# LEHD/State Workshop

A new partnership between the U.S. Census Bureau and state partners

January 2003
Alexandria, VA

# Preface: Workshop Aims

It's been an eventful year – and as a result, this workshop is very different from our earlier workshops. In addition to moving from almost three years of research and development to production mode, we welcome 18 new states to the partnership. This presents a number of challenges that need to be jointly resolved.

While, as before, a major aim of the workshop is for the Census Bureau to report back to LEHD state partners on the progress and pitfalls of the previous year, we expect many new issues to come up in the workshop. A partial list of these that we hope will be addressed includes:

- Finalizing the production schedule
- Finalizing the way in which data are returned to states
- Formalizing the partnership: the role of the states and the role of the Census Bureau in terms of
  - data review and quality assurance
  - data access
  - data dissemination
- Developing client friendly products – particularly aimed at employers
- Priorities for next yearRelevant material.

This can ONLY work if we have a full and open discussion. To that end, we have provided time for sessions on sharing thoughts and an open mike session. We hope that any issues and questions that you have will be raised then – and that we can have a full discussion of the challenges that face us.

# Contents

# 1 Workshop Agenda

**January 29**

8:00 – 8:45am Coffee and Breakfast

8:45 – 9:00 am Introductions and Welcome (Census Partners)

9:00 – 11:00 am Core Products

1. Quarterly Workforce Indicators
    a. Update and Review (Census Partners)
    b. Examples of Use for WIBs (IL and PA)
    c. Floor Discussion

2. Successor/Predecessor Firm Analysis
    a. Update and Review (Census Partners)
    b. Implementation (State Partners)
    c. Floor Discussion

3. Edited Wage Records
    a. Update and Review (Census Partners)
    b. Use for Wage Record Program (CA)
    c. Floor Discussion

11:00 – 11:15 Coffee Break

11:15 – 12:15 Research Access: Cornell Simulated Site

1. Introduction and Access protocols (Census Partners)
2. Use and Potential (IL)
3. Floor Discussion

12:15 – 1:15 Lunch (Presentation on GIS and Demographics )

**Breakout Sessions: Using LEHD Data Locally**

| | Session 1: Using LEHD data to better better understand local labor markets | Session 2: Using LEHD Data to better serve customers |
|---|---|---|
| 1:15-3:30 | Low wage work<br>a. Update and Review (Census Partners)<br>.....b. Example of Product (NC)<br>.....c. Floor Discussion<br>Transportation<br>.....a. Update and Review (Census Partners)<br>.....b. Example of Product (FL)<br>.....c. Floor Discussion<br>Immigration<br>.....a.Update and Review(Census Partners)<br>b. Example of Product (TX)<br>c. Floor Discussion<br>Aging<br>a. Update and Review(Census Partners)<br>b. Example of Product (Census Partners)<br>c. Floor Discussion | WIA Performance Standards 'Adjustments' – Use of LHED *Quarterly Workforce Indicators* in State and Local Negotiations.<br><br>Using *Quarterly Workforce Indicators* to target WIA client service assignments and business client engagements<br><br>Technical assistance to community Use of LEHD *Quarterly Workforce* Indicators to help community college's research staff understand their institution's local economy. |

3:30-3:45 Coffee Break (reconvene in plenary session)

**Plenary Session**

3:45-5:00 Tactics for Leveraging Cooperation (TLC)

A sharing of thoughts about the structure of the partnership.

1. The current structure
2. Current and future expectations
3. Leveraging existing resources
4. Developing new sources of funding
5. Regional collaboration

**Dinner**

**January 30**

8:00 – 8:45 Working Coffee and Breakfast:

...Recapitulation of major points covered in Day One.

8:45 - 10:45 LEHD Priorities

1. Data Dissemination
2. Production Schedules
3. New Products

10:45 – 11:00 Coffee

11: 00 – 12:30 'Open Mike': Opportunity to express new ideas and/or concerns. Future workshops—scheduling, location, length, content and process. Marketing of the LEHD Partnership.

12:30 – 1:30 **Working Lunch**

1:30 – 2:30 2003 Implementation Planning

1. Structure of communications with customer groups and ongoing outreach

2. Summary and discussion of workshop decisions

**Closing**

# 2 Core Products

State and local authorities increasingly need detailed local information about their economies to make informed decisions — and yet are frustrated by the lack of timely local data. The LEHD/state partnership works to fill critical data gaps and provide indicators needed by state and local authorities.

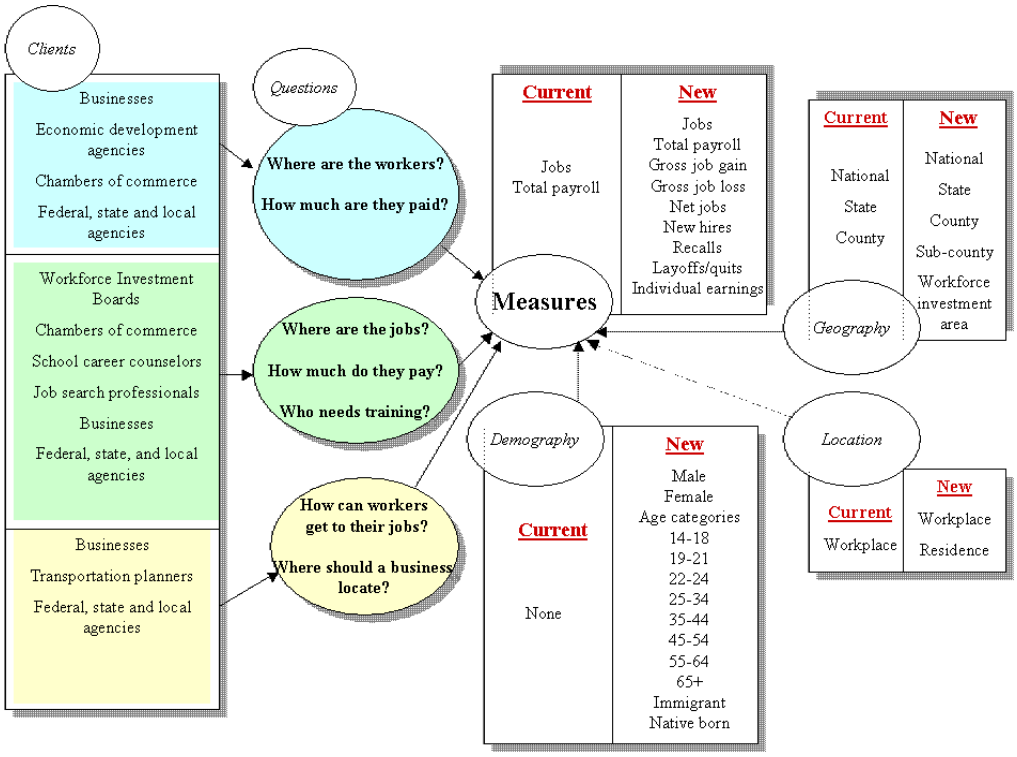
The LEHD/State Partnership is an ongoing project using existing data to provide new information about the economy. Specifically, this project integrates state administrative data and Census data products, allowing improved labor market information. Both the state partners and the Census Bureau benefit from this sharing of information. The state partners fulfill their mandate of providing high quality regional labor market information and the Census Bureau uses state administrative data to improve Census Bureau economic and demographic survey estimates.

*The LEHD/State Partnership*

*What state partners provide:* States that have agreed to a voluntary partnership with the Census Bureau provide state unemployment insurance (UI) wage record and ES202 data, their data expertise, and their state-specific knowledge to the Census Bureau under the parameters specified in the Memoranda of Understanding (MOU) between Census and each of the state partners.

*What Census partners add:* The Census Bureau exploits its large computing power, Census data technologies as well as economic and demographic survey information to create high quality labor market information for the state partners.

*What the Census Bureau delivers to state partners:* States receive three key products from the Census Bureau: (1) quarterly workforce indicators (QWI) providing information about the state economy at detailed industry and geography level, (2) enhanced UI data, (3) information about changes in economic entities (successor/predecessor firms). State partners also receive periodic reports on customized research done in collaboration with the Census Bureau

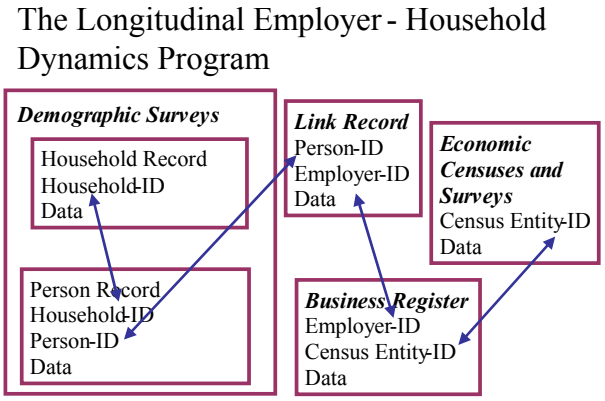



1.The Quarterly Workforce Indicators

State partners receive 29 quarterly employment indicators about the state economy for each county, for each industry, and for each quarter the state provides data; enhanced UI wage records; and information about successor/predecessor firms. Each of these deliverables is described in greater detail in the following sections.

## The Quarterly Workforce Indicators

The LEHD program uses new technology to create a unique set of timely quarterly indicators of economic activity. Just as national economic indicators measure the performance of the overall economy, these local indicators measure the performance of the local economy-where jobs are, for what kind of workers, how much workers can expect to make and employers expect to pay them. Because these indicators were developed in as a result of a partnership between the Census Bureau and the states, they are unique in their ability to serve local needs.




The LEHD Program

The QWI are created by integrating state administrative data with Census data using LEHD technology and extensive computing resources. As shown in the graph above, LEHD uses common identifiers from these disparate data sources to produce high-quality local employment, earnings, turnover, job growth, and place of work and residence indicators. These indicators are then disclosure proofed to remove identifying information and released to the state partners, who can use them to answer important questions about the local economy.

## QWI Applications

State and local decision makers – businesses, workers, economic development agencies, Workforce Investment Boards, transportation planners and educational institutions - need high-quality labor market information to make informed decisions. The Quarterly Workforce Indicators provide information that can help answer questions such as:

- What are the characteristics of the labor force in a particular area?
- How high is worker turnover in specific areas and in specific industries?
- Where are the jobs?
- What are workers (and new hires) in a particular region and industry being paid?
- Where do workers live, and where do they work?

The QWI provides this information as well as information on many other labor market indicators such as: measures of hires and layoffs for different types of workers, measures of employment by where people work and where they live, and detailed measures of labor market turnover in different industries, measures of job gain and loss in each

industry, and what workers are affected by each.

### What are the characteristics of the local labor force?

The QWI's can be used to provide detailed information about the local labor market: who's employed in what industry – at the county, workforce investment board area (WIA's) and metropolitan area level of detail.

This information - together with comparisons to other counties and WIA's - can be distributed to government departments, chambers of commerce, local businesses and economic development agencies.

### How high is worker turnover?

The QWI's can be used to generate a measure of worker turnover . Workers can use this to identify the likely duration of employment in an industry; firms can use it to benchmark their turnover with that of other employers in the industry, WIBs can use it as a performance benchmark, and state and local agencies can use it as a measure of workforce quality (particularly in service oriented industries, like nursing homes).

### Where are the jobs?

Change characterizes the U.S. economy. The QWI's provide more information on this change – by identifying growth industries, those industries hiring workers, and targeting the opportunities for different types of workers. This helps workers, firms and placement agencies.

### What are workers (and new hires) in a particular region and industry being paid?

These are probably the most useful of all the measures that are provided by the QWI's. Employers need to know what workers are being paid, and what to pay new hires. Workers need to know what pay they can make in different kinds of industries – and what they can make after they've been in the industry for a few years. Placement agencies need to know what different types of jobs are likely to pay, and educational institutions need benchmarks so they can measure the performance of their graduates. Economic development agencies need to tell prospective businesses what the workforce earns.

### Where do workers live, and where do they work?

The Quarterly Workforce Indicators provide measures of employment by where people work as well as where they live. This information allows transportation planners to

know where new roads and public transportation should be located. Because the QWI's measure employment over time, transportation agencies can use the trends to develop better projections of future transportation needs. These measures can also be used by community colleges and other educational institutions to identify where their potential clients live and work.

### Other LEHD products of interest to states

*Analysis of low-wage workforce*: LEHD has worked with state partners to identify the low-wage population in each state, and to examine issues such as the transition of low-wage workers out of low-wage work and the location of low-wage workforce. The later information is a great aid to transportation planners, as low-wage workers are a major user of public transit systems. Maps of low-wage worker concentration such as the one shown in Figure 2 can aid planners in mapping bus routes and planning mass transit schedules.

*Edited wage records:* State partners receive edited wage record data created at the Census Bureau using Census name-matching technology to identify false name-SSN matches and to identify likely 'true' matches in the employment history data.

*Successor/Predecessor firms:* The LEHD partnership uses worker flows to improve information on changes in economic entities over time. Information on changing economic entities is of interest to states in of itself, and also helps the partnership improve measures of employment dynamics by suppressing false job changes.

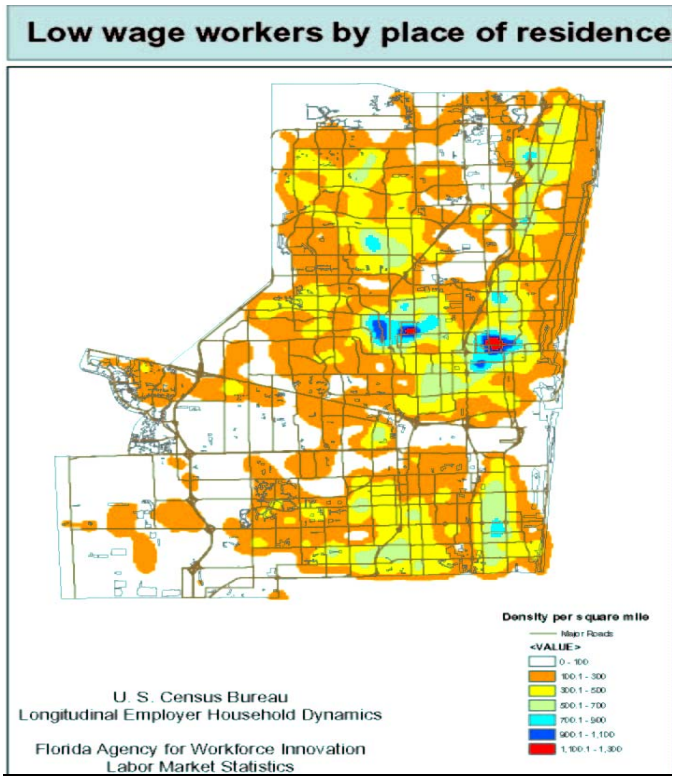
*Immigration:* The Census Bureau is analyzing data to describe the evolution of the immigrant population in each state over the 1990s and into 2002.

*Aging:* The Census Bureau is using partnership data to describe the change in the demand for older workers over time

*Measures of workforce skill*: The Census Bureau staff has developed measures of worker skill, for each worker in the dataset. These measures allow states to examine the skill composition of their workforce, and what industries are 'upskilling' or 'downskilling' their workforce.

## More information: QWI variables

For more information on QWI variables and their meanings, see Appendix A.




2.Residences of Low Wage Workers

## Using the CD-ROM

Opening your CD-ROM will reveal 19 files (where 'yourstate' denotes your state's postal abbreviation).

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qwi_yourstate_wia_county_sicdiv_dbf.zip
qwi_yourstate _wia_county_sicdiv_sas.zip
qwi_yourstate _wia_metro_sicdiv_csv.zip
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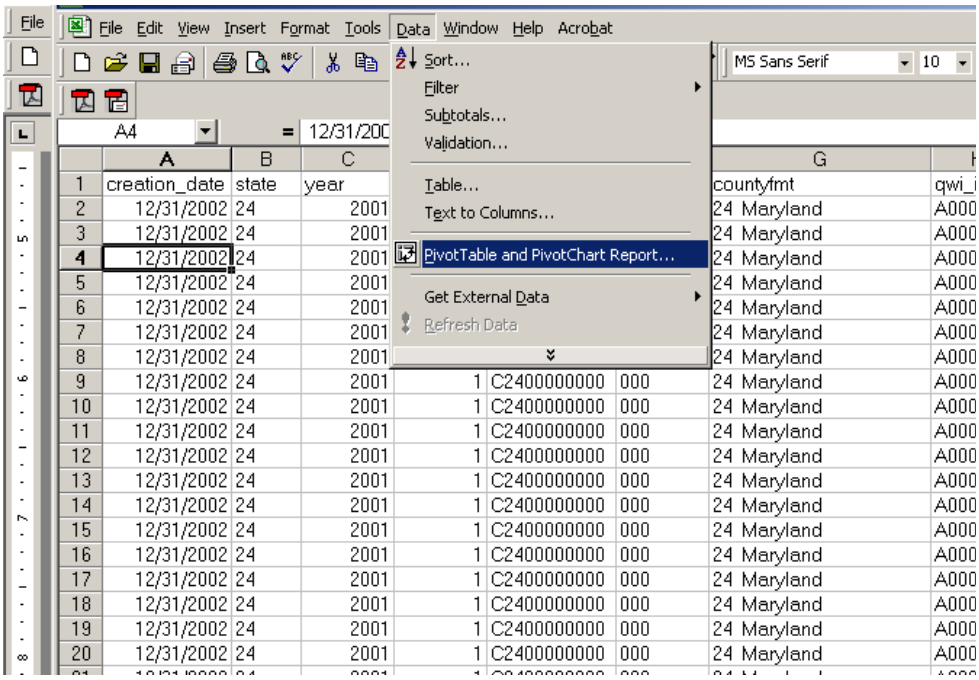
qwi_yourstate_wia_sic4_sas.zip
qwi_yourstate_wia_wib_sicdiv_csv.zip
qwi_yourstate_wia_wib_sicdiv_dbf.zip
qwi_yourstate_wia_wib_sicdiv_sas.zip
qwi_yourstate_contents.lst

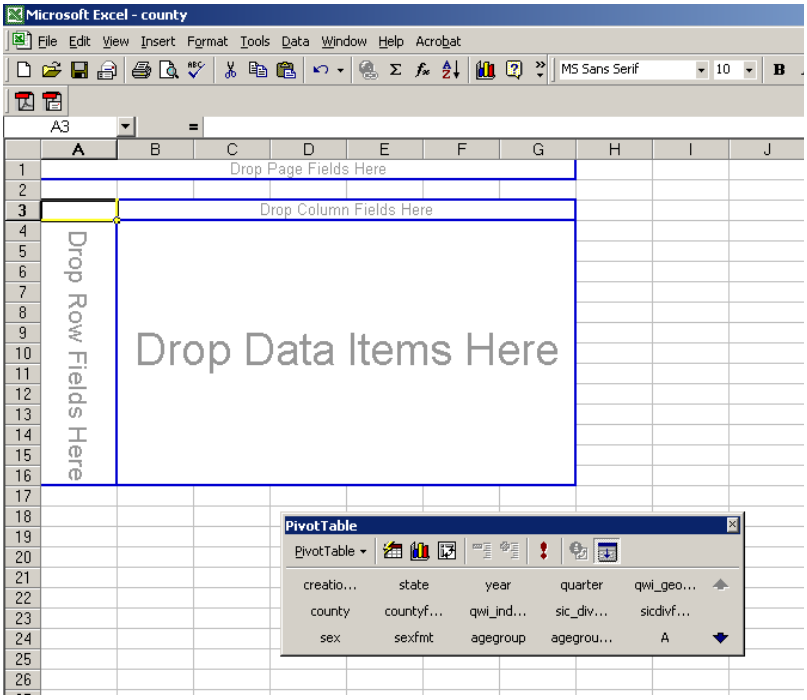
These are the SAS, DBF, and CSV files for the QWI data at the SIC division level, the SIC two-digit, three-digit, and four-digit level, with SIC division level data at the county, metro, and WIB geography levels. Of particular interest to states is are the CSV files, easily opened with Microsoft Excel for quick access to QWI data (for those interested in using the SAS files but do not have access to SAS, access to SAS is available through the CRADC accounts, which are described later in this booklet).

**Using Excel to generate tables**

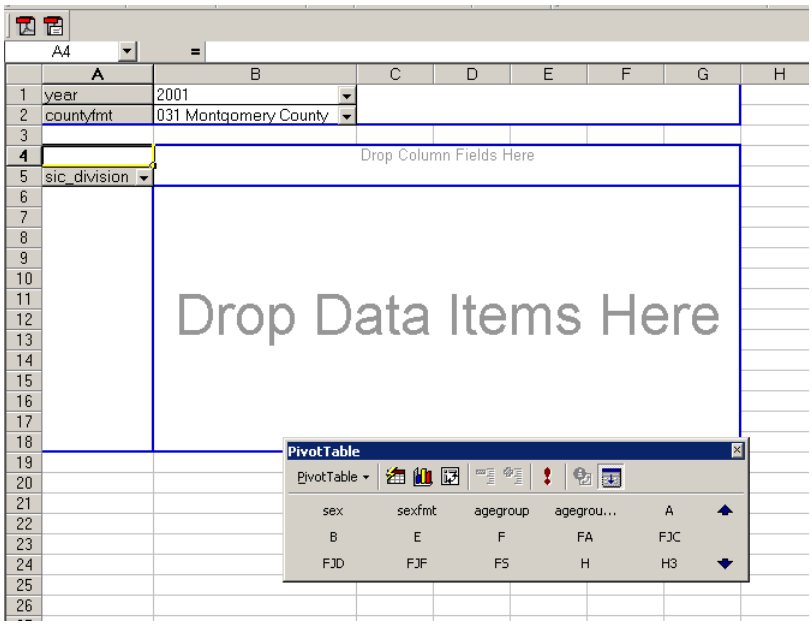
The slides following show how to use the county level .csv file in Excel to create pivot tables quering specific data. In this example, data is selected to rank the top industries by employment in Montogomery County MD during the year 2001 and create a pie chart using that table.



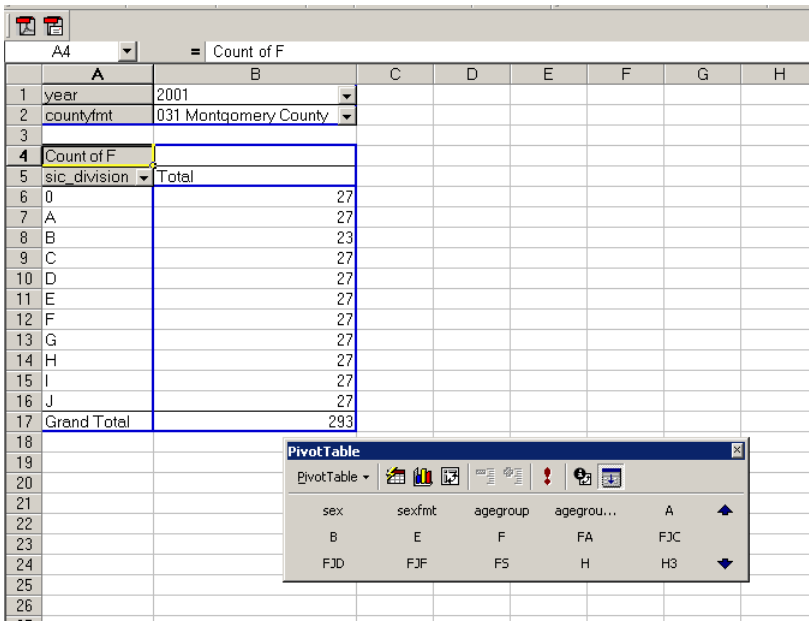

3.Selecting Pivot Table



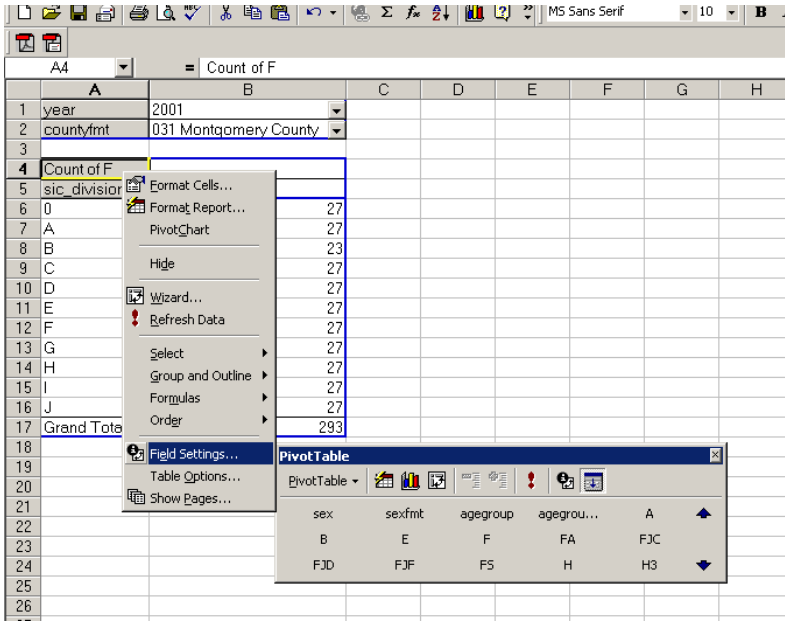

4.The Pivot Table Fields



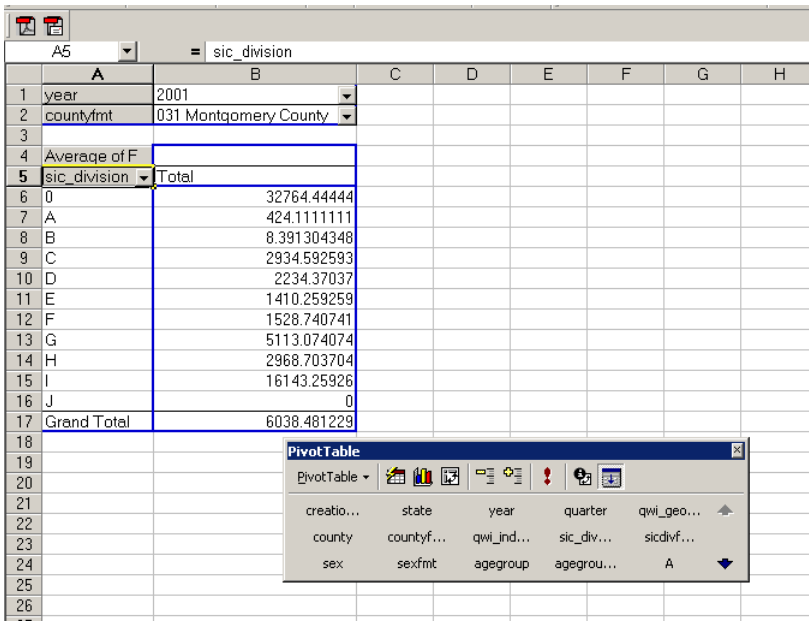

5.Filling the Pivot Table Fields



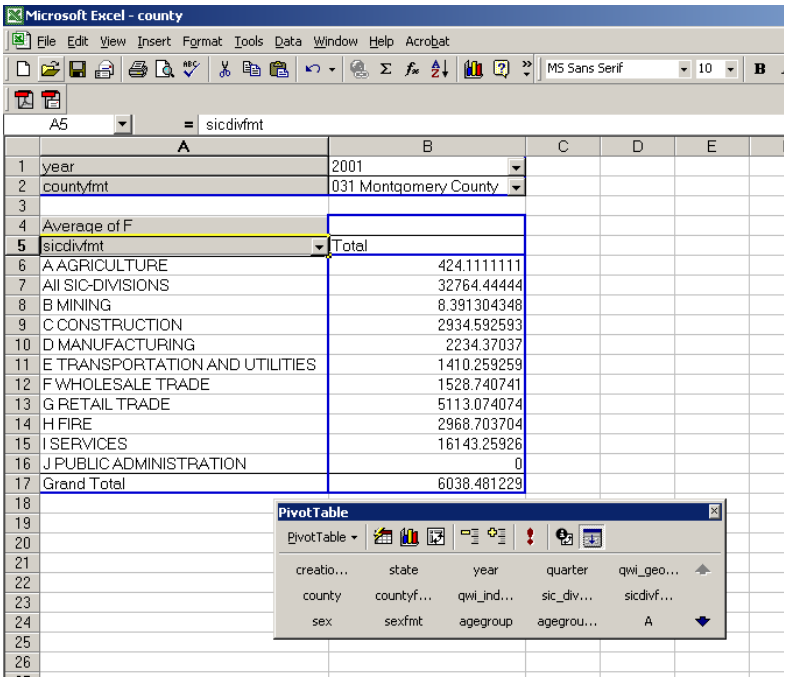

6.Putting Full Quarter Employment in the Data Field



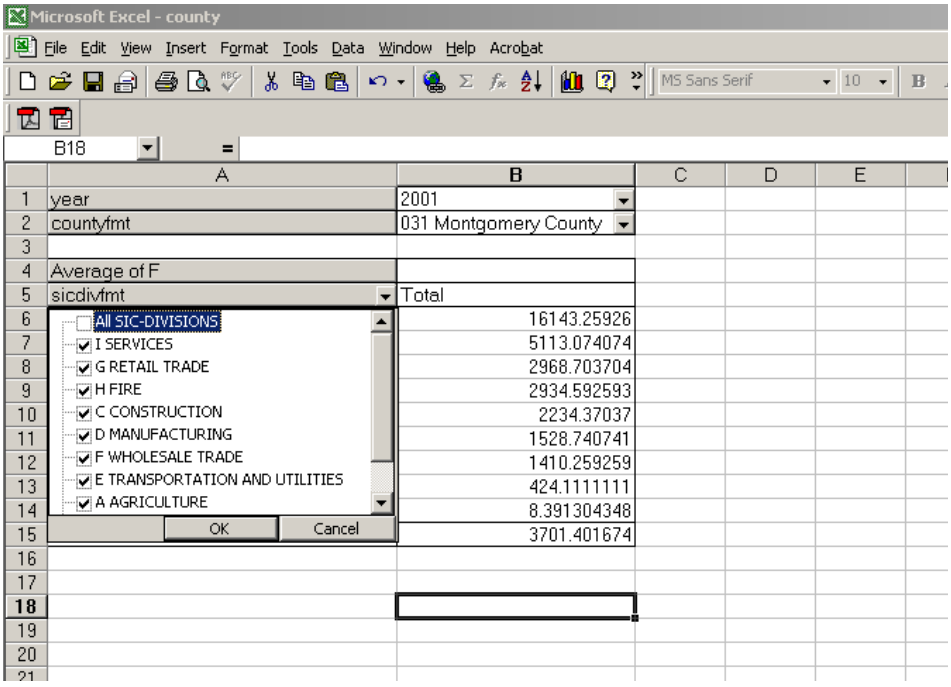

7.Changing the Field Settings



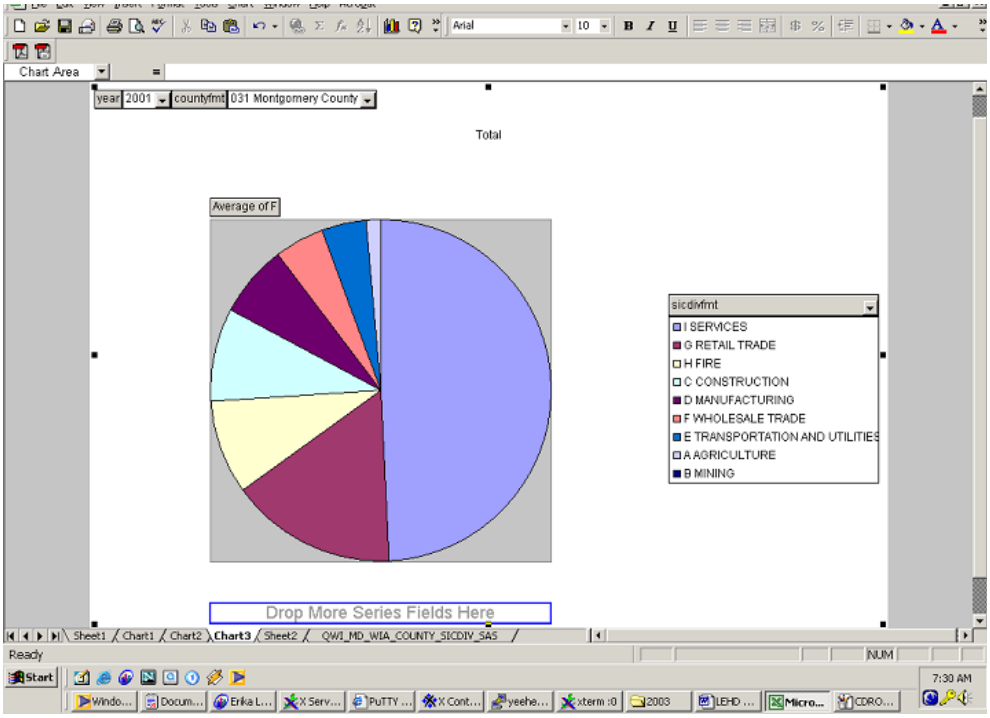

8.After Changing the Field Formats




9.Using Formatted Variables




10.Changing What Data Appears on the Table




11.Making a Chart of the Data

### The Census Numident: An Introduction.

See appendix B for a description of the Census Numident, a Census data file used in the linking of state and Census data.

## Successor/Predecessor Firm Analysis

The purpose of this project is to use worker flows to improve information on changes in economic entities - successor/predecessor UI accounts (SEIN) and reporting units (SEINUNITs) - over time. This is useful in its own right to our partner states, and to the Census Bureau. It has the additional benefit of eliminating false worker and job flows from the employment dynamics estimates. Successor/Predecessor analysis provides better measures of business births and deaths, as well as consolidations and breakouts (spin-offs).

### Working with Successor/Predecessor Files

The LEHD staff has worked with a number of states to use UI wage record data to shed light on the births/deaths/mergers and acquisitions of businesses (entity demography editing). We have sent each state a report which identifies:

1. Total linkages identified by ES202 and UI data, and their concurrence

2. Typical ES202 discrepancies that may be a source of the relatively low concurrence

3. The most commonly occurring industry links in the UI data

4. The most commonly occurring industry links in the ES202 data

5. An analysis of industries 7361 and 7363

We identify four sets of linkages

1. Predecessor firm dies & more than 80% of predecessor's employment moves to successor

2. Predecessor firm dies & less than 80% of predecessor's employment moves to successor

3. Predecessor firm lives & more than 80% of predecessor's employment moves to successor

4. Predecessor firm lives & less than 80% of predecessor's employment moves to successor

When using the ES202 file, the definition of firm "death" is that there is a successor/predecessor flag in the data. A death in the UI data is when a firm's employment drops below 10% of previous quarter employment for two consecutive quarters.

### What is provided to the state partners

The elements of this project that are returned to the states are currently determined in consultation with partner states. An example of what states receive is an ASCII file, where the first row of the file contains the variable names. The variables, in the order in which they appear from left to right, are as follows:

- SEIN = Predecessor's State Employer Identification Number
- SEIN_SUCC = Successor's State Employer Identification Number
- MATCH_PERIOD = (letting YEAR and QUARTER comprise period t) the number of employees from NUM_LEFT who are observed at the successor for the first time in period t+1 divided by NUM_LEFT
- NUM_LEFT = number of employees observed transitioning from predecessor to successor
- LINK_UI
  - = 1 if condition 1 and condition 2 are both true
  - = 2 if condition 1 is true but condition 2 is false
  - = 3 if condition 1 is false but condition 2 is true
  - = 4 if condition 1 and condition 2 are false
- PRED_SIZE_CLASS_UI = size class of predecessor (see class definitions below)
- SUCC_SIZE_CLASS_UI = size class of successor (see class definitions below)
- SUCC_LINK_UI
  - = 1 if condition 3 and condition 4 are both true
  - = 2 if condition 3 is true but condition 4 is false
  - = 3 if condition 3 is false but condition 4 is true
  - = 4 if condition 3 and condition 4 are false
- PRED_SIC4 = 4 digit SIC of predecessor
- SUCC_SIC4 = 4 digit SIC of successor
- YEAR = Year of transition
- QUARTER = Quarter of transition

Definition of size classes:

- SIZE_CLASS
  - = 1 if 1 <= employment < 5
  - = 2 if 5 <= employment < 20
  - = 3 if 20 <= employment < 50
  - = 4 if 50 <= employment < 100
  - = 5 if 100 <= employment < 250
  - = 6 if 250 <= employment < 500
  - = 7 if 500 <= employment

## Examples of use

These data can be used to:

- Provide additional information about the births and deaths of firms
- Provide summary statistics (as below) about the size class of firms generating the greatest number of transitions

Actual examples from one of our partner states are provided below.

| **Size Class of Firms with Sucessor/Predecessor Links** | **Link Code** | | | | **Grand Total** |
|---|---|---|---|---|---|
| succ_size_class_ui | 1 | 2 | 3 | 4 | |
| 1<=employment<5 | 1 | 1 | | 8 | 10 |
| 5<=employment<20 | 257 | 158 | 9 | 270 | 694 |
| 20<=employment<50 | 190 | 125 | 4 | 469 | 788 |
| 50<=employment<100 | 105 | 95 | 2 | 859 | 1061 |
| 100<=employment<250 | 104 | 94 | 6 | 2007 | 2211 |
| 250<=employment<500 | 51 | 68 | 3 | 1860 | 1982 |
| 500<=employment | 143 | 272 | 4 | 8621 | 9040 |
| blank | 7 | 12 | 1 | 58 | 78 |
| Grand Total | 858 | 825 | 29 | 14152 | 15864 |

- Identifying the industries of predecessor firms, by type of link
- Industry of Predecessor firms, by type of link and number of firms
- Identifying the industry to industry transition of large clumps of workers from one firm to another (link code 4, only those with more than 200 businesses included by type of link, and for 2001).

| Predeccessor | Successor Industry | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Industry** | 1542 | 1611 | 1771 | 5311 | 5812 | 7361 | 7363 | 7389 |
| 1542 | 37 | 49 | 98 | | | | 2 | |
| 1611 | 68 | 170 | 120 | | | | 5 | |
| 1771 | 87 | 67 | 206 | | | | 1 | |
| 5311 | | | | 126 | 47 | 6 | 89 | 21 |
| 5812 | | | | 36 | 36 | 8 | 148 | 46 |
| 7361 | | | | 7 | 1 | 62 | 423 | 2 |
| 7363 | 4 | 2 | 3 | 94 | 161 | 430 | 2755 | 94 |
| 7389 | | | | 7 | 14 | 3 | 43 | 56 |

### Sample Successor/Predecessor Report

See appendix B for a sample Successor/Predecessor Report to a state partner.

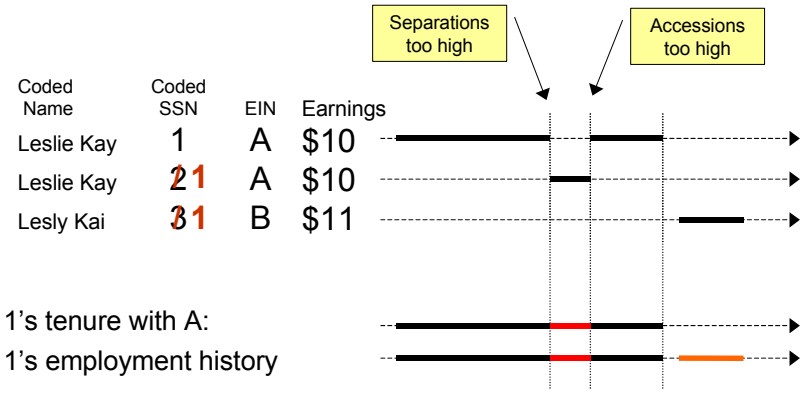
## Edited wage records

### Overview

The QWI, as is described elsewhere, is built up from individual wage records and work histories. Their accuracy is crucial to ensuring that the QWI reflect the true state of the labor market. The purpose of the wage record editing process described in this CHAPTER is to construct clean employment histories for individuals in wage record data. Based on results from a test state, it is found that even a very conservative correction procedure has a sizable impact on the QWI. The average bias across variables ranges from 0.25 percent up to 15 percent for flow statistics, and up to 5 percent for payroll aggregates.

Brief description of process

The correction is based on name-matching technology originally developed at the U.S. Census Bureau. It is crucially dependent on the name information received with state wage data, but also exploits LEHD's capacity to generate long (10-year plus) individual earnings histories for entire states. Both are used in the matching process to identify donor records. A statistically more formal presentation of the logic underlying the




12.Wage record editing

matching process is provided in Abowd and Vilhuber (2002, LEHD TP 2002-17), and technical details are provided in the reports provided to each state upon initial wage record editing (see References for a list of states processed as of December 2002).

Figure 12 describes two examples of the effect of miscoded SSNs.

The second and third records have Leslie Kay's SSN miscoded. The miscoding of the second record leads to a false gap in Leslie's job history with employer A. The effect would be an overestimation of all flows associated with employer A. The wage record editing procedure described here handles such a miscoding.

Miscoding of the third record, combined with a different spelling of the name, is more difficult to handle. There is no corroborating information on Leslie's job tenure with employer B (such as other wage records with the right spelling of the name and correct entry of the SSN). The information on wage records is not strong enough to associate such coding errors with Leslie's other employment history, and the current wage record editing process does not attempt to do so.

There are two stages to the wage record editing process. The first stage, using observation-weighted name information, identifies likely false matches - miscoding of an SSN resulting in another valid SSN on file. Such false positives typically lead to the erroneous observation of multiple job-holding, underestimates of non-employment periods, and in a more technical way, reduction of the candidate record pool for the second stage.

The second stage typically uses eight passes of the matching software. Eligible wage records are defined based on the characteristics of the wage history, i.e. only job histories

with single-quarter interruptions can be falsely interrupted for a single period, and only wage records part of a single-quarter job history can be the result of spurious miscoding of the SSN. All other records are thus not used. The resulting reduction of records scanned for coding errors substantially increases the efficiency of the matching process, without impacting on its quality. The actual matching is based on varying combinations of name components, as well as on earnings.

Summary of editing results for four states:

Across all states, between 9 and 17 percent of all jobs observed in the available data have an interruption of at least one quarter, and typically half of those interruptions last exactly one quarter, and are the only interruption for that job. If an SSN is miscoded, the likely observed effect is just such a job history, and the holes of such observed job histories constitute the candidate pool for the matching process.

The first stage of the wage record editing process typically flags between 1 and 6 percent of all observed SSN-Name combinations as possible false matches. This increases the number of candidate records by around 4 percent. Of the eligible records, between 8 and 23 percent are associated with a single-quarter employment history, thus eliminating the false interruption. The remaining job history interruptions are either true (economic) interruptions, or cannot be associated with any other wage record with sufficient confidence.

Use of the first stage improves match rates in the second stage by between 12 and 44 percent, i.e. without being flagged as a possible false match, these job histories would not have been part of the set of candidate records.

The net total increase in number of successfully matched records, when compared to an exact name-based matching process, varies between 100 and over 500 percent. This seems to depend primarily on whether the state already uses some sort of consistency check or not.

## Summary of impact on QWI

Although the number of records successfully changed (edited) is very small (less than one percent), the impact is quite important. Across all states, the number of single-quarter interruptions of job histories is reduced by between 2 and 15 percent. That by itself points to a likely substantial impact on the QWI. For the first state processed (California), Abowd and Vilhuber (2002) went one step further, producing pre- and post-

editing estimates of the QWI version 2.3, and evaluating the bias both at the firm level, in unpublished intermediate files of the QWI estimates, and at the county and industry level, as would be available to the general public. Biases range up to 15 percent for flow statistics, and up to 5 percent for payroll aggregates. In particular, coding errors lead to the average firm, county, or industry overestimating accessions and separations by around 2 percent, underestimating full-quarter employment by around 1 percent, overestimating the extent of recalls by around 5 percent. The average county or industry will exhibit a 5 percent overestimate of earnings of separations and accessions. The number of quarters of non-employment associated with accessions prior to acceding to their current employer is overestimated by around 2 percent, and this bias again increases for recalls to over 5 percent.

## Requirements and Deliverables

In order for wage record editing to be feasible, name information is required on the wage record. For best results, first name information should exceed single characters, and last name information should exceed six characters. States receive in return an edited wage record file, usable for research purposes, with processing flags from the wage record editing process added to the file (the exact layout is available in the state reports, and available on request). The process adds no demographic information.

## State partners receive

Edited wage record data as well as individual earnings and employment histories. These can be used in a number of different ways. For example:

· Earnings histories can be matched to welfare recipient records to examine the impact of different types of program interventions.

· The earnings and employment outcomes of workers displaced from particular industries can be compared to the outcomes of worker remaining with their employer, or to the outcomes of other workers who leave employment without experiencing a mass layoff.

· Summary statistics can be generated to identify what types of businesses, in what types of industries are most likely to provide inaccurate wage records

· Summary statistics can be generated to examine whether and how wage record

reporting quality has improved over time.

# 3 LEHD Research Products

Partner states have indicated interest in additional work in the areas of low-wage work, worker skill, immigration, and aging. LEHD staff have attracted external grants from the Rockefeller Foundation, the Sloan Foundation, the Russell Sage Foundations, and the National Institute on Aging to support this research. Partner states receive interim reports customized to their states.

It is important to recognize that these reports are simply research – they do not undergo the standard Census Bureau review, and are not to be considered Census Bureau publications. We hope that this work will be reviewed by the states, and that, after discussion about data idiosyncracies and definitions, the research can go through the standard Census Bureau and state review process and then be released.

## Analysis of low-wage workforce

The state partners indicated a particular interest in studying the low-wage workforce. The LEHD program staff succeeded in securing a two-year grant from the Sage and Rockefeller foundations, as well as HHS to fund this research. We are now about two-thirds of the way through the project. We have provided partner states with two reports of our progress, with state-specific information, and expect the final report in August, together with the final draft of the book that is the main deliverable of the project. The main researchers on the project are Harry Holzer, former chief economist at the US Department of Labor, Julia Lane and Fredrik Andersson.

The core purpose of the work is to identify those matches between low wage workers and firms that lead to successful earnings and employment outcomes. Because we are interested in the effect of job ”quality” on earnings and on using administrative definitions to identify low-wage workers, we focus particularly on workers who have substantial labor force attachment.

### Approach

We identify individuals as low wage workers if they meet both an earnings criterion - they earn no more than $12,000/year (in 1998 dollars) for each of three years – and a labor force attachment criterion – they are employed for at least two quarters in each of three years. These criteria, combined with a restriction that the workers are between 25 and 55, capture a group of ”persistently” rather than ”transitorily” low-wage workers. Our match of this group with workers in the Current Population Survey revealed that this administrative low-wage definition was largely consistent with other low-wage definitions (such as minimum wage, living in poor families and low education).

We first established a set of facts: describing the characteristics of low wage workers, the industries they work for, and who escapes low-wage work. We then examined the sources of the escape: the role of wage growth within firms, and the role of movements across firms and industries. This was linked to the characteristics of the firms for which low-wage workers work: in addition to industry, the size, turnover, job creation, and firm specific wage premia (firm fixed effects). Finally, we examined the role of location, institutions and macroeconomic effects on the number and characteristics of low-wage workers.

### Sample Research Report: North Carolina’s Low Wage Labor Market

See Appendix C for a sample low wage report for North Carolina.

## Transportation research

As a result of the 2002 state workshop, the Bureau of Transportation Statistics (BTS) established a partnership with the Longitudinal Employer-Household Dynamic (LEHD) Program and two state partners – FL and IL - in order to develop transportation specific data from the LEHD data holdings. These data will be aggregated in such a manner as to allow for distribution to the transportation planning community.

There are several key steps that need to be implemented in order for the key deliverable to be produced.

1. Improve and geocode ES202 data for each state

2. Geocode place of residence data

3. Create TAZ like areas

4. Create Origin-Destination tables by worker and firm characteristics

a. Origin/Destination (O-D) employee numbers from household to place of employment.

Tables will be provided which include the O-D numbers at a TAZ-like level of geography acceptable to both parties. Where the geographies do not encompass sufficient numbers to ensure privacy protection, these areas will be aggregated up to a larger acceptable geographic region. For each state, the appropriately attributed geographic area files used in performing the LEHD spatial analysis will be provided in a geographic information system (GIS) format. [Note: The tabular data will include row and column totals, also known as the marginal values. For instance if the columns of the table represent the Place of Residence (Origin) and the rows of the table represent the Place of Employment (Destination), then the sum of each row will indicate the number of persons working in each geographic area, and the sum of each column will indicate the number of workers residing in each geographic area.]

b. Number of Employers/Businesses Within Each TAZ-like area.

c. Types of Businesses Located Within Each TAZ-like area.

Where possible, businesses will be described using Specific Industry Codes (SIC). A list of the SICs falling within each TAZ-like area should be provided. If industry codes are too specific to ensure confidentiality, then broader categories may be used. Examples of broader categories might include agriculture, food service, manufacturing, or retail. "Business type" categories will be agreed upon by both BTS and the LEHD Team.

d. Measure of Incomes of Individuals (Employees) Who Live Within Each TAZ-like area.

The numbers of employees falling within particular "wage-ranges" who live within each TAZ-like area will be provided. The LEHD team will develop optional methods for categorizing the "wage-ranges." These prototype methods will be demonstrated and discussed. A method agreeable to both parties will be selected

e. Measure of Salaries/Payrolls of Businesses Located Within Each TAZ-like area.

The numbers of employees falling within particular "wage-ranges" who work within each TAZ-like area will be provided. The LEHD team will develop optional methods for categorizing the "wage-ranges." These prototype methods will be demonstrated and discussed. A method agreeable to both parties will be selected.

5. Disclosure proof the O-D flows

6. Present to BTS and MPOs for review

If this approach is successful, we hope that BTS will fund additional work with additional partner states.

## Immigration research

A major challenge facing the federal, state and local statistical systems is accurately counting the number of immigrants in the population and in the workforce. Staff from the LEHD program is working with both the state partners and the Census Bureau to determine whether LEHD program data can inform current approaches. It is important to note that the work is all preliminary in nature – and we will need extensive iterations with all parties to better understand differences in definitions and measures before any final report can be released. However, staff at the LEHD program provide interim reports both to the state partners and internally within the Census Bureau and ask for feedback about both the results and the general approach.

### Methodology

We have approached the question with the following set of steps:

Step 1 Identify differences between the different measures of employment – job based(ES202) and household survey(Decennial and CPS) based? How does this vary by place of birth?

Step 2 What additional information on immigrants can be derived from UI wage record data vs.other Census data?

Step 3 How well do the CPS, ACS and UI wage records relationships track the 2000 decennial?

Step 4 What are the broad relationships between population and jobs?

Results

Our first attempt at using the Unemployment Insurance (UI) worker data, while encouraging, highlighted some of the differences between the decennial Census and the

UI. These initial results provide the motivation for the question we seek to answer: Is the coverage of the working population in the UI comparable to the coverage in the recent decennial census (SCEF)?

Overall, state level totals are similar between the two data sources, with a few simple adjustments and qualifications we will detail below. We also explore the agreement of both sources along two additional dimensions; industry and sub-state geography. Our results reveal significant differences in coverage. All of these differences are likely to be manageable, but will require extra effort on our part to understand and model their source.An important difference between the two surveys is that Census 2000 is based on place ofresidence while the UI data is based on place of work. If the place of work is relatively close to the place of residence and/or the geographic unit is large then the differences between the two sources will likely be small. For example, in California, Florida, Illinois, and Texas almost all of the workers live in the state where they work. However, Maryland is a state where a large number of the worker's in the state live elsewhere and a large number of residents work elsewhere. The across state line commuting patterns are the primary contributor to the large differences in worker totals for Maryland. Data in the Census 2000 on place of residence and place of work will allow adjustments for this problem, but these adjustments have not been implemented and are a future research project. In order to achieve a consistent definition of employment for both sources, various groups of workers were excluded. The initial estimates presented last time were modifiedto contain only civilian workers that were actively employed at the time of the survey (generally early April). In addition we removed workers that were self-employed in anunincorporated business and those working without pay in a family business. These workers are not covered by the UI system and inflate the difference between Census 2000and UI. On the UI side we removed the small number of workers under the age of sixteen that are not covered in Census 2000.

The net effect of these changes greatly reduces the gap between Census 2000 and the UI for both natives and the foreign born (the percentage difference between Census 2000 and Emp3 is shown in the last column of Table 1). For example, in California the difference between Census 2000 and the UI was about 16% compared with our current gap of about 4.5%. Our prior that Census 2000 worker totals should match most closely with UI employment definition Emp3 gains additional support. Individuals

employed in both quarter 1 and 2 on the UI are very likely to have been employed at the beginning of April when the Census was conducted. Although emp3 may appear too low, keep in mind that we are comparing 2000 totals on the Census with 1999 totals on the UI. Therefore, we would expect that 1999 totals should be less than 2000 totals on the Census. How much less is reasonable depends on the actual growth in employment that occurred between the two years?

Growth estimates are used to calculate expected UI totals in 2000 and compare them with actual Census 2000 data. Using state specific growth estimates from both the CPS and BLS results in very close agreement between the native worker population from both sources (less than 4% using the population growth rates and less than 2% with the establishment growth rates, excluding Maryland). The foreign born differences remain large, but there is evidence suggesting a higher growth rate is more appropriate for this group. Using a national foreign born growth rate estimated from the CPS results in differences that are close, but still larger than those for natives (less than 5%). However, the limited evidence using actual 2000 UI data reinforces the idea that the foreign born results are similar to those reported for natives. Taken in their entirety, these results suggest that Census 2000 and UI data provide a similar estimate of the number of workers once the universe is properly adjusted and if the data meet certain restrictions on commuting patterns across geographic boundaries.

## Industry Comparisons

The Census 2000 and UI estimates of worker totals in California were produced using two different methods; the Census 2000 is household based, while the UI data is employer based. In the UI, all workers at a given FIRM have the same industry code. Individuals working at the same firm in the Census 2000 may or may not have the same industry code depending on the consistency of Census 2000 coders and differing activities at the various places of employment within the firm (On the Census 2000, the industry coder has detailed information on the place of business, the kind of business and the kind of work performed while UI industry coding is based on self-reports by the person establishing the account and the skill of state industry coders). Present limitations in the UI do not allow linking of a worker to the establishment or place of work, only to the firm. For large, geographical and industrially diverse companies there are likely to be errors in industry coding and geographic location on the UI. Work is underway at LEHD to improve the quality of the person to firm linkages by imputing the actual place of employment. This should greatly improve both the industry and geography quality of

the UI data.

### Sample Research Report: Analysis of Texas Foreign Born Workforce

See Appendix D for a sample immigration report for a state partner.

## Aging research

At the 2001 state workshop (held in sunny CA!), the states indicated an interest in examining the market for older workers. The LEHD staff submitted a proposal to the National Institute on Aging that was funded to begin July 1, 2002 and end June 30, 2005.

The are three components to the proposal: creating summary tabulations that describe the labor market for older workers; doing analytical research, and disseminating the labor market information

### Summary Tabulations

These tabulations will answer the following questions

- What pension benefits are available to the workforce, and how has this changed over time?
- What types of firms employ older workers?
- Does the likelihood of employing older workers vary by industry and firm characteristics?
- How much persistence and heterogeneity is there in employers' workforce composition?
- How do firms adjust their workforce composition—who is hiring and firing older workers?
- How are the earnings outcomes of older workers related to firm characteristics?
- How does the changing nature of the firm affect older workers?
- How does the earnings growth of older workers compare with other workers within a firm hired at the same time?

## Analytical Research

The senior fellows will undertake three projects which investigate the demand for older workers. It is hoped that these will spur interest in the research community to use the rich new databases to investigate issues in aging of interest to the states and of interest to NIA.

- How do firm events affect older workers' earnings and employment outcomes?
- Who chooses older workforces? Is the choice of worker mix the result of complementarities between other observable aspects of a business – such as technology?
- Why do firms choose different workforces? Is this choice related to observed productivity, wages, growth and survival?
- What is the role of learning and selection in this evolution? How do new firms evolve in terms of their choice of worker mix?
- What is the impact of demand and technology on older worker outcomes? What happens to the worker mix as firms adopt new technologies (broadly defined)?
- What happens to older workers who find themselves ill-matched to a firm (for example, as a result of a firm's adoption of a new technology)?
- The Role of Prior Employment History in Firm Hiring Decisions.
- How do older workers get hired? What is the effect of their past history on the likelihood of their getting hired by different types of firms?
- The Demand for Older Workers
- How much do younger workers substitute for older workers? This study assesses the extent to which businesses substitute younger workers for older workers.
- Dissemination
- The proposal is to disseminate the results through
- Presentations at the Centers for Demography on Aging
- An annual workshop with the key states to discuss the pilot work
- Publications at the International Programs Center (IPC) at the Bureau of the Census to add summary statistics on the employment characteristics of the aging population

## Preliminary Results: Availability of Pension Benefits

The approaching retirement of the Baby Boom generation and recent corporate troubles have led to increasing concerns about the reliance of workers on employer-provided benefits such as health insurance and pension coverage. The LEHD program is seeking to answer key policy questions about such benefits. In particular, we are investigating what employee benefits firms provide; how the characteristics of the firms that do provide

**Table 4a:** Firm size – Total Employment at EIN – 11 categories

| | Match | Percent of Total matched EINs 763,691 | No Match | Percent of Total non-matched EINs 8,142,203 |
|---|---|---|---|---|
| 5 or fewer employees | 215,438 | 28.21% | 6,744,339 | 82.83% |
| 6-25 employees | 275,348 | 36.05% | 1,169,926 | 14.37% |
| 26-50 employees | 104,629 | 13.70% | 141,526 | 1.74% |
| 51-100 employees | 72,841 | 9.54% | 54,511 | 0.67% |
| 101-250 employees | 54,803 | 7.18% | 22,574 | 0.28% |
| 251-500 employees | 19,825 | 2.60% | 5,550 | 0.07% |
| 501-750 employees | 6,963 | 0.91% | 1,533 | 0.02% |
| 751-1000 employees | 3,528 | 0.46% | 678 | 0.01% |
| 1001-2500 employees | 6,510 | 0.85% | 1,062 | 0.01% |
| 2501-5000 employees | 2,099 | 0.27% | 265 | 0.00% |
| 5001+ employees | 1,707 | 0.22% | 239 | 0.00% |
| Total | 763,691 | 100% | 8,142,203 | 100% |

13.EIN Employment

benefits differ from those of firms that do not provide benefits (e.g. industries, big vs. small firms, old vs. new firms etc.); and finally, how workforce composition is related to benefit provision.

To this end, a new integrated data product is being created that combines information from the IRS Form 5500, state ES-202 and UI wage record data. Employers are required by law to file the Form 5500 in order to obtain the tax benefits granted to spending on employee benefit plans. The IRS shares this information with the Department of Labor, who in turn makes it publicly available under the Freedom of Information Act. The Form 5500 data contain information about employer-provided fringe and welfare benefits (e.g. health insurance, supplemental unemployment insurance, disability insurance, cafeteria plans, etc.) and pension benefits (mostly defined benefit plans and defined contribution plans). Plans are categorized according to benefit type and report nation-wide participant totals, total plan assets, firm and employee contributions as well as an indicator for collectively bargained plans.

The LEHD staff integrate these data into the Census Business Register. A major complication is that many large firms file the 5500 report under one EIN, but actually have multiple EINs, spanning nationwide multiple parent/subsidiary relationships. Thus a very important component of the work involves using Census administrative and survey data on company ownership structures to fully capture all dimensions of the coverage. These rich data can then in turn be integrated with ES-202 and UI wage record data for any state that has provided EINs (Federal Employer Identification Numbers) for the firms in its state.

| **Table 4c:** Industry – Major SIC Division | | | | |
|---|---|---|---|---|
| | Match | Percent of Total matched EINs 755,098 | No Match | Percent of Total non-matched EINs 8,142,203 |
| Agriculture | 12,214 | 1.62% | 471,837 | 5.79% |
| Mining | 3,696 | 0.49% | 32,251 | 0.40% |
| Construction | 52,480 | 6.95% | 1,019,589 | 12.52% |
| Manufacturing | 88,225 | 11.68% | 401,881 | 4.94% |
| Transportation, Communications, Electric, Gas, and Sanitary Services | 26,387 | 3.49% | 353,897 | 4.35% |
| Wholesale Trade | 83,822 | 11.10% | 519,241 | 6.38% |
| Retail Trade | 68,736 | 9.10% | 1,646,715 | 20.22% |
| Finance, Insurances, Real Estate | 78,025 | 10.33% | 712,568 | 8.75% |
| Services | 335,986 | 44.50% | 2,948,143 | 36.21% |
| Public Administration (non-missing SIC) | 5,527 | 0.73% | 36,081 | 0.44% |
| Total | 755,098 | 100% | 8,142,203 | 100% |

*Number of EINs with SIC=blank, '999999', '000000' is 8,593 for the matched group and 1,521,778 for the non-matched group.

14.EIN matches

This match has the potential to greatly augment the firm ES-202 information by providing specific details about pension and health insurance provision. Using one prototype state, we investigate the percentage of firms who offer some type of benefit by industry and county in 1997. We then compare the workforce composition and turnover rates of firms with and without benefit offerings. These statistics will be provided for all states that wish to participate in this project in the near future. Simultaneously, we are working on generating these statistics on a national level and will be able to provide them to interested states for research purposes.

Our initial match of the form 5500 data to the Census Business Register resulted in 96% of the EIN's filed being successfully matched. As one would expect, however, most small firms do not file, as is apparent from the following table 4c

The match rate is also very different by industry: As expected, the majority of EINs that cannot be matched to the Form 5500 data are in construction, retail trade, and services, exactly the industries least likely to offer benefits. The majority of EINs that can be matched are services, manufacturing and wholesale trade.

# 4 Additional Data Access

In addition to the QWI data releases for each state, access to data is provided through two resources: online access to the QWI at the LEHD website and access to simulated micro data at the Cornell Restricted Access Data Center (CRADC). The QWI Online allows states and their clients quick access to frequently desired local economic and workforce data and tables. The CRADC offers access to simulated micro data for micro-data research. Descriptions of these two data access sites are provided in the following subsections.

## QWI Online

The Quarterly Workforce Indicators are now available online at our website:

- http://lehd.no-ip.com.

Online access to the QWI will greatly facilitate state clients access to the data and allow for greater ease in use by users. In this section we provide a few examples of how QWI online facilitates access to commonly requested local economic data.

For example, suppose a state client is interested in comparing the wages of newly hired women to continuing women in a particular county. Clicking on the 'QWI Online' icon in the initial screen will lead the user to the query feature shown below. Simply select 'Average Earnings Reports' and then indicate the year of interest, gender, age group and click 'Display Report'. The result is shown in Figure 15.

Similarly imagine that a state client is interested in job creation in across industries for a particular year. Selecting 'Industry Reports' from the initial menu and then select 'Change in Employment' and indicate the industry, year, gender and age group of interest. The result is shown in the Figure 16.

The LEHD website also offers online access to QWI technical documentation and research papers.

County Reports | Industry Reports

- Employment Reports
- Change In Employment Reports
- Change In Full Quarter Employment Reports
- Hires-Recalls-Separations Reports
- Average Earnings Reports
- Average Periods of Non-Employment Reports

| County | Map | Year | Sex | Age Group | |
|---|---|---|---|---|---|
| Fulton | | 199 | Femal | All | Display Report |

## Average Earnings (County)

| Download this Dataset | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| End-of-period employees | 3536 | 3808 | 3781 | 4127 |
| Full-quarter employees | 3848 | 4140 | 4101 | 4470 |
| Transits to Full-quarter status | 1847 | 2573 | 3119 | 3064 |
| Separations from Full-quarter status | 2676 | 1446 | 1769 | 1920 |
| Full-quarter new hires | 1977 | 2604 | 3301 | 3128 |


**Note:** These site is a work-in-progress. It represents samples of queries to the LEHD dataset and is meant for illustrative purposes only.

This dataset contains information for the state of Illinois only.



15.A Sample QWI Online Query

SAS/IntrNet htmSQL LEHD Data http://lehd.no-ip.com/

County Reports | Industry Reports

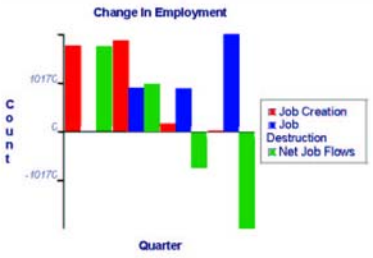
- Employment Reports
- Change In Employment Reports
- Change In Full Quarter Employment Reports
- Hires-Recalls-Separations Reports
- Average Earnings Reports
- Average Periods of Non-Employment Reports

Industry Year Sex Age Group

[ ] [199 ] [All ] [All ] Display Report

## Change In Employment (Industry)

| Download this Dataset | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Job Creation | 18130 | 19315 | 1663 | 261 |
| Job Destruction | 53 | 9304 | 9061 | 20473 |
| Net Job Flows | 18077 | 10011 | -7398 | -20212 |




**Note:** These site is a work-in-progress. It represents samples of queries to the LEHD dataset and is meant for illustrative purposes only.

This dataset contains information for the state of Illinois only.

16.A Sample Employment Dynamics Query

The QWI Online is currently in the development stage and a number of expanded functions are being planned for future implementation. These planned developments include:

- Ranked tables: Top 10 industries in a region; Highest paying jobs; etc.
- Mapping facility: Map job growth over the state; Map industry employment across the state; etc.
- Printer-friendly formats

Census is also working with the states to develop and improve online access to and usability of QWI data during the development stage.

## The Cornell Restricted Access Data Center

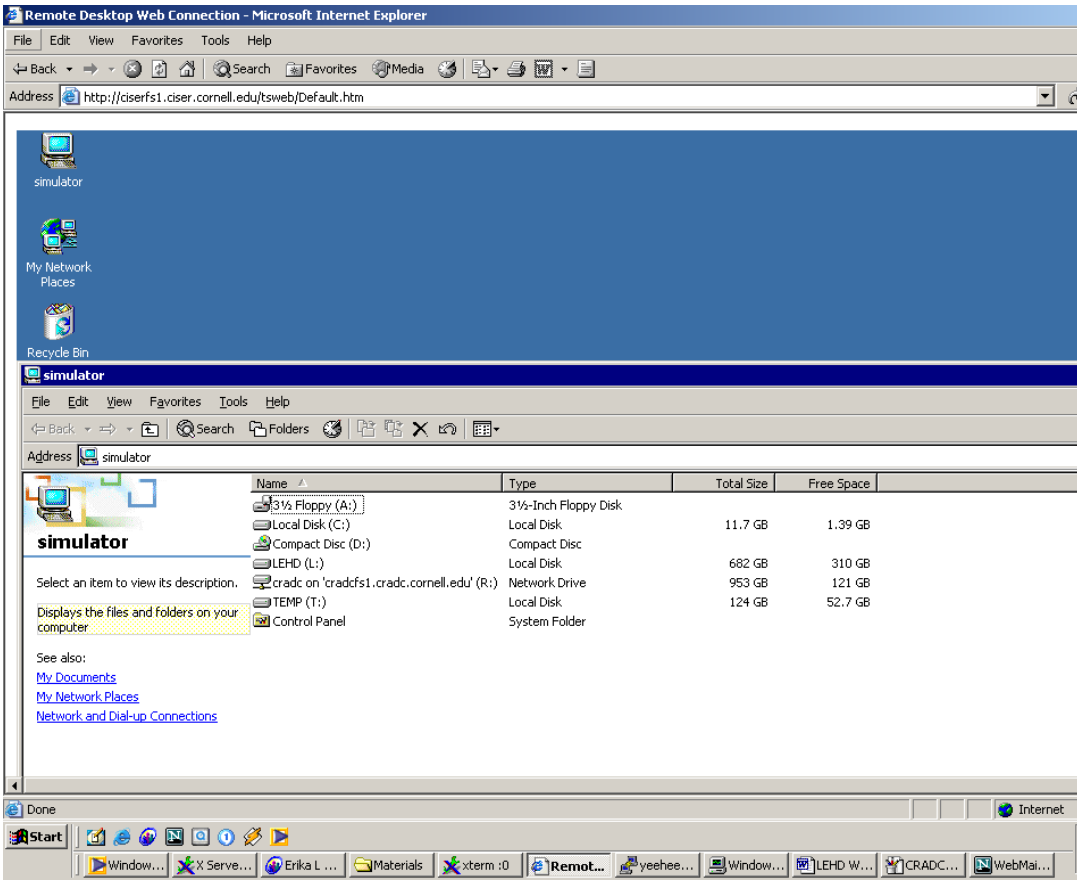
Research access to QWI data is provided through the Cornell Restricted Access Data Center (CRADC), which is operated by the Cornell Institute for Social and Economic Research (CISER). The purpose of the Cornell Restricted Access Data Center is to provide the state partners with access to data from their state's QWI files as well as access to the data research tools used at LEHD.

Computing resources for facilitating research on the QWI data are provided on the CRADC nodes. These resources include SAS, intercooled Stata, Matlab, Fortran V6, GLIM, Genstat, Gauss, data conversion software StatTransfer, as well as tools such as TextPad, Microsoft Office, Scientific Workplace, and Adobe Acrobat.

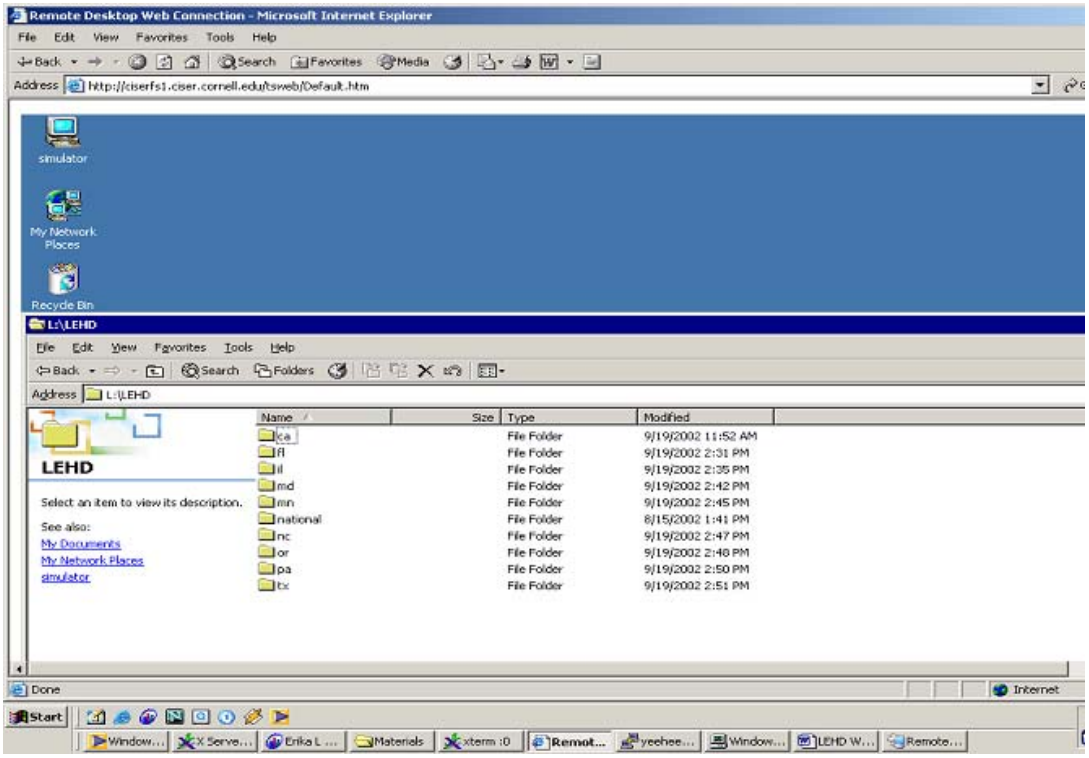
### Data Access Through CRADC:

Once a user agreement is signed between you and CRADC (see the following insert 4.2.2 for an example of a CRADC user agreement) and you have gained access to CRADC (see the following insert 4.2.1. for instructions on accessing CRADC from your computer once you have signed a user agreement and received a password), you will see a screen with a computer icon labeled "Simulator". To access QWI data through CRADC, click the 'Simulator' icon. This will result in a menu appearing similar to what you see when you click on 'Your Computer' in a typical Windows environment, as shown in Figure 17.

The appearance of your screen may be slightly different, depending on what type of permissions you have with your account.




17.CRADC environment




18.State Data on CRADC

To access QWI data, click the icon identifying the drive ‘LEHD’. This will bring up the screen shown in Figure 18. This screen allows you to select which state data you are interested in examining. The number of state folders that will appear on this screen depends on your account permissions, which define what states’ data you have access to. The default state user permissions will allow you to have access to your own state’s data as well as any state who has agreed to let all states view their data. LEHD staff has permissions to access QWI data for all states. For more information on data security and data sharing on CRADC, see the discussion on security near the end of this section.

Opening any of these folders will provide access to both the data files associated with state as well as the resources to analyze the data, such as Excel, SAS, or Stata and resources to write up reports, such as Scientific Word.

The CRADC will also allow state researchers to conduct micro data research on simulated data. Simulated data are disclosable data with the same characteristics as the QWI

micro data. The simulated data are values drawn from a probability distribution that is defined using disclosable data and summary statistics from LEHD data. The simulation contains no confidential data and can be done multiple times. Each copy of the simulation contains unique simulated values. Comparisons of multiple estimates obtained from different simulated data allow researchers to examine the robustness of the estimates obtained from the data. States will be notified when the simulated data is available for each state.

For detailed information on how to use conventional complete-data methods for analyzing simulated data see "Disclosure limitation in longitudinal linked data" Abowd and Woodcock (2001) in Confidentiality, Disclosure and Data Access: Theory and Practical Applications for Statistical Agencies edited by P. Doyle, J. Lane, J Theeuwes and L. Zayatz, North Holland, Amsterdam, 2001. (http://www.elsevier.nl/inca/publications/store/6/2/2/1/2/9/index.htt)

Security

The CRADC maintains a secure computing system and domain that exceeds the U.S. Defense Department standards for secure computing environment. Access to the CRADC is granted only to those who sign a CRADC non-disclosure agreement. Each state is allowed to access data for its own data; states may also grant permission for other states to use their data. All users have a unique login ID and password, which will identify what data the user has access to. Users belonging to different data access groups cannot share information on CRADC. File permissions are set by custodians at CRADC only.LEHD Outreach

# A Appendix: QWI Variable Definitions

**QWI Variable Descriptions**

| Employment Indicators | Technical Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Total Employment (M) | Total number of *jobs* with positive earnings in the current quarter. | Who is filling what jobs? What industries are biggest employers? What industries employ the largest number of a particular type of worker? | Top area industries<br><br>Top employers of young workers/older workers/female workers, etc.<br><br>Identifying similar local economies for exchanging best practices. |
| Beginning of Quarter Employment (B) | Total number of *workers* who were employed by the same employer in both the current and *previous* quarter (point in time measure similar to ES202) | Same as for total employment, but with a focus on 'core' employment. | Same as above |
| End of Quarter Employment (E) | Total number of workers who were employed by the same employer in both the current and *subsequent* quarter. | Same as for beginning of quarter employment but with a different point in time definition of 'core' employment | Same as above |
| Full Quarter Employment (F) | Total number of workers who were employed by the same employer in the *current, previous, and subsequent* quarter | Same as for beginning of quarter employment but with different definition of 'core' employment | Same as above |

**QWI Variable Descriptions (cont.)**

| Employment Change Indicators | Technical Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Accessions (A) | Total number of workers who were employed by a business during the current quarter, but not the previous quarter. | What industries are hiring the most workers? Which industries are hiring older workers? Young workers? What geographic areas are doing the most hiring? | Top industries hiring in the area.<br><br>Top industries hiring men/women/young/old. |
| New Hires (H) | Total number of accessions that were also not employed by that employer during the previous four quarters. | Same as accessions, but focus on new hires. | Same as above. |
| Recalls (R) | Total number of accessions that were employed by that employer at some time during the previous four quarters. | Same as accessions but with focus on workers who are recalled to jobs. | What industries are recalling workers? What types of workers are being recalled? |
| Separations (S) | Total number of workers who were employed by a business in the *current* quarter, but *not in the subsequent* quarter. | What workers are leaving jobs? What industries are workers leaving? | Together with accessions can be used to construct turnover measures for workers and industries. |
| Flow into Full-Quarter Employment (FA) | Total number of workers who began work with employer in last quarter and are full-quarter employed in the current quarter. | Which industries are hiring 'core' workers? | |
| Flow out of Full-Quarter Employment (FS) | Total number of workers full-quarter employed in previous quarter but succeed in current quarter. | What industries are 'core' workers leaving? | |

**QWI Variable Descriptions (cont.)**

| Job Growth Indicators | Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Job Creations (JC) | The number of new jobs that are created by either new area businesses or the expansion of employment by existing firms. | What industries are creating the most jobs? | Top regions of job creation<br><br>Top industries creating jobs |
| Job Destructions (JD) | The number of jobs lost to the economy by businesses that are lost or who contract employment. | What industries are eliminating jobs? | Top regions of job loss<br><br>Top industries contracting employment. |
| Net Job Flows (JF) | The difference between current and previous employment at each business. | Which industries are expanding employment? Contracting employment? | Fastest regions of employment growth<br><br>Top expanding industries. |
| Net Change in Full Quarter Employment (FJF) | The difference between current and previous full quarter employment at each business. | Which industries are expanding 'core' employment? Contracting? | Top expanding industries<br><br>Top contracting industries |

**QWI Variable Descriptions (cont.)**

| Earnings Indicators | Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Average Earnings for Full-Quarter Employees (Z_W3) | Total earnings of all full-quarter employees divided by the number of full-quarter employees. | What are the average earnings of 'core' employees? | Highest paying area jobs. |
| Average Earnings for End-of-Period Employees (Z_W2) | Total earnings of all end-of-quarter employees divided by the number of end-of-quarter employees. | What are employees earning in particular industries? | Industries with highest earnings growth in the region. |
| Average Earnings for Full-Quarter Accessions (WFA) | Total earnings of all full-quarter accessions divided by the number of full-quarter accessions. | What are new employees earning? | What are the best paying jobs for new employees in a particular industry? In a particular region? |
| Average Earnings for Full-Quarter New Hires (Z_WH3) | Total earnings of all full-quarter new hires divided by the number of full-quarter new hires. | What are new hires earning? (Similar to above, but excludes recalled workers.) | What are the best paying jobs for new hires in a particular industry? In a particular region? |
| Average Change in Earnings for Accessions (Z_dWA) | The difference between total earnings earned in the current quarter and the previous quarter for workers who started with a new employer in the current quarter, averaged over all accessions for that employer. | What is the improvement (or lack) in earnings for workers starting with a new employer in a particular industry? | Top industries associated with earnings growth for new employees. |
| Average Change in Earnings for Separations (Z_dWS) | The difference between total earnings earned in the current quarter and the previous quarter for workers who started with a new employer in the current quarter, averaged over all accessions for that employer. | What is the improvement (or lack) in earnings for workers separating from an employer in a particular industry? | Industry separations associated with greatest earning loss (to target for worker training programs). |
| Total Quarterly Payroll (W1) | Total earnings paid to all workers who earned positive wages in the current quarter. | What are the dominant industries in the region in terms of total earnings paid to workers? | |

**QWI Variable Descriptions (cont.)**

| Periods of Non-Employment Indicators | Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Average Periods of Non-employment for Accessions (Z_NA) | Average number of quarters previous to the current quarter for which accessions to this employer have no wage records (up to 4). | How long on average are non-employment spells? | Industries whose workers have longest non-employment spells. |
| Average Periods of Non-employment for New Hires (Z_NH) | Average number of quarters previous to the current quarter for which new hires to this employer have no wage records (up to 4). | Similar to above. | Regions with longest/shortest non-employment spells. |
| Average Periods of Non-employment for Recalls (Z_NR) | Average number of quarters previous to the current quarter for which recalls to this employer have no wage records (up to 4). | How long are workers not employed before being recalled to jobs? | |
| Average Periods of Non-employment for Separations (Z_NS) | Average number of quarters after the current quarter for which separations from the employer have no wage records. | How long are workers separating from employers not employed? | |

**QWI Variable Descriptions (cont.)**

| Demographic and Timing Variables | Definition | Questions Answered | Useful Statistics |
|---|---|---|---|
| Industry division | 1-digit Standard Industrial Classification code. | Allows comparison of different industries within a geographic area. | Top 10 area industries.<br><br>Industries associated with greatest earnings growth for new hires. |
| Industry | 4-digit Standard Industrial Classification code. | Same as above, at a greater level of industry detail. | Same as above, at greater level of industry detail. |
| Year | 4-digit Calendar year. | Allows for time-series analysis. | Changes in core employment growth in health services from 1995-2000. |
| Quarter | 1-digit Quarter of estimate. | Allows for time-series analysis. | Cyclicality in retail services earnings in 1999. |
| State | State from which data was received. | | |
| County | 3-digit County FIPS code. | Allows detailed portrait of economy at county-level. | Counties with fastest employment growth.<br><br>Highest paying industries for young men in county. |
| WIB | Workforce Investment Board. | Allows detailed portrait of economy at WIB-level. | Similar to county. |
| Sex | Denotes whether data cover men, women, or both genders. | Allows breakdown of labor market information by gender. | Best paying industries for older women. |
| Age Group | Denotes which of eight age categories are covered by the data, or if data cover all ages. | Allows breakdown of labor market information by age group. | Top industries for older workers.<br><br>Best paying industries for young men. |

# B Appendix: Introduction to the Census Numident

**Census Numident: Summary of Facts and Characteristics**

What is the Census Numident?

The Census Numident is a file derived from the Social Security Administration's (SSA) Numident file. The SSA Numident file represents, effectively, every transaction on every Social Security Number (SSN) ever issued. It was obtained under Title 13 auspices for census and survey improvement, and was purchased from SSA at a direct cost of approximately $750,000. It is maintained on doubly secure computers in the Administrative Records Research area of the Planning, Research and Evaluation Division (PRED), and is updated quarterly. Census Numident 1998 (up to December 98), 2001 (up to March 2001) and 2002 (up to March 2002) versions exist, based on extracts from the stated calendar year. We spent 3-4 person years developing Census Numident, and require about 1/2 person year and $50,000 to maintain it each year.

What do we use the Census Numident for?

SSN validation and search methods:

In 2000, PRED developed new methods for searching the Census Numident to determine whether an SSN/Name/date of birth combination is valid or not. These methods have demonstrated potential to improve false non-matches and false matches that might occur under a strictly clerical review system. These validation and search methods have been used in the development of the Statistical Administrative Records System (StARS), a database intended to simulate an administrative records census of the population of the U.S. for coverage improvement purposes. In addition it is used for support of other census bureau programs and ongoing research.

Estimation methods:

In 2000, PRED developed ways to use Census Numident data as a contributor to a model in which we estimate the age, race, gender, and Hispanic origin characteristics of administrative records persons who do not have such data on their record. Examples include:

- Race modeling:
  - Race definitions have changed in the SSA Numident over time; prior to 1980, only three race codes were recorded: White, Black, and Other. After 1980, coding was elaborated, but does not match the Census' 4 race x 2 Hispanic origin system, nor does it match current OMB multi-race standards. In addition, about 14% of the records are missing a race code; therefore, Bye and Thompson (Bye, 1998; Bye and Thompson, 1999) developed a model, using the Census Numident, in which the race of a respondent can be estimated using characteristics obtained from the data and from the Census Numident, when this race is not known.
- Gender modeling:
  - About 5.4% of the Census Numident is completely missing a gender code; Thompson (1999) developed a model, using the Census Numident, in which the gender of a respondent can be estimated using characteristics obtained from the data and from the Census Numident, when this gender is not known.
- Mortality modeling:
  - Falkenstein, Resnick, and Judson (2000), using life table methods, estimated that of the 396 million person records in the 1998 Numident, about 60 million are deceased and are not recorded as such. They therefore developed a method to estimate the probability that a person is deceased and erroneously on a data file, using a model developed from the Census Numident, other administrative records data, and cohort life tables.

"Gold standard":

The Census Numident is treated as the "gold standard" for SSN's. In the development of person unduplication methods for the StARS 1999 and 2000, the Census Numident was taken as the "gold standard" and unduplication procedures were based on this. Similarly, the PRED validation system for SSN validation and search treats the Census Numident as a "gold standard."

Applications to Surveys

The Census Numident can be used to validate Social Security Numbers that have been provided by respondents in ongoing surveys.

## Description of Census Numident 2001 Processing

### Collapse SSA's multiple records to 1 record per SSN

SSA records are maintained on a transaction basis, while Census Numident requires an SSN basis (that is, the "basic object" in the SSA database is a transaction, while the "basic object" in the Census Numident is a single record per SSN). Because the Census Numident has the SSN as its basic object, the Census Numident processing workgroup developed methods for summarizing data when multiple records may contain information that changes over time. This summarization methodology is a relatively new area of research for database and statistical data users.

### General Procedures

In general, the Census Numident operated under the philosophy that can be summarized as: "Select the best *data*, not the best *record*." Thus, the final person record on the Census Numident might contain information from different transaction records. In addition, the workgroup recognized that, as a data source, we cannot get perfection, and, moreover, we should not assume that any component of the record is "correct" in any absolute sense. Thus, the file contains codes to flag questionable data (for example, a code to flag when a "cycle date" was earlier than 1936, or when dates of birth and death are inconsistent, or when different transactions have different gender codes, etc.) In addition, the fields are very lightly edited: For example, name fields containing UNKNOWN or UNNAMED or similar strings are replaced with blanks, date components are cleaned only to the extent of removing character strings (e.g. XX), and race codes outside the valid range (0-6) are replaced with blanks.

### Census Numident 2001 Production Statistics

| | | |
|---|---|---|
| [1] | SSA Record Count: | 721,315,321 |
| [2] | Census Record Count | 721,228,119 |
| [3] | "Invalid" Entries (SSN voided by SSA) | 86,132 |
| [4] | Deleted Records (SSN deleted by SSA) | 1,070 |
| | | |
| [5] | Census Numident Records | 408,447,131 |
| [6]=[1]/[5] | Average number of transactions per Census Numident record | 1.77 |
| | | |
| [7] | Alternate Name Records | 250,334,453 |
| [8] | SSNs with Alternate Names | 144,618,587 |
| [9]=[7]/[8] | Additional Alternate Name Records per SSN w/Alt. Names | 1.73 |
| | | |
| [10] | Alternate Date-of-Birth Records | 19,057,391 |
| [11] | SSNs with Alternate Date-of-Birth | 17,816,935 |
| [12]=[10]/[11] | Additional Alternate DOB Records per SSN w/Alt. DOBs | 1.07 |

## What is the Person Characteristics File?

The purpose of the Person Characteristics File (PCF) is to append detailed race, gender, and mortality modeling information onto the Census Numident file. For administrative records databases that do not contain detailed race, gender, and mortality information, the PCF can serve as a tool for ascertaining that SSN's race, gender and mortality status.

The PCF addresses existing shortfalls in the Census Numident database. In particular, we can name three important limitations of Census Numident data:

- Race data are incomplete (14% missing), and do not conform to current or previous Census/OMB standards.

- Mortality data are incomplete; older deaths are not always captured, and certain states do not allow SSA to pass death information to the Census Bureau (estimated at 60 million in the 1998 Numident; after improvements in processing, this was reduced to 24 million in the 2001 Numident).
- Gender is occasionally unknown (approximately 5.4% of the Census Numident).

The Mortality Model

The mortality model uses a combination of race, nativity, gender, age, and "last known alive date" to assign a cumulative probability of survival to a record. Mortality probabilities are generated from yearly survival rates, in approximately the following fashion. For a given age cohort:

- The beginning year population is assumed known;
- The number dying each year is estimated according to characteristics, using a cohort life table;
- Yearly survival rates are adjusted for the known deaths;
- The person's last known alive date is determined from administrative records data; and
- The person's cumulative probability of being deceased is calculated from the last known alive date, using that person's cohort and personal characteristics. Known deaths receive a probability of 1.0.

For the 2000 version of the PCF, this modeling effort resulted in the following: Of a total PCF population of 408 million, 83 million were known dead, 24 million were modeled dead, 6 million were un-modeled (due to lack of information or birth date after 4/1/2000), and this left 295 million assumed alive (of which emigration is certainly a component).

The Gender Model

The gender model uses a combination of first name, middle name, and whether the last name ever changed to infer the probability that a person is male or female. For a particular first name or middle name, the ratio of males to females having that particular name is calculated, and this ratio is used to predict the probability that a particular record is male. (for example, "John" is almost entirely a male first name, while "Lee" is less discriminative, and so on). Similarly, females are much more likely to have a last name change indicator, and the gender model reflects this fact.

The Race Model

The race model uses several pieces of information to predict an SSN's probability of being in one of four races (White, Black, API, AIAN) and one of two Hispanic origin ethnicities (Hispanic, NonHispanic). Estimation takes place in the following fashion:

- First, a logistic regression model, predicting race from a selection of variables (including ancestry/place of origin, selected demographic variables, Hispanic and Asian surname lists, and presence on the Indian Health Service database) is estimated from a match of adult CPS data to the Numident file.
- Second, adults are assigned a probability vector for four races and two Hispanic origin categories using solely Numident information and the above estimated logistic regression model.
- Third, children are assigned the race of an adult from the 1040 tax-filing unit in which the child is counted as an exemption.

In order to create the PCF, the race, gender and mortality models were applied to the Census Numident and their results were appended. Because these models are probability models, they do not determine a person's race, gender, or mortality status with certainty; instead, a probability vector is appended to the record. For example, a person might have a probability of being of Hispanic origin of .6; thus their probability of being non-Hispanic, according to the race model, is .4. Both quantities are stored on the Person Characteristics File. Staff determined that different users might wish to use these probability models in different ways; by appending the probability vector to the record, we retain the users ability to use these probabilities as they see fit.

Miller, Judson, and Sater (2000) and Judson (2000) evaluated the success of the 1998 PCF modeling process by comparing the age, race, gender, and Hispanic origin distributions in the 1998 PCF with modeled mortality with the comparable distributions in the 1998 national population estimates. Figure 1 compares the population estimates, with and without the mortality model. Figure 2 compares the overall race distributions for these two sources. In these figures, "White" refers to those whom the race model determined to be White, "Black" refers to those whom the race model determined to be Black, "API" refers to those whom the race model determined to be Asian or Pacific Islander, and "AI" refers to those whom the race model determined to be American Indian. After including mortality, the PCF file contained about 8.5% more living persons than the 1998 estimates (some of whom almost certainly have emigrated from the U.S.). The 1998 estimates used in these papers did *not* account for the results of Census 2000.

***Figure 1: Comparison Between the National Estimates and the Person Characteristics File (PCF) Before and After Applying the Mortality Model, by Age: 1998***

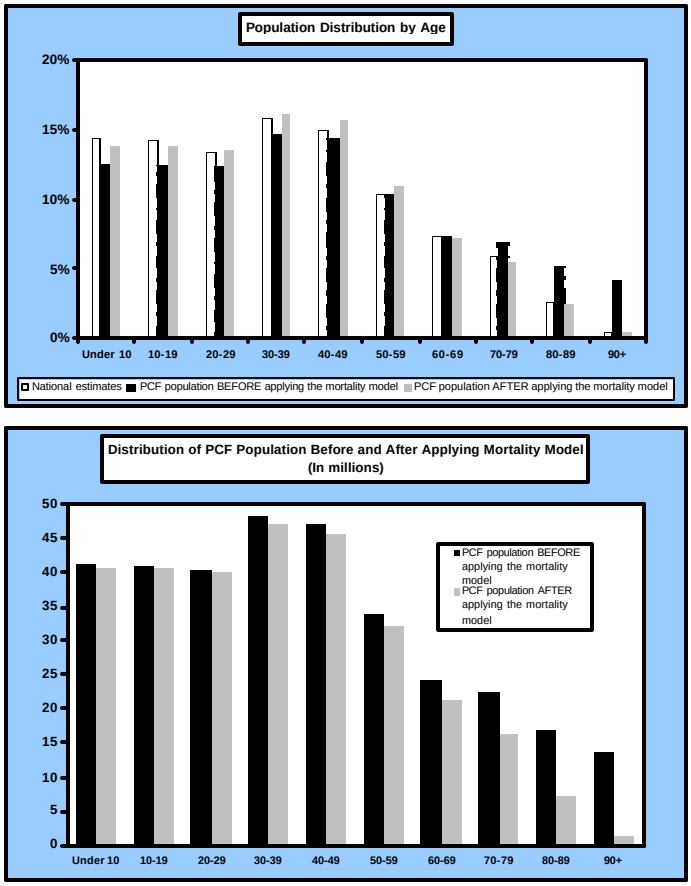
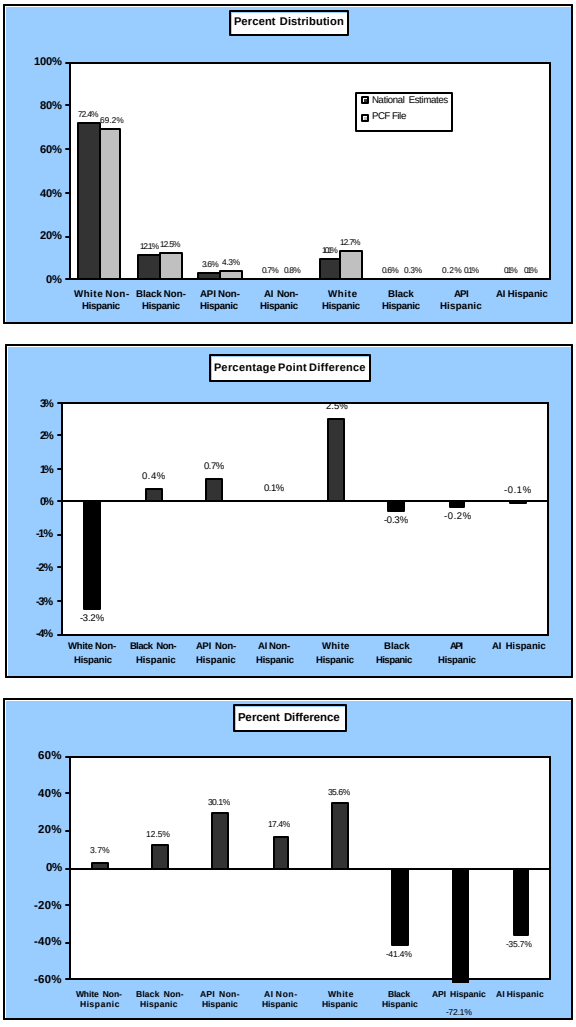



***Figure 2: Distributions, Percentage Point differences, and Percent Differences Between the National Estimates and the Person Characteristics File (PCF) by Race and Hispanic Origin: 1998***



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# C Appendix: Sample Successor/Predecessor Report

# Foreign Born Workers and the Texas Labor Market: New Facts from New Data

## Overview

Immigrants have historically been a driving force of economic growth and social change in the US – and this force will take on new importance as the native-born workforce ages. The Texan economy, which attracts workers from all over the world, is at the forefront of the US in experiencing immigrant change. Although many Texan workers come from Mexico, large numbers come from more than 85 countries - from places as far apart as Albania and New Zealand. This enormous influx raises many questions: how do these workers differ between foreign and native-born workers, how do they contribute to the Texan economy, and what changes can Texans expect in the next few years?

Until now, the only data that have been available to answer these questions have been decennial Census data. A new data source is now available that can provide a different perspective on the Texan workplace – the outcome of a new partnership between the Texas Workforce Commission and the United States Census Bureau. These data can be updated on a quarterly basis, with additional insights into the distribution of foreign-born employment across industries, types of firms, and geographic location. The focus of this initial report is to provide an overview of the insights into the Texan economy made possible by these data.

## How many foreign workers are there, where do they come from and how are things changing?

Foreign-born workers are an important component of the Texas workforce - almost one in seven workers was born outside the US. While it is not surprising that half of these are born in Mexico, the wide variety of countries that supply the balance of Texan immigrants is surprising. No single country accounts for more than five percent of foreign-born workers. 10 percent of foreign-born workers come from Latin American countries other than Mexico and 19 percent come from Asia. After Mexico, the next five largest groups of immigrants are from Vietnam, Germany, El Salvador, and India, but each group only represented 4 percent of foreign-born workers.

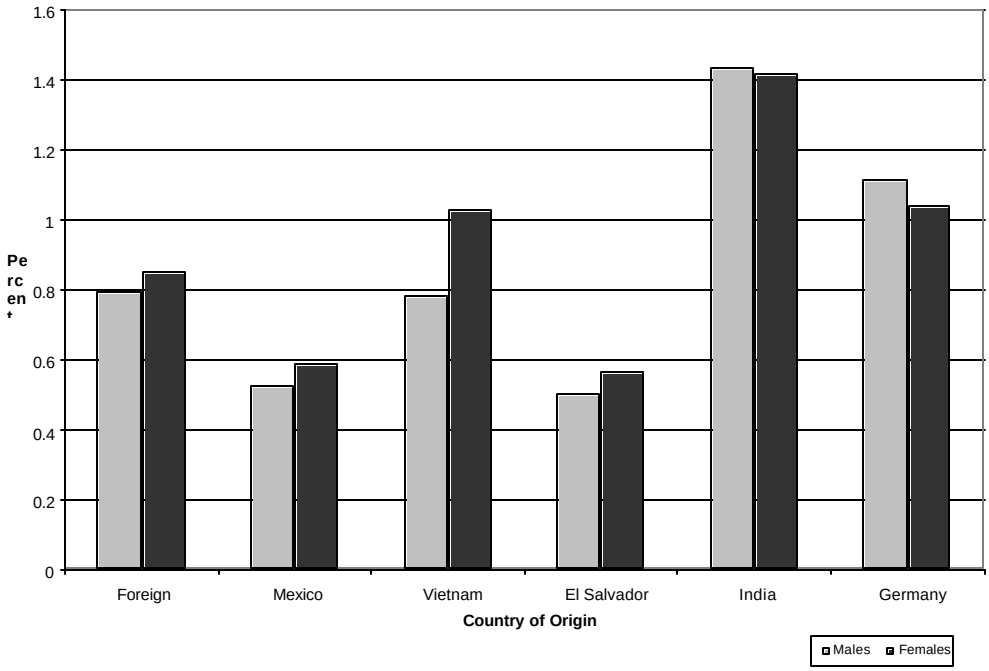
The vibrancy of change in Texas is also surprising. In 1995 - 1999, Indian born workers were the fifth most numerous immigrant group; by 2000 they had become the fourth most important group. In 1995 and 1996 German born workers (presumably children of military workers) were the third most numerous – by 1997 they had yielded third place to El Salvadorans, and by 2000 they were in fifth place.

## How do foreign-born workers contribute to the Texan economy?

Earnings are one indicator of how much foreign-born workers contribute. While foreign-born workers as a whole earned considerably less than U.S. born workers, some groups of immigrants did better ~~than U.S. born workers~~. Earnings of foreign-born male workers averaged $10,060, or about 20 percent below the $12,660 average quarterly earnings for

U.S.-born workers[1]. However, these earnings figures combine extremely low levels earned by workers born in Mexico and El Salvador with the high levels earned by workers born in India and Germany. As Figure 1 shows, earnings of Indian-born male workers averaged 43 percent more than U.S.-born workers, while the earnings of workers born in Mexico~~an~~ and El Salvador amounted to only about half the U.S.-born average. Workers born in Vietnam earned more than those from Mexico and El Salvador, averaging about 78 percent of the U.S. figure. Female foreign-born workers averaged about 85 percent of female U.S.-born workers, a rate well above their foreign-born male counterparts. However, the earnings patterns across countries were similar. Female workers from Mexico~~an~~ and El Salvador earned just over half what U.S.-born female workers earned, while women from India earned 42 percent more than did women born in the U.S.

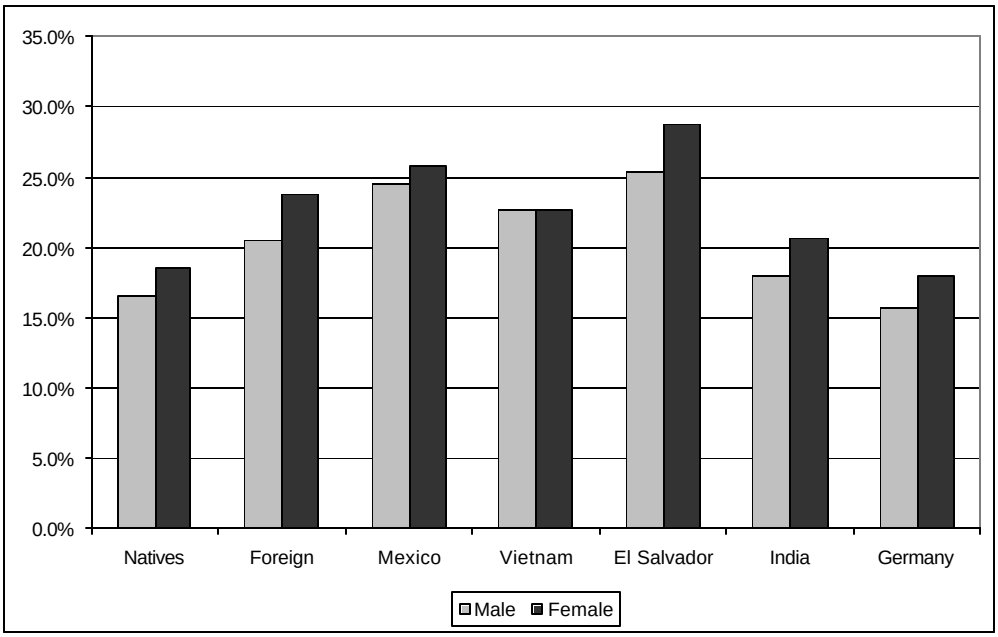
**Figure 1:**
**Earnings of Foreign Born Workers as Proportion of Earnings of Native Born Workers**




[1] Among primary jobs held by workers with the same employer over three calendar quarters,

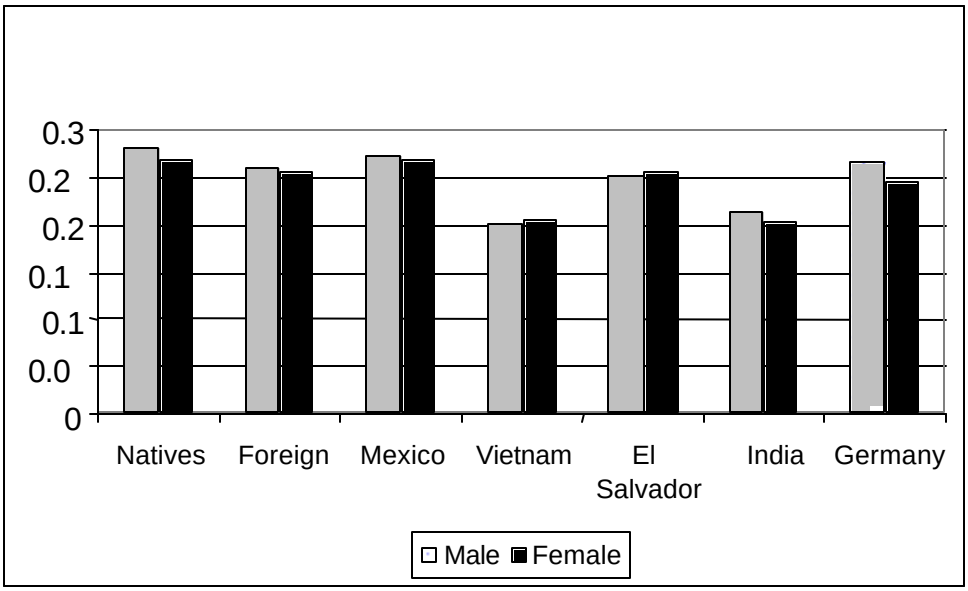
These earnings differences reflect earnings from the main job. However, for three of the five most important immigrant groups, earnings are supplemented by multiple job holding. As is evident from Figure 2, workers born in Mexico, Vietnam and El Salvador, in particular, earn from 22% to 28% more from their additional jobs, while native-born workers, and those born in India and Germany add about 15% from additional jobs.

**Figure 2:**
**Proportion of total earnings due to second (or more) jobs**



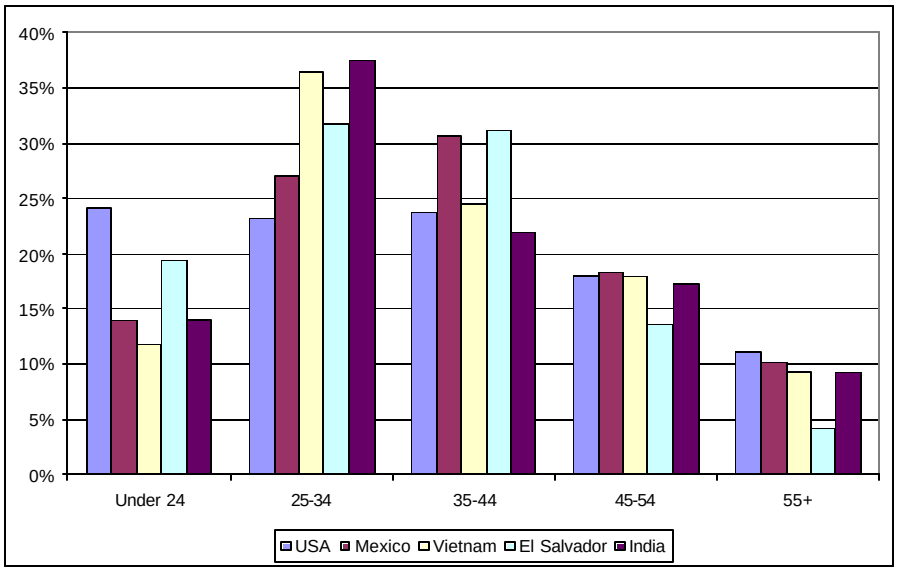

Worker turnover is a major issue both for employers and workforce investment boards. The LEHD data permit a wide variety of measures of turnover: here we simply calculate a quarterly turnover rate. As Figure 3 shows, there are substantial differences in turnover rates across the different groups of workers. In particular, workers born in Vietnam and India are much more likely to stay with their employer than are native-born workers or those born in El Salvador, Mexico or Germany.

**Figure 3:**
**Turnover Rates of Native and Foreign Born Workers**




**What Changes Can Be Expected Over the Next Few Years?**
A major issue facing the United States is the aging of the workforce, and Texas is no exception - about 11% of Texan workers are over 55. While almost the same proportion of foreign born workers are in that age group, there are marked differences by country of birth. More than one in five workers born in European countries, such as Hungary, Czechoslovakia, and Ireland are over 55 – although the same is true for workers born in Argentina and Cuba. By contrast, fewer than one in 20 workers born in a variety of developing countries such as Honduras, Hong Kong, Kenya, Ethiopia and Nigeria are over 55. The age differences are quite vividly seen in Figure 4. Workers from India and El Salvador are much more likely to be prime-age workers (25-44) than are native born workers.

**Figure 4:**
**Age Distribution of Native and Foreign Born Workers**




**Summary**

This brief description of the new results which are possible as a result of the partnership between the US Census Bureau and the Texas Workforce Commission represent just the beginning of a series of reports that will be forthcoming over the next year. Your comments and suggestions regarding topics of interest would be welcomed as we develop new products of interest to our clients.

# Appendix

**Description of the data-set used**

The database used in this study is the result of a partnership between the U.S. Census Bureau and the Texas Workforce Commission. The partnership matches Unemployment Insurance wage records and ES202 records from the state of Texas with data from the Census Numident file which contains basic demographic information such as country of birth, sex, and age for almost every Social Security Number (SSN) issued. The file is mainly constructed from information received from the Social Security Agency, but information from other data sources is also incorporated.

The state data have a number of advantages. They are (almost) universal – they cover 98% of the labor force, excluding self-employed. They are relatively current – the data are provided six months after the end of the transaction period. Although the reports here are for the whole state, the dataset could be used to provide information at the very local level –at the county, metropolitan area, or local Workforce Investment Board area. They also provide insights into both the dynamics of the workforce and into the dynamics of businesses.

There are some drawbacks. No hours or weeks worked information is available. In addition, no educational or occupational detail is provided, although there are long term plans to remedy this. In addition, there is no information on whether or not workers work for the entire quarter, or simply part of the quarter.

Because the data are administrative in nature, they are not directly comparable to data produced by surveys such as the Decennial Census. However, in order to compare the two datasets, we compare decennial Census data on individuals, particularly civilian workers that were actively employed[2] at the time of the survey (generally early April) with four definitions derived from the UI data, defined in Figure 1.

Figure 1: UI Definitions of Employment

| |
|---|
| Emp1 = Individual works anytime during the year |
| Emp2 = Individual works in first quarter of the year |
| Emp3 = Individual works in both the first and second quarter of the year |
| Emp4 = Individual works for the same dominant employer in the first and second quarter of the year |

The results of this comparison are reported in Figure 2.

[2] Not self-employed, working in unincorporated business or working without pay in a family business.

| Texas | | 1999 UI Files | | | | |
|---|---|---|---|---|---|---|
| | Census 2000 | Emp1 | Emp2 | Emp3 | Emp4 | Pct Diff |
| Initial | 9,264,246 | 10,784,000 | 8,833,000 | 8,201,000 | - | 12.18% |
| Current | 8,342,051 | 10,568,405 | 8,767,524 | 8,175,977 | 7,190,976 | 2.01% |
| Native | 6,955,472 | 8,819,693 | 7,405,922 | 6,926,462 | 6,081,035 | 0.42% |
| Foreign | 1,386,579 | 1,473,675 | 1,204,854 | 1,125,206 | 1,002,799 | 20.81% |
| No_match | - | 275,037 | 156,748 | 124,309 | 107,142 | - |
| Frgn + No Match | 1,386,579 | 1,748,712 | 1,361,602 | 1,249,515 | 1,109,941 | 10.40% |

.

Briefly, the estimates of employment from the UI data – Emp3 – are very close to the Census estimates for native born workers: the difference is approximately .42%. There is a considerable gap between estimates of the foreign born workforce, which needs further investigation.

**Age Distribution of Foreign Born Workers (2000)**

| Country | Under 24 | Age 25-34 | Age 35-44 | Age 45-54 | Age 55+ | Total |
|---|---|---|---|---|---|---|
| USA | 24.12% | 23.16% | 23.66% | 17.97% | 11.10% | 9,289,487 |
| Foreign | 14.46% | 28.24% | 29.76% | 17.94% | 9.61% | 1,575,109 |
| Mexico | 13.87% | 27.07% | 30.65% | 18.27% | 10.14% | 816,135 |
| Vietnam | 11.76% | 36.55% | 24.51% | 17.90% | 9.27% | 69,261 |
| El Salvador | 19.39% | 31.79% | 31.17% | 13.48% | 4.17% | 60,184 |
| India | 14.08% | 37.48% | 21.88% | 17.33% | 9.23% | 58,871 |
| Germany | 20.38% | 26.23% | 31.57% | 14.00% | 7.82% | 57,964 |
| Philippines | 12.96% | 26.65% | 27.39% | 21.59% | 11.41% | 39,295 |
| United Kingdom | 11.81% | 22.15% | 29.81% | 21.05% | 15.17% | 32,621 |
| Canada | 13.29% | 28.28% | 27.70% | 18.60% | 12.14% | 27,455 |
| China | 7.49% | 33.20% | 34.03% | 15.68% | 9.59% | 22,654 |
| Taiwan | 9.32% | 21.92% | 29.09% | 28.46% | 11.21% | 20,204 |
| Korea | 17.63% | 32.06% | 25.65% | 15.62% | 9.04% | 19,245 |
| Honduras | 22.84% | 36.98% | 25.50% | 10.85% | 3.83% | 18,449 |
| Pakistan | 16.79% | 29.87% | 31.59% | 17.11% | 4.64% | 17,842 |
| Japan | 12.34% | 28.50% | 34.27% | 18.42% | 6.47% | 17,327 |
| Nigeria | 11.13% | 23.59% | 44.94% | 17.87% | 2.48% | 16,798 |
| Guatemala | 16.51% | 32.91% | 29.81% | 14.51% | 6.25% | 12,803 |
| Colombia | 13.43% | 22.97% | 31.69% | 19.36% | 12.56% | 12,797 |
| Iran | 11.26% | 17.51% | 35.57% | 26.57% | 9.09% | 12,544 |
| Cuba | 5.98% | 17.86% | 32.60% | 23.25% | 20.32% | 10,108 |
| France | 9.71% | 20.75% | 44.18% | 15.55% | 9.81% | 7,985 |
| Laos | 14.22% | 33.89% | 28.58% | 16.01% | 7.30% | 7,895 |
| Russia | 21.33% | 25.24% | 20.90% | 18.40% | 14.13% | 7,148 |
| Thailand | 21.19% | 30.93% | 18.54% | 21.77% | 7.57% | 6,974 |
| Ethiopia | 15.61% | 38.55% | 31.02% | 12.22% | 2.59% | 6,783 |
| Panama | 17.79% | 27.68% | 24.40% | 20.74% | 9.38% | 6,384 |
| Peru | 14.59% | 22.55% | 29.30% | 21.46% | 12.10% | 6,216 |
| Nicaragua | 21.63% | 28.75% | 26.83% | 14.66% | 8.13% | 6,098 |
| Jamaica | 12.51% | 28.32% | 29.23% | 18.77% | 11.17% | 5,988 |
| Venezuela | 15.88% | 27.31% | 34.41% | 17.52% | 4.88% | 5,371 |
| Hong Kong | 12.90% | 26.22% | 33.48% | 23.65% | 3.75% | 5,179 |
| Italy | 18.03% | 23.79% | 24.65% | 17.97% | 15.55% | 4,913 |
| Cambodia | 12.06% | 33.33% | 26.90% | 19.42% | 8.29% | 4,743 |
| Trinidad and Tobago | 10.82% | 21.35% | 31.20% | 24.18% | 12.45% | 4,660 |
| Spain | 17.86% | 35.24% | 29.35% | 9.07% | 8.49% | 4,654 |
| Brazil | 18.67% | 27.69% | 32.35% | 13.98% | 7.31% | 4,622 |
| Kenya | 29.62% | 33.59% | 22.38% | 11.37% | 3.04% | 4,308 |
| Lebanon | 10.46% | 28.69% | 38.44% | 14.79% | 7.62% | 4,253 |
| South Africa | 13.09% | 29.67% | 26.13% | 18.71% | 12.39% | 3,559 |
| Argentina | 10.62% | 21.94% | 25.34% | 21.38% | 20.73% | 3,410 |
| Poland | 15.60% | 15.49% | 23.10% | 26.37% | 19.44% | 3,390 |
| Egypt | 11.27% | 21.63% | 26.38% | 25.25% | 15.47% | 3,089 |
| Ecuador | 15.87% | 23.50% | 27.25% | 20.97% | 12.41% | 3,038 |
| Netherlands | 11.92% | 22.69% | 26.57% | 20.89% | 17.94% | 2,887 |
| Romania | 17.64% | 30.30% | 22.22% | 18.57% | 11.27% | 2,795 |
| Israel | 13.52% | 27.51% | 25.15% | 21.43% | 12.39% | 2,744 |
| Dominican Republic | 15.82% | 25.10% | 30.13% | 19.63% | 9.32% | 2,725 |
| Jordan | 9.70% | 29.11% | 39.40% | 14.55% | 7.24% | 2,721 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ghana | 12.78% | 26.22% | 34.62% | 22.25% | 4.13% | 2,715 |
| Australia | 14.63% | 30.59% | 23.86% | 17.40% | 13.52% | 2,707 |
| Turkey | 14.07% | 41.79% | 27.46% | 10.48% | 6.21% | 2,673 |
| Indonesia | 26.01% | 31.25% | 20.88% | 13.51% | 8.35% | 2,672 |
| Greece | 12.33% | 20.11% | 27.12% | 22.37% | 18.07% | 2,651 |
| Malaysia | 18.33% | 35.22% | 28.91% | 13.50% | 4.03% | 2,629 |
| Ireland | 12.16% | 21.84% | 23.17% | 21.56% | 21.27% | 2,106 |
| Yugoslavia | 17.70% | 22.78% | 25.76% | 18.32% | 15.44% | 2,085 |
| Guyana | 12.76% | 23.53% | 28.72% | 24.45% | 10.53% | 2,061 |
| Morocco | 13.50% | 29.06% | 37.73% | 14.33% | 5.37% | 2,030 |
| Chile | 8.80% | 21.42% | 28.44% | 22.89% | 18.44% | 1,909 |
| Costa Rica | 17.63% | 26.20% | 26.95% | 17.74% | 11.48% | 1,855 |
| Sweden | 15.73% | 32.14% | 24.59% | 15.16% | 12.38% | 1,761 |
| Iraq | 17.22% | 37.17% | 25.54% | 11.80% | 8.27% | 1,754 |
| Austria | 11.62% | 18.63% | 15.89% | 33.82% | 20.04% | 1,712 |
| Portugal | 15.19% | 23.59% | 30.13% | 20.45% | 10.64% | 1,560 |
| Haiti | 13.99% | 23.08% | 32.79% | 21.66% | 8.49% | 1,473 |
| Belgium | 18.26% | 28.75% | 23.64% | 17.44% | 11.92% | 1,468 |
| Norway | 17.32% | 28.85% | 24.43% | 16.77% | 12.63% | 1,449 |
| Bolivia | 15.33% | 21.34% | 28.18% | 20.23% | 14.92% | 1,448 |
| Syria | 8.91% | 23.44% | 38.95% | 17.47% | 11.23% | 1,425 |
| Hungary | 9.89% | 22.30% | 14.08% | 25.11% | 28.61% | 1,314 |
| Sri Lanka | 10.94% | 30.26% | 31.45% | 17.44% | 9.91% | 1,170 |
| Czechoslovakia | 10.82% | 17.24% | 18.65% | 24.80% | 28.50% | 1,137 |
| New Zealand | 11.31% | 31.65% | 24.21% | 20.44% | 12.40% | 1,008 |

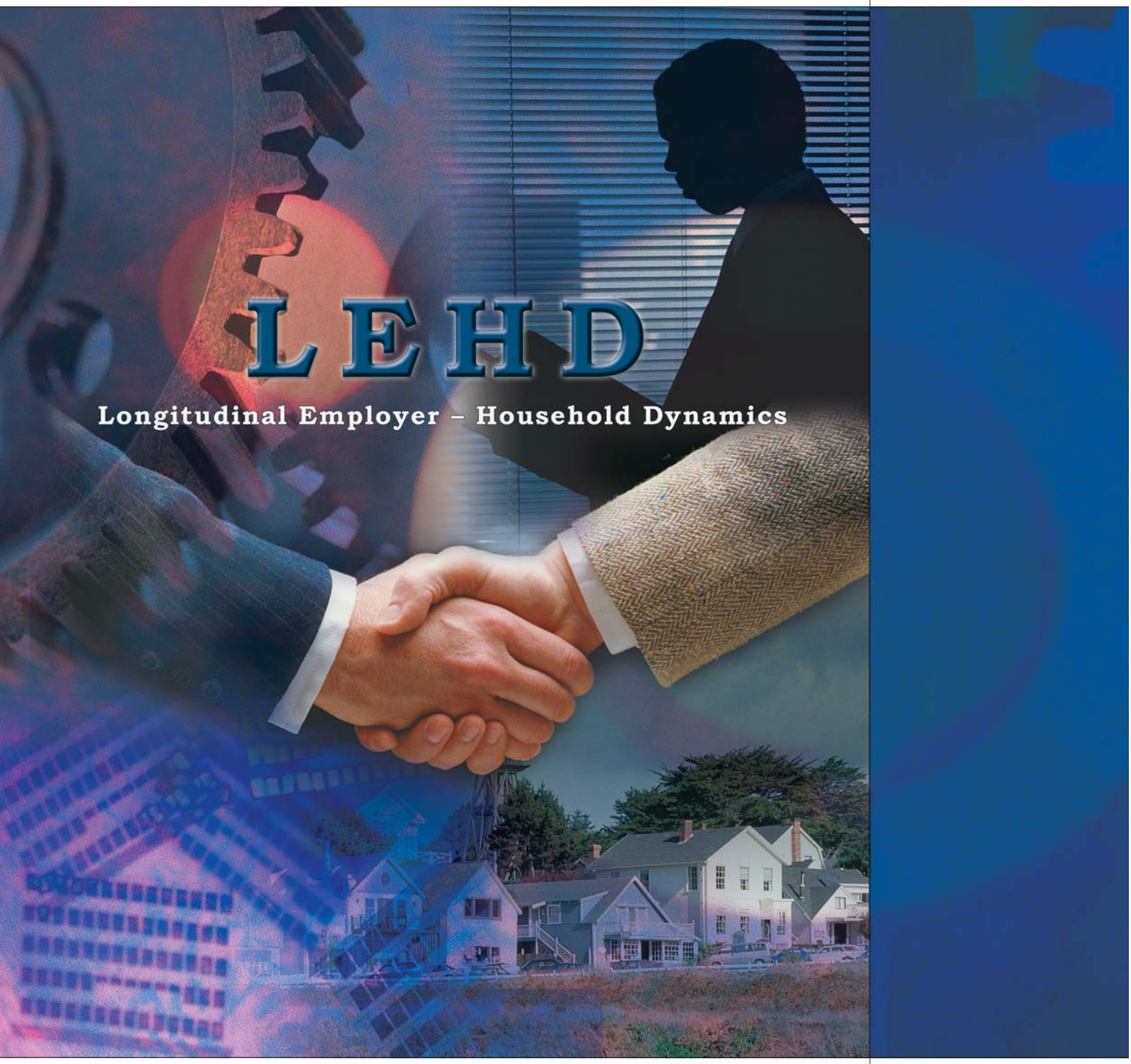
# D Appendix: Sample Report: Analysis of Texas Foreign-Born Workforce

# E Appendix: Sample Report: Analysis of Texas Foreign-Born Workforce

# F Appendix: LEHD brochure

# Filling Data Gaps

*The LEHD State Partnership*

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Economics and Statistics Administration
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# LEHD Fundamentals

## What Is the LEHD/State Partnership?

The Longitudinal Employer – Household Dynamics (LEHD) program is an innovative new state/federal partnership between the Census Bureau and ten states (CA, FL, IL, MD, MN, NC, NJ, OR, PA, and TX). Both sides gain from this partnership. States fulfill their mandate of providing high quality local labor market information to their customers. The Census Bureau uses state unemployment insurance (UI) wage record and ES202 data to fulfill its Title 13 mandate: improving the Census Bureau's economic and demographic censuses, surveys, and intercensal population estimates. The Memoranda of Understanding (MOU) between the Census Bureau and the state partners specify that this is a voluntary partnership. Research beyond that specified in the MOU must have the express written authorization of the state data custodian.

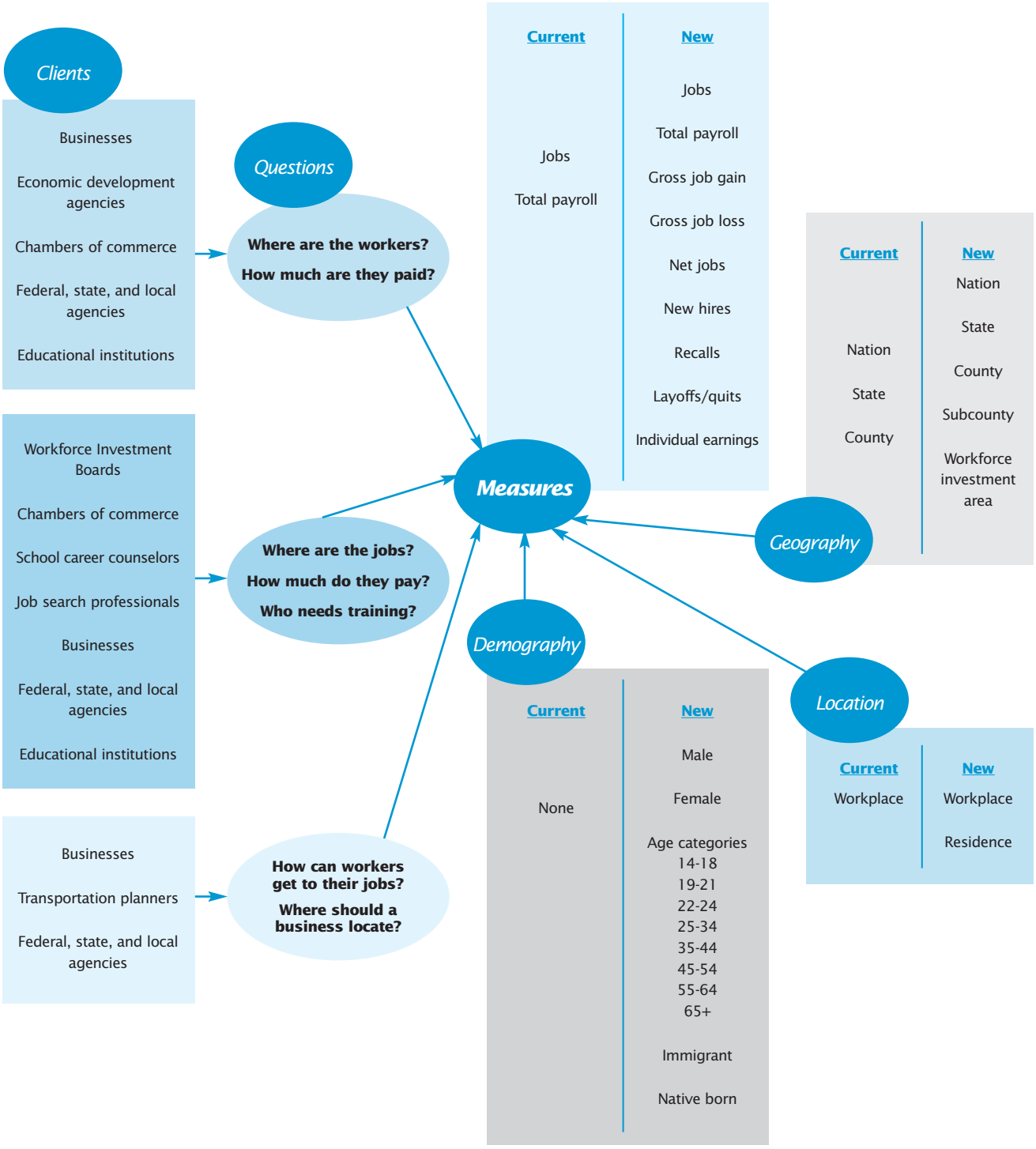
States receive three key products from the Census Bureau: (1) quarterly workforce indicators about the state economy at detailed industry and geography, (2) enhanced UI wage records, and (3) information about successor/predecessor firms:

## Quarterly Workforce Indicators

States receive 27 indicators for each county, for each industry, for each quarter for which they provide data. These indicators include:

- Measures of job gain and loss for different types of workers – so that economic development agencies know where jobs are created and for whom.
- Measures of hires and layoffs for different types of workers – so that Workforce Investment Boards know what skills to provide.
- Measures of employment by where people work and where they live – so that transportation planners know where roads and public transportation should be located to reduce congestion and pollution, while improving emergency evacuation routes, and businesses know where to locate their establishments and attract workers.
- Measures of earnings by type of worker – so that job search professionals can provide information on job location decisions and career counselors can tell students where to get jobs.

# Quarterly Workforce Indicators



# Quarterly Workforce Indicators — What They Are

1. Total Employment (for example, Texas and North Carolina Temporary Help Industry)
    A. Beginning of period
    B. End of period

2. Change in Employment (for example, California Health Care Industry)
    A. Job creation[1]
    B. Job destruction[1]
    C. Net job change[1]

3. Turnover (for example, Education Industry in Miami/Dade County, Florida)
    A. Accessions[1]
        - New hires[1]
        - Recalls[1]
    B. Separations[1]

4. Earnings (for example, High Tech Industry in Montgomery/Frederick Counties, Maryland)
    A. All employees[1]
    B. Accessions[1]
    C. Separations[1]
    D. New hires[1]

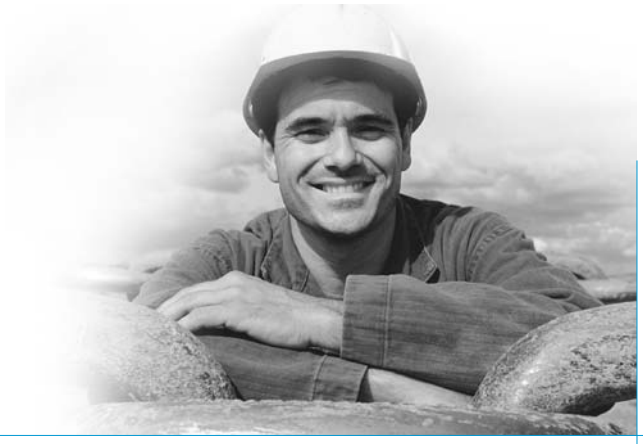
5. Change in Earnings
    A. Accessions[1]
        - New hires[1]
        - Recalls[1]
    B. Separations[1]

Disaggregated by:

Nine Age Categories –
14-18, 19-21, 22-24, 25-34, 35-44, 45-54, 55-64, 65+, All

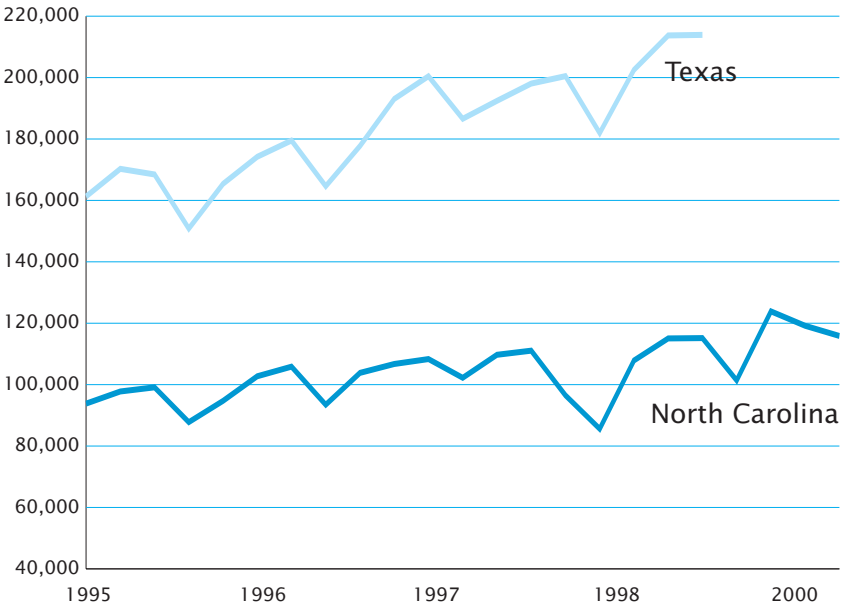
Gender –
Men, Women, All

[1]These series are also available by the degree of workforce attachment.

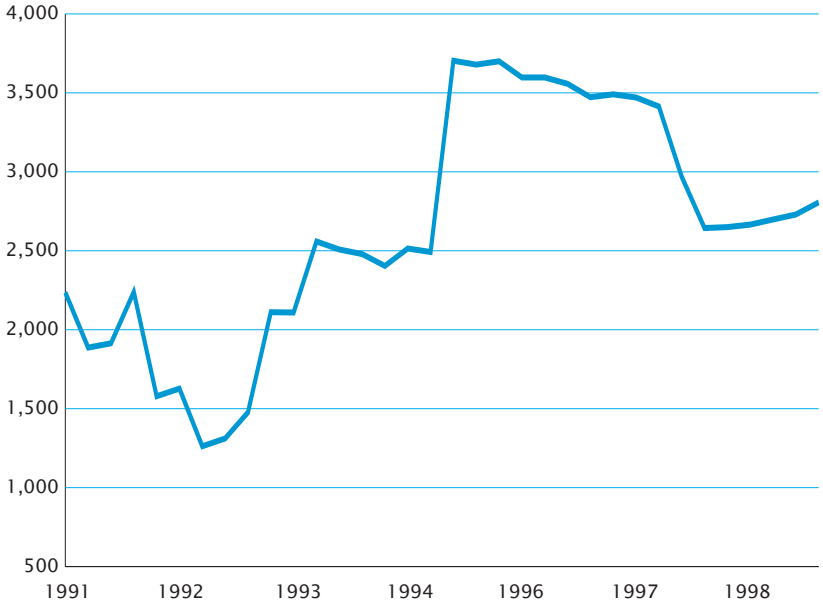


# Quarterly Workforce Indicators — What Was Available Before LEHD

Employment in the Temporary Help Industry in Texas and North Carolina



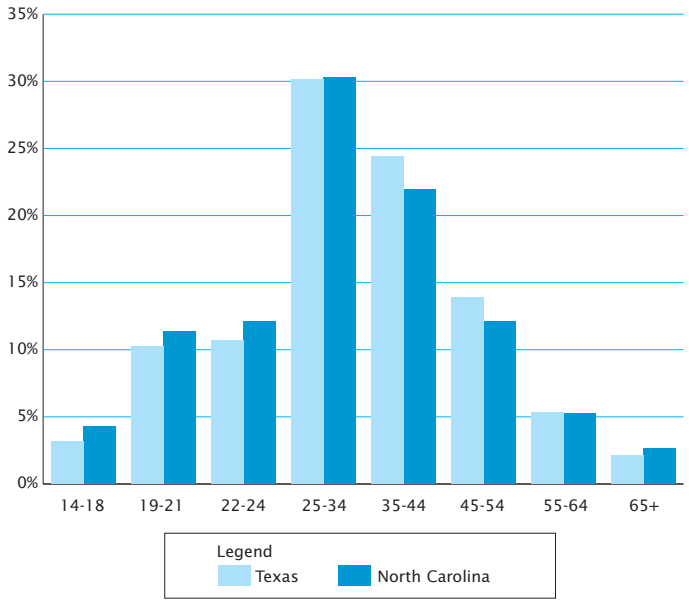

Employment Growth in High Technology Industries in Montgomery and Frederick Counties, Maryland



# Quarterly Workforce Indicators — What LEHD Adds

## 1. Total Employment: Example

Who Works in the Temporary Help Industry?




### Why We Care

- Temporary help – fastest growing employment sector
- One-fifth the size of manufacturing
- Major input is labor, but no information available about the workforce

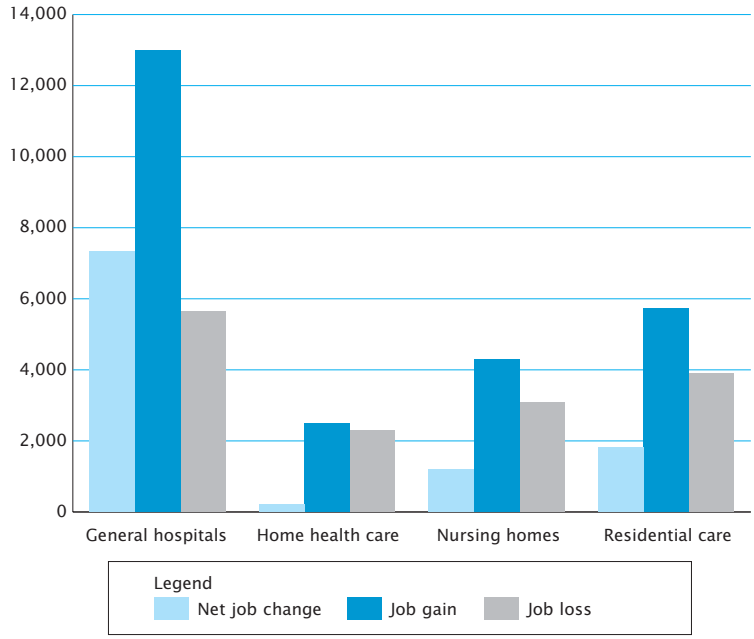
### Key Clients

- Labor market information agencies
- Workforce investment boards

Source: Texas Workforce Commission, North Carolina Department of Employment Security, LEHD Program

## 2. Change in Employment

Job Gains and Job Losses in the California Health Care Industry




### Why We Care

- Aging population
- Labor – key input of production
- Quick indicator of shift in demand – change in employment between hospitals and nursing homes

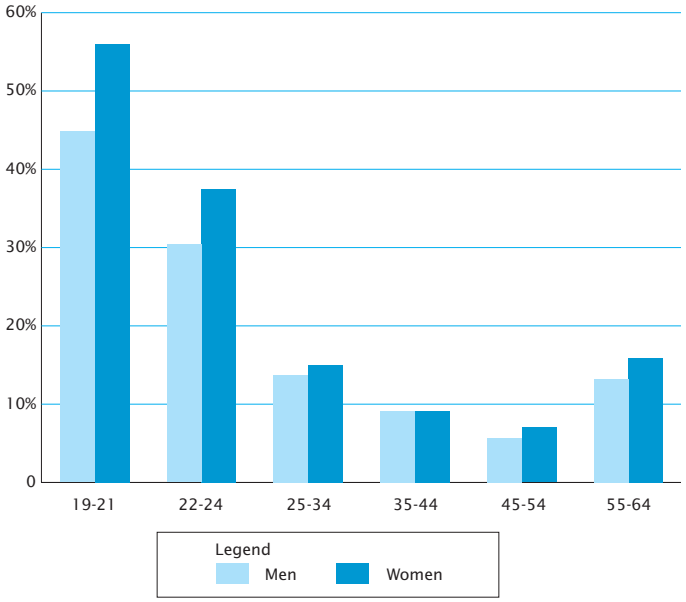
### Key Clients

- Local businesses
- Caregiver training initiative
- California Department of Economic Development

Source: California Employment Development Department LEHD Program

## 3. Turnover: Example

Turnover Rates for Workers in Elementary/Secondary Education in Miami/Dade County, Florida




**Why We Care**

- Governor Bush mandated statewide performance measures
- Little data for counties about turnover, earnings changes, job gains and losses

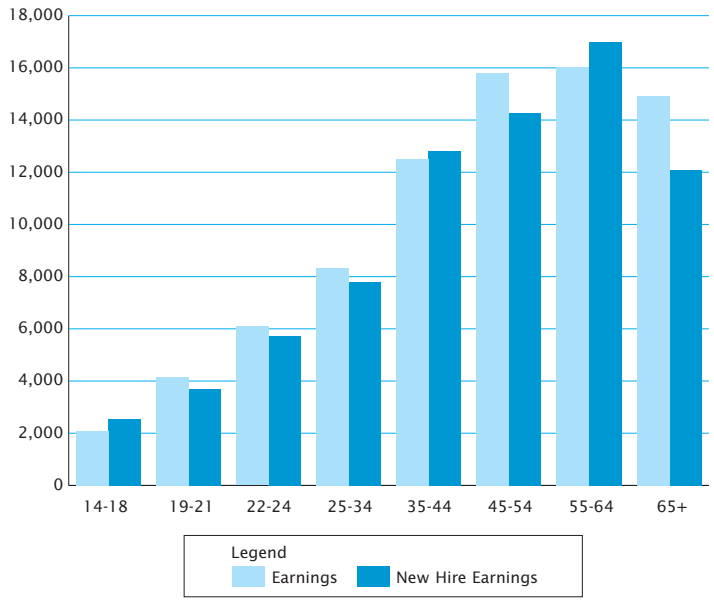
**Key Clients**

- State legislature
- Florida Department of Education

Source: Florida Agency for Workforce Innovation Florida Department of Education; LEHD Program

## 4. Earnings: Example

Earnings of All Workers and Earnings of New Hires in High Technology Industries in Montgomery and Frederick Counties, Maryland




**Why We Care**

- Volatile industry
- Engine of job growth
- Labor is a key input that is important for competitiveness

**Key Clients**

- High technology businesses hiring workers
- Workers looking for high technology jobs
- Maryland Department of Business and Economics

Source: Maryland Department of Labor, Licensing and Regulation; LEHD Program

# Other LEHD Products — Edited Wage Records

State partners receive edited wage record data and edited individual employment histories that are created without using any confidential Census Bureau data. The editing is based on name-matching technology developed at the Census Bureau. The process is crucially dependent on the name information received with state wage data. It also exploits LEHD's very large computing capacity to generate individual earnings histories. Both are used in the matching process to identify donor records.

- The wage record editing process has two stages. The first stage uses observation-weighted name information to identify false matches miscoding of a social security number (SSN) resulting in another valid SSN on file. The second stage uses name, earnings, and within-firm employment history to match donor records (plugs) to job interruptions (holes).
- LEHD has worked with a number of state wage records. In a typical state, approximately 4 percent of all name-SSN combinations are found to be false matches, affecting 0.5 percent of all records. Across all years, about 8 percent of wage records qualify as potential plugs, but slightly less than 1 percent contribute to the definition of a hole.
- The overall match rate varies between 15 and 23 percent of eligible holes, depending on the quality of the underlying data.
- Preprocessing of records through Stage 1 unduplication improves match rates in Stage 2 by more than 40 percent. The net total increase in number of successfully matched records, when compared to an exact name-based matching process, is more than 200 percent.
- Typically, the number of single-period interrupted spells is reduced by over 15 percent.
- It is important to note that the reason the data can be returned to the states is because processing occurs before any Census Bureau data are used. The states agree that the data can only be used for statistical purposes—not program administration.

# Other LEHD Products — Successor/Predecessor Information

This activity uses worker flows to improve information on changes in economic entities – successor/predecessor UI accounts (SEIN) and reporting units (SEINUNITs) – over time. The resulting product is useful in its own right to our partner states, and to the Census Bureau. It has the additional benefit of eliminating false worker and job flows from the employment dynamics estimates.

## Key Findings

For UI data:

- The industry with the most successor/predecessor changing is eating and drinking establishments (SIC 5810), followed by doctor's offices (8011).
- The industry into which most businesses are acquired is industry 7363 (temporary help), followed by eating and drinking establishments.

For industries of particular interest: employment agencies (7361) and temporary help (7363):

- The main predecessor firms for industry 7363 are in eating and drinking establishments (5810), firms with no industry provided, 7363 itself, and construction firms (1711).
- When the predecessor firm continues, and still sends large numbers of employees to temporary help agencies (7363), they are predominantly in industries: temporary help agencies (7363), eating and drinking establishments (5810), grocery stores (5411), department stores, (5311) and employment agencies (7361).
- For employment agencies (7361), there are significant employment flows from one firm in the industry to another. The other main industries that send large clusters of workers to employment industries are primarily temporary help (7363), eating and drinking establishments (5810), and grocery stores (5411).

# Other LEHD Products — Additional Research

Partner states have indicated interest in additional work in the areas of low-wage work, worker skill, immigration, and aging. LEHD staff have attracted external grants from the Rockefeller Foundation, the Sloan Foundation, the Russell Sage Foundations, and the National Institute on Aging to support this research. Partner states receive interim reports customized to their states.

## Low Wage Work: Selected Results

- LEHD has worked with state partners to identify the low-wage population in each state. About 12 percent of workers have low wage jobs according to our definitions: 16 percent of women and 9 percent of men.
- Of these low-wage workers, 24 percent are foreign born.
- Eleven percent of all low-wage workers are employed in eating and drinking establishments; 11percent in educational services, and 10 percent in business services.
- Almost 70 percent of low-wage workers are employed in only ten 2-digit industries.
- Women are more likely to remain low-wage than men; foreign born workers are more likely to remain low-wage than native born.
- Firm and industry placements matter: two-thirds of those who escape low-wage work do so through a job change, and about one-half do so through an industry change. This varies – if workers are in health services, staying with the industry is the best way out of low-wage work.

## Worker Skill: Selected Results

- LEHD staff have developed measures of worker skill, for each worker in the dataset.
- Consistent upskilling of the workforce has occurred in partner states during the 1990s.
- While the amount of human capital increased for the typical business, tremendous differences exist across businesses – even within the same industry. Some businesses upskill and others downskill over the same period. Technology is a driving force.
- Continuing businesses and entering businesses used more human capital at the end of the 1990s than they did at the beginning of the decade—not because they employed more workers, but because the workers they employed were more skilled.
- Exiting businesses generally used less human capital than either continuers or new entrants.

## Immigration: Selected Results

- LEHD is analyzing state data to describe the evolution of the immigrant population in each state over the 1990s and into 2002.
- The largest immigrant group is Mexican.
- The Philippines account for the next largest group (from a single country).
- Most immigrant workers are between 25 and 44 years old: 61 percent of Mexicans, 50.7 percent of Filipinos, 60.8 percent of Vietnamese, and 48.1 percent of U.S. born workers are in this age group.
- Immigrants from Europe and Cuba are most likely to still be working after age 65—7.85 percent of Cuban workers, 6.1 percent of Europeans, and 3.4 percent of native born workers.

# How to Contact

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**Senior Research Fellows:**
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*John Haltiwanger*
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DSD/02-LEHD

# G Appendix: WIB brochure

# H Appendix: Sample Presentation by LEHD Staff

# I Appendix: Contact List

**2003 LEHD State Workshop**
**Attendees List**
**January 29-30, 2003**


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