue Service sources, and for the state of Nebraska we used information found at the Nebraska State Department of Revenue at <http://www.revenue.state.ne.us/>. The rates are provided below:

Federal Rates		State Rates	
Income range	Rate	Income range	Rate
\$0-\$10,750	10%	\$0-\$2,400	2.56%
\$10,750-\$41,050	15%	\$2400-\$17,000	3.57%
\$41,050-\$106,000	25%	\$17,000-\$26,500	5.12%
\$106,000-\$171,650	28%	\$26,500-over	6.84%
\$171,650-\$336,550	33%		
\$336,550-above	35%		

Source: For the federal tax rates, information was retrieved on February 2, 2008 (http://www.moneychimp.com/features/tax_brackets.htm). For the state tax rate data, information was retrieved on February 2, 2008 (<http://www.revenue.state.ne.us/>).

We then applied these tax rates to various levels of income up to the level of mean personal income. The resulting tax rates were between 12.5 and 13.3 percent for federal tax deductions and between 3.8 and 4.5 percent for state tax deductions, depending on demographic group.

An additional income deduction is the payroll tax. While there is significant debate among economists regarding who bears the greater burden of the payroll tax, which requires contributions from both employers and employees (the total of which is about 15.3 percent), we follow convention and apply 7.65 percent to employees' income.

Applying these three deductions gives us a measure of after-tax income. For example, consider the total immigrant group in Nebraska, which as a whole earned \$1,829,570,880.00 in wages and salaries in 2006. The after-tax income is estimated to be:

$$\begin{aligned} \$1,829,570,880.00 * (1 - \text{Taxfed} - \text{Taxstate} - \text{Taxpayroll}) &= 1,829,570,880.00(1 - 0.1293 - 0.0402 - 0.0765) \\ &= \$1,379,457,476.63. \end{aligned}$$

Remittances

Once these after-tax figures are calculated, we need to deduct the income that immigrant populations send to their region of origin, i.e., remittances, as these represent a leakage from the local economy and should not then be used as direct inputs into IMPLAN. For Central and South American remittances, we employed data from the Inter-American Development Bank (the data can be found at the following web page: http://www.iadb.org/mif/remesas_usamap.cfm?language=english). For the Central and South American populations, it was estimated that \$154 million was remitted to country of origin in 2006, representing about 23 percent of after-tax income for the immigrant populations from Central and South American countries. For immigrant populations from other

regions of the world, we employed data from the World Bank’s “Migration and Remittances Factbook, 2008,” which can be found at:

<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21352016~isCURL:Y~menuPK:3145470~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>

This data is available only for the US as a whole so we calculated a remittances share of total US disposable income and applied that share to the Nebraska income figures. The remittance levels are smaller, accounting for about 1.3 percent of after-tax income. To calculate the overall remittance rate for all immigrant populations in the state of Nebraska, we calculated a population share weighted average of the remittance rates for Central and South American populations and the rest of the immigrant population. To calculate these population shares, we used the population aged 16 and over since these are the groups in the labor force likely earning income. This calculation then is as follows:

$$23*(\text{Cent. \& South Am.}/\text{Total Imm.})+0.013*(\text{Rest of World}/\text{Total Imm.}) =$$

$$.23*(40,382.00/69,844.00)+0.013*(29,462.00/69,844.00) = .14$$

Given that most of the immigrant population, about 58 percent of the foreign-born population aged 16 and over, comes from Central and South America, the overall remittance rate is closer to the higher-end estimate, representing about 14 percent of after-tax income.

Table B2 below provides a summary of the tax and remittances calculations on the PUMS income data.

Table B2. Earnings and After-Tax and Remittances Income					
	Total Earnings (\$ millions)	Effective Tax Rate (Federal and State Income+Payroll)	After Tax Income (\$ millions)	Remittances (%)	After Tax and Remittances Income (\$ millions)
Nebraska					
Native Born	\$31,033.52	25.43%	\$23,141.96		
Foreign Born	\$1,829.57	25.43%	\$1,379.46	13.85%	\$1,188.38
Central & South American Born	\$881.34	23.97%	\$670.10	22.98%	\$516.10
Tri-County					
Native Born	\$17,472.18	25.88%	\$12,951.14		
Foreign Born	\$1,272.94	24.91%	\$955.84	13.85%	\$823.44
Eastern					
Native Born	\$6,838.82	24.90%	\$5,136.14		
Foreign Born	\$265.34	23.80%	\$202.18	13.85%	\$174.17
Western					
Native Born	\$6,722.52	24.81%	\$5,054.67		
Foreign Born	\$291.30	24.40%	\$220.21	13.85%	\$189.71

Source: Author's calculations based on income data from PUMS and remittances data from the Inter-American Developmental Bank, retrieved March 20, 2008 (<http://www.iadb.org/mif/remittances/usa/>), and the World Bank’s “Migration and Remittances Factbook, 2008, retrieved March 21, 2008 (<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21352016~isCURL:Y~menuPK:3145470~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>).

Appendix C: Calculations of Public Contributions and Costs Estimates

Contributions

As indicated in the text, the property tax data came from the PUMS. The state income tax figures were calculated using the state tax rate figures calculated in Appendix B.

The sales tax figures were based on expenditure shares on certain key consumer spending categories as defined by the US Bureau of Labor Statistics' *Consumer Expenditure Survey*, 2005, published in 2007. These categories were: food away from home, alcoholic beverages, utilities fuels and public services, household operations, housekeeping supplies, household furnishings and equipment, apparel and services, vehicle purchases (net outlay), other vehicle expenses, entertainment, personal care products and services, tobacco products and smoking supplies, and miscellaneous items. This was done for the immigrant group based on Hispanic spending patterns as published in the Consumer Expenditure Survey, and for the total native group based on household incomes ranging between \$40,000 and \$60,000 per year, also in the BLS publication. The state sales tax is 5.5 percent. In addition, we added, for expenditures occurring in Douglas and Sarpy counties, an additional municipal (Omaha) sales tax of 1.5 percent.

The gasoline consumption tax figures were calculated as follows. Based on data from the BLS's *Consumer Expenditure Survey*, about 5 percent of total expenditures in 2005 were gasoline expenses. We calculated what 5 percent of total after-tax income would be to determine the gasoline expenditure figure for Nebraska's various demographic groups of interest. We then calculated total gallons consumed based on a price per gallon of \$2.23. This figure was, according to the US Department of Energy, Energy Information Administration (www.eia.doe.gov), the average per-gallon price for unleaded gasoline in 2006. We divided the gasoline expenditure figure by 2.23. The total gallons' figures were then multiplied by the state's 25 cents per gallon gas tax.

Costs

Public costs comprise four categories; food stamp expenditures, public assistance and supplementary income, education expenses, and public coverage of health care costs. The food stamp and public assistance and supplemental income come from the PUMS data system.

Educational expenditure estimates were constructed based on population data for native and immigrant groups aged 5 to 17 from PUMS. We obtained statewide per pupil from the Nebraska Department of Education. This data can be found on line at: (<http://ess.nde.state.ne.su/SchoolFinance/AFR/StatewidePPC.htm>). These data indicate that in 2005/2006 per-pupil expenditure was \$8,509.86. The immigrant population aged 5 to 17 in 2006 was 10,925 and total native population aged 5 to 17 was 306,178. Multiplying these figures by the above per-pupil expenditure results in the estimates reported.

The estimates are more complicated to construct. First, we obtained data from the US Department of Health and Human Services' Medial Expenditure Panel Survey for the year 2000. These data and the full report for the US can be found at the following web site: http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml. The data we used were for the US as a whole in the year 2000 and are in the table below:

Table C1. National Data From Medical Panel Survey, 2000

Age Group	Population (1000s)	% with an Expense	Total Expenses (\$ millions)	Expense per Person
Under 6	24,126	0.87	23,497.00	1,123.33
6 to 17	48,405	0.80	43,241.00	1,116.65
18 to 44	109,021	0.78	161,419.00	1,905.56
45 to 64	62,072	0.89	195,776.00	3,563.86
65 and over	34,782	1.00	203,964.00	5,893.54
Hispanic	33,955	0.70	41,770.00	1,749.87
Non hispanic	244,451	0.84	586,127.00	2,871.53

Source: U.S. Department of Health and Human Services' Medial Expenditure Panel Survey for the year 2000. Retrieved February 26, 2008 (http://www.meps.ahrq.gov/mepsweb/data_files/publications/rf21/rf21.shtml).

The expenses-per-person figures were then applied to the various demographic numbers for the state of Nebraska as estimated by the PUMS. Assuming then that these per-person costs are roughly equivalent to Nebraska's population, total expenses for immigrants and native-born groups were calculated by adding up each demographic cohort's estimated expenses. These figures are presented in Tables C2 and C3 below.

Table C2. Expenses Applied to Nebraska Population Data - Immigrants

Age Group	Expense per Person (from B1)	% with an Expense (from B1)	Nebraska Foreign Born	Total Expenses (\$ millions)
Under 5	\$1,123.33	0.87	1,308	\$1.27
5 to 17	\$1,116.65	0.80	10,925	\$9.76
18 to 44	\$1,905.56	0.78	62,664	\$92.78
45 to 64	\$3,563.86	0.89	19,269	\$60.77
65 and over	\$5,893.54	1.00	5,334	\$31.28
Total Expenses				\$195.87

Source: Author's calculations using PUMS.

For the immigrant population, certain adjustments were made to this total. First, as is clear from Table C1, the Hispanic population in the US spent per capita 61 percent of what the average US citizen spent in 2000. According to our PUMS data for 2006, Central and South American immigrants represent about 57 percent of total immigrants in Nebraska. Assuming that non-Central and South American immigrants tend to use health services as suggested by the US figures (i.e., the \$2,871.53 figure for Table C1), we generated an immigrant population weighted per capita expenditure figure by the following calculation:

$$0.57 * \$1,749.87 + (1 - 0.57) * \$2,871.53 = \$2,232.18$$

This figure represented about 78 percent of what the average US citizen spent in 2000. We then applied the 78 percent to the total immigrant population health expenditures of \$195.87 million from Table C2. This provided us with an estimate of \$152.3 million. Finally, evidence from the Medical Expenditure Panel indicates that the Hispanic population's use of Medicaid was 19.3 percent. Assuming this is a reasonable percentage in the state of Nebraska, we applied this percentage to the \$152.3 million figure to obtain \$29.4 million as our estimate of 2000 immigrant health expenditures in Nebraska.

To this figure we applied a Consumer Price Index (CPI) price deflator for health services as supplied by the US Bureau of Labor Statistics. For 2006, this deflator was 1.318. Since the base year is 2000, this index indicates that health service prices have increased almost 32 percent between 2000 and 2006. Applying this index to our \$29.4 million estimate gives us our 2006 health expenditure estimate of \$38.73 million.

Table C3. Expenses Applied to Nebraska Population Data - Native Born

Age Group	Expense per Person (from B1)	% with an Expense (from B1)	Nebraska Foreign Born	Total Expenses (\$ millions)
Under 5	\$1,123.33	0.87	126,999	\$123.69
5 to 17	\$1,116.65	0.80	306,178	\$273.51
18 to 44	\$1,905.56	0.78	588,011	\$870.62
45 to 64	\$3,563.86	0.89	419,702	\$1,323.75
65 and over	\$5,893.54	1.00	227,941	\$1,336.66
Total Expenses				\$3,928.23

Source: Author's calculations using PUMS.

Evidence from the Medical Expenditure Panel indicates that the total US population's use of Medicaid was 7.8 percent. Assuming again that this is a reasonable percentage in the state of Nebraska, we applied this percentage to the \$3.93 billion figure from Table C3 to obtain \$306.4 million as our estimate of 2000 total health expenditures in Nebraska.

To this figure we applied a Consumer Price Index (CPI) price deflator for health services. Applying this index to our \$306.4 million estimate gives us our 2006 health expenditure estimate of \$403.9 million.

Appendix D: Basic Input-Output (IO) Modeling and Derivation of IO Multipliers

Since their development in the mid-1930s, Input-Output (IO) models have been used extensively by economists and policy analysts to quantitatively measure the impact on an economy (either national or regional) from a variety of economic phenomena such as tax policy, pollution regulation, oil price spikes, military base closings, and industrial entry.

The main strength of the IO approach is that, with a primary focus on production, it recognizes that production processes are complex and that production of any given good or service requires production from other goods or services in the economy as inputs. Hence, it quantitatively measures the interdependency that exists among all industries in an economy. Something that impacts one market, for example, higher labor costs in the construction sector, will have subsequent impacts on many other sectors in the economy. Other regional models, such as Economic Base Theory, do not account for this interdependency. The magnitudes of these “ripple effects” are ultimately what determine the magnitudes of the various multipliers discussed in the text. The purpose of this appendix is to briefly describe the essential elements of an IO model from the perspective of where these multipliers come from. It is not designed to be a complete discussion of IO models in general.³⁰

In general, the following assumptions regarding IO models are made:

1. Each industry (i) produces only one homogeneous commodity or service (i).
2. Each industry uses a fixed input ratio (or factor combination) for the production of its output.
3. Production in every industry is subject to constant returns to scale, so that a k-fold increase in every input will result in a k-fold increase in output.

From these assumptions it will be the case that the production of one unit of the jth commodity requires a fixed proportion a_{ij} ($0 \leq a_{ij} < 1$) of the ith input.

The key to the IO model is the IO matrix, which incorporates these fixed proportions. Consider, for instance, the following (simplified) IO matrix (denoted as **A**):

		Output					
		1	2	3	...	n	
Input	1	a_{11}	a_{12}	a_{13}	...	a_{1n}	d_1
	2	a_{21}	a_{22}	a_{23}	...	a_{2n}	d_2
	3	a_{31}	a_{32}	a_{33}	...	a_{3n}	d_3

	n	a_{n1}	a_{n2}	a_{n3}	...	a_{nn}	d_n
		v_1	v_2	v_3	...	v_n	

The *columns* of this matrix represent the input requirements from industries 1, 2, 3,..n needed for the production of commodity 1. Hence, to produce x_1 units of commodity 1 requires as inputs the proportions of other commodities in the matrix: $a_{21}x_1$, $a_{31}x_1$, etc., as well as some primary input v_1 (a labor and/or capital input, for example). Algebraically, then, by reading down the first *column* of **A** we can describe a fixed proportions production function for commodity 1:

$$x_1 = a_{11}x_1 + a_{21}x_2 + a_{31}x_3 + \dots + a_{n1}x_n + v_1 \tag{D1}$$

³⁰For such a discussion, the reader is referred to Mouhammed (2000), Hewings (1986), and Hoover and Giarratani (1984).

The rows of this matrix can be used to determine the total output production necessary from a given industry to produce all the other commodities in the economy, as well as meet final (or end user) demand (households, for instance) for that given industry. For example, if industry 1 is to produce an output level sufficient to meet the input requirements of the n commodities as well as final demand, commodity 1's output level, x_1 , must be (reading across the first *row* of A):

$$x_1 = a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + \dots + a_{1n}x_n + d_1, \quad (\text{D2})$$

where d_1 is the final demand for commodity 1. To calculate the OI multipliers, we first solve (A2) for d_1 :

$$x_1(1 - a_{11}) - a_{12}x_2 - a_{13}x_3 - \dots - a_{1n}x_n = d_1. \quad (\text{D3})$$

We then do this same operation for the remaining industries comprising our economy. In so doing, we can represent the resulting system of equations compactly using matrix algebra notation:

$$(\mathbf{I}-\mathbf{A})\mathbf{x} = \mathbf{d}, \quad (\text{D4})$$

where \mathbf{x} is an $(n \times 1)$ output vector, \mathbf{d} is an $(n \times 1)$ final demand vector, and \mathbf{I} is an $(n \times n)$ identity matrix. The matrix $\mathbf{I}-\mathbf{A}$ is often referred to as the *technology matrix* and is critical to deriving IO multipliers. Notice that if we solve for our vector of industry output levels we obtain:

$$\mathbf{x} = (\mathbf{I}-\mathbf{A})^{-1}\mathbf{d}, \quad (\text{D5})$$

where letting $\mathbf{B} = (\mathbf{I}-\mathbf{A})^{-1}$, comprises a matrix of individual industry multiplier effects and therefore can be summed to obtain the total output (production) multiplier effect from an increase in a given final demand sector. To see this, expand (D5) and, for the sake of simplicity, assume only two sectors, 1 and 2. In so doing, we obtain:

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix} \begin{bmatrix} d_1 \\ d_2 \end{bmatrix}. \quad (\text{D6})$$

Using matrix multiplication, this system becomes:

$$\begin{aligned} x_1 &= b_{11}d_1 + b_{12}d_2 \\ x_2 &= b_{21}d_1 + b_{22}d_2 \end{aligned} \quad (\text{D7})$$

Notice now that the *direct* impact of a one-dollar increase in final demand in sector 1 yields a b_{11} dollar increase in output from x_1 . Notice further, however, that that same dollar increase in sector 1's final demand has an *indirect* impact equal to d_{21} dollars on sector 2's output. The total output multiplier (i.e., the total *direct* and *indirect* effects) from a one-dollar increase in sector 1's final demand is $b_{11}+b_{21}$. In general then, to determine the total output multiplier from an increase in final demand from a given sector i , we simply add up the elements in our \mathbf{B} matrix corresponding to the i th *column* in \mathbf{B} .

As stated above, the OI modeling framework has been and is currently used extensively in applied economic analysis because it has a number of desirable attributes that other model structures do not possess. However, there are some limitations as well. For completeness, these strengths and limitations are listed below.

Strengths of the IO modeling framework:

1. More industry detail than is typically provided in most regional econometric models.
2. The simultaneous nature of IO models allows for direct and indirect effects to be measured. Such feedback or ripple effects are generally not possible in most regional econometric models.
3. Ease and flexibility in simulation analysis.

Limitations of the IO modeling framework:

1. The coefficients in production are fixed in the IO matrix. This does not allow for input substitution in response to relative input price changes.
2. IO matrixes are usually developed accurately for a particular year. Over time, it is reasonable to assume the matrix coefficients to change, perhaps due to technological innovations in production or processing. However, this sort of flexibility is generally lacking in IO models.
3. The IO framework by construction imposes constant returns to scale for all industries in the economy.
4. IO models assume the same production technology (i.e., a single, linear production function) is used in a particular industry. This has two potentially troubling implications. First, it assumes that all firms within a particular market employ the same production technology, which may or may not be true in practice. Perhaps more troubling, however, is that often the definition of a “sector” may involve several relatively distinct industries. For instance, there exists an IO production function for the “Utility Sector.” However, this sector is comprised of electricity generation and electricity distribution, water supply systems, and natural gas production and distribution. It is unlikely that all of these industries would have the same production technology. Clearly then, more detail in an IO matrix is better than less. Unfortunately, cost and data limitations often limit the detail on most readily available models.

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