Employment Growth and Labor Force Participation: How Many Jobs Are Enough?

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There are two basic reasons to be concerned about the rate at which the U.S. economy is creating jobs. The first is what has captured the public's attention coming out of the 2001 recession: the creation of enough jobs to provide work for people who want it. The lackluster job creation following the end of the recession led to the recovery being dubbed "jobless." Analysis of post-recession job creation has spawned much discussion and debate about how many jobs are enough to provide work for the willing and able.

The second source of interest in job creation is not how many jobs are needed to employ the willing but how many jobs are needed to fuel a desired growth in overall economic output. There may be enough jobs to employ most of the people who want jobs, but that does not necessarily mean there are enough people working to supply a growing level of production that leads to more goods, less expensive goods, and an improved standard of living.

The purpose of this article is to provide an analysis of just how many jobs are needed to keep unemployment in check, to consider whether the current rate of labor force growth is enough to supply the desired growth in gross domestic product (GDP) (or total economic output), and to ponder what the future holds for labor force growth.

The Job Creation and Unemployment Paradox

The White House Council of Economic Advisers predicted that the economy would generate about 300,000 jobs per month in 2003 and 2004. In December 2002, the Macroeconomic Advisers consulting group projected an average monthly job creation of about 184,000 in 2003 and 224,000 in 2004. And, ever since the recession was declared over, numerous economists have expressed disappointment whenever monthly job creation fell below 150,000. In a historical context, most of the job growth expectations were not necessarily unrealistic (see Figure 1). The 1980s averaged

Figure 1
Average Monthly Employment Change

Source: Bureau of Labor Statistics, Establishment Survey
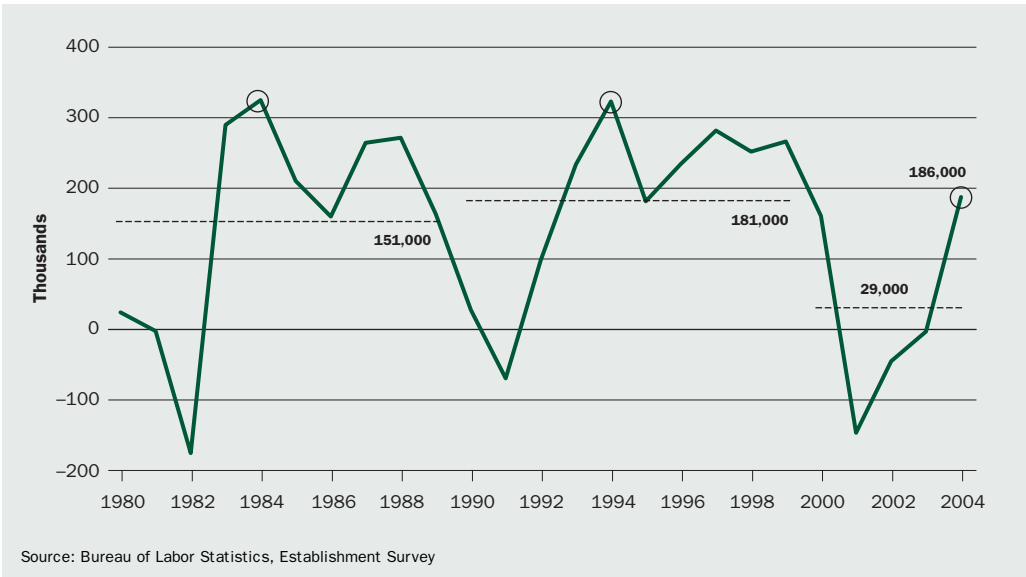
a creation of 151,000 jobs per month, and the 1990s averaged a creation of 181,000 jobs per month. From the beginning of 2000 to the end of 2004, however, the U.S. economy added only 29,000 jobs per month on average.

How can the less-than-hoped-for job creation that has occurred since the 2001 recession be expected to affect the unemployment rate?[1] In answering this question, one might typically assume that job creation needs to grow at the same rate as the population in order to keep unemployment in check. From the beginning of 2000 through 2004 the U.S. non-institutional population (people not in prison or other institutions) experienced an average annual growth rate of 1.27 percent. Furthermore, by the end of 2004 there were approximately 132 million nonfarm jobs in the economy.[2] Applying the population growth rate to this employment base means the economy needs to create 1.67 million jobs per year, or an average of about 139,000 jobs per month, to at least keep unemployment from rising. Job growth, then, on the order of what was projected by the administration and other forecasters would have resulted in a large decline in the unemployment rate.[3]

Between June 2003 and the end of 2004 the economy has created an average of only 126,000 jobs per month, which, on the basis of the above calculations, should have caused the unemployment rate to rise.[4] The apparent paradox is that over this same time period the unemployment rate (depicted in Figure 2) has declined steadily.
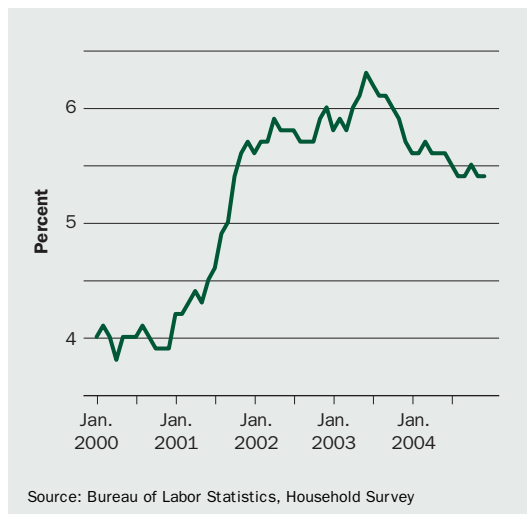
Paradox Resolved: Labor Force Participation

The "employment growth = population growth" estimation has typically provided a reasonable lower bound target for policymakers. This simple formula, however, works only if the labor force participation rate is either increasing or, at least, not decreasing over time. In 2004, only 66 percent of the population was actually in the labor force (working or actively looking for work). And, indeed, it is not really the population growth that the labor market needs to absorb but, rather, the growth in the labor force.[5] If the percentage of the population in the labor force remains con-

stant over the time period for which one calculates population growth, it does not matter what the percentage of participation is (adjusting each component in a percentage change calculation by the same number does not change the result; the population growth rate will equal the labor force growth rate). However, if the labor force participation rate is declining, leaving it out of the calculation means population growth will overestimate the growth in the labor force and, thus, overestimate the number of jobs needed to lower the unemployment rate. Indeed, the labor force participation rate has been declining steadily since 2000, when it averaged 67.1 percent. While this rate is only 1.1 percentage points higher than the 2004 labor force participation rate, when this differ-

Figure 2
Seasonally Adjusted Unemployment Rate

Source: Bureau of Labor Statistics, Household Survey

ence is multiplied by a noninstitutional population of 220 million, the resulting percentage change in the labor force can be quite different from the percentage change in the population.

Thus, the average annual percentage increase in population from 2000 through 2004, as stated above, was 1.27 percent.[6] Adjusting the population levels in 2000 and 2004 by their respective labor force participation rates results in an estimated average annual growth in labor force participants of 0.8 percent. Using this percentage growth as a more accurate target, and from a base of 132 million jobs (in 2004), the more appropriate job creation target to keep unemployment under control is 1.11 million jobs per year, or about 93,000 jobs per month. The actual average job creation of

1. The popular press has been mulling over these issues, as well. See Porter (2004) and Lowenstein (2004).
2. See the Bureau of Labor Statistics, Current Employment Statistics, <www.bls.gov/ces/home.htm> (March 21, 2005).
3. The monthly job growth goal reported most often in the media has been on the order of 150,000 (for example, see *Wall Street Journal* 2003 and Kanell 2004). This goal is consistent with population growth experienced between 2000 and 2003. Population growth was slower between 2003 and 2004, lowering the projected need for job growth. A more recent media report placed the job growth goal at 125,000 (Maher 2005).
4. These numbers reflect U.S. Bureau of Labor Statistics (BLS) adjustments to jobs numbers made through January 2005.
5. Technically, in order for the unemployment rate to not change, the percentage change in employment must equal the percentage change in the labor force, or

$$Urate_t = Urate_{t-1} \Rightarrow \frac{LF_t - LF_{t-1}}{LF_{t-1}} = \%\Delta LF = \%\Delta E = \frac{E_t - E_{t-1}}{E_{t-1}}.$$

This relationship, though fairly transparent, is proved in the appendix.
6. Estimating population levels is one of the more difficult tasks of the U.S. Bureau of the Census. The numbers reported by the bureau are taken as accurate although adjustments are made from time to time to incorporate new information. Details of recent adjustments to population estimates can be found in *Employment from the BLS household and payroll surveys: Summary of recent trends* (Population control adjustments to the household survey) <www.bls.gov/cps/ces_cps_trends.pdf>.
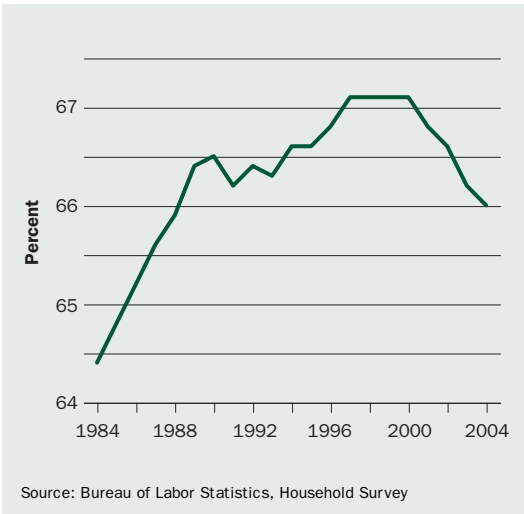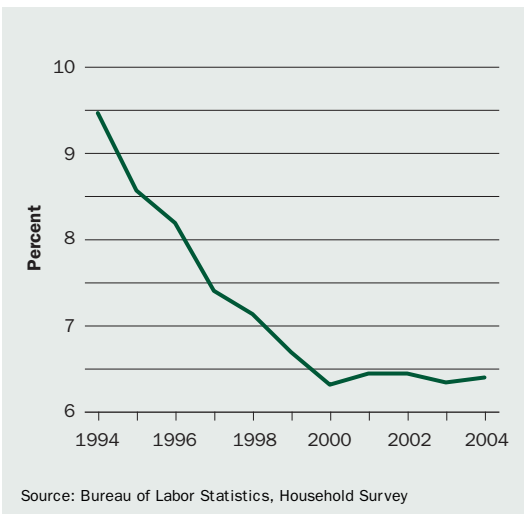
Figure 3
Labor Force Participation Rate

Source: Bureau of Labor Statistics, Household Survey

Figure 4
Percent of Labor Force Nonparticipants Who Want a Job

Source: Bureau of Labor Statistics, Household Survey

126,000 per month between June 2003 and the end of 2004, then, was enough to have produced the observed steady decline in the unemployment rate over the time period.[7]

A Closer Look at the Decline in Labor Force Participation

The negative relationship between the labor force participation rate and the unemployment rate is well known. In order to be counted as unemployed, one has to be actively searching for employment. The number of people unemployed, then, can decline if the unemployed transition into employment or if the unemployed stop looking for work. In the latter case, the resulting decline in the unemployment rate is not accompanied by an increase in employment but, rather, only by a decline in the total labor force.

There has been some concern about the decline in the labor force participation rate that leads to the lower projected job growth needs calculated above (for example, see Andrews 2004). Figure 3 depicts this decline graphically and also puts it into perspective. The percentage of the population working or looking for work in 2004 was, on average, 66 percent, which is roughly the same rate of labor force participation as in 1988.

The labor force participation rate is primarily a function of the age distribution of the population (with older people being less likely to enter the labor market—this distribution will be explored further below), individual preferences, and the economic prospects in the economy. It is possible that the labor force participation rate in the 1990s was artificially inflated; it actually happened, but it was perhaps an anomaly of the times rather than any change in trend. In other words, that time period provided extraordinary economic opportunities, pulling people into the labor market who might not have otherwise entered. Analogously, part of the labor force participation rate decline was also likely a response to fewer job opportunities as a result of the 2001 recession. A similar decline in the participation rate can be seen in the 1991–92 recession, as well. However, the recent decline, and even its acceleration, began well before the 2001 recession, suggesting other, noncyclical, contributors (such as changes in preferences) to the decline. What exactly those contributors might be is difficult to identify, but analysts are not willing to rule out the potential of a new trend in labor force participation.[8]
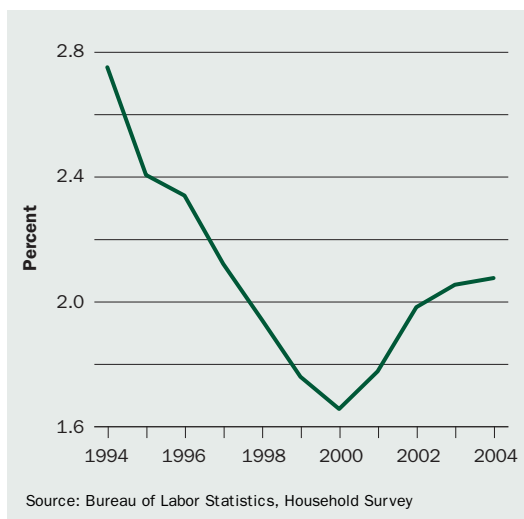
**Types of labor force nonpartici-
pants.** There are basically two types of
labor force nonparticipants: (1) those who
do not want a job (retirees, for example)
and (2) those who would like to have a job
but who for some reason have stopped
looking. The bulk of labor force nonpartic-
ipants (roughly 90 percent or more) do not
want a job. Figure 4 shows that the per-
centage of nonparticipants who want a job
declined steadily between 1994 (the first
year such a question was asked in the BLS
household survey) and the middle of 2000.
It has stayed roughly constant at about 6
percent since that time.

An even smaller percentage of non-
participants that are of the greatest con-
cern are those who not only want a job but
have also looked for a job during the pre-
vious year and are available to take a job if
one were offered. These people, given that
they have exerted some effort to find a job

Figure 5

**Percent of Labor Force Nonparticipants Who
Want a Job, Searched in the Previous Year,
and Are Available to Work Now**

Source: Bureau of Labor Statistics, Household Survey

in the past year, are considered to have demonstrated a commitment to the labor
market. The fact that they have stopped looking is of interest because it may reflect
their negative assessment of overall job prospects. While as of 2004 this group rep-
resents only 2 percent of all nonparticipants, that percentage has grown steadily
since 2000 (although the increase has flattened out since 2002) (see Figure 5).

There are several reasons why one may have stopped looking for work but would
want a job and would take one if it were available to them. The survey answers given
for not currently looking for work include family responsibilities (such as child-care
difficulties), being in school, being in poor health, or being discouraged; there is also
an undefined "other" category. The one reason that has received most of the atten-
tion coming out of the 2001 recession is "discouraged." A discouraged worker is one
who has given up the job search because of perceived poor prospects—that is, the
chance of getting a job is not worth the effort one would have to exert to find it. In
2004 these people averaged 30 percent of nonparticipants who want a job, searched
in the previous year, and are available for work now (see Figure 6). They represent
less than 1 percent of all nonparticipants.

Discouraged workers and employment growth. While representing only
1 percent of all nonparticipants, the number of people classified as discouraged
amounted to an average of 466,000 in 2004. If indeed these people were still actively

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7. These job growth estimates by the BLS are merely estimates, and the numbers reported here are
   not intended to reflect a degree of accuracy that does not exist. Details on the accuracy of the
   monthly employment numbers can be found in the technical appendix on any "Employment
   Situation" news release. For example, see <www.bls.gov/news.release/empsit.toc.htm>.

8. Federal Reserve Board Vice Chairman Roger Ferguson considered both cyclical and noncyclical
   components to the recent decline in labor force participation rates in a recent speech (Ferguson
   2005). He argues that while a trend change cannot be ruled out, cyclical influences are the most
   likely culprit for the declining labor force participation.

Figure 6

Discouraged Workers as a Percent of Labor Force Nonparticipants Who Want a Job, Searched, and Are Available

Source: Bureau of Labor Statistics, Household Survey
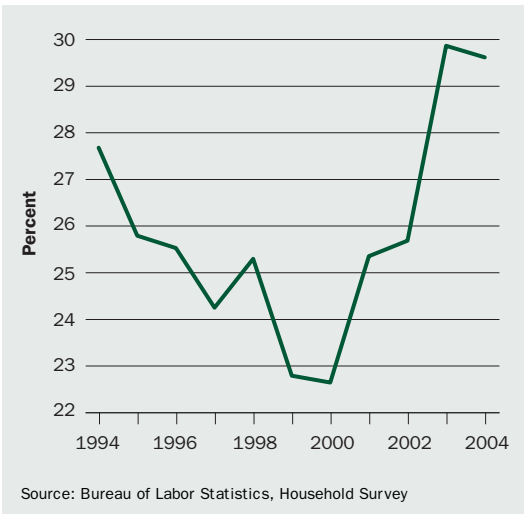
searching for work, the total number of unemployed in 2004 would have been 8.6 million, and the unemployment rate for 2004 would have averaged 5.8 percent (instead of 5.5 percent). Figure 7 plots the unemployment rate between January 2000 and December 2004 as reported by the BLS and what the unemployment rate would have been if those classified as discouraged had not stopped looking for work.[9] The two series obviously track each other very closely, with the largest difference between the two series being roughly 0.4 percentage points.

Adding the discouraged workers to the official count of the unemployed, however, would not likely alter the view of the labor market, which is generally believed to be gaining strength. Furthermore, if the additional number of discouraged workers each month were counted in the labor force (as unemployed), the average number of jobs that would have needed to be created between June 2003 and the end of 2004 to absorb these additional workers increases to 109,000 per month (as opposed to only 93,000 per month without including the discouraged workers). The bottom line is that the 126,000 average monthly increase in jobs between June 2003 and December 2004 was enough to accommodate labor force participants and discouraged workers.

As the unemployment rate continues to fall, however, people reassess the best use of their time and are more inclined to enter or reenter the labor market. This cyclical increase in the labor force participation rate occurred following the 1990–91 recession (see Figure 3). Not only will those currently classified as discouraged likely reenter the labor force, but, in a different, more lucrative economic environment, nonparticipants who currently say they do not want a job also may enter. Of course, if these events occur, the creation of an average of 126,000 jobs per month may not be enough to keep the unemployment rate from rising. Over the next several years, however, a natural downward pressure on labor force participation will occur as the baby-boom generation reaches retirement age.

### Taking the Age Distribution into Account

It was stated earlier that an average of 66 percent of the population was in the labor force in 2004. In fact, the percentage of the population participating in the labor market varies quite dramatically across the age distribution. For example, in 2004, 61.1 percent of those between the ages of sixteen and twenty-four, 82.7 percent of people between twenty-five and fifty-four years old, and 36.2 percent of those fifty-five years and older participated in the labor market.

In addition, the population growth in each of these age categories has varied considerably. Specifically, from 2000 through 2004, the population of people between the ages of sixteen and twenty-four grew an average of 1.6 percent per year, the population between twenty-five and fifty-four grew an average of 0.6 percent per year, and the population fifty-five and older grew at an average of 2.5 percent per year.

As a percentage of their respective populations, the labor force participation rate has been changing in different ways across the age distribution. Adjusting the population growth in each age category by the labor force participation rates in each age category, the labor force of those aged sixteen to twenty-four is estimated to be decreasing at an annual average rate of 0.03 percent, the labor force of those twenty-five to fifty-four years old is increasing annually by 0.06 percent, and the labor force of those fifty-five years and older is increasing by 1.9 percent. Taking these different growth rates in the labor force across age groups into account, the estimate of the number of jobs needed to keep unemployment under control is refined further and turns out to be an average of 95,000 jobs per month.[10]

In the future, the age distribution is expected to shift quite substantially, with baby boomers retiring (increasing the number of people in the lowest labor force participation age bracket) and the number of workers in their prime working years (twenty-five to fifty-four) declining.[11] A rough estimate of the average number of jobs that must be created per month just five years from now can be made by imposing the age distribution that will exist in 2010 on today's labor market.[12] The result of this exercise suggests that just the shift in the age distribution alone will decrease the number of jobs that need to be created to about 91,000 per month on average. This smaller number of jobs needed to absorb the labor force is a direct result of a slowing in the population growth of working-age (twenty-five- to fifty-four-year-old) adults (from 0.6 percent per year to –0.1 percent per year) and a large increase in the segment of the population with the lowest rate of labor force participation; the number of individuals in the fifty-five and older age bracket is expected to grow at 3 percent per year between 2004 and 2010.

Figure 7
Standard Unemployment Rate and Adjusted Rate for Discouraged Workers

Source: U.S. Bureau of Labor Statistics, Household Survey

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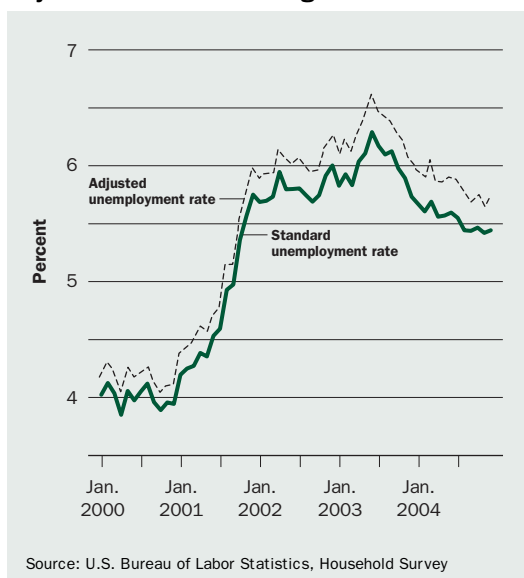
9. These data are available from the Bureau of Labor Statistics at <www.bls.gov/Webapps/legacy/cpsatab12.htm>.

10. The entire February 2004 issue of the *Monthly Labor Review* is devoted to projecting GDP, employment, and labor force growth. Each of the articles assumes the same average annual rate of growth in total population (there is a slight projected difference in the 16+ population) and total labor force between 2002 and 2012 as was seen between 1992 and 2002. Furthermore, there is no accounting in the macroeconomic models for changes in labor force participation rates among different age categories.

11. This projection, of course, assumes that other infusions into the labor force are held constant. The potential role of increased immigration will be discussed below.

12. This estimate assumes that labor force participation rates stay the same (something just demonstrated to be problematic) and that technological advancement is such that the same number of base jobs exists five years from now. These are, obviously, both very crude assumptions. Estimates of population growth are obtained from population projections estimated by the U.S. Census Bureau (www.census.gov).

Supplying Job Growth Potential

It's important to understand that the focus so far has been on the number of jobs that need to be created to keep unemployment in check. Nothing discussed here has anything to do with growth in consumer demand, labor productivity growth, or any other factors that may affect how many jobs are actually created or what the U.S. economy's job creation potential is. It may be in the interest of policymakers to set goals for job creation in the United States, but it is also important to realize that not meeting those goals does not necessarily mean more people are out of work; the job numbers presented earlier in this article should be considered a lower-bound target for policymakers.

Sustaining a desirable overall growth in the U.S. economy, however, may require a rate of job creation that exceeds this lower-bound target. A recent report by the Organisation for Economic Co-operation and Development (OECD) (2003) indicates that differences in economic growth across developed economies can largely be explained by differences in labor utilization.[13] In other words, countries in which employment rates and hours of work were among the lowest also experienced the slowest growth in GDP. It was also found that weaknesses in labor utilization were not offset by faster growth in labor productivity (Baily 2003, 66; OECD 2003). While the recent labor productivity growth in the United States is a likely culprit for explaining the unprecedented lack of employment coinciding with enviable levels of GDP growth, the OECD report points out that there are limits to the ability of labor productivity growth to sustain growth in GDP. Ensuring continued output growth will eventually require an infusion of labor to support it. Several options have been suggested as to how the United States can fuel its economic growth in light of the projected natural decline in the growth of its labor force.
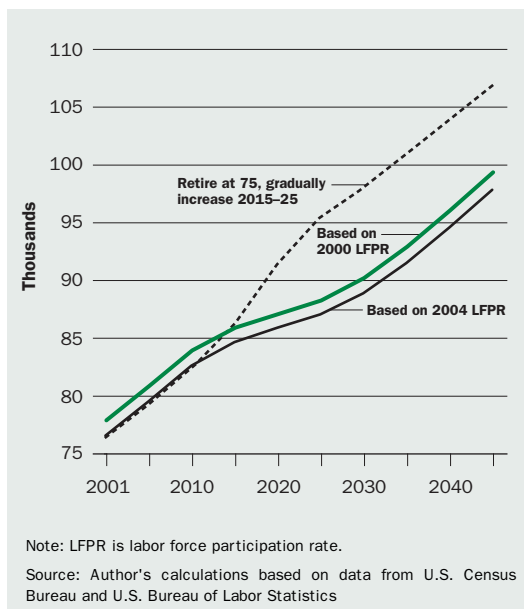
One source of interest in job creation is not how many jobs are needed to employ the willing but how many jobs are needed to fuel a desired growth in overall economic output.

Social Security reform. One suggestion that is unpopular with many workers and policymakers is the encouragement of later retirement ages through modification of Social Security and Medicare policies. Since the mid-1990s Alan Greenspan, the chairman of the Board of Governors of the Federal Reserve System, has noted that the Social Security system, as currently constructed, will not be financially able to support all future retirees at the level promised in current law (see, for example, Greenspan 1997, 2005). He has noted that benefit cuts are almost surely to be part of the solution, and increasing the age at which one can qualify for Social Security is one possible way to accomplish that. Greenspan has raised the possibility, for example, of adjusting the normal age of retirement to "keep the ratio of retirement years to expected life span approximately constant" (see Greenspan 1997). To see how this adjustment might work, consider the following illustrative example. Life expectancy at birth in 1946 (the first year of the baby-boom generation) was 66.7 years. The ratio of retirement years to expected life span, then, for someone born in 1946 is 0.025 (= [66.7 − 65]/66.7). If this same ratio is applied to someone born in 1964 (the last year of the baby-boom generation), the retirement age for that person should be 68.4 years (= 70.2 − [0.025 * 70.2]).[14]

So how effective will raising the retirement age be in generating greater labor supply? Some evidence on this point is provided by seeing what happened to the incidence of retirement when the United States introduced an early retirement age. Beginning in 1961, workers were allowed to start receiving Social Security benefits

at age sixty-two. Early-retirement Social Security payments are actuarially adjusted, based on life expectancy, so that expected total Social Security wealth for an early retiree is the same as if the person had waited to retire at the normal age. As a result of this change, the probability that a worker retired at age sixty-two increased from about 2 percent in 1960 to about 7 percent in 1970 to over 20 percent in the late 1990s.[15] An additional contributor to the tendency of U.S. workers to retire earlier and earlier is the growth of private employer-provided pension plans, which typically have an earlier benefit eligibility age than Social Security. The bottom line is that people respond to incentives, and if the incentives are appropriately structured the U.S. economy would benefit from more able-bodied elderly contributing to the labor force.[16]

Figure 8 illustrates three scenarios for what the labor market can expect over the next forty years regarding male labor force participants under a couple of different scenarios.[17] The first scenario depicts the expected growth in the labor force using the population projections from the U.S. Census Bureau and the labor force participation rates for different age groups in 2004. The flattening of growth in labor force participants seen between 2010 and 2030 exactly corresponds to the retirement among baby-boomers when they reach sixty-five years of age. The second scenario corresponds to the same population projections but assumes a return of labor force participation rates to their 2000 levels. This profile is the same shape, with numbers slightly higher. The third scenario simulates a delay in the age of Social Security eligibility. Again assuming the same population projections, this profile depicts a delay in eligibility by five years, in five-year increments, starting in 2015.[18] Delaying the age of eligibility has the effect of changing the structure of the labor force growth profile, retaining its pre-2010 trajectory.

Figure 8

Projected Growth in Male Labor Force: Three Scenarios

Note: LFPR is labor force participation rate.

Source: Author's calculations based on data from U.S. Census Bureau and U.S. Bureau of Labor Statistics

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13. Also see Altavilla, Garofalo, and Vinci (2004), Baily (2003), and Rhoads (2002).

14. Note that the life expectancy of someone born in 1940 (the first year Social Security benefits were paid on a regular basis) was sixty-three years, two years before he (typically) could start receiving Social Security payments.

15. See Gruber and Wise (1997), who document the same retirement disincentive effects of early retirement provisions in Social Security programs in other countries.

16. More evidence on the power of the incentives of Social Security provisions can be found in Cole and Gruber (2000). One consideration with more elderly workers participating in the labor market is potentially higher health and disability costs for all workers because these older workers would still likely be included in their employer-provided health and disability plans.

17. The trends discussed here for men are the same for women, but total numbers are always lower because men have a higher labor force participation rate at every age.

18. This assumption of a change every five years in five-year increments is for the sake of simplicity since the population and labor force participation rates are reported for five-year age ranges.

Figure 9
Employment-Based Immigration Levels and Percent of Population

Source: http://uscis.gov/graphics/shared/aboutus/statistics/IMM02yrbk/IMMExcel/table4.xls
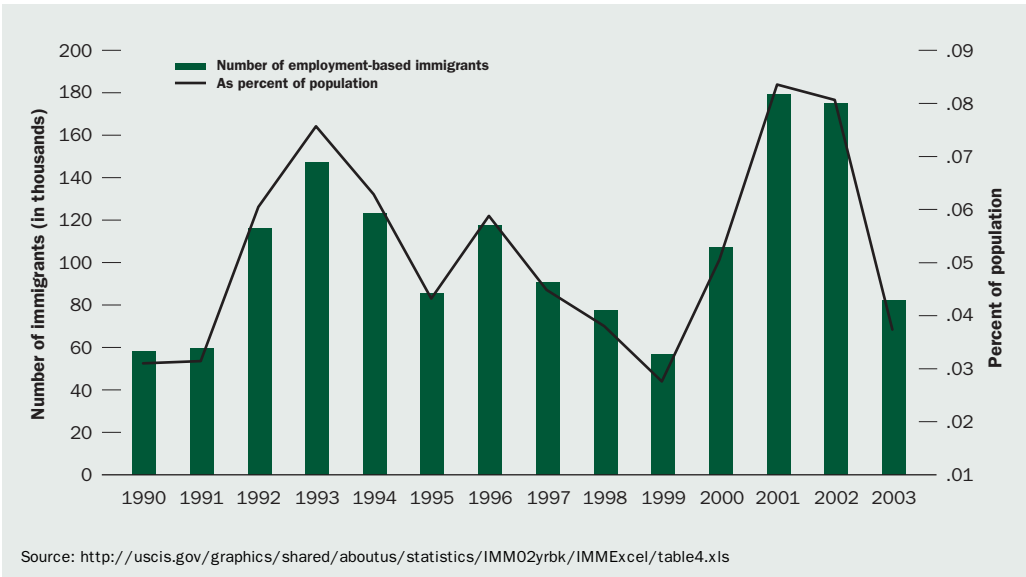
Increased immigration. Another identified potential source for contributions to the declining native labor force in the United States is immigration. Industry lobbyists have been among the most vocal proponents for easing immigration restrictions to supply their skilled labor needs.[19] Immigration policy has gone through many changes over the years as the flow of foreigners to the United States is affected by political constraints, social forces, and economic need. Figure 9 depicts the recent trends in employment-based immigration to the United States, both the number and percent of population. These two statistics follow the same path and show an increase in immigration since 1999 followed by a sharp decline, likely as a result of post-9/11 Homeland Security policies.[20]

The most recent effort to change immigration policy is a guest-worker-type program President Bush is promoting. This program would allow foreign nationals to work for three years in the United States and would ease their transition to permanent residency.[21] While some argue this program is motivated by security concerns and a desire for the United States to better document the many workers who are in the country illegally, the effect would still be to increase the pool of workers from which industry could draw.[22]

There are two main criticisms of the immigration plan to fuel U.S. labor force growth (see, for example, Ip 2004). The first is that there are not enough young, educated workers in the developing world to supply all of the growing labor force demands in the West. Not only is the population of the United States aging, but the populations of all major developed economies are going through roughly the same changes in their age distributions (for example, see Gregor 2004). Furthermore, lower fertility rates in some countries (particularly in eastern and southern Europe) provide an even greater threat to longer-term declines in labor force growth than those faced by the United States.[23] In other words, competition will be fierce for luring would-be immigrants to the United States to supply this country's employment demands. The second criticism of relying on immigration to make up labor force shortfalls is that, by

importing skilled workers from other countries, those countries of origin are being deprived the human capital they need to grow and develop. The concern about "brain drain" is not limited to the developing world. Saint-Paul (2004) documents the extent to which immigration to the United States from Europe during the 1990s has deprived European countries of some of their most talented resources.

Offshore outsourcing. The unpopular later retirement ages and the potential infeasibility of relying on immigration lead us to a the third possible source of supplying growing labor needs in the United States: offshore outsourcing. Making use of labor that stays in its own country could provide needed labor inputs to fuel production in the United States while the returns to that human capital stay in the country of origin. In this context, the use of offshore outsourcing should be viewed as an opportunity to replenish an anticipated decline in a domestically produced factor input (that is, labor).

While the productivity gains to outsourcing in this circumstance would arguably be larger than if outsourcing resulted in the substitution of foreign labor for domestic labor, this third solution is not without its critics. Benefits and costs to outsourcing would not be equally distributed because it is not possible to outsource all types of production processes. For example, those that require customer contact, such as education, health care, and tourism (hotels and restaurants), cannot be outsourced overseas and will continue to require domestic infusion of labor. It is also important to realize that while some jobs flow offshore, the economic growth this source of labor might fuel would generate demand for domestic products and could result in the creation of jobs we cannot even yet imagine. "Logistics," for example, is a service industry that provides high-paying domestic employment to keep track of and direct the flow of products and services that are being supplied all over the world.

Conclusions

The technological advancements through the 1990s are likely what has allowed the U.S. economy to grow at a respectable pace coming out of the recession of 2001 without generating the numbers of jobs such growth typically creates. This lack of anticipated job creation, along with a continued decline in the unemployment rate, has created some confusion about the number of jobs that need to be created versus the level of job creation that is desirable.

While this article has explained the first part of this confusion, it has merely made suggestions about the second part. In other words, while the current rate of job

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19. For example, see Aeppel (2004) and Machalabe (2004), who detail the shortage of truck drivers in the United States. Also see Lowell (2000).

20. These statistics overcount the number of workers added to the labor force through immigration because they include the spouse and children of the immigrant who is coming to the United States for employment. A report produced by the Federal Reserve Bank of Dallas (Orrenius 2003) suggests that post-9/11 policies affected immigration more indirectly (for example, through stricter background checks, fee increases, and longer wait times) than directly through stricter quotas. However, Orrenius also points out that after 2001 the H-1B visa cap of 195,000 was allowed to revert to the 1992 level of 65,000.

21. Details of the Bush administration's proposal can be found at "Fact Sheet: Fair and Secure Immigration Reform," (January 7, 2004) <www.whitehouse.gov/news/releases/2004/01/20040107-1.html>.

22. A recent estimate is that there are 6 million undocumented immigrants in the U.S. labor force (Passel, Capps, and Fix 2004).

23. See <www.prcdc.org/summaries/worldpop/worldpop.html>.

creation appears to be able to sustain the expected growth in the labor force for the time being, it is not clear that it is enough to sustain the rate of economic growth that will be desirable in the long run. This article has touched on several options available to policymakers in affecting this trend of slower labor force growth, but any one of them will take time to implement and adjust to, suggesting that serious and immediate discussion of their respective merits is in order.

Appendix
Algebraic Requirement for a Constant Rate of Unemployment

It is possible to demonstrate algebraically that the unemployment rate staying constant from one period to the next must necessarily imply that the percentage change in the labor force equals the percentage change in employment across the two periods.

Let the subscript 1 correspond to the first time period and the subscript 2 to the second time period. UR is the unemployment rate, LF is the labor force, and E is employment. Then

$$UR_1 = UR_2 \Rightarrow \frac{LF_1 - E_1}{LF_1} = \frac{LF_2 - E_2}{LF_2}.$$

Multiplying this out ($LF_2 LF_1 - LF_2 E_2 = LF_1 LF_2 - LF_1 E_2$) and subtracting $LF_2 LF_1$ from both sides and dividing by -1 yields

$$LF_2 E_2 = LF_1 E_2.$$

Subtracting $LF_1 E_1$ from both sides and rearranging produces

$$E_1 (LF_2 - LF_1) = LF_1 (E_2 - E_1).$$

Finally, dividing both sides by $E_1 LF_1$ results in

$$\frac{LF_2 - LF_1}{LF_1} = \frac{E_2 - E_1}{E_1},$$

which reflects the equivalence of the percentage change in the labor force and the percentage change in employment.

REFERENCES

Aeppel, Timothy. 2004. Turn of the screw: In tepid job scene, certain workers are in hot demand. *Wall Street Journal*, August 17.

Altavilla, Carlo, Antonio Garofalo, and Concetto Paolo Vinci. 2004. Evaluating the effect of working hours on employment and wages. University of Naples Parthenope Economics Working Paper 11-04, November.

Andrews, Edmund L. 2004. A growing force of non-workers. *New York Times*, July 18, sec. 3.

Baily, Martin Neil. 2003. *The sources of economic growth in OECD countries*: A review article. *International Productivity Monitor*, no. 7 (Fall): 66–70.

Cole, Courtney, and Jonathan Gruber. 2000. Social Security and retirement. NBER Working Paper 7830, August.

Ferguson, Roger W., Jr. 2005. Interpreting labor market statistics in the context of monetary policy. Remarks to the Andrew Brimmer Policy Forum, Allied Social Sciences Associations annual convention, Philadelphia, January 7. <www.federalreserve.gov/boarddocs/speeches/2005/200501072/default.htm> (January 2005).

Greenspan, Alan. 1997. Testimony before the Task Force on Social Security of the Committee on the Budget, U.S. Senate, November 20. <www.federalreserve.gov/ boarddocs/testimony/1997/19971120.htm> (March 9, 2005).

———. 2005. Testimony before the Special Committee on Aging, U.S. Senate, March 15. <www.federalreserve.gov/boarddocs/testimony/2005/20050315/default.htm> (March 21, 2005).

Gregor, Alison. 2004. Skilled immigrants more important as population ages, Goodale says. *Ottowa Citizen*, April 24.

Gruber, Jonathan, and David Wise. 1997. Social Security programs and retirement around the world. NBER Working Paper 6134, August.

Ip, Greg. 2004. The outlook: Greenspan warns of shortfall as U.S. ages. *Wall Street Journal*, August 30.

Kanell, Michael E. 2004. Job numbers should add spark to Bush-Kerry debate tonight. *Atlanta Journal-Constitution*, October 8.

Lowell, Lindsay B. 2000. The demand and new legislation for skilled temporary workers. *People and Place* 8 (December): 29–35.

Lowenstein, Roger. 2004. Help wanted. *New York Times Magazine*, September 5.

Machalabe, Daniel. 2004. U.S. trucking companies haul their highest prices in years. *Wall Street Journal*, April 29.

Maher, Kris. 2005. Jobs outlook may stay volatile as caution in hiring persists. *Wall Street Journal*, January 19.

Organisation for Economic Co-operation and Development (OECD). 2003. The sources of economic growth in OECD countries. <www.oecd.org/dataoecd/17/10/2712737.xls> (March 8, 2005).

Orrenius, Pia M. 2003. U.S. immigration and economic growth: Putting policy on hold. *Southwest Economy*, no. 6 (November/December).

Passel, Jeffrey S., Randolph Capps, and Michael E. Fix. 2004. Undocumented immigrants: Facts and figures. Urban Institute Immigration Studies Program, January 12.

Porter, Eduardo. 2004. In trying time, scaling down expectations of job growth. *New York Times*, September 6.

Rhoads, Christopher. 2002. Short work hours undercut Europe in economic drive. *Wall Street Journal*, August 8.

Saint-Paul, Gilles. 2004. The brain drain: Some evidence from European expatriates in the United States. IZA Discussion Paper 1310, September.

Wall Street Journal. 2003. What's news: Business and finance, December 8.

On the Uniqueness of Community Banks

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The authors thank Jerry Dwyer, Scott Frame, Larry Wall, and participants at the Texas
Tech finance workshop for helpful comments and Shalini Patel for research assistance. An
earlier version of this paper was presented at the 2003 Association of Private Enterprise
Education conference.*

A number of years ago in Lubbock, Texas, where the three authors once lived, the market was served solely by community banks, each with a different strategic focus and emphasis. The relative tranquility of this banking landscape changed when the largest community bank in town was acquired by a large bank holding company.

Soon after the acquisition announcement, one of the authors was visiting the CEO of a local bank. The author wondered if the large bank holding company's presence would be viewed as a serious competitive threat by the community banks in Lubbock. Surprisingly, the CEO saw the acquisition as a great opportunity for his bank. First, he felt he would be able to hire many of the better lending officers from the acquired bank because they would feel too constrained by the limits put on their discretion to make lending decisions and by similar problems associated with large bureaucratic organizations. Second, he thought that many of the acquired bank's loan customers might leave the acquired bank once their lending officer left, so his bank's loan portfolio could grow if his bank could attract these customers. Finally, the CEO felt that many of the acquired bank's depositors would become frustrated by the lack of personal attention and thus seek to bank elsewhere. If his bank could attract these depositors, funding the anticipated loan growth would not pose a serious problem.

Many of these predictions came true over the next few years. The community bank CEO hired several lending officers from the acquired bank, and many loan customers moved their business with these officers. Deposits also grew, so funding problems were no more a problem there than elsewhere. Indeed, so many of these predictions came true that the authors realized that community banks may do things differently than large bank holding companies. The purpose of this article is to further explain and explore the uniqueness of community banks.

What Are Community Banks?

To many outsiders all banks are alike. They accept deposits and make loans. The banking industry, in turn, is often viewed as a uniform competitor with nonbank financial services companies. However, to insiders there are many variations among banks, with the distinction between community banks and all other banks being one of the most important.

As the name suggests, community banks focus their activities on local communities, gathering deposits and lending within a restricted trade area rather than operating in regional or national markets. Because of their narrow focus, these banks are generally smaller. In fact, many market participants label banks with less than $1 billion in assets as community banks.

Bankers not only view community banks as being far different from large banking organizations but also draw important distinctions between different types of community banks. For example, the banking industry sponsors many trade associations, with some devoted strictly to community banks. Most states have associations for independent (community) banks, whose members are typically the smallest institutions, in addition to a state bankers association, which generally draws members from all size banks. As another illustration, when evaluating community bank performance, most bankers and analysts compare performance across banks of similar size that operate in similar geographic markets with the same general strategies. In fact, the uniform bank performance report set up by the Federal Financial Institutions Examination Council (FFIEC) selects peer institutions for banks on the basis of size.[1]

Because community banks are associated with small business lending, local community development, and direct customer contact, policymakers have worried whether such banks will be able to survive threats brought by consolidation of the banking industry.

Policymakers also often focus their attention narrowly on community banks. For example, because community banks are associated with small business lending, local community development, and direct customer contact, policymakers have worried whether such banks will be able to survive threats brought by consolidation of the banking industry. Implicitly, policymakers worry whether consolidation will reduce the availability of credit to small businesses and impose rising fees on consumers.[2]

While the banking industry has experienced dramatic changes over the past twenty years, community banks have survived and in many cases prospered. Regulatory changes during this period include geographic deregulation, with the passage of the Interstate Banking and Branching Efficiency (Riegle-Neal) Act of 1994 and the general elimination of restrictions against interstate and intrastate banking, and branching and product deregulation with the passage of the Financial Services Modernization (Gramm-Leach-Bliley) Act in 1999. The last twenty years have also witnessed extraordinary technological changes, which have directly affected the banking industry.[3] Amid these changes, many community banks have flourished financially (see Bassett and Brady 2001), and de novo banks continue to enter the scene to the surprise of many who expected greater consolidation of small banks resulting from significant scale and scope economies in banking.[4] Many factors and circumstances argue against the long-term success of community banks: excessive concentration of risk in lending; competitive pressures from deregulation and new technologies; and limitations on market power, brand recognition, and technological investment (see Berger 2003). Their size presumably prevents smaller banks from

adequately diversifying credit risk and prevents management from investing sufficiently in new technologies to compete effectively.[5] According to aggregate data, most large banks are becoming more cost efficient in their operations while smaller banks are not, making it more difficult for smaller banks to offer a sufficiently broad range of services at competitive prices (see FDIC 2002). These latter factors limit the growth in noninterest income, an attractive and stable source of future earnings.

On the other hand, there are many reasons why community banks are flourishing. First, community bank managers seem to process information differently than managers of larger banks, placing a greater emphasis on long-term customer relationships. The relatively smaller size of community banks, along with more local ownership, allows them to give more decision-making authority to bank employees, which further allows these banks to exploit "soft" information.[6] Widespread mergers and acquisitions among larger banking organizations enhance this difference and drive many customers who seek nonstandard and personal banking services to community institutions. Second, the recent availability of relatively low-cost Federal Home Loan Bank (FHLB) advances as a funding source has reduced funding constraints on qualifying community banks in growth markets. FHLB advances allow small banks to better compete with large banks on the basis of price. Third, many community banks have substantial credit exposure to customers involved in agriculture. Recent programs have expanded federal guarantees and agriculture payments, which improve overall credit performance and quality. Finally, since 1997 many community banks have elected to be taxed as Subchapter S corporations, thereby avoiding corporate income taxes and directly increasing aggregate profitability. At the time of this study, the "Sub S" option was not available to firms with more than seventy-five shareholders.[7]

The primary purpose of this article is to explore differences between community banks and larger banks and to describe certain differences among community banks. Understanding these differences is important to students of the U.S. financial system, to participants in the banking industry, and to policymakers who regulate depository institutions.

We initially summarize recent academic literature that tries to identify the unique aspects of community banking. In doing so, we distinguish between *relationship banking*, which we associate with community banks, and *transactional banking*,

1. Beginning in March 2004, the FFIEC selects peer group banks in the following asset size categories: less than $50 million, $50 million to $100 million, $100 million to $300 million, $300 million to $1 billion, $1 billion to $3 billion, and all banks above $3 billion.

2. Federal Reserve Bank surveys consistently show that large banking organizations charge higher fees than community banks do and have increased their fees more over time (see Hannan 2002). Berger and Udell (2002) and Scott and Dunkelberg (2004) provide evidence that credit service and availability for small business firms is better at community banks than at large banks.

3. Berger and Mester (2003) and Allen, McAndrews, and Strahan (2002) provide discussions on technological change and banking.

4. DeYoung and Hasan (1998) and DeYoung (1999) discuss and present evidence on de novo banks.

5. Yeager (2004) provides evidence that the geographic concentration risk that community banks must bear is not responsible for the declining numbers of community banks in the United States.

6. Information can be differentiated as being "hard" or "soft." Hard information consists of easily verifiable facts that can be credibly shared. Soft information consists of the opinions of one individual who knows the person whose information is being evaluated. Many argue that community banks are better equipped to produce soft information than are larger banks. See, for example, Berger and Udell (2002), Scott (2004), and Scott and Dunkelberg (2004).

7. The limit on the number of shareholders was increased from seventy-five to one hundred by the American Jobs Creation Tax Act of 2004.

which we associate with larger banking entities, and discuss the different hierarchies of decision making in the two types of institutions. This line of inquiry suggests that banks of various asset sizes conduct business in very different ways. Community banks, in particular, appear to have quite different strategic orientations. For example, they are afforded unique ways to manage their taxes and appear to rely much less on noninterest income than do the largest banks in the country.

We then examine profit and risk measures for the 1998–2002 period for community banks of different sizes and large banking organizations, thus providing evidence that community banks differ in many ways from their larger banking brethren.[8] Our analysis considers why community banks have different focuses and identifies key factors that are associated with strong financial performance across different strategies.[9]

The Unique Role of Community Banks

This section summarizes recent contributions to the understanding of the unique role that community banks play in financial intermediation and outlines key characteristics of these intermediaries. For years academics have argued that banks exist because significant costs are associated with bringing lenders and borrowers together and some participants do not have sufficient information about counterparties in borrowing arrangements. As financial intermediaries, banks facilitate transactions by reducing costs and increasing the amount of information available. As a result, banks stimulate economic development.

At least two general arguments support the conventional wisdom that community banks cannot adequately compete with larger banking organizations and that further industry consolidation is inevitable. The first relates to the primary function of an intermediary—gathering, collecting, analyzing, and disseminating information. It is generally assumed that larger organizations can more cheaply access valuable information and thus better facilitate transactions. But dramatic advances in technology have made gathering and analyzing information less costly and therefore have reduced the value of an intermediary.[10] The second argument is that economies of scale and scope enable larger banks to reduce costs of providing services. Interestingly, academic research provides conflicting evidence on whether or not significant cost differentials exist for large versus small banks or for banks that offer more product lines than other banks (Berger and Humphrey 1999). As a result, there is little agreement about what size bank or what banking organizational structure provides the greatest efficiency.

Strategic focus: Relationship banking versus transactional banking. Arguments suggesting that large banks will dominate banking assume that all financial intermediaries collect and analyze information in the same way. Some have questioned the validity of this treatment. Sharpe (1990), Diamond (1991), and Rajan (1992), among others, emphasize a distinction between transactional banking and relationship banking, implicitly suggesting that not all intermediation is the same. Transactional banking is primarily the provision of intermediation services, the gathering of deposits and extension of loans. Because these transactional products are highly standardized, they require little human input to manage and involve information that is generally easily available and reliable. Thus, in transactional banking hard information drives performance.

Relationship banking, in contrast, generally involves the use of soft information, which is not readily available or easily quantifiable. Soft information requires more human input and evaluation and is acquired primarily by working one-on-one with the banking customer. For example, lenders obtain soft information through special efforts directed at prospective borrowers. Relationship banking also frequently involves more than facilitating the movement of funds from lenders to borrowers.[11] In

the case of a relationship loan, the lender many times adds real value by providing accounting, business planning, and tax planning expertise. Relationship banking also generally requires localized decision making. Because relationship banking attempts to exploit soft information that is difficult to assess and evaluate, the loan officer must be given the latitude and ability to act on this information without the approval of numerous others. This approach has important implications for the ownership structure of the bank, which we will address shortly.

While all types of lending entail some relational aspects, relationship lending is typically perceived to be the strongest for small businesses, agriculture customers, and retail consumers. Frame, Srinivansan, and Woosley (2001) provide evidence that large banks have increasingly used credit scoring—the process of incorporating hard information as inputs to quantitative models that are used to make accept/reject decisions—to increase their small business lending. Credit scoring is somewhat mechanical and involves less human input, thereby lowering the unit cost of making a loan. To the extent that loans to small businesses, agriculture customers, and individuals can be successfully credit scored over time, community banks will face increasing competition in their loan portfolios because they may not be able to compete with larger banks on price. However, the use of credit scoring systems generally does not allow the provision of real value from the banker, as described above.

Large banks have similarly concentrated decision making among fewer entities, with credit approval from analysts far removed from the borrower. In turn, large banks offer the most attractive rates to their most profitable customers as determined by comprehensive customer profitability models that often incorporate both business and personal account information. Less profitable customers often are given access to a reduced level of service and pay higher fees and rates. Many customers do not need or want a broad array of credit, deposit, insurance, and trust services from their bank. They value the intimate knowledge their banker has of their business and/or total relationship and prefer dealing consistently with the same individuals whom they do not have to frequently reeducate about their own unique financial and business situations. Such customers are consequently willing to pay relatively more for such service. Relationship lending thus provides a niche for community institutions that many large banks find less attractive or are less capable of providing (see Berger and Udell 1995, 2002; Scott and Dunkelberg 2004).

In many smaller companies, financial statements are not standardized and management lacks the financial expertise needed to be a direct participant in the financial

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8. Even community banks can differ from each other in strategic focus. For example, a later discussion distinguishes between community banks that focus on the deposit side of the balance sheet and those that focus on the lending side.

9. Although this article does not directly address the future of community banking, the issue is obviously related to our investigation. For those interested in this issue, see DeYoung (2003), which provides a summary of the 2003 Federal Reserve Bank of Chicago Research Conference "Whither the Community Bank?" Many conference participants were surprisingly upbeat about the future of community banking, an inference consistent with the arguments expressed in this article.

10. Petersen and Rajan (2002), for example, provide evidence that small businesses are now better able to borrow from more physically distant lenders than they were in the past.

11. DeYoung, Hunter, and Udell (2003) discuss relationship lending from the perspective of bankers having access to soft information acquired through personal contact with the borrower. While we do not disagree that this element is important to relationship banking at community banks, our definition is broader, emphasizing that the lender may be additionally providing value associated with tax, accounting, and other expertise as well as funds.

markets. By definition, lenders to these companies need to evaluate soft information in making a credit decision. Banks may also aggressively market or cross-sell noncredit products and services to such customers in order to lock in or enhance the relationship. The familiarity between borrower and lender and the convenience of completing transactions without beginning the information search anew encourages both the bank and customer to maintain the relationship over time.

Relationship lending and bank asset size. The typical bank engages in both types of lending—transactional and relationship—because the two types are not necessarily substitutes for each other. Still, large commercial banks are likely to be more transaction oriented while smaller, community banks are more relationship focused. Berger and Udell (2002) argue that banks offering relationship lending must delegate more lending authority to their loan officers than do banks that focus on transactional lending and that small banks are better able to resolve problems associated with delegating authority than large banks are. Thus, small community banks are better equipped to engage in relationship lending than large banks are. Transactional banking is generally associated with economies of scale because unit costs fall with increasing bank size. If all a bank does is provide funds for borrowers, spreading fixed costs over more borrowers is likely to result in a lower cost per customer. Hence, larger banks are more attracted to credit scoring and loan securitizations (see Pilloff and Rhoades 2000). Because any asset with standardized features can be credit scored and securitized, large banks likely securitize a greater portion of their loans and leases than smaller banks do. Investors can examine the pooled assets' credit scores to assess risk and readily establish prices for these standardized instruments to generate reasonable risk-adjusted returns. Thus, to the extent that more economies of scale and scope exist in transactional banking, larger banks can be expected to focus more on transactional banking, which, in turn, is likely to result in continued consolidation in the banking industry.

Relationship deposit gathering. In addition to relationship lending, many community banks attempt to build and exploit deposit relationships. (See the sidebar on page 21 for a comparison of deposit-driven and loan-driven banks.) Such efforts help differentiate their services from those of larger institutions. On the other hand, many large banks have tried to eliminate much of the human touch in banking in an effort to minimize transaction costs. The unit costs associated with ATM usage, telephone banking, and Internet banking are well below those for live teller transactions. At many large banks, customers who open new deposit accounts can often receive reduced minimum balance requirements or lower service charges if they agree to conduct business electronically rather than physically enter a bank office. The banks are attempting to attract customers to the lowest-cost delivery systems via lower prices. In contrast, community banks conduct more business via human interaction at higher unit cost. Thus, we would expect to see that large banks have less by way of core deposits and pay more explicit interest on deposits, on average.

According to these arguments, there is little reason to expect greater cost advantages resulting from increased institution size in relationship banking, which is much more likely to be niche driven. If a bank is providing value to a borrower beyond basic credit services, the customer will be willing to pay for the service. Community banks that provide relationship banking services are more likely to find profit-making opportunities regardless of their asset size because competition for these services is likely to be limited.[12]

The relative importance of interest income and noninterest income. Another important distinction between a community bank and other banks relates to

Deposit-Driven versus Loan-Driven Community Banks

Community banks' strategic objectives are greatly influenced by ownership structure and the geographic markets in which the banks compete. In particular, some community banks focus on building franchise value via deposits. Many are family-owned and managed and do not want to take on high credit risk for fear of losing the implicit annuity associated with a steady stream of earnings. Other such banks operate in geographic markets with limited growth opportunities, such as rural communities with a declining population and no local business expansion, and are unwilling to take the risks associated with growth outside their core trade area. Regardless of the motivating force, such deposit-driven banks typically operate with high ratios of core deposits to assets and low ratios of loans to assets. While their average cost of funds is low, the average asset yield is also low given the relatively heavy reliance on securities. The net interest margin is generally lower but more stable over time while noninterest expense is low as a fraction of assets.

In contrast, other community banks build franchise value primarily on the lending side of the business. Loans typically offer the highest promised yields before taxes and expenses, and managers can increase profits faster by increasing credit exposure. Such banks either operate in high growth markets or are willing to expand operations via branching, de novo entry, or acquisition. Such loan-driven banks operate with high ratios of loans to assets and low ratios of core deposits to assets because they rely proportionately more on purchased liabilities to fund loan growth. Access to Federal Home Loan Bank advances has allowed these banks to continue growing rather than restricting growth to the pace of core deposit growth. Net interest margins are typically greater, as is noninterest expense as a fraction of assets. These banks further differentiate themselves by the loans that management emphasizes. Clearly, banks that lend primarily to small commercial businesses differ from those that deal primarily with agriculture borrowers or mortgage customers.

the relative importance of different sources of revenue. With their emphasis on relationship banking, community banks are expected to have relatively larger net interest margins because their loan customers are willing to pay higher interest rates to obtain nonstandardized credits and their depositors are willing to accept lower explicit interest rates, on average, because of the personal touch. Large banks that do little relationship lending will have smaller margins because proportionately more of their assets and liabilities are priced like commodities.

DeYoung and Rice (2004) show that large banks generate proportionately more noninterest income as a fraction of operating revenue than smaller community banks do. Greater noninterest income reflects two phenomena. First, fees are tied closely to transactions activity. Banks that make and then securitize loans generate fee income. For large transaction-oriented banks, noninterest income is often a more important source of revenue than interest income. Second, operating with reduced (relative) credit exposure frees up capital to invest in nontraditional, fee-based businesses. Many large banks have diversified their operations from traditional lending toward insurance and investment banking, which generate fee income rather than net interest income. DeYoung and Rice provide evidence that community banks that have tried to generate more noninterest income have encountered more volatile

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12. We recognize that focusing on asset size ignores off-balance-sheet commitments and exposures, but we continue the tradition in the banking literature of using asset size as the benchmark of economic/financial size. See Clark and Siems (2002) for a detailed examination of such off-balance-sheet activities and the impact of evidence regarding efficiencies or inefficiencies in banking.

earnings and, in fact, have found a poor risk-return trade-off in developing many of these lines of business. This evidence suggests that large, transaction-oriented banks are more capable of generating noninterest income than are smaller community banks. Moreover, a smaller community bank may be doing shareholders a disservice in trying to generate this type of business.

Ownership differences. Most small bank stock is privately held rather than publicly traded while large bank stock is generally publicly traded. Thus, the ownership of small banks is more concentrated in the hands of fewer stockholders while the ownership of large banks is widely dispersed. In addition, ownership is more concentrated at small banks, and owners are more actively involved in managing the banks. For example, Brickley, Linck, and Smith (2003) show that small bank ownership in Texas is much more concentrated than it is for large banks: Officers and directors of small banks owned roughly two-thirds of their banks' stock while the officers and directors of the large banks in their sample owned only about one-quarter of the stock.

Community banks appear to differ in their emphasis on human-aided transactions on the lending and deposit side, in their interest versus noninterest income sources, and in their ownership structure as well as possible tax differences.

The fact that local decision makers in small banks own relatively more stock in the banks and are more actively involved in the banks' management mitigates agency problems. Brickley, Linck, and Smith argue that this setup allows smaller banks to grant local managers more decision authority. Allowing the person who acquires soft information on a borrower to act upon the information makes it easier for smaller banks to engage in relationship lending. This line of reasoning is similar to that of Berger and Udell (2002), who argue that stockholders in large banks, who are more dispersed and not local, are less willing to grant decision-making authority to local managers and prefer instead to use more bureaucratic rules for decision making.

Tax differences. A final distinction among community banks is their federal income tax status. In 1996 Congress passed the Small Business Job Protection Act, which allowed insured banks to choose to be taxed as S corporations effective in 1997. Because S corporations do not pay federal corporate income taxes, income is transferred directly to stockholders with significant tax savings. For tax purposes, S corporations are treated as partnerships, with income allocated to stockholders based on the number of shares held. To qualify for Subchapter S status, a bank must be headquartered in the United States and cannot have more than seventy-five stockholders (recently increased to one hundred shareholders in 2004), and each stockholder must be an individual, an estate, a qualified plan, or a specific type of tax-exempt organization. Nonresident aliens cannot be stockholders in Sub S banks. In addition, each bank can have only one class of stock and cannot use the reserve method for accounting for loan losses.

The Subchapter S status effectively allows the corporation to transfer all income for federal tax purposes to shareholders and have no income tax obligation itself. However, because the act limits the number of shareholders to seventy-five or less, not all banks choose this unique tax status. As we have seen, large banks are generally publicly traded with numerous shareholders and thus are precluded from selecting Subchapter S status. Community banks have far more concentrated ownership and therefore have greater flexibility in selecting Subchapter S status. Through March 2004, 2,137 FDIC-insured banks had selected Subchapter S status. Indeed, approximately 20 percent of all banks with less than $100 million in assets have selected Subchapter S status. On the other hand, less than 2 percent of all banks with more than $1 billion in assets have done so.

Table 1

The Relationship between Mergers and New Charters: Commercial Banks and Savings Banks

	1997	1998	1999	2000	2001	2002	2003
New charters	199	217	268	223	145	94	119
Mergers	725	671	497	535	421	336	275
Percent of new charters to mergers	27.5	32.3	53.9	41.7	34.4	28.0	43.3

Source: FDIC, *Quarterly Banking Profile*, 1997–2003

The choice of Sub S status imposes specific constraints on a bank's operating strategy. Specifically, with only seventy-five shareholders, Sub S banks generally have limited access to new capital. To fund growth, they must rely on retained earnings and external capital raised via new equity offerings to existing stockholders or use trust-preferred stock offerings. Each source of new capital is limited over time and thus potentially constrains growth opportunities. Eventually, growth constraints may lead to different risk and return profiles.

Summary of the uniqueness of community banks. Much evidence suggests that community banks do business in ways that are very different from those of larger banking institutions. Community banks appear to differ in their emphasis on human-aided transactions on the lending and deposit side, in their interest versus noninterest income sources, and in their ownership structure as well as possible tax differences. The distinction between transactional banking and relationship banking might explain why academic studies find conflicting evidence on the existence of significant economies of scale in banking and why some bankers appear to think there are significant size advantages while others do not see much advantage due to increased size. If, as we have argued, transactional banking results in cost savings as bank size increases but relationship banking does not, we would expect to find some evidence of cost efficiencies in the first but not the latter. This distinction might also explain why some bankers anticipate great benefits from consolidation while others spend considerable energy and resources starting up de novo banks. The data in Table 1 indicate that, during the merger mania of the late 1990s, the relationship between mergers and de novo formations has been fairly steady, averaging about three mergers for every start-up bank over the last seven years. We contend that larger banks, especially those more interested in mergers, are likely focused relatively more on transactional banking and that smaller banks, such as de novo banks, are likely focused relatively more on relationship banking.

Unfortunately, information regarding the banking industry does not readily distinguish between these two strategic pursuits. In the following analysis, we analyze key performance ratios using data from the 1998–2002 period and present evidence consistent with our distinction between relationship banking and transactional banking. We essentially assume that community banks, being smaller in asset size, represent relationship banking and larger banks represent transactional banking.

Examining Differences between Community Banks and Larger Banks

In the following analysis, we compare key financial ratios characterizing aggregate profitability and risk across different-sized banks. Specifically, we examine key ratios for commercial banks across different asset size categories for the period 1998–2002 period. We consider a five-year period to assure that our findings are not driven by cyclical events. The fact that the 1998–2002 period includes both economic expansion

Table 2

Sample Banks by Size, Tax Status, and Loan-to-Asset Ratio:
1998–2002, Millions of Dollars

	<$100M	$100M–$300M	$300M–$500M	$500M–$1B	$1B–$10B	>$10B
Total	4,810	2,329	473	317	320	78
Sub S	1,037	333	38	22	6	0
Non-Sub S	3,773	1,996	435	295	314	78
Loan-driven (percent)	50.80	64.50	69.30	69.40	64.10	69.20
Sub S	529	212	31	15	5	0
Non-Sub S	1,914	1,290	297	205	200	54
Deposit-driven (percent)	49.20	35.50	30.70	30.60	35.90	30.80
Sub S	508	121	7	7	1	0
Non-Sub S	1,859	706	138	90	114	24

Source: BankSearch; Sheshunoff Information Services Inc.

and contraction is reassuring on this point. The data examined are for all FDIC-insured commercial banks and thrifts in operation during the year in question. The data are from Sheshunoff Information Services Inc., BankSearch, and the Federal Deposit Insurance Corporation (FDIC) (www.fdic.gov).

We distinguish between banks across six asset-size categories: those with assets of less than $100 million, $100 million to $300 million, $300 million to $500 million, $500 million to $1 billion, $1 billion to $10 billion, and more than $10 billion.[13] The general demarcation for community banks is $1 billion in asset size, but we provide finer detail to further expand comparisons. To underscore tax-related differences, we separate banks that chose Subchapter S status from those taxed as C corporations on a year-by-year basis. Finally, we further distinguish loan-driven banks from deposit-driven banks according to each bank's average loan-to-asset ratio. Specifically, banks with an average loan-to-asset ratio of at least 60 percent, the approximate median in each year, are designated as loan-driven banks with all other banks designated as deposit-driven.[14]

Table 2 documents the number of banks that fall within each category. The greatest number of banks had under $100 million in assets, and most banks paid taxes as C corporations. Fewer than eighty banks had more than $10 billion in assets, and none claimed Subchapter S tax status. Not surprisingly, given the restrictions on the number of shareholders, the smaller the bank, the greater the proportion of banks that selected Sub S status. For the smallest asset size grouping, more than 20 percent of the banks in the sample were classified as Sub S as opposed to C corporations. Similarly, as asset size increases up to $1 billion, an increasing proportion of banks were loan-driven. Thus, there are only fifteen deposit-driven banks in our sample that are Subchapter S and have more than $300 million in assets. We provide medians for certain ratios in these six asset-size groupings. Readers should be aware that some of these medians are determined for a small number of banks, especially for Subchapter S banks with asset size greater than $500 million.

In the following analysis, we initially calculate an average value for each ratio for each bank in the sample over the five years. We report median values of these average ratios in order to minimize the impact of data outliers.[15]

Key Performance and Risk Measures across Banks of Different Asset Sizes

Analysts have long recognized that fundamental differences exist between the operating profiles of community banks and large banking organizations. In terms of funding sources, small banks rely proportionately more on core deposits while large banks rely more on purchased liabilities. Small banks, in turn, make loans primarily to small businesses, consumers, and agriculture customers and are more dependent on net interest margin while large banks generally emphasize large commercial customers, large-volume credit card and indirect consumer lending, and international customers (emphasizing transactional banking). Finally, the largest banks typically structure operations around lines of business, emphasizing noncredit products and services that generate fee income. Community banks get the bulk of their noninterest income from deposit service charges and have little noninterest income from other sources. The purpose of this section is to document some of the more important differences between banks of different asset size.

Banks that follow different operating strategies have fundamentally different profitability and risk profiles, on average. The following analysis initially documents key differences in aggregate profitability measures between community banks with less than $1 billion in assets and larger banks and among community banks of different asset sizes. Throughout the analysis, we separate Subchapter S banks from non-Subchapter S banks because of differences in tax treatment and the possibility that growth constraints might alter a Subchapter S bank's tolerance for risk. We then examine select risk ratios to assess the risk bearing done by the various banking institutions.

Aggregate profitability: Return on assets and return on equity. Figures 1 and 2 present the respective median returns on equity (ROEs) and returns on assets (ROAs) for the different categories of banks. Loan-driven banks are banks with an average loan-to-asset ratio of at least 60 percent, the approximate median in each year, while all other banks are designated as deposit-driven.

Three important observations relate to the patterns of ROEs among banks in Figure 3. First, within each asset-size category, Subchapter S banks have greater ROEs than their corresponding C corporate institutions.[16] This result is not surprising because Subchapter S corporations have no direct tax obligations, so their net income should be higher, ceteris paribus. While the result is not surprising, it does caution against looking at all banks together, regardless of their corporate structure. To the extent that smaller banks have a greater proportion of Subchapter S structures, ROEs for small banks would be artificially inflated if one did not distinguish between C corporate and Subchapter S banks. For the smallest size category, C corporate banks

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13. Another important distinction among commercial banks is whether or not they operate in metropolitan areas. In our analysis we do not distinguish banks on this difference not because we do not believe that this distinction is important but because we found it expedient to narrow the focus of attention. We have some preliminary evidence that banks have different performance and risk characteristics depending upon whether or not they operate in a metropolitan area. We would be happy to provide this evidence to interested readers upon request.

14. Because our analysis is primarily focused on banks with different operating strategies, determined by various asset sizes, the 60 percent loan-to-asset ratio was selected for the full sample of banks, not for a particular size category.

15. The use of medians eliminates distortions caused by extreme values. For example, Merrill Lynch Bank reports substantial loans but virtually no deposits. Its loan-to-deposit ratio is thus large, inflating the average ratio for the sample of similar-sized banks.

16. We make no distinction as to whether or not the differences in ratios are statistically significant, preferring to focus on relative and economic values.
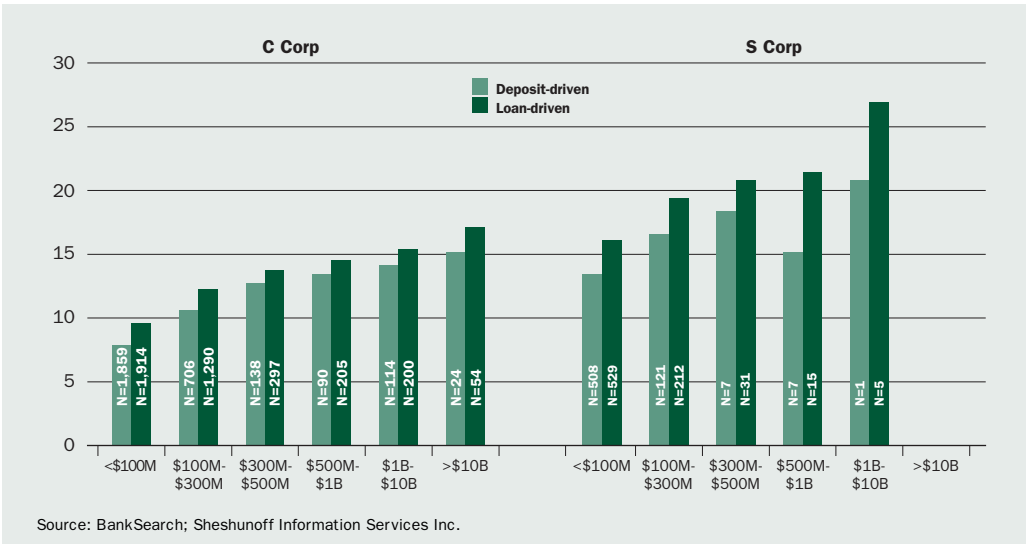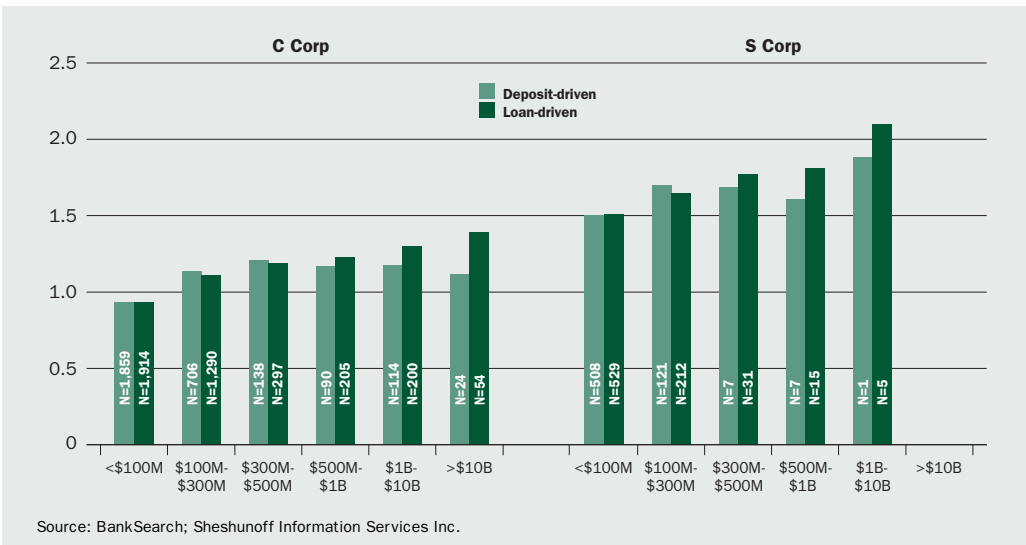
Figure 1
Return on Average Equity, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.

Figure 2
Return on Average Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.

have median ROEs less than 10 percent while Subchapter S banks have ROEs closer to 15 percent. Importantly, the peer groups formed by the FFIEC in comparing banks under the Uniform Bank Performance Report do not distinguish banks by tax status but lump all banks together regardless of tax status. Second, ROE generally increases with asset size. Thus, we see the incentive to grow asset size regardless of corporate structure. Third, loan-driven banks appear to have higher ROEs than those of deposit-driven banks when corporate structure and asset size are controlled for.

Figure 3
Total Equity Capital to Average Total Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
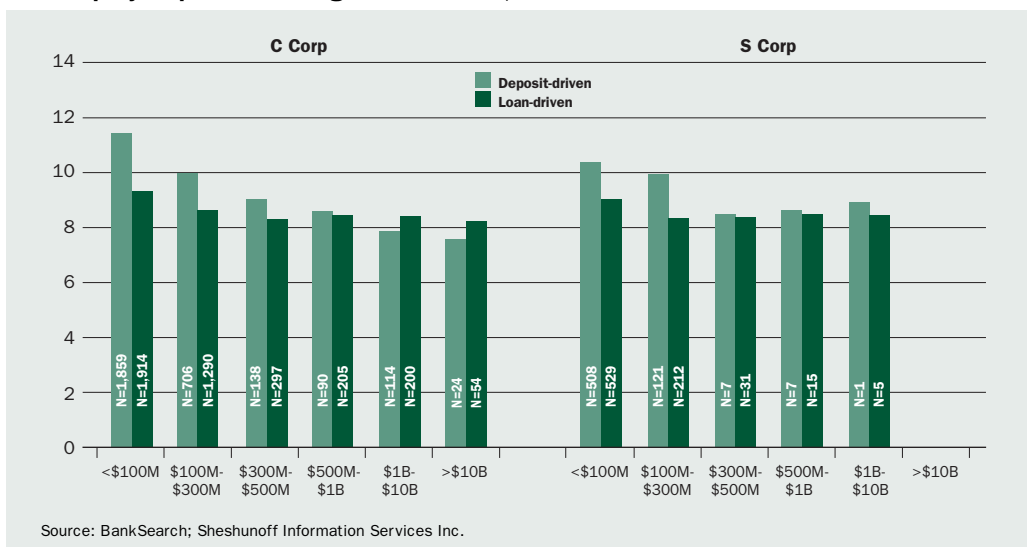
All in all, the data in Figure 1 suggest that not all banks perform similarly in terms of ROE. Analysts would be best served by distinguishing banks in terms of their corporate structure, asset size, and loan-driven versus deposit-driven strategic focuses. Moreover, the evidence suggests that the smaller banks in the sample might be viewed as operating somewhat at a competitive disadvantage because their ROEs are relatively small. However, we question this view as we examine further differences.

Not all of the patterns observed regarding ROE carry over to ROA, as Figure 2 shows. But one pattern as related to corporate structure differences is consistent. Specifically, Subchapter S banks continue to have higher ROAs than their C corporate counterparts as the tax differences continue to have a significant effect. Still, the other patterns in Figure 1 are not as strong. For example, asset size does not appear as strong in driving ROA higher. While there is a general tendency for ROA to rise with asset size, controlling for other factors, the positive association is not universal. For example, for deposit-driven banks, the largest asset category does not have the largest ROA. Also, loan-driven banks no longer dominate in terms of ROA performance over deposit-driven banks. In fact, Figure 2 shows several cases in which the median ROA for deposit-driven banks exceeds the median for comparable loan-driven banks.

Financial leverage. It is important to remember that ROE reflects both the ability to generate a return on invested assets (ROA) and the use of financial leverage. The latter is determined by the comparative amounts of debt and equity financing in a bank's capital structure and is characterized by the firm's equity multiplier (EM). Note that

$$ROE = ROA \times EM,$$

where ROE is equal to net income/total (average) stockholders' equity, ROA is equal to net income/total (average) assets, and EM is equal to total (average) assets/total (average) stockholders' equity.

Figure 4
Net Interest Margin to Average Total Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
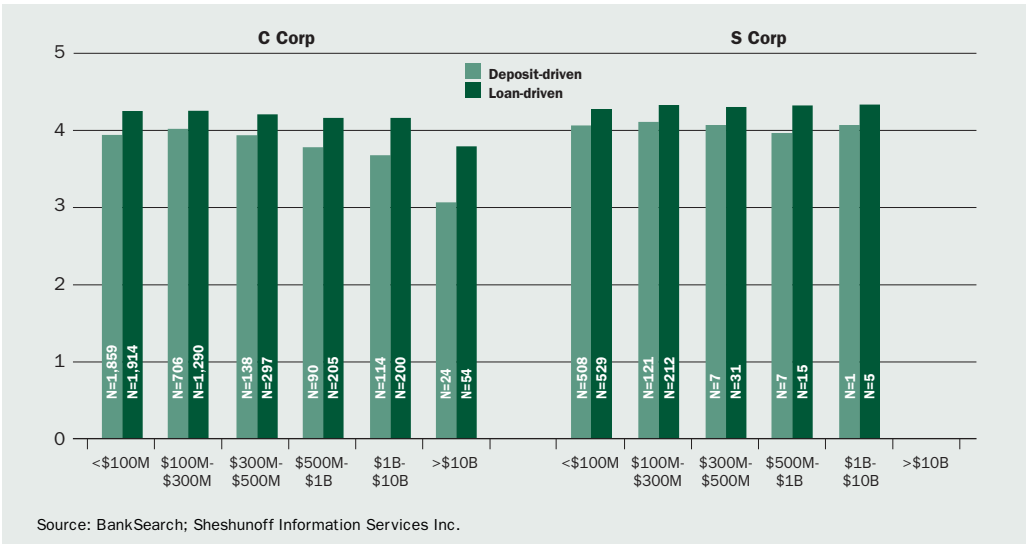
Median equity-to-asset (leverage) ratios, the inverse of EM, for our various bank classifications appear in Figure 3. For C Corp banks, the equity ratio generally declines consistently with asset size, indicating that the associated EM increases with size. Thus, the larger the bank is, the greater the multiplier effect of financial leverage on ROE. Smaller banks operate with the highest ratio of equity capital to total assets, possibly reflecting their limited diversification and ownership structure more closely tied to family-owned institutions. The lower leverage, in turn, partially explains why aggregate ROEs are lower, ceteris paribus, for community banks than for larger banks. In other words, the lower ROEs observed for smaller banks appear due in part to the desire to employ relatively less financial leverage. Smaller banks appear to prefer less risk and pay for this with slightly lower ROEs. There is no evidence, however, to indicate that this trade-off accepted by small banks is inferior to the trade-off taken by their larger brethren. Carter, McNulty, and Verbrugge (2004) find evidence that smaller banks earn greater risk-adjusted yields than do larger banks. These results suggest that the lack of credit diversification is not a serious handicap for community banks and that these banks might be better equipped to make good lending choices because they have an information advantage relative to the larger banks.

Importantly, the difference in leverage is large for deposit-driven banks but much lower for different-sized loan-driven banks. While small loan-driven banks still report the highest equity-to-asset ratios, these ratios are only modestly higher than those for larger banks. Sub S banks with assets between $300 million and $500 million reported the lowest equity-to-asset ratios and thus the highest EMs among such tax-advantaged banks.

Net interest margin. Figure 4 documents differences in median net interest margins (NIMs), net interest income divided by earning assets, across banks in different size categories based on tax status and whether they are loan driven or deposit driven.[17] Two strong relationships are evident. First, from 1998 to 2002, net interest margin medians for loan-driven banks always exceeded the medians for deposit-driven banks, regardless of size and tax status. The greater NIM for loan-driven banks is not surprising given that

Figure 5
Core Deposits to Average Total Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
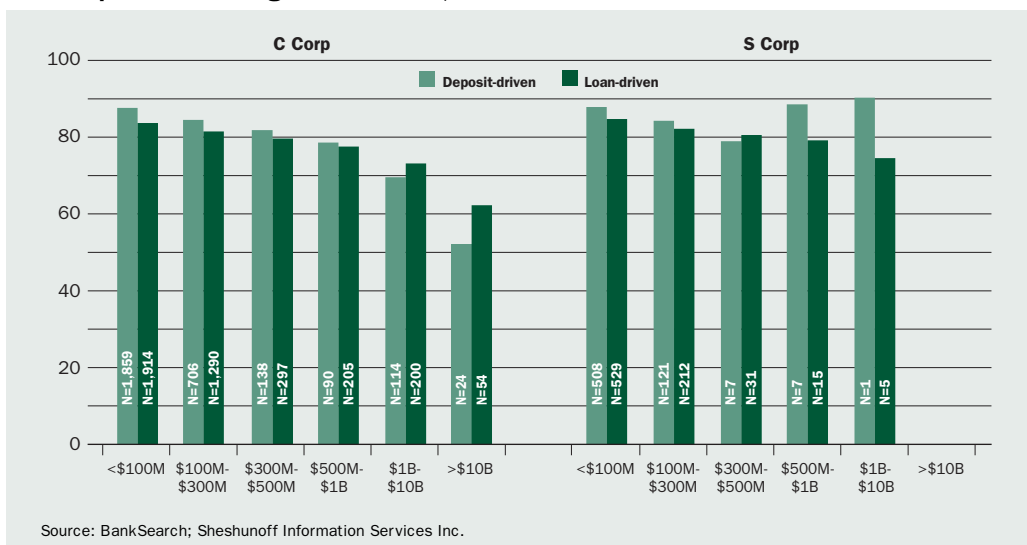
loans carry higher promised yields and banks with greater holdings of loans should operate with higher margins (provisions for loan losses). Over the sample period, loan-driven banks reported median loan-to-asset ratios near 70 percent while deposit-driven banks reported medians around 49 percent. The cumulative NIM effect is partially offset by the lower average cost of funds associated with deposit-driven banks' greater funding from core deposits (evidence of this point is provided below). Thus, the differences in NIMs are lower for the smallest banks and increase with size.

Second, the median NIMs are virtually the same for all Subchapter S banks, regardless of size, while NIM falls with size for C Corp banks. The decline for C Corp banks is particularly dramatic for deposit-driven banks with more than $500 million in assets and loan-driven banks with more than $10 billion in assets. For example, the median NIM is 30–40 basis points lower for the largest loan-driven C Corp banks and almost 60 basis points lower for the largest deposit-driven banks compared with all smaller banks. Thus, in sharp contrast to the strong asset size effect seen on ROE, NIM ratios show little evidence that smaller community banks are disadvantaged. In fact, there is some evidence that smaller community banks have higher NIMs than their larger brethren, an observation consistent with the view that smaller banks are more likely engaged in relationship lending, which provides them a niche to operate with relatively larger margins.

One factor that drives NIM is the reliance on core deposits, which are not as rate-sensitive as other funding sources. Medians for core deposits-to-assets ratios, shown in Figure 5, reveal dramatic differences. First, note the sharp drop in the ratio for C Corp banks as asset size increases. Not surprisingly, core deposits make up 20 percent to 40 percent less of funding for the largest banks than for smaller loan-driven and deposit-driven banks. The difference in average funding costs also increases with

17. Net interest margin (NIM) is defined as interest income minus interest expense as a fraction of earning assets. Interest spread is measured as the average yield on earning assets minus the average interest cost of interest-bearing liabilities. NIM will increase relative to the spread as a bank obtains proportionately more funding from non-interest-bearing sources of funds, ceteris paribus.

Figure 6
Total Noninterest Income to Average Total Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.

bank size, suggesting that community banks are also more engaged in relationship deposit gathering than their larger bank counterparts. Second, note that core deposits are generally higher for Subchapter S banks of similar size compared with C Corp banks. A critical component of Subchapter S banks' financial success is the strong reliance on cheap, stable core deposits. Finally, note that core deposits contribute proportionately more to the funding of Subchapter S banks with more than $1 billion in assets—admittedly a very small group, with only six banks in our sample—than they do in smaller banks.[18]

A key difference in aggregate net interest income thus appears to be attributable to the deposit mix. The same general relationship holds for the interest spread, which is not reported. This evidence is consistent with our argument that small banks are more involved in relationship banking.

Noninterest income and noninterest expense. In addition to net interest income, another driver of profitability is a bank's ability to generate noninterest income while controlling noninterest expense. Figure 6 demonstrates that the median values of noninterest income as a fraction of total assets increase with size for C Corps, with a dramatic jump occurring for banks with more than $10 billion in assets. It would appear that the largest banks in the country are relying on noninterest income much more than the community banks are. For C Corps, loan-driven banks generate slightly higher fees relative to assets except for the largest banks. No clear size relationship is evident at Subchapter S banks. Noninterest income increases with asset size up to $500 million and then decreases except for deposit-driven banks with $1 billion to $10 billion in assets, which reported a sharply higher median ratio.

The pattern for noninterest (overhead) expense as a fraction of assets in Figure 7 appears to be quite stable for C Corps. As expected, loan-driven banks report consistently higher ratios compared with deposit-driven banks. Higher ratios reflect the higher cost of loan officers and loan administration expense. The ratio is high for the smallest banks versus other community banks with less than $1 billion in assets and increases modestly with size for banks with more than $100 million in assets. C Corp

Figure 7
Total Overhead Expenses to Average Total Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
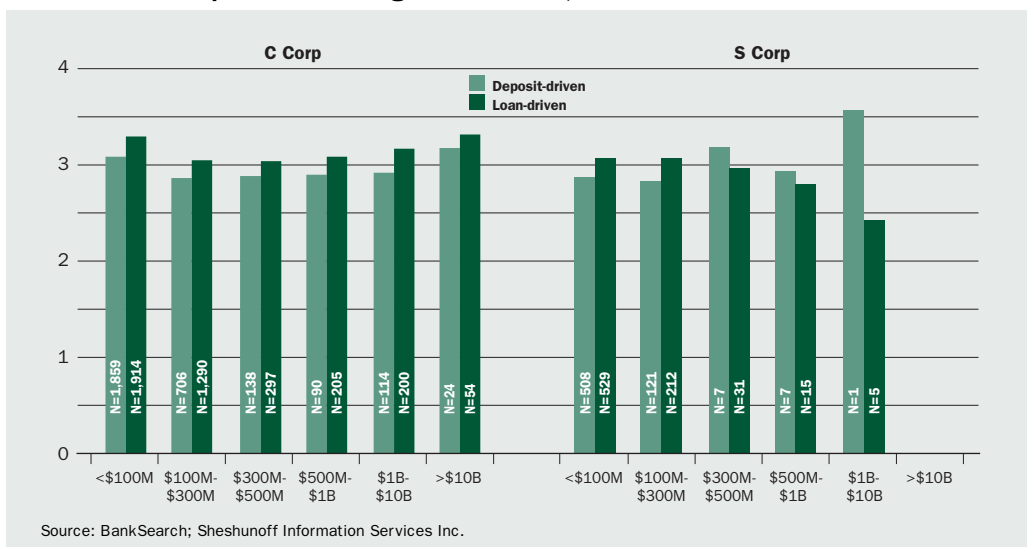
banks with assets over $10 billion reported higher overhead costs relative to assets versus all community banks. Thus, community banks seem to benefit relative to larger banks from lower overhead costs in apparent contradiction of scale and scope economies. Of course, this comparison ignores the linkage between overhead costs and noninterest income.

Interestingly, the ratio of noninterest expense to assets declines with size for Subchapter S banks that are loan driven but generally increases with size for deposit-driven banks. The ratio likely reflects the cost of operating branch networks, which increases with the number of bank branches and offices. Importantly, community banks with under $1 billion in assets benefit from lower overhead costs, on average.

Efficiency ratio. Figure 8 illustrates the effects of combining noninterest expense with the ability to generate net operating revenue, defined as net interest income plus noninterest income, in the reported efficiency ratio. This ratio shows a robust pattern for loan-driven banks. It is highest for the smallest banks and declines with bank asset size regardless of tax status.[19] Large loan-driven Subchapter S banks with more than $1 billion in assets have a median efficiency ratio around 45 percent— far below that of all other banks. For deposit-driven C Corp banks, the efficiency ratio exhibits a U-shaped pattern, initially falling for community banks as size exceeds $100 million in assets. The efficiency ratio rises beyond the $1 billion benchmark for community banks. The ratio is fairly stable for all deposit-driven Subchapter S banks, ranging from 58 cents to 62 cents per $1 of net operating revenue, regardless of size.

18. It is interesting to note that the business model of some of the largest banks dramatically affects the relationship between core deposits and total assets. For example, Bank of America NA USA in Phoenix, Arizona, has a loan-to-deposit ratio of 127,268 percent while Merrill Lynch B&TC in Plainsboro, New Jersey, has a loan-to-deposit ratio of only 2.81 percent.

19. A bank's efficiency ratio is measured as overhead expense, which includes personnel, occupancy, and other operating costs, as a fraction of net operating revenue, which equals the sum of net interest income and noninterest income.

Figure 8
Efficiency Ratio, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
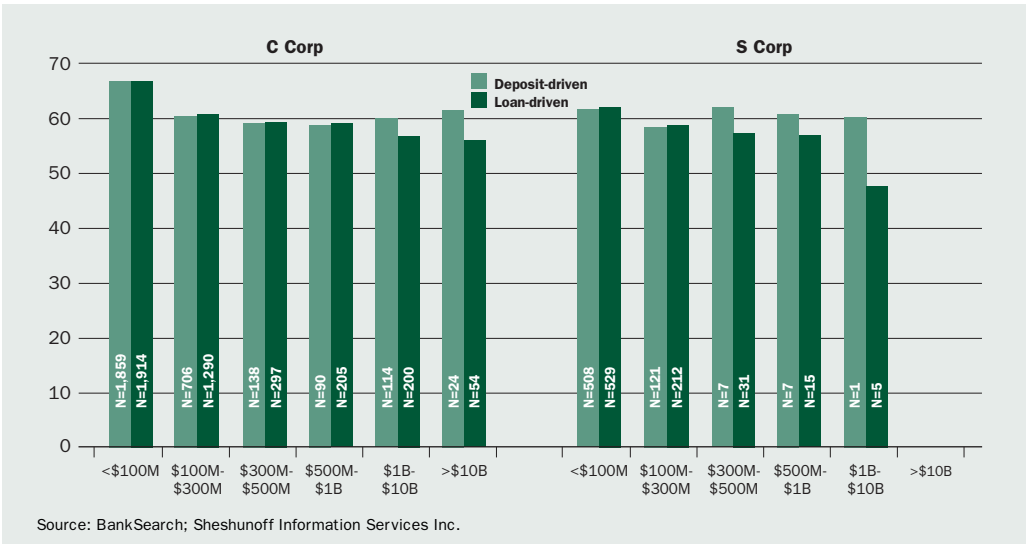
Among community banks, loan-driven institutions exhibit higher efficiency ratios than do similar-sized deposit-driven community banks, except for Subchapter S banks with more than $300 million in assets. Thus, community bank efficiency appears to improve with size except for larger Subchapter S banks. Within the smallest-sized category, C Corp banks show the greatest inefficiencies regardless of loan or deposit focus.

Compared with community banks, larger loan-driven banks report lower efficiency ratios, reflecting a greater ability to generate noninterest income, particularly fees associated with nontraditional banking activities. Apparently, deposit-driven large banks do not reap the gains from fee income relative to overhead costs. Median large loan-driven banks pay 2 to 14 cents less per $1 of net operating revenue than community banks do, a pattern that has a substantive impact on these large banks' ROA.

Credit risk measures. A common criticism of community banks is that they have limited geographic diversification, which leads to greater relative credit risk. The following ratios provide some information regarding credit risk exposure, albeit with limited data.

Consider the loan charge-off ratios provided in Figure 9. Even though smaller banks' loan portfolios are less diversified geographically and by industry, this additional risk does not appear in their loan charge-off patterns over the 1998–2002 period. Specifically, for both C and S Corp banks, charge-offs as a fraction of loans increase with size. Clearly, the median values are at relatively low levels, indicating that in relatively good times community banks benefit proportionately more from strong asset quality. The relatively high charge-off rates for the largest banks likely reflect credit card banks and banks with higher proportions of commercial and industrial loans that charge off far more than banks with other asset concentrations. Credit card banks typically use credit-scoring models to "transactionalize" credit card loans. The higher charge-offs may also signify greater risk if larger banks extended more credit to subprime borrowers.[20] The smallest community banks generally do not credit score individual loans and thus are generally more selective in the type of consumer

Figure 9
Net Charge-Offs to Average Loans, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
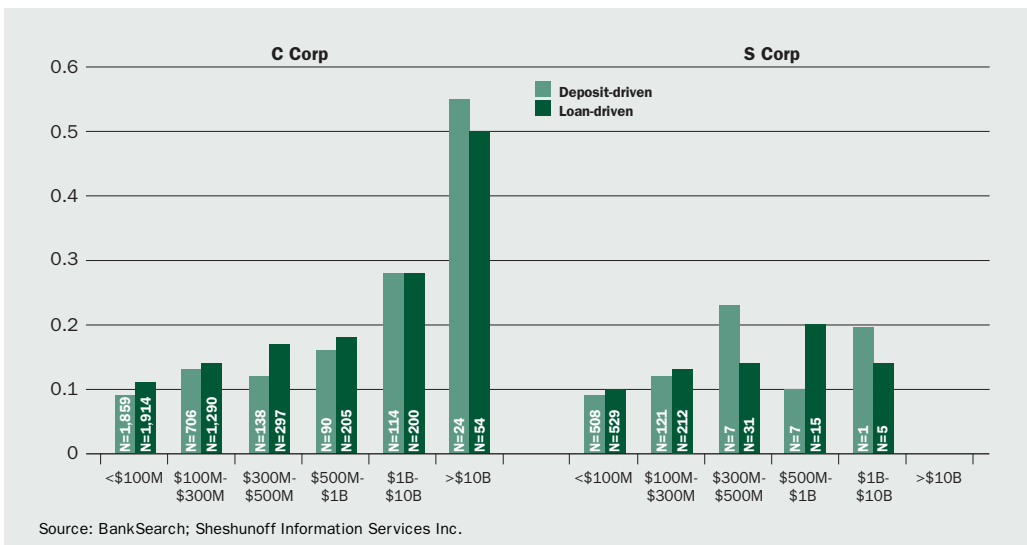
loans they make. Of course, credit card lending makes up a small portion of loan portfolios at most community banks.

The implication of these patterns is that banks of different sizes use different models for success. In addition, the larger equity-capital-to-asset ratios at many small banks suggest that owners and management are less willing to expose the bank to the risk of insolvency even in times of good asset quality. Note the sharply lower charge-off ratios at Subchapter S banks over the period. Generally, these institutions are more closely held and have fewer agency problems. Perhaps for this reason Subchapter S banks have operated with much lower loan losses in recent years.[21]

Noncurrent loans and the loan-loss allowance. Figure 10 reports nonperforming loans across banks. Careful review suggests that deposit-driven and loan-driven community banks (with less than $1 billion in assets) report similar medians over the five-year period. For C Corps, nonperforming loans for community banks are well below those reported by banks with more than $1 billion in assets. Nonperforming loans are similarly a smaller fraction of gross loans at deposit-driven community banks. For Subchapter S banks, medians for nonperforming loans as a fraction of gross loans are comparable to those for C Corps for banks with less than $500 million in assets. However, the seven deposit-driven Subchapter S banks report a higher median ratio versus loan-driven banks with $300 million to $500 million in assets. Deposit-driven Subchapter S banks with more than $500 million in assets report much lower median ratios of nonperforming loans compared with similar-sized loan-driven banks. In fact, only the largest Subchapter S banks, with more than $1 billion in assets, report a high ratio. Thus, community banks have generally experienced better asset quality than

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20. Even with relatively high charge-off rates, credit card banks report the highest average ROAs in recent years, indicating that they appear to have adequately priced the risk of loss. See the FDIC's Web site (www.fdic.gov) for the most recent data.

21. The pattern for loan-loss provisions tracks that for net loan charge-offs across the different categories of banks.

Figure 10
Nonperforming Loans to Gross Loans, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
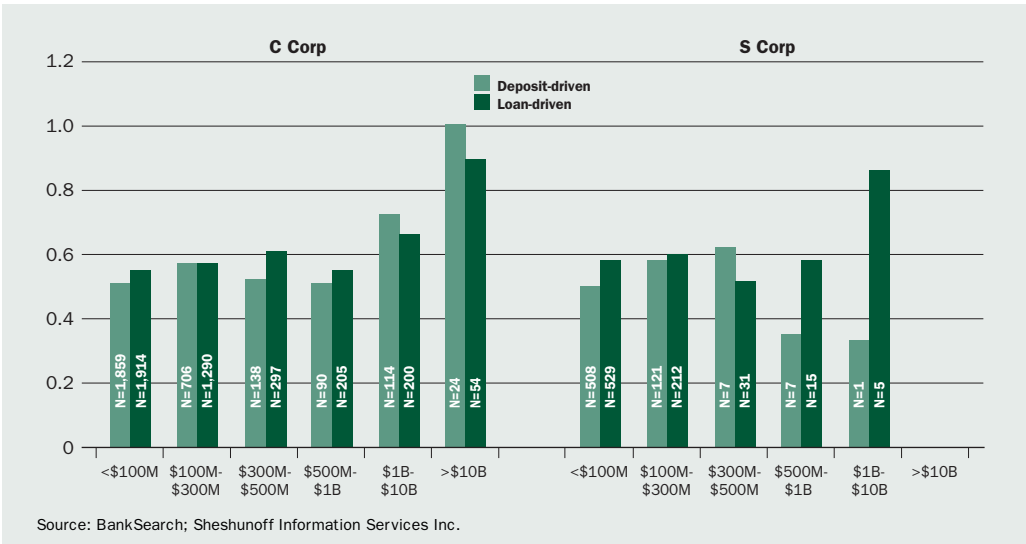
larger banks in recent years, and deposit-driven banks have reported the lowest levels of nonperforming loans.

Data for the median loan-loss reserve as a fraction of nonperforming loans appear in Figure 11. For all categories, the ratio far exceeds 100 percent, indicating that these ratios are at strong levels given historical trends. Still, except for the one Subchapter S deposit-driven bank with more than $1 billion in assets, the largest banks reported lower loss reserve allowance ratios, indicating smaller loan-loss provisions over time relative to charge-offs compared with community banks. The relatively lower provisions, in turn, are consistent with reporting higher ROAs. Interestingly, loan-loss reserve ratios increase with size for loan-driven and deposit-driven C Corp community banks and exhibit the same pattern for Subchapter S banks except for loan-driven banks with more than $500 million in assets. The implication is that the smallest banks realize higher ROAs associated with lower loan-loss provisions over time.

Summary, Conclusions, and Implications

Many individuals view banks as homogeneous financial intermediaries. This article argues that such a view is misleading because the more numerous smaller community banks in the United States operate very differently than larger commercial banks. This research describes recent performance and risk assessment data for FDIC-insured banks across different size categories, different tax structures, and across different asset concentration categories. We find evidence that small banks were generally profitable over recent years. Only the smallest community banks appear to have significant operating inefficiencies. Above the smallest size category, community banks have performed well, in many cases better than the larger banks, in managing their net interest margins.

On the other hand, noninterest income is not as important for community banks, and it is unclear whether the generation of more noninterest income represents as good a risk-return trade-off for all community banks as it does for the larger banks

Figure 11
Loan-Loss Reserve to Nonperforming Assets, 1998–2002

Source: BankSearch; Sheshunoff Information Services Inc.
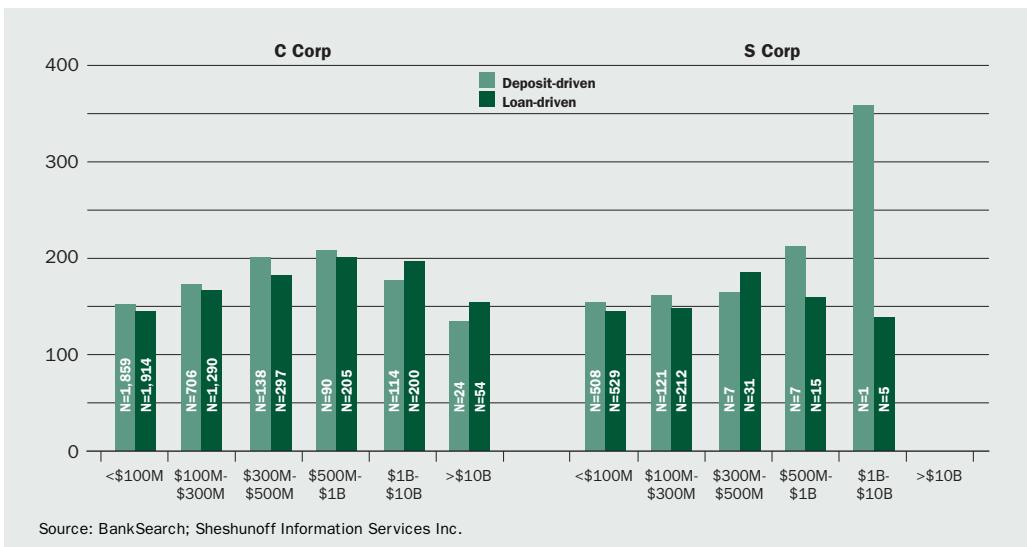
in the country. Smaller banks also generally operate with more equity capital as a funding source, which lowers ROE relatively, and have more core deposits, which increase ROA relatively. Interestingly, credit risk measures also suggest that smaller institutions have managed credit risks at least as well as the largest banks in the United States. The evidence also shows, not surprisingly given the restrictions on the number of shareholders, that community banks are more likely to adopt the Subchapter S tax status that allows an institution to avoid direct federal income taxation and pass tax benefits on to shareholders. These institutions have relatively higher ROEs and ROAs because they pay no direct federal income taxes but pass this obligation on to shareholders.

Many of these observed differences occur primarily because community banks focus relatively more attention on relationship banking while large commercial banks focus more on transactional banking. We emphasize differences in performance and risk bearing based on traditional transactional banking versus relationship banking and generally associate higher interest rate spreads and greater profitability per loan with relationship banking. As commercial banks grow in size, they appear to find it more difficult to maintain an effective relationship focus. Community banks concentrate their efforts on customers with personal loan and deposit relationships that are generally profitable and stable over time. It is this focus that better differentiates strong versus weaker performance.

As of the end of 2002, most community banks were well positioned in terms of profitability and reported limited credit risk exposure. These trends are likely just as strong today. Yet the ability to sustain and improve historical performance will depend on how well managers find valuable relationship lending niches, invest bank capital, and balance asset quality with growth.

REFERENCES

Allen, Franklin, James McAndrews, and Philip Strahan. 2002 E-finance: An introduction. *Journal of Financial Services Research* 22, nos. 1–2:5–27.

Bassett, William F., and Thomas Brady. 2001. The economic performance of small banks, 1985–2000. *Federal Reserve Bulletin* (November): 719–28.

Berger, Allen N. 2003. The economic effects of technological progress: Evidence from the banking industry. *Journal of Money, Credit, and Banking* 35, no. 2:141–76.

Berger, Allen N., and David Humphrey. 1999. Bank scale economies, mergers, concentration, and efficiency: The U.S. experience. University of Pennsylvania Wharton School Working Paper.

Berger, Allen N., and Loretta J. Mester. 2003. Explaining the dramatic changes in performance of U.S. banks: Technological change, deregulation, and dynamic changes in competition. *Journal of Financial Intermediation* 12, no. 1:57–95.

Berger, Allen N., and Gregory F. Udell. 1995. Relationship lending and lines of credit in small firm finance. *Journal of Business* 68, no. 3:351–81.

———. 2002. Small business credit availability and relationship lending: The importance of bank organisational structure. *Economic Journal* 112, no. 477:32–53.

Brickley, James A., James S. Linck, and Clifford W. Smith Jr. 2003. Boundaries of the firm: Evidence from the banking industry. *Journal of Financial Economics* 70, no. 3:351–83.

Carter, David A., James E. McNulty, and James A. Verbrugge. 2004. Do small banks have an advantage in lending? An examination of risk-adjusted yields on business loans at large and small banks. *Journal of Financial Services Research* 25, no. 2 (2004): 233–52.

Clark, Jeffrey A., and Thomas F. Siems. 2002. X-efficiency in banking: Looking beyond the balance sheet. *Journal of Money, Credit, and Banking* 34, no. 4: 987–1013.

DeYoung, Robert. 1999. Birth, growth, and life or death of newly chartered banks. Federal Reserve Bank of Chicago *Economic Perspectives* 23, no. 3:18–35.

———. 2003. Whither the community bank? A conference summary. *Chicago Fed Letter* 189a, May.

DeYoung, Robert, and Iftekhar Hasan. 1998. The performance of de novo commercial banks: A profit efficiency approach. *Journal of Banking and Finance* 22, no. 5:565–87.

DeYoung, Robert, William C. Hunter, and Gregory F. Udell. 2003. The past, present, and probable future for community banks. Federal Reserve Bank of Chicago Working Paper No. 2003-14.

DeYoung, Robert, and Tara Rice. 2004. Noninterest income and financial performance at U.S. commercial banks. *Financial Review* 39, no. 1:101–27.

Diamond, Douglas W. 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of Political Economy* 99, no. 4:689–721.

Federal Deposit Insurance Corporation (FDIC). 2002. *FDIC Quarterly Banking Profile*, fourth quarter.

Frame, W. Scott, Aruna Srinivasan, and Lynn Woosley. 2001. The effect of credit scoring on small-business lending. *Journal of Money, Credit, and Banking* 33, no.3:813–25.

Hannan, Timothy H. 2002. Retail fees of depository institutions, 1997–2001. *Federal Reserve Bulletin* (September): 405–13.

Petersen, Mitchell A., and Raghuram G. Rajan. 2002. Does distance still matter? The information revolution in small business lending. *Journal of Finance* 57, no. 6:2533–70.

Pilloff, Steven, and Stephen Rhoades. 2000. Do large, diversified banking organizations have competitive advantages? *Review of Industrial Organization* 16, no. 3:287–302.

Rajan, Raghuram G. 1992. Insiders and outsiders: The choice between informed and arm's length debt. *Journal of Finance* 47, no. 4:1367–1400.

Scott, Jonathan A. 2004. Small business and the value of community financial institutions. *Journal of Financial Services Research* 25, no. 2:207–30.

Scott, Jonathan A., and William C. Dunkelberg. 2004. A note on small business banking outcomes and community banks. Temple University Working Paper, September.

Sharpe, Steven A. 1990. Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships. *Journal of Finance* 45, no. 4:1069–87.

Yeager, Timothy J. 2004. The demise of community banks? Local economic shocks are not to blame. *Journal of Banking and Finance* 28, no. 9:2135–53.

On the Remitting Patterns of Immigrants: Evidence from Mexican Survey Data

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F or a variety of reasons, a heightened interest in understanding the remitting practices of immigrants has emerged. Banks have come to recognize the untapped potential for business in this burgeoning market. Economists have begun to note that remittance inflows into developing nations are, in many cases, catching up to and exceeding traditional sources of foreign currency earnings, and the research community is exploring the potential impact of immigrants' money flows on the economic development of economies receiving remittances. Likewise, government officials have intensified efforts to control money laundering and other illicit transactions and to bring immigrants' transactions into the formal transfer market. Such tasks would minimize the opportunities for criminals to camouflage their transactions by sharing informal channels traditionally used by immigrants to transfer funds abroad.

In this paper, we summarize and present the basic trends in remittance transfers from Mexican immigrants in the United States to their families in Mexico. While Mexican immigrants are not the only immigrant group with high rates of participation in the remittance transfer markets, Mexicans represent a very large segment of the total foreign-born U.S. population, accounting for about one-third of the 33 million foreign born in the United States (Grieco 2003). A series of large, extensive, and long-standing surveys carefully detail the migration experiences of Mexican immigrants and their subsequent remittance flows, allowing for an in-depth analysis of these migrants and their remitting behavior. Using these data, we track patterns in remittance flows and answer several questions: Who remits? How much and why do they remit? What are the transfer mechanisms used to remit funds? To what extent the behavior of Mexican immigrants can be generalized to other immigrant groups remains an open question. Nonetheless, by carefully detailing the experiences of this large and important immigrant group, we obtain some important insights about remittances that can stimulate discussion and invite further study of this growing phenomenon.

Models of Migration and Immigrant Remitting Patterns

Wage differentials and variations in economic opportunity are likely explanations of many individuals' decision to migrate (LaLonde and Topel 1997). Some migrants relocate with the intention of permanent resettlement while others expect to relocate only temporarily. Some individuals migrate to take advantage of educational opportunities while others seek religious or political freedoms. Still others are prompted to migrate simply to join family members who emigrated in earlier periods. These numerous reasons for migration make it difficult to generalize about this phenomenon.

A companion to the migration decision is the decision of whether or not to remit a portion of one's earnings. Much of the academic literature on remittances strives to peg the motive for remittance flows. Do immigrants' remittances reflect altruistic feelings toward the family left behind? Or are these transfers the result of a coinsurance arrangement with family in the community of origin who strive to smooth consumption by geographically diversifying family earnings? Or are remittances simply the periodic accumulations of target savers who will return home once their "saving for investment" goal is attained? Just as a multitude of motives underlie the migration decision, it is also likely that many different motives exist for remitting. In this respect, the debate over what motivates remittances will probably not be resolved if the overriding goal is to pick one motive to the exclusion of all others. In all likelihood, all the motives for remittances that have been suggested are at play for different subsets of migrants and their families. Remittances may be motivated by altruism, by a desire to smooth family consumption, by a coinsurance scheme, by an investment goal, by a need to repay a debt, or by many other situations.

Economists have begun to note that remittance inflows into developing nations are, in many cases, catching up to and exceeding traditional sources of foreign currency earnings.

While we do not subscribe to the need to fit all migrants' remitting behavior into one model, we also recognize the importance of providing a framework through which one can better analyze, predict, and understand the various circumstances that surround migrants' remitting behavior. To this end, we briefly review the models developed to explain immigrants' international money transfers.

Altruism. One of the most common explanations given for remittance flows in the popular literature is migrants' altruism toward the family left behind (Stark 1991). This framework follows logically from the popular economic view of migration as a quest for higher earnings. Migrants share their bounty with the family that has been left behind. In the altruism model, we can expect remittance flows to respond to economic circumstances in both the host and home countries. If immigrants' earnings rise, or if their home-based families are subjected to income shortfalls, then altruistic payments from the host to the home country are likely to increase. Another implication of the altruism model is that remittances may decay over time. Household ties will weaken over time, diminishing the levels of altruistic transfers taking place.

Consumption smoothing. In the consumption-smoothing model, migration takes place to diversify household earnings (Rosenzweig and Stark 1989). The spreading of household members in a geographic sense allows for the unanticipated income shortfalls in one household to be alleviated by earnings from family jobholders living and working elsewhere. The lower the income correlation across regions, the more likely households are to achieve consumption smoothing. In both the altruism and consumption-smoothing models, increased flows of remittances are expected as a by-product of negative income shocks in the home community.

Target saving. Some individuals migrate to accumulate financial assets to make a specific investment or purchase. For example, a migrant might desire to set up a small business, to purchase a plot of land for farming, or to construct a house. An individual's ability to accumulate the required savings to undertake these relatively large purchases is limited unless he or she migrates to an area with high-paying jobs. Target savers are likely to be short-term or temporary immigrants. They are less apt to make investments in the host community, and they are frugal in their consumption, instead remitting and carrying large sums home (Ahlburg and Brown 1998; Glytsos 1997).

Insurance. In some cases individuals migrate with the intention of eventually returning home, while in other cases migrants might not intend to return home. In either case, however, it may be in migrants' interest to maintain and secure good standing with the family. Migration is fraught with uncertainties, making it prudent for migrants to cover for these risks by remitting funds home. In this way, immigrants may secure a place with the family in the future. Alternatively, immigrants may accumulate precautionary savings back home or self-insure. (See Amuedo-Dorantes and Pozo 2004 for models of insurance and precautionary saving in this context.) The implication of this motive for sending remittances home is that immigrants who face greater risks and uncertainties with respect to the migration experience are likely to remit larger sums back home to either "purchase insurance" through family members or to self-insure via the accumulation of precautionary savings. As immigrants assimilate into their host countries and the risk of deportation or income exposure is reduced, the rationale for such transfers diminishes, and, as a result, we may observe a decay of remittance flows.

Loan repayment. The monetary sums expended to migrate are often substantial. Immigrants may need to secure sufficient funds to cover transportation charges, smuggling charges, and a pool of resources to fund a potential period of unemployment. These expenses can add up to a relatively large amount, requiring prospective migrants to borrow from friends, relatives, and moneylenders. The expectation is that migrants will repay these loans with proceeds from jobs in the destination country. Hence, remittances in the early part of the migration spell might be explained by the loan repayment motive (Connell and Brown 1995). Thus remittances may be expected to diminish over time as individuals complete their obligations with respect to loan repayments.

Combined models. Models of remittances that combine many of the above motives have also been developed. For example, Stark (1991) suggests that a typical migrant might have both altruistic and self-serving motives for remitting. Migrants may remit for altruistic reasons while also seeking insurance or making payments to their families for earlier investments in their education. According to Stark's (1991) coinsurance arrangement, migrants may envision their families as insurers covering for risks encountered during migration until migrants establish themselves in their adopting nations. Once migrants permanently settle or assimilate into their host countries, they reciprocate by remitting money home to provide family members with the opportunity to engage in sometimes risky, yet potentially lucrative, investments.

Who Remits?

We use data from the Mexican Migration Project (MMP93) (2004) to characterize the remittance patterns and the demographic, job, and home-community characteristics of immigrants transferring funds back to Mexico. The MMP93 is one of the richest data sets available for studying Mexican migration to the United States. It contains important information on immigrants' remittance and banking behavior in addition to immigrants' legal status at the time of migration. The survey is the result of a

multidisciplinary study of Mexican migration to the United States, which includes detailed information from approximately 16,000 households in ninety-three representative communities in seventeen of Mexico's thirty-one states.[1] For each household, a complete life history is gathered for the household head, which includes detailed information on whether the head migrated to the United States in the past. If so, he or she is extensively queried about that migration experience. In addition, interviewers travel to the destination areas in the United States to administer identical questionnaires to households from the same communities in Mexico who have settled permanently in the United States and no longer return home. Altogether, the MMP93 provides reasonably representative data on authorized and unauthorized Mexican immigrants in the United States interviewed between 1982 and 2002 (Massey and Zenteno 2000; Munshi 2003).[2] For the purpose of this study, we use the information collected from approximately 5,000 migrating household heads.

Immigrant profile in the MMP93. Table 1 displays some of the characteristics of the overall sample as well as of remitters and nonremitters. Of household heads that migrated to the United States, 71 percent remitted money home on a monthly basis. For those who remitted, average remittances exceeded $450 per month (in 2000 dollars), accounting for more than 40 percent of remitters' mean monthly earnings. In addition to making monthly remittance payments, about 64 percent of immigrants in our sample returned to Mexico with accumulated funds at the conclusion of their last U.S. migration spell. If the household head brought savings back to Mexico, the average amount was over $2,800 in real terms (in 2000 dollars). Only 42 percent of immigrants in the MMP93 sample were documented during their last U.S. trip, and only 14 percent had a U.S. bank account.

Remittances may be motivated by altruism, by a desire to smooth family consumption, by a coinsurance scheme, by an investment goal, by a need to repay a debt, or by many other situations.

Other interesting demographic characteristics include immigrants' gender, age, and human capital. Given that our sample comprises household heads who migrated to the United States, it is not surprising that 95 percent of our sample is male. On average, immigrants in the sample were thirty-three years old when they last migrated to the United States, and they possessed limited human capital. The average educational attainment was five years of schooling, and only 27 percent of immigrants were fluent in English. Additionally, the vast majority of our sample (95 percent) worked while in the United States, and 78 percent left their spouses behind in Mexico with a family made up of mostly non-working-aged dependents (62 percent). Finally, the average length of stay in the United States was close to three years.

Nearly 40 percent of the immigrants worked in agriculture, another 40 percent in manufacturing, and most of the remaining 20 percent in service occupations. Very few worked in technical or professional jobs. On average, real monthly income for migrating household heads was close to $1,700 (in 2000 dollars) during their last episode in the United States.

Remitters versus nonremitters. *Remittances.* Table 1 compares the characteristics of Mexican immigrants who remitted on a monthly basis with those who did not remit while in the United States. According to the figures in panel A, remitters were more likely to be male, older, and undocumented when compared to nonremitters. Additionally, remitters tended to have fewer years of education, were less fluent in English, and were more highly reliant on social networks while in the United States.

Table 1
Characteristics of Mexican Migrant Household Heads

	All migrants (mean)	Remitters (mean)	Nonremitters (mean)	Difference	t-statistic
A: Remitting and nonremitting household heads					
Personal					
Probability of remitting	0.71	1.00	0.00	1.00	
Probability of bringing savings	0.64	0.72	0.44	–0.28	–17.73***
Real remittances	466.53	466.53	0.00	–466.53	–45.48***
Real savings returned to Mexico	2,854.38	2,367.77	4,136.89	1,769.12	3.34***
Male	0.95	0.97	0.92	–0.05	–6.69***
Age	33.15	33.74	30.86	–2.88	–7.52***
Illegal	0.58	0.62	0.51	–0.11	–6.99***
Married	0.91	0.94	0.87	–0.06	–6.55***
Left spouse in Mexico	0.78	0.84	0.62	–0.22	–15.20***
Dependents in Mexico	0.62	0.62	0.60	–0.02	–2.39**
Social networks	0.82	0.87	0.78	–0.09	–7.11***
Years of education	5.07	4.80	5.80	1.01	7.54***
Speaks English	0.27	0.23	0.32	0.09	6.24***
Job characteristics					
Working	0.95	0.98	0.93	–0.05	–7.24***
Professional	0.01	0.01	0.01	0.004	1.29
Technical	0.002	0.001	0.003	0.002	0.93
Agricultural	0.39	0.41	0.34	–0.07	4.29***
Manufacturing	0.38	0.37	0.40	0.03	1.96*
Services	0.20	0.20	0.22	0.02	1.79*
Monthly income	1,674.84	1,747.34	1,684.42	–62.92	–0.62
Proportion banked	0.14	0.11	0.23	0.12	10.14***
Duration of last trip to U.S. (in months)	35.07	27.22	52.78	25.56	10.15***
Community of origin					
Number of factories in origin	467.55	392.52	603.05	210.53	3.09***
Number of banks in origin	9.52	8.12	11.93	3.82	4.10***
Banks in home community	0.64	0.63	0.67	0.04	2.61***
Number of observations	5,842	3,492	1,450		

Remitters were also more likely than nonremitters to have left their spouses, as well as a larger fraction of dependents, in Mexico.

In terms of their level of resources, those who remitted were more likely to have a job despite the shorter duration of their trips relative to nonremitters. Remitters were also more likely to be unbanked. Of those who remitted, only 11 percent had a bank

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1. See the Mexican Migration Project (2004) at mmp.opr.princeton.edu for details on the geographic coverage of this survey.
2. The MMP93 interviews were conducted in communities of various size, ethnic composition, and economic development that are typical source regions for U.S.-bound migrants. In addition, the sample expands over time to incorporate communities in newer sending states.

Table 1 (continued)
Characteristics of Mexican Migrant Household Heads

	All migrants (mean)	Returned with savings (mean)	Returned w/o savings (mean)	Difference	*t*-statistic
B: Household heads returning to Mexico with and without savings					
Personal					
Probability of remitting	0.71	0.79	0.54	–0.26	17.46***
Probability of bringing savings	0.64	1.00	0.00		
Real remittances	466.53	499.14	369.71	–129.43	–6.39***
Real savings returned to Mexico	2,854.38	2,854.38	0.00	–2,854.38	16.34***
Male	0.95	0.97	0.94	–0.03	–4.64***
Age	33.15	33.43	31.81	–1.63	–4.47***
Illegal	0.58	0.62	0.54	–0.08	–5.51***
Married	0.91	0.94	0.88	–0.06	–6.03***
Left spouse in Mexico	0.78	0.83	0.66	–0.18	–12.98***
Dependents in Mexico	0.62	0.62	0.60	–0.03	–3.56**
Social networks	0.82	0.87	0.79	–0.07	–6.32***
Years of education	5.07	4.83	5.65	0.82	6.54***
Speaks English	0.27	0.20	0.36	0.17	11.79***
Job characteristics					
Working	0.95	0.98	0.94	–0.04	–5.73***
Professional	0.01	0.00	0.01	0.01	2.44**
Technical	0.002	0.001	0.005	0.004	2.14**
Agricultural	0.39	0.44	0.29	–0.14	9.64***
Manufacturing	0.38	0.36	0.43	0.07	4.27***
Services	0.20	0.19	0.24	0.06	4.23*
Monthly income	1,674.84	1,730.37	1,712.36	–18.00	–0.17
Banked	0.14	0.09	0.25	0.15	12.93***
Duration of last trip to U.S. (in months)	35.07	20.60	60.48	39.88	16.11***
Community of origin					
Number of factories in origin	467.55	413.58	515.21	101.63	1.71*
Number of banks in origin	9.52	6.88	12.76	5.88	6.47***
Banks in home community	0.64	0.66	0.68	0.02	1.31
Number of observations	5,842	2,870	1,646		

Notes: *** signifies a significant difference from zero at the 1 percent level or better, ** at the 5 percent level or better, and * at the 10 percent level or better. Average figures for real remittances and savings returned home, expressed in 2000 dollars, are conditional on transfers being nonzero. The number of observations for remitters plus nonremitters does not equal the number of observations for all migrants because some observations on migrants' remitting patterns are missing.

Source: MMP93

account while in the United States. Meanwhile, close to a quarter of those who did not remit were banked. Lastly, remitters migrated from communities with relatively fewer factories and banks, possibly reflecting their more rural origins.

Savings brought back. In addition to information on monthly remittances, the MMP93 collects information on the amount of savings brought back to Mexico at the end of a visit to the United States. These lump sums taken back home to Mexico are an alternative form of money transfers.

Table 2
Characteristics of Mexican Migrant Remitters versus Savings Returned Only

	All migrants (mean)	Remitted only (mean)	Repatriated savings only (mean)	Difference	t-statistic
Personal					
Probability of remitting	0.71	1.00	0.00		
Probability of bringing savings	0.64	0.00	1.00		
Male	0.95	0.97	0.95	–0.02	–1.68*
Age	33.15	32.96	31.67	–1.29	–1.97**
Illegal	0.58	0.59	0.56	–0.03	–1.14
Married	0.91	0.91	0.90	–0.01	–0.45
Left spouse in Mexico	0.78	0.75	0.69	–0.05	–2.11**
Dependents in Mexico	0.62	0.59	0.60	0.01	0.96
Social networks	0.82	0.86	0.85	0.02	1.41
Years of education	5.07	5.18	5.32	0.14	0.61
Speaks English	0.27	0.33	0.21	–0.12	–5.12***
Job characteristics					
Working	0.95	0.98	0.97	–0.01	–1.02**
Professional	0.01	0.01	0.00	–0.01	1.44
Technical	0.002	0.00	0.005	–0.005	–2.00**
Agricultural	0.39	0.33	0.44	0.11	4.19***
Manufacturing	0.38	0.40	0.34	–0.05	–1.92*
Services	0.20	0.24	0.20	–0.04	–1.98**
Monthly income	1,674.84	1,748.23	1,575.97	–172.26	–1.55
Banked	0.14	0.19	0.13	–0.06	–2.93***
Duration of last trip to U.S. (in months)	35.07	47.30	24.07	–23.22	–6.70***
Community of origin					
Number of factories in origin	467.55	372.66	393.00	20.35	0.24
Number of banks in origin	9.52	10.72	8.08	–2.64	–1.90*
Banks in home community	0.64	0.67	0.69	0.02	0.70
Number of observations	5,842	836	570		

Notes: *** signifies a significant difference from zero at the 1 percent level or better, ** at the 5 percent level or better, and * at the 10 percent level or better.

Source: MMP93

The characteristics of those who brought savings back to Mexico compared with those who did not are presented in panel B of Table 1. The differences observed in the two groups are similar to those that we found for remitters versus nonremitters. For example, migrants who brought savings back were also more likely to be male, older, undocumented, married, less educated, and less fluent in English. In addition, immigrants who saved and brought some of their earnings home were less likely to have a bank account relative to nonsavers. Finally, immigrants who brought savings back home at the end of their last U.S. trip originated from more rural communities back in Mexico, with fewer factories and banks.

Remitters (only) versus savings brought back (only). Table 2 presents demographic, job, and community-of-origin characteristics of those who only remit compared to those who only bring money back with them at the end of their last migration spell in

the United States. There are significant differences between these groups. Heads of household who choose to only remit money home are more likely to be male. In addition, remitters tend to be older and more likely to have left a spouse in Mexico relative to migrants who only bring money back home. Furthermore, remitters were more likely to speak English. Thus, migrating household heads who only remit money home on a periodic basis may be more tied to the United States and less likely to return to Mexico

Undocumented immigrants are more likely to remit money home periodically and to save money to bring back home at the end of their migration spell.

regularly. In contrast, migrating household heads bringing savings back to Mexico have much shorter stays in the United States, with a larger fraction of them working in agricultural jobs relative to their remitting-only counterparts. In addition, household heads who only remit are 6 percentage

points more likely to have a bank account in the United States relative to migrants who only transfer funds to Mexico by bringing savings back at the end of a migration spell.

How Much Money Do Migrants Remit and Take Back Home?

Trends by decade when immigrants last entered the United States. Keeping in mind the profiles of remitters and those who bring their accumulated savings back home at the end of their migration spells, it is important to examine the magnitude of these money transfers and how it has changed over time and with the duration of immigrants' trips. Figures 1 and 2 describe some overall trends in the average dollar amount either remitted on a monthly basis or carried home by migrants according to when they last entered the United States. The average real dollar amount remitted on a monthly basis by household heads who last came into the country during the 1960s was approximately 16 percent higher than the dollar figure sent by their counterparts who last entered the United States a decade earlier ($740 compared with $636). However, for immigrants who entered in subsequent decades the dollar amount remitted monthly by immigrants appears to have decreased, reaching a minimum of $345 per month for migrants who last entered after the year 2000.

The average dollar figure brought back to Mexico by migrants at the end of their migration spells also declined from $4,271 (in real 2000 dollars) among the immigrant cohort who last entered the United States during the 1950s to approximately $3,930 among immigrants who last migrated during the 1960s. Immigrants' repatriated savings temporarily rebounded for the 1970s cohort, who brought back home an average of $4,183. However, the average dollar amount brought back home dropped to $2,899 for immigrants who last entered the United States during the 1980s and even further, to $2,037, among immigrants who last migrated during the 1990s. A rebound to $2,290 occurred in the repatriated savings of immigrant cohorts entering the United States after the year 2000.

Overall, much of the second half of the twentieth century has been characterized by a steady decline in the money transferred home by Mexican immigrants. Several factors may be at play in explaining this trend. First, improvements in Mexican living standards may have contributed to a decline in the average level of remittances. Second, there may be a difference in the mix of temporary and permanent immigrants according to the decade of last entry. In particular, earlier cohorts may have contained a greater share of temporary migrants relative to permanent immigrants given that less strenuous border patrol efforts were in place during earlier decades. Temporary immigrants appear more likely to accumulate and remit larger sums than permanent immigrants do (Glytsos 1997; Ahlburg and

Figure 1
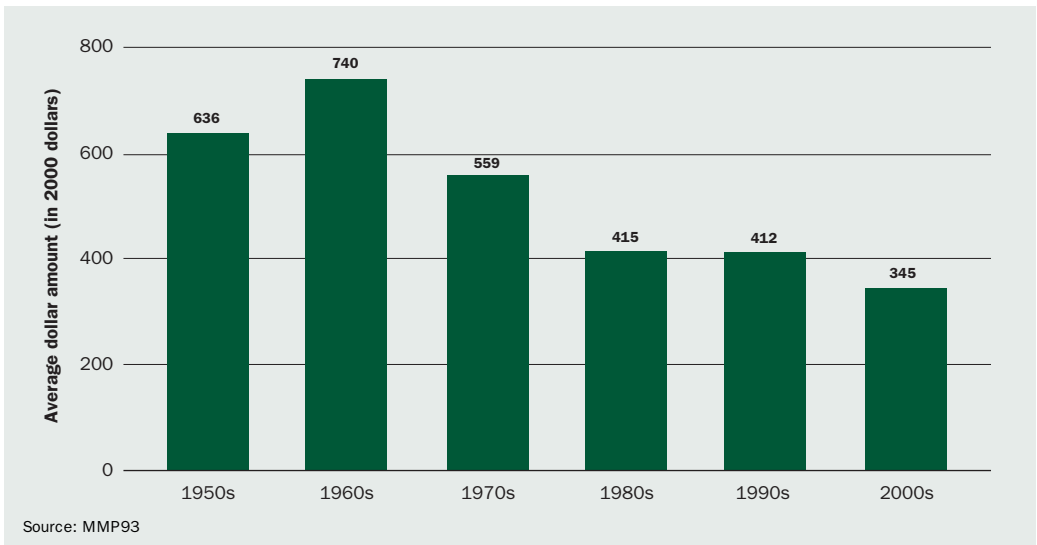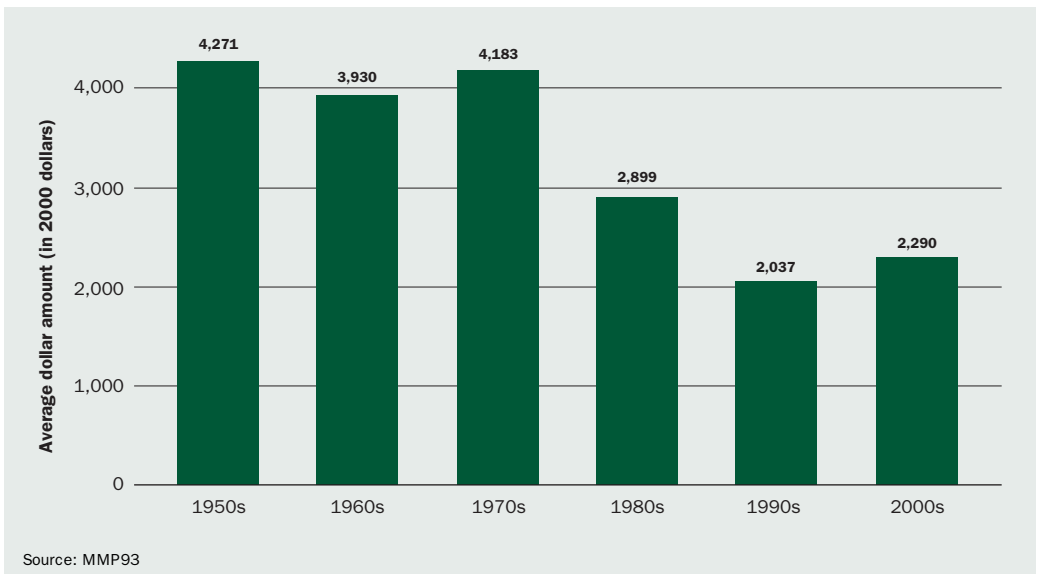**Monthly Remittances by Mexican Migrants by Decade of Last U.S. Visit**

Source: MMP93

Figure 2
Savings Brought Back Home by Mexican Migrants by Decade of Last U.S. Visit

Source: MMP93

Brown 1998). Our data suggest that changes in the composition of migrant cohorts may be at least partly responsible for the observed decline in the average amount remitted and brought home.

The average trip duration of Mexican migrants has steadily increased over time—from an average of eleven months for those who last entered the United States in the 1960s to sixty-seven months for those who last migrated after the year 2000 (see Figure 3). The longer duration of immigration is suggestive of more permanent migration and, possibly, of reduced remittances and returned savings.

Figure 3
Average Duration of Mexican Migrants' U.S. Visits by Decade of Last U.S. Visit

Source: MMP93
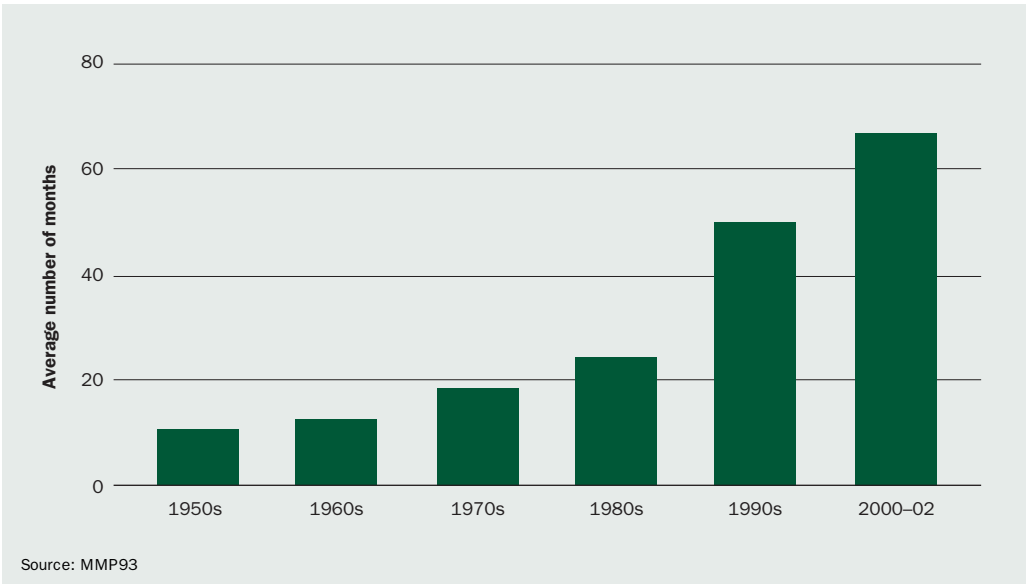
Trends by duration of immigrants' stay. Perhaps one of the most widely recognized patterns in immigrants' remitting behavior is the tendency for the amount remitted home on a regular basis to decline as the duration of migrants' trip lengthens; this tendency is referred to as remittance decay. The declining remitting patterns may be due to the weakening of immigrants' ties with their home communities and a concurrent decrease in altruistic payments. Immigrants are also likely to reduce their remittances home as they form new families of their own in the United States. The overall pool of migrants may also change, with longer-staying immigrants saving less to take home and remitting smaller sums home than their counterparts who migrate with the sole purpose of accumulating a sum of money and returning back home, as is the case with target savers. Finally, some of the reasons for remitting money home may progressively vanish as immigrants get stable jobs and settle in the United States, displaying less of a need for insurance against unexpected deportation and income risks borne during migration.

Figure 4 displays the average dollar amount remitted on a monthly basis by immigrants according to the duration of their last U.S. trip. The graph supports the remittance decay hypothesis, with the average dollar amount remitted on a regular basis by immigrants with longer than one-year stays declining to $440 per month from $478 remitted by immigrants with shorter stays. This pattern is also consistent with the hypothesis that remittances are in part payment on a past loan. Many Mexican immigrants finance their trips to the United States via loans from friends, family, or money lenders. Upon arrival in the United States, the first order of business is to repay these amounts. Hence, the initial remittances flows include not only altruistic (or investment) flows but also loan repayment flows. Once these loans are paid off, the transfers may fall in magnitude.

In contrast, Figure 5 displays the growing magnitude of the savings brought back home by immigrants as the duration of their U.S. stay lengthens. Total savings are likely to be larger the longer migrants stay simply because they are able to accumulate more with time.

Figure 4
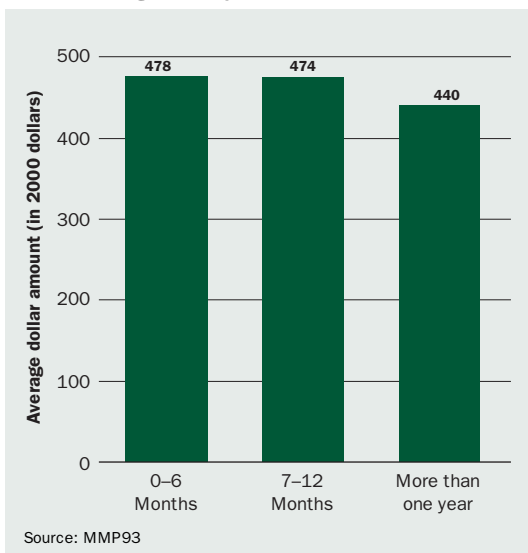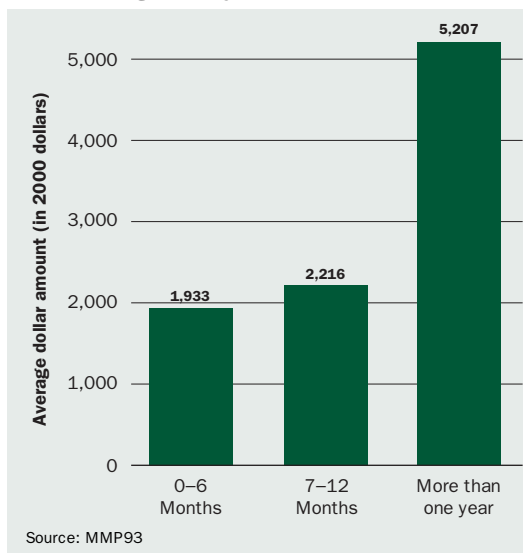**Average Dollar Amount Remitted Monthly by Mexican Migrants by Duration of Last U.S. Visit**

Source: MMP93

Figure 5
Average Dollar Amount Brought Back Home by Mexican Migrants by Duration of Last U.S. Visit

Source: MMP93

Immigrants' money transfer patterns according to their legal status. In addition to a variety of sociodemographic and employment characteristics, Table 3 displays the money transfer patterns of undocumented and documented Mexican immigrants in our sample. Undocumented immigrants are significantly more likely to remit money home on a periodic basis as well as to save money to bring back home at the end of their migration spell. The higher likelihood of transferring money home exhibited by undocumented migrants may be related in part to the need of the undocumented to insure for a place back home in the event of deportation and the greater insecurities experienced by undocumented immigrants in their job situations. Alternatively, demographic considerations may be at the core of this higher likelihood because a higher fraction of these migrants are married and have migrated leaving a spouse and dependents in Mexico. However, possibly because of the higher monthly earnings that accompany their higher educational attainment and English-speaking ability, legal immigrants remit approximately $69 more per month and bring home about $510 more in savings than their undocumented counterparts. Additionally, the larger sum brought back home by documented immigrants may also be partially accounted for by their banked status (which may facilitate the accumulation of savings) as well as to the longer duration of their trips.

Purpose of Migrants' Monthly Remittances and Savings Brought Back Home

As explained earlier in the paper, immigrants may transfer money to their families back in Mexico either through regular remittances or through savings brought home at the end of their migration spell, for a variety of reasons: altruism, consumption smoothing, target saving, loan repayment, or insurance. In some cases these remitted funds will be immediately consumed while in others they may be used to purchase consumer durables or to invest in capital goods, housing, or financial assets.

In Table 4, we provide some details on the consumption/investment mix of these flows. Panels A and B display the share of immigrants in the MMP93 who reported each of a series of reasons as the primary motive for sending money to

Table 3

Characteristics of Mexican Migrants According to Documentation Status

	All migrants (mean)	Documented (mean)	Undocumented (mean)	Difference	t-statistic
Personal					
Probability of remitting	0.71	0.65	0.75	0.09	6.97***
Probability of bringing savings	0.64	0.59	0.67	0.08	5.50***
Real remittances	466.53	508.21	438.87	–69.34	3.02***
Real savings returned to Mexico	2,854.38	3,175.44	2,665.06	–510.38	1.48
Male	0.95	0.94	0.95	0.01	1.87*
Age	33.15	34.91	31.93	–2.98	–9.13***
Illegal	0.58	0.00	1.00		
Married	0.89	0.89	0.92	0.03	3.91***
Left spouse in Mexico	0.78	0.69	0.85	0.15	13.58***
Dependents in Mexico	0.62	0.60	0.63	0.03	4.17**
Social networks	0.82	0.78	0.85	–0.02	–1.41
Years of education	5.07	5.32	4.89	–0.42	–3.87***
Speaks English	0.27	0.38	0.20	–0.18	–14.6***
Job characteristics					
Working	0.95	0.93	0.96	0.03	5.03**
Professional	0.01	0.01	0.00	–0.01	–2.61***
Technical	0.004	0.004	0.001	–0.003	–1.90*
Agricultural	0.39	0.46	0.35	–0.12	–8.62***
Manufacturing	0.38	0.33	0.41	0.08	5.77***
Services	0.20	0.17	0.22	0.05	4.38***
Monthly income	1,674.84	1,735.18	1,633.40	–101.78	–1.06
Banked	0.14	0.23	0.07	–0.15	–15.6***
Duration of last trip to U.S. (in months)	35.07	43.35	29.18	–14.17	–7.21***
Community of origin					
Number of factories in origin	467.55	510.90	435.93	–74.97	–1.36
Number of banks in origin	9.52	10.28	8.95	–1.33	–1.80*
Banks in home community	0.64	0.66	0.63	–0.03	–2.74***
Number of observations	5,842	2,416	3,403		

Notes: *** signifies a significant difference from zero at the 1 percent level or better, ** at the 5 percent level or better, and * at the 10 percent level or better. Average figures for real remittances and savings returned home, expressed in 2000 dollars, are conditional on transfers being nonzero.

Source: MMP93

their families. The single most important stated category is health expenses incurred by their families, followed by food and housing expenses. While housing can be considered partially consumption and partially investment, many of these expenses would be classified as consumption.

Figures 6 and 7 display the average dollar amount either remitted on a regular basis or brought back home at the end of the migration spells according to the primary purpose stated for remitting or taking money home. Migrants who claimed to be remitting for a special event, as in the case of a wedding or baptism, remitted the largest sums. The next-largest dollar figures are sent by migrants who claimed to be primarily remit-

Table 4
Primary Reasons for Remitting Funds or Repatriating Savings to Mexico

Reason	Share (percent)	Reason	Share (percent)
A: Reason for remitting funds to Mexico		**B: Reason for repatriating savings to Mexico**	
Health expenses	46.18	Health expenses	22.53
Food and maintenance	29.79	Food and maintenance	21.84
Construction or repair of house	7.47	Construction or repair of house	15.86
Debt payment	5.42	Savings	8.35
Purchase of consumer goods	4.46	Purchase of consumer goods	7.11
Other	2.38	Debt payment	5.15
Savings	1.39	Recreation	4.86
Purchase of house or lot	1.02	Other	4.83
Start/expand a business	0.46	Purchase of house or lot	3.08
Purchase of agriculture inputs	0.36	Start/expand a business	1.85
Education expenses	0.36	Purchase of livestock	1.67
Purchase of livestock	0.33	Purchase of vehicle	1.16
Recreation	0.30	Purchase of agriculture inputs	0.76
Purchase of vehicle	0.03	Finance a special event	0.40
Finance a special event	0.03	Purchase of tools	0.36
		Education expenses	0.18

Source: MMP93

ting for what may be considered investment purposes, such as the purchase of livestock, agriculture inputs, savings, or the purchase, construction, or repair of a lot or house. Migrants send, on average, more than $500 on a monthly basis if they claim this category as their primary reason for remitting. In the case of the lump sums brought home, immigrants who claim recreation and the purchase of a house or lot as their primary categories take back, on average, amounts in excess of $4,000. These two categories are then followed by the purchase of livestock, savings, and educational expenses. Migrants reporting these categories as the primary motive for bringing money back home reported an average dollar amount of $3,000 for their repatriated savings.

Overall, it is worth noting that, despite our first impressions of immigrants claiming to transfer financial resources to their families mainly for consumption purposes (as indicated in Table 2), the dollar amounts transferred tend to be larger when investment is claimed as the primary motive for remitting or taking sums home.[3] As such, these patterns point to the importance of migrants' remittances and savings for the economic development of recipient areas.

Methods Used by Migrants to Remit Money Back Home

To learn about the methods by which Mexican migrants remit money back home, we use data from the Encuesta sobre Migración en la Frontera Norte de México (EMIF), a migration survey carried out by the Colegio de la Frontera Norte (COLEF).[4] Unlike

3. Actually, financing a special event and recreation are associated with the largest transfers. These transactions are, of course, more fitting with consumption expenditures. However, these transfers account for only a very small share of all transfers.
4. COLEF carried out the survey for the Secretaría del Trabajo y Previsión Social, the Consejo Nacional de Población, and the Instituto Nacional de Migración.

Figure 6
Primary Motive for Remitting and Average Amount Remitted by Mexican Migrants
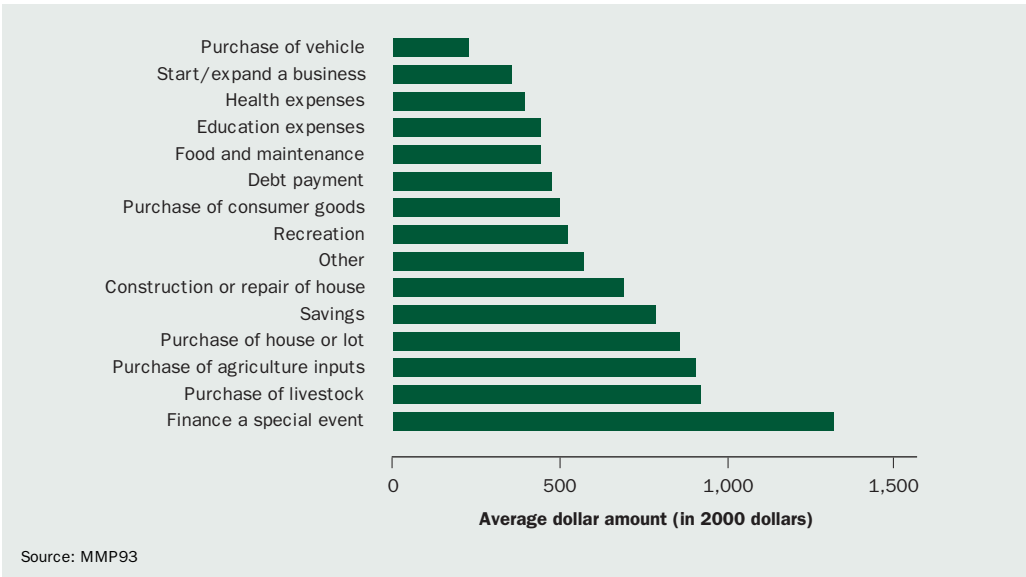

Source: MMP93

Figure 7
Primary Motive for Bringing Savings Home and Average Amount Saved by Mexican Migrants

Source: MMP93
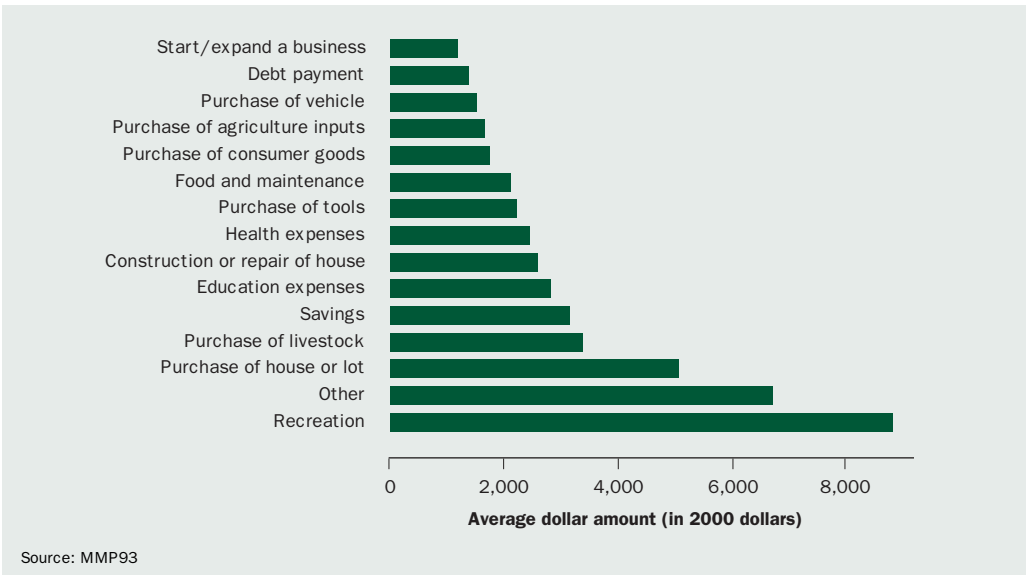
the MMP93, the EMIF asks migrants about the method used to remit money home, allowing us to learn about immigrants' preferences for using banks or other methods for periodically remitting funds home.

The EMIF surveys are conducted in eight different cities along the United States–Mexico border: Tijuana, Mexicali, Nogales, Ciudad Juárez, Piedras Negras, Nuevo Laredo, Reynosa, and Matamoros. These cities account for more than 90 percent of the migration flows between Mexico and the United States (Secretaría del

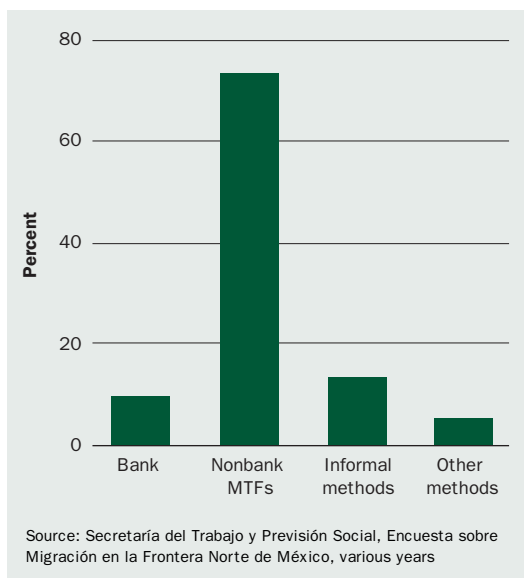Trabajo y Previsión Social 2001). A representative sample of individuals voluntarily returning from the United States on foot, by train, car, bus, and airplane are extensively interviewed about their migration and work experience.[5] Sociodemographic and family information is collected along with information on the migrant's documentation status as well as specifics about remitting behavior with respect to his or her last month's earnings. Because of its objectives, the EMIF is fairly representative of the Mexican migration flow whereas the MMP93 intends to represent the stock of Mexican immigrants returning to Mexico or staying in the United States. As a result, the EMIF is more likely to include commuters and other frequent border crossers, who constitute an important fraction of the daily cross-border migration flow, relative to the MMP93. Because they make frequent trips across the border, these individuals are less likely to remit money home on a monthly basis compared to their migrant counterparts in the MMP93. For instance, an estimated 47 percent of migrants remitted a fraction of their last monthly earnings home in the EMIF compared to 71 percent in the MMP93.[6]

Figure 8
Money Transfer Methods Used by Mexican Migrants

Source: Secretaría del Trabajo y Previsión Social, Encuesta sobre Migración en la Frontera Norte de México, various years

For the purpose of this study, we use survey data from five consecutive waves of the EMIF: 1993–94, 1994–95, 1996–97, 1998–99, and 1999–2000. Our sample consists of approximately 6,000 Mexican migrants returning from the United States who have declared remitting a fraction of their last month's U.S. earnings. The EMIF asks migrants about the method used to remit money home, distinguishing among banks, money orders, telegram, hand carried by family or friends, and regular mail. We group transfers hand carried by family and friends with regular mail and designate these as informal transmission methods, and money orders and telegrams are lumped into a category we call nonbank money transfers, undertaken by institutions we refer to as money transfer firms, or MTFs. Figure 8 displays the percentage of Mexican migrants claiming to remit via banks, MTFs, informal methods, or other nonspecified methods during the entire survey period. The vast majority of Mexican migrants, more than 70 percent, declared using MTFs to remit money home. About 13 percent of migrants used informal methods, such as friends, family, and cash in the mail, with approximately 10 percent relying on bank transfers to send money home.

The repeated design of the EMIF survey (five waves over the 1993–2000 period) allows us to detect trends in remitting methods over time. An overview of trends and patterns is evident in Figure 9, which shows the percentages of Mexican migrants using the four broad categories: MTFs, banks, informal methods, and unspecified other means. While MTFs constitute the preferred money transmission mechanism

5. See Secretaría del Trabajo y Previsión Social (2001) for an extensive explanation of the EMIF's sampling methodology.
6. This comparison reflects authors' tabulations using the EMIF and the MMP93.

Figure 9
Money Transfer Methods Used by Mexican Migrants by Time Period

Source: Secretaría del Trabajo y Previsión Social, Encuesta sobre Migración en la Frontera Norte de México, various years
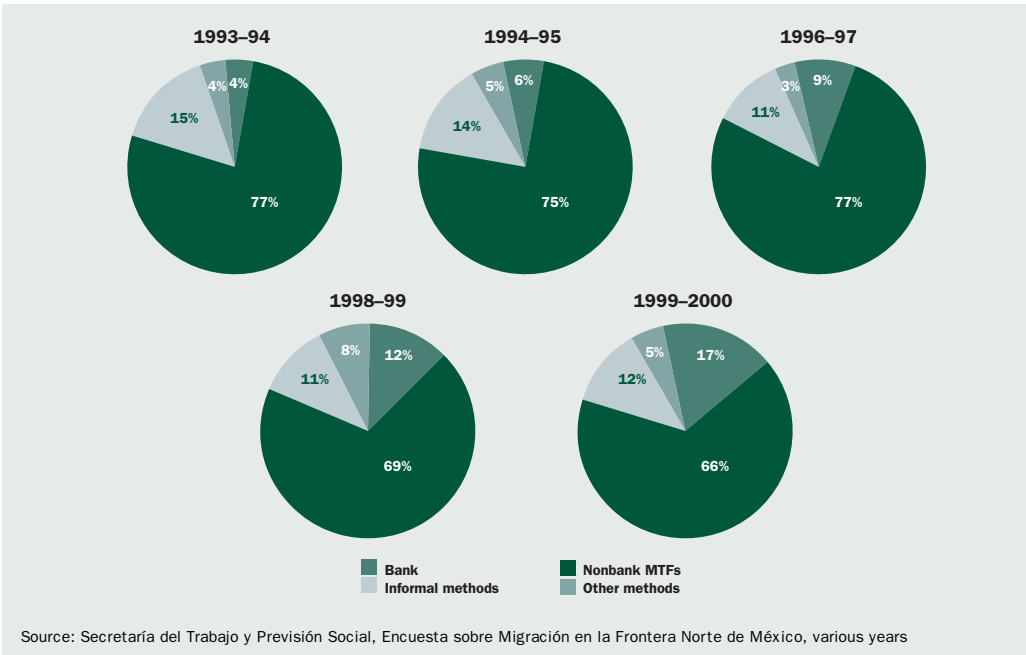
for most migrants, it is interesting that this method experienced a substantial decline in market share during the survey period, from 77 percent of transfers to 66 percent of transfers. Banks, in contrast, increased their market share from 4 percent to 17 percent over this period. The use of informal means to remit money (using friends, family, or cash in the mail) has decreased a bit, falling from about 15 percent of transactions in 1993–94 to about 12 percent of transactions in 1999–2000.
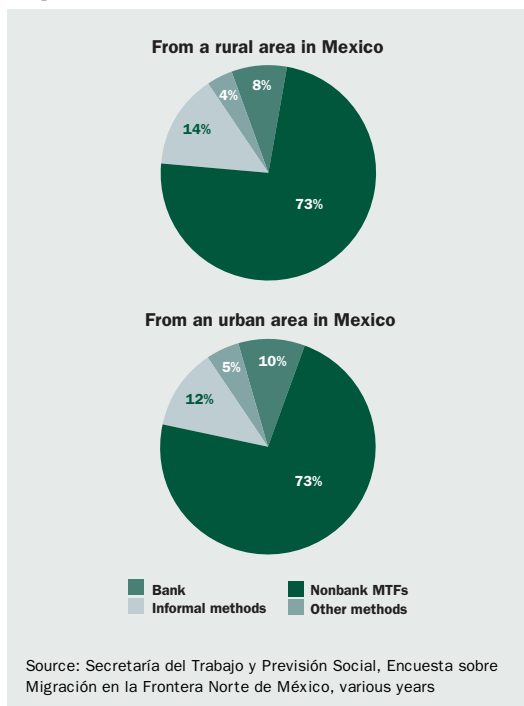
The finding that migrants prefer MTFs is significant because it shows that the institutions are able to attract immigrant business despite the fact that the fees they charge for money transfers often exceed, by a significant margin, the fees charged by banks (Orozco 2002). Despite MTFs' relatively steeper fees,[7] immigrants appear to feel fairly comfortable with and well served by MTFs. The extensive networks of agencies in both sending and recipient communities apparently compensate for the higher fees. The importance of a well-spread infrastructure for remitting money is evident in Figure 10, which shows that MTFs appear to serve both rural and urban areas. As a result, the fraction of immigrants from rural and urban areas using MTFs is identical (about 73 percent). However, the fraction of Mexican migrants from urban areas who remit through banks is 2 percentage points higher than for migrants originating from rural areas. Presumably, families in urban areas have the advantage of a better banking infrastructure. By the same token, Mexican migrants from urban areas are also less likely to rely on informal methods when remitting money back home relative to their counterparts from rural areas in Mexico.

Differing regulations imposed on banks and nonbank MTFs with respect to transmitting funds may also have contributed to the greater ease that migrants appear to enjoy when remitting via nonbank MTFs. Individuals may be at a disadvantage for preserving their anonymity when remitting through banks. Thus, it is logical that undocumented immigrants would rely to a greater extent on informal methods and MTFs to

send money home and would be less likely to remit through banks relative to documented and authorized immigrants.[8]

Figure 11 displays the fraction of unauthorized and legal Mexican migrants using a particular money transfer method in the first and last survey waves of the EMIF. At the beginning of the survey, unauthorized immigrants appeared to use informal methods to a greater extent than their legal counterparts. They were also slightly less likely to use banks. By the 1999–2000 wave, however, a substantial shift in remitting methods had occurred. The fraction of unauthorized Mexican immigrants remitting through informal methods had been cut in half; furthermore, unauthorized immigrants now appeared more likely than their legal counterparts to remit money home through banks. It is possible that the anonymity advantage nonbank MTFs enjoyed has recently been eroded by legislation that attempts to place more responsibility on all financial institutions to better establish clients' identity and to put anti-money-laundering safeguards in place. This possibility may explain a convergence in the remitting methods used by documented and undocumented immigrants.

Figure 10

Money Transfer Methods Used by Mexican Migrants in Rural versus Urban Areas

Source: Secretaría del Trabajo y Previsión Social, Encuesta sobre Migración en la Frontera Norte de México, various years

Immigrants' Banking Patterns

Time trends in immigrant banking. Using data from the MMP93, we are able to further explore Mexican migrants' familiarity with the U.S. banking system. More specifically, we assess trends in the share of migrating household heads with U.S. bank accounts over the past fifty years and present the characteristics of the banked for our sample. As mentioned earlier, the share of Mexican migrants with bank accounts while living in the United States has been limited. For our entire sample, only 14 percent of Mexican migrant household heads had a U.S.-based bank account during their most recent trip to the United States. However, the use of banking services has varied during the past five decades (as shown in Figure 12), increasing steadily as a share of immigrants from 1 percent in the 1950s to 10 percent in the 1980s and 23 percent in the 1990s. For those household heads who were last in the United States between 2000 and 2002, the share banked was close to 35 percent.[9] While the share banked is

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7. More recent findings by Orozco (2004) suggest that a convergence of charges by banks and MTFs is taking place.

8. See Amuedo-Dorantes and Pozo (forthcoming) for a formal analysis of the matching of immigrant characteristics with the differing attributes embodied in the various transfer mechanisms.

9. For comparative purposes, it is interesting to note that, according to the Federal Reserve's 2001 Survey of Consumer Finances (SCF), nearly 90 percent of families in the United States have checking accounts.

Figure 11
Money Transfer Methods Used by Mexican Migrants by Legal Status

Source: Secretaría del Trabajo y Previsión Social, Encuesta sobre Migración en la Frontera Norte de México, various years
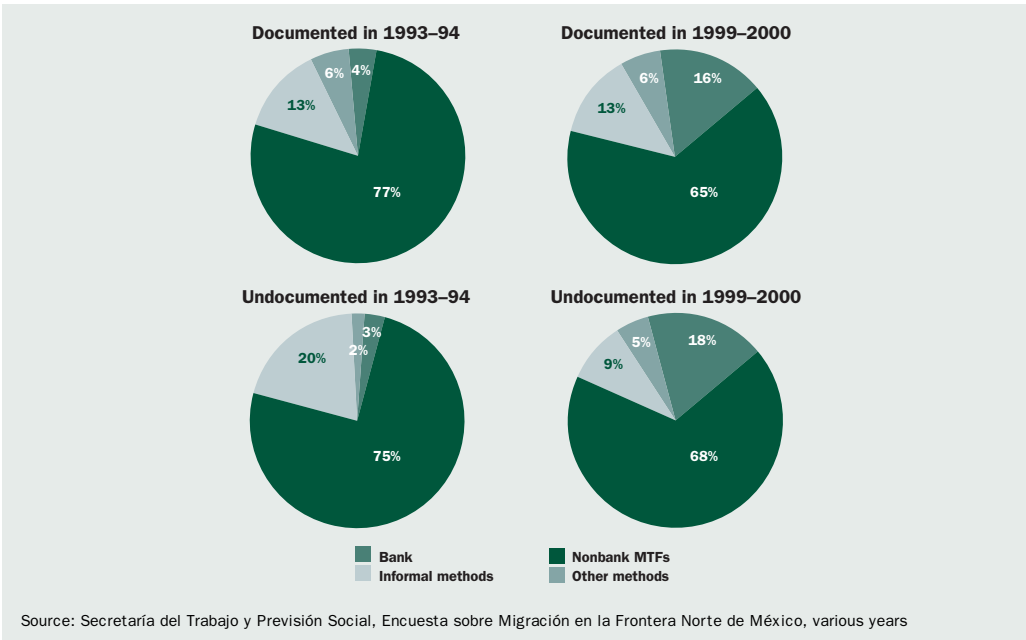
Figure 12
Share of Mexican Migrants with a U.S. Bank Account by Decade of Last U.S. Visit

Source: MMP93
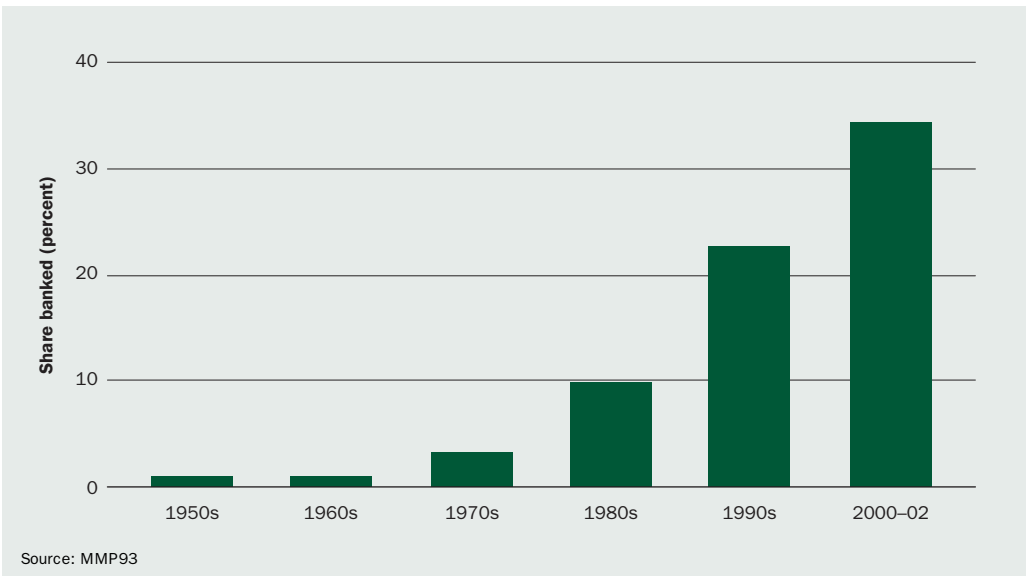
lower for the undocumented, it is evident from Figure 13 that banking trends have been on the rise for both documented and undocumented migrants.

Who are the banked Mexican migrants? Table 5 presents the characteristics of banked Mexican migrants in our sample relative to the characteristics of unbanked Mexican migrants. Consistent with previous research (Amuedo-Dorantes and Bansak

Figure 13
**Share of Mexican Migrants with a U.S. Bank Account by Decade and
Legal Status during Last U.S. Visit**

Source: MMP93
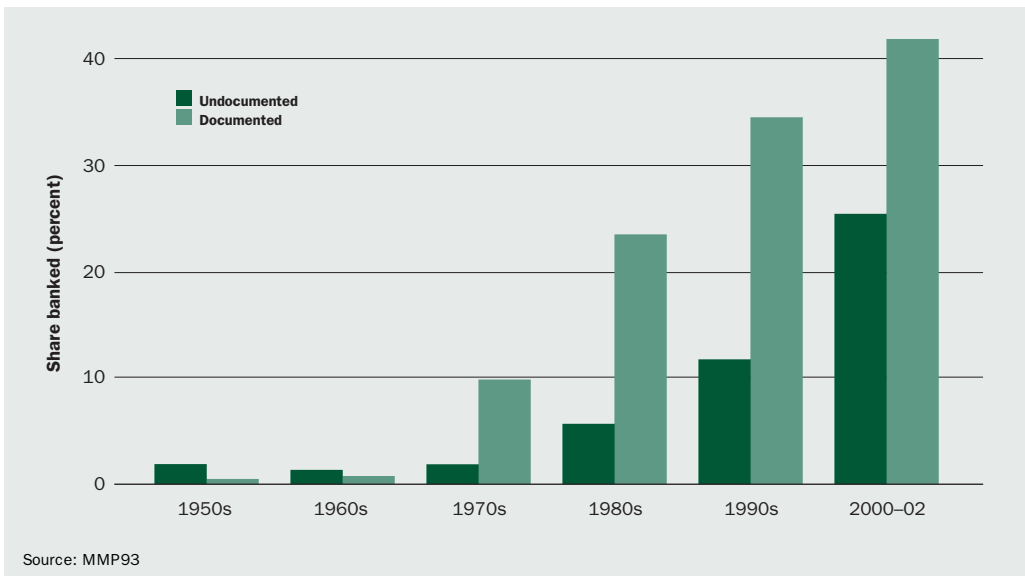
2004), the banked tend to send slightly lower levels of monthly remittances to
Mexico (although the difference is not statistically significant) but take back more
savings at the conclusion of the migration spell. While monthly remittances are rather
similar for both banked and unbanked migrants, the lump sums transferred home by
banked migrants are $4,951 higher than those of unbanked migrants. In addition, the
banked are less likely to remit or to bring money back to Mexico, possibly reflecting
their longer U.S. stay, greater assimilation, and severing of ties to their homeland rel-
ative to the unbanked.

In terms of individual characteristics, banked Mexican migrants are more likely
to be young, documented, and fluent in English relative to the unbanked. The banked
also display characteristics suggesting a loosening of ties with Mexico. A smaller
share of banked immigrants has left a spouse or dependents in their community of
origin, and fewer rely on social networks in the United States relative to unbanked
immigrants. Immigrants with bank accounts are more likely to have professional or
technical jobs. They are also more highly represented in the manufacturing and ser-
vice occupations than the unbanked, who are more highly concentrated in agricul-
ture. Finally, banked immigrants also earn approximately $700 more per month than
those without bank accounts. This result is not surprising given that other studies
(Caskey 2000; Hogarth and O'Donnell 1998) have found that lower-income individu-
als do not find it worthwhile to open a bank account. In addition, banked immigrants
have enjoyed a longer U.S. visit (on average, ten years) compared to the unbanked
(with an average stay of twenty-two months), again suggesting their greater assimi-
lation into the U.S. banking culture. Finally, immigrants with bank accounts in the
United States are more likely to come from communities with larger numbers of
banks and from communities with a bank in place before the migrant traveled to the
United States; both of these factors may have increased these migrants' familiarity
with the banking system. In contrast, immigrants without accounts originate from

Table 5

Characteristics of Banked and Unbanked Mexican Migrants

	All migrants (mean)	Banked (mean)	Unbanked (mean)	Difference	t-statistic
Personal					
Probability of remitting	0.71	0.53	0.74	0.21	10.51***
Probability of bringing savings	0.64	0.39	0.68	0.28	13.91***
Real remittances	466.53	463.90	467.81	3.91	0.12
Real savings returned to Mexico	2,854.38	7,357.08	2,405.95	−4,951.13	−3.70***
Male	0.95	0.95	0.95	0.00	−0.01
Age	33.15	31.21	33.26	2.06	4.56***
Illegal	0.58	0.32	0.63	0.31	17.30***
Married	0.91	0.89	0.91	0.03	2.21**
Left spouse in Mexico	0.78	0.41	0.84	0.44	23.72***
Dependents in Mexico	0.62	0.59	0.62	0.03	3.01**
Social networks	0.82	0.82	0.84	0.02	1.41
Years of education	5.07	6.89	4.81	−2.08	−13.24***
Speaks English	0.27	0.69	0.18	−0.51	−28.96***
Job characteristics					
Working	0.95	0.97	0.95	−0.02	−2.36**
Professional	0.01	0.02	0.00	−0.02	−3.36***
Technical	0.002	0.007	0.002	−0.006	−1.96*
Agricultural	0.39	0.17	0.43	0.26	16.85***
Manufacturing	0.38	0.52	0.36	−0.16	−8.35***
Services	0.20	0.27	0.19	−0.08	−4.57***
Monthly income	1,674.84	2,307.93	1,576.63	−731.31	−7.33***
Banked	0.14	1.00	0.00	1.00	
Duration of last trip to U.S. (in months)	35.07	113.32	22.34	−90.97	−20.74***
Community of origin					
Number of factories in origin	467.55	554.61	448.26	106.36	1.46
Number of banks in origin	9.52	14.96	8.56	−6.40	−4.65***
Banks in home community	0.64	0.79	0.61	−0.17	−11.17***
Number of observations	5,842	780	4,862		

Notes: *** signifies a significant difference from zero at the 1 percent level or better, ** at the 5 percent level or better, and * at the 10 percent level or better. Average figures for real remittances and savings returned home, expressed in 2000 dollars, are conditional on transfers being nonzero.

Source: MMP93

communities with fewer banks and thus may be less acquainted with banks and possibly more concerned with corruption in the banking system, making them more wary of the role of banks in savings and money transfers.

Conclusions

Immigrants migrate for myriad reasons, including overcoming hunger, enjoying higher earnings, escaping political or social persecution, joining family, acquiring education, and spreading consumption risks. Given this plethora of reasons for migrating, it should come as no surprise that immigrants' motives for remitting to their home

economies are at least as varied. These motivations include altruism, accumulating precautionary savings, accumulating and diversifying assets, securing the option to return to the home community should the need arise, and repaying loans. Therefore, we do not subscribe to a "one size fits all" explanation when reporting on this under-researched area. Instead, we point to how the various trends and patterns in remittance flows support the differing approaches.

Because a high proportion of migrants claim that consumption is the primary purpose for remitting, the generalization is often made that altruism is a good explanation for most of the funds that are remitted. We find, however, that the amounts remitted for consumption are relatively modest when compared to the amounts remitted for investment, which are often double in size. It follows that large portions of total dollar amounts remitted actually do serve to fund capital investments, giving rise to the investment (target saving) motive as another important determinant of remitting behavior.

Our data also provide evidence of remittance decay. Migrants with more U.S. experience seem to reduce the amounts that they remit home. This observation is consistent with several models of remittances. First, as immigrants' ties with their home communities weaken and altruistic feelings diminish, lower amounts are likely to be remitted. Second, as immigrants become more secure in the host community and their projected earnings are subject to less risk, the need for insurance via remitting money falls as the pressure to keep open the option of returning to the home community subsides. Third, once loans are paid off, the amount remitted may no longer need to be as large. Finally, our data also point to another interesting pattern—longer-staying immigrants seem to save more and carry larger sums home, as indicated by Figure 5.

We also observe a decrease in the amount remitted by more recent immigrants. This pattern may be due to a rise in the ratio of permanent immigrants less likely to remit money home. Nonetheless, the decrease in the amount remitted is not inconsistent with the growing volumes of remittance inflows reported by Mexico. Given the explosion in immigration from Mexico to the United States, it is not hard to imagine that these increasing numbers of immigrants make up for the decline in the average per capita transfer amount.

The data reveal that the propensity to remit seems to be greater among immigrants who are undocumented, those who have left dependents in Mexico, those with lower levels of education and English skills, and the unbanked. The average amount remitted is 40 percent of earnings. Additionally, for remitting migrants, MTFs continue to be the main transfer mechanism used in the survey data we analyzed. However, we also observe a substantial decline in the use of MTFs, from 77 percent of all transfers to 66 percent over the 1993–2000 period. In contrast, banks have more than quadrupled their market share during that period, from 4 percent of all transactions to 17 percent. The impact of banking on remittances is interesting because while banked individuals appear to remit less, they also appear to use banks to save. At the end of their migration spells, banked migrants bring back to their communities sums three times larger than the dollar amounts taken home by unbanked migrants. Finally, it is interesting to note the convergence in the share banked and in the methods used to remit by documented and undocumented immigrants, with the behavior of undocumented and documented migrants becoming more similar over time.

REFERENCES

Ahlburg, Dennis A., and Richard P.C. Brown. 1998. Migrants' intentions to return home and capital transfers: A study of Tongans and Samoans in Australia. *Journal of Development Studies* 35, no. 2:125–51.

Amuedo-Dorantes, Catalina, and Cynthia Bansak. 2004. Access to banking services and remittances by Mexican immigrants. San Diego State University Department of Economics, unpublished working paper.

Amuedo-Dorantes, Catalina, and Susan Pozo. 2004. Remittances as insurance: Evidence using Mexican migrants. Western Michigan University Department of Economics Working Paper 02-01.

———. Forthcoming. On the use of differing money transmission methods by Mexican immigrants. *International Migration Review*.

Caskey, John. 2000. Reaching out to the unbanked. Washington University Center for Social Development Working Paper 00-15, September.

Connell, John, and Richard P.C. Brown. 1995. Migration and remittances in the South Pacific: Towards new perspectives. *Asian and Pacific Migration Journal* 4, no. 1:1–33.

Glytsos, Nicholas P. 1997. Remitting behaviour of "temporary" and "permanent" migrants: The case of Greeks in Germany and Australia. *Labour* 11, no. 3:409–35.

Grieco, Elizabeth. 2003. The foreign born from Mexico in the United States. Migration Information Source, October 1. <www.migrationinformation.org/feature/display.cfm?ID=16> (February 13, 2005).

Hogarth, Jeanne M., and Kevin H. O'Donnell. 1998. Being accountable: A descriptive study of unbanked households in the U.S. Federal Reserve Bank of Atlanta *Partners in Community and Economic Development* 8, no. 2.

LaLonde, Robert J., and Robert H. Topel. 1997. Economic impact of international migration and the economic performance of migrants. In *Handbook of population and family economics,* edited by Mark R. Rosenzweig and Oded Stark. Amsterdam: Elsevier.

Massey, Douglas S., and René Zenteno. 2000. A validation of the ethnosurveys: The case of Mexico-U.S. migration. *International Migration Review* 34, no. 3:766–93.

Mexican Migration Project. 2004. MMP93 database (April release). Office of Population Research, Princeton University, and Departamento de Estudios Sobre Movimientos Sociales, Universidad de Guadalajara. <http://mmp.opr.princeton.edu> (March 14, 2005).

Munshi, Kaivan. 2003. Networks in the modern economy: Mexican migrants in the U.S. labor market. *Quarterly Journal of Economics* 118, no. 2:549–99.

Orozco, Manuel. 2002. Remittances and markets: New players and practices. In *Sending money home: Hispanic remittances and community development*, edited by Rodolfo de la Garza and Briant L. Lowell. Oxford: Rowman & Littlefield.

———. 2004. The remittance marketplace: Prices, policy and financial institutions. Pew Hispanic Center Report, June.

Rosenzweig, Mark R., and Oded Stark. 1989. Consumption smoothing, migration, and marriage: Evidence from rural India. *Journal of Political Economy* 97, no. 4:905–26.

Secretaría del Trabajo y Previsión Social. 2001. Encuesta sobre Migración en la Frontera Norte de México, 1998–1999. Mexico D.F.

Stark, Oded. 1991. *The migration of labor*. Oxford: Basil Blackwell.

The Quality of Preventive and Diagnostic Medical Care: Why Do Southern States Underperform?

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Health care expenditures are increasing and are projected to grow at what some perceive as an alarming rate—7.3 percent in 2003 (CMS 2004). As expenditures rise, the focus of the health care industry is turning toward cost containment and ways to slow this growth rate. However, some are concerned that such efforts may lower the quality of medical care (Jencks et al. 2000). This concern over cost containment crowding out quality led the Centers for Medicare and Medicaid Services (CMS) to develop a program to evaluate the quality of medical care received by Medicare beneficiaries.

Jencks et al. (2000) use CMS data on the medical care delivery process for Medicare beneficiaries in each state over the period 1997–99 to evaluate the quality of care.[1] Specifically, the authors analyze quality indicators for preventive services (influenza and pneumococcal immunizations) and diagnostic services (mammograms and screenings for diabetics) to rank states on the basis of the quality of medical care to Medicare beneficiaries. These services are selected because they are associated with high rates of morbidity and mortality improvements and are widely believed to improve outcomes.[2]

Jencks et al. (2000) report distinct geographical differences in the level of preventive and diagnostic services received by Medicare beneficiaries. In general, southern states had lower levels, and thus a lower quality, of services than states in other regions. The reasons behind the state-level differences in the quality of Medicare-beneficiary medical care have not been analyzed. Thus, the goal of this article is to determine which state-level characteristics are associated with the level of diagnostic and preventive medical care. States can then use this information to improve the quality of care. If indeed an ounce of prevention is worth a pound of cure, then improvements in the utilization of preventive and diagnostic services may also slow the growth rate in health care expenditures.

Quality Indicators

Preventive care. Between 1969 and 1996, deaths attributable to influenza averaged 20,000 per year, with approximately 90 percent of these occurring among persons aged sixty-five and older (CDC 2002a). Furthermore, the CDC (2002b) reports that approximately 114,000 people are hospitalized because of influenza each year, with an estimated average inpatient cost of almost $7,000 for those aged sixty-five and older (Meltzer, Cox, and Fukuda 1999). The influenza vaccine has been shown to reduce influenza mortality by approximately 30 percent (Fedson et al. 1993) and hospitalizations by approximately 50 percent (Nichol, Margolis, and Wuorenma 1994). Thus, an improvement in the influenza vaccination rates may lead to a reduction in health care expenditures by lowering hospital expenditures.[3]

For the elderly population, the estimated annual mortality rate for pneumococcal infection exceeds 30 percent (CMS 2002). This rate translates to approximately 3,400 deaths among persons in this age group in 1998 (CDC 2002a). There are an estimated 175,000 hospitalizations for pneumococcal pneumonia every year, with pneumococci accounting for approximately 36 percent of community-acquired pneumonia cases and 50 percent of hospital-acquired pneumonia patients. Herman, Chen, and High (1998) estimate the average cost per day of hospitalization for a patient with pneumococcal pneumonia over the 1983–94 period to be approximately $1,650, with the length of stay averaging eight to ten days for those aged sixty-five and older.[4]

The pneumococcal vaccine is effective in reducing infection by 57 to 75 percent (NNII 2004), and the evidence suggests that cost savings are associated with the use of the vaccine (Herman, Chen, and High 1998; Sisk et al. 1997). In addition, vaccinations are important because antibiotic resistance is increasing, and, thus, the ability to treat pneumococcal infections is becoming more and more difficult (NNII 2004).

Diagnostic care. Diabetes is the sixth leading cause of death in the United States; health care expenditures related to the disease were approximately $91.8 billion in 2002 (NDIC 2003). Diabetes is a common condition for adults over age sixty-five, with the CDC (2004a) estimating that more than 18 percent of the elderly population are diabetic. The CMS includes three diabetic indicators—eye exams, lipid profiles, and hemoglobin A1c tests—when assessing state-level differences in the quality of Medicare-beneficiary medical care. These screenings can help prevent blindness as well as cardiovascular, kidney, and nerve disease (NDIC 2003).

The CDC (2004a) reports that improving glycemic control, which is monitored with hemoglobin A1c blood tests, can decrease the probability of patients' developing microvascular diabetic complications (specifically eye, kidney, and nerve disease) by up to 40 percent. In addition, improving control over blood lipids has been shown to dramatically reduce cardiovascular disease among men by 20 to 50 percent (ADA 2005). The incidence of diabetes-related blindness can be reduced by up to 90 percent with regular eye exams and timely treatment. Thus, the use of these three screenings may reduce both complications for diabetics and the growth rate in health care expenditures (CDC 2003).

Breast cancer is the second leading cause of cancer-related deaths among American women, with 40,000 deaths projected and more than 200,000 new diagnoses expected in 2003 (American Cancer Society 2003b). According to the CDC (2004b), mammograms are currently the best method of detecting breast cancer, and early detection leads to a better chance of survival.[5] Furthermore, according to the National Committee for Quality Assurance (2001), the cost of treating breast cancer

Table 1

Medicare Beneficiary Quality Indicators by Preventive and Diagnostic Care

Clinical topic	Quality indicator	Sample size
Preventive care		
Pneumonia	Influenza immunization every year	BRFSS national sample of 134,236 persons aged 65+; state samples range from 1,504 to 4,911.
	Pneumococcal immunization at least once ever	
Diagnostic care		
Breast cancer	Mammogram at least every two years	All Medicare claims
Diabetes	Hemoglobin A1c at least every year	
	Eye exam at least every year	
	Lipid profile at least every two years	

Source: Jencks et al. (2000)

in the early stage of diagnosis averages $11,000 per patient while diagnosis at the most advanced stage results in average expenditures of $140,000.[6] This finding implies that increasing the percentage of Medicare women who receive regular mammograms, and thereby increasing the rate of early detection, has the benefit of both reducing mortality and slowing the growth rate in health care expenditures.

Data

The data on the quality indicators for the 1997–99 period were obtained from the CMS.[7] A description of the individual quality indicators by category of care (preventive and diagnostic) and sampling method is shown in Table 1.[8] Given the two

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1. By focusing on the process of care rather than outcomes, the CMS will be able to identify weaknesses in the delivery system without the concerns over risk adjustment.
2. Since four large clinical trials performed in the early 1960s found that mammograms led to a decrease in the death rate from breast cancer, mammograms have been recommended yearly or every other year for women over age fifty (Christensen 2002). The Balanced Budget Act of 1997 expanded Medicare coverage to an annual basis for Medicare beneficiaries. However, a recent paper by Gotzsche and Olsen (2001), which noted research flaws in the original studies, has placed some doubt on the true benefit of mammograms.
   Despite this uncertainty of their full benefit, regular mammograms for women over the age of forty are still recommended by the National Cancer Institute, the American Cancer Society, and the American College of Obstetricians and Gynecologists (Christensen 2002).
3. This cost saving is partially offset, however, by the increase in expenditures on the influenza vaccine and the cost of promotions.
4. In addition to pneumonia, the vaccine is also used to prevent pneumococcal bacteremia and pneumococcal meningitis (CDC 2002b).
5. The five-year survival rate drops from 87.9 percent for early-stage diagnosis to 15.2 percent for the most advanced stage of diagnosis (American Cancer Society 2003a).
6. The increasing cost of care with stage of diagnosis is also supported by Taplin et. al (1995).
7. The data series used is Quality of Care–PRO Priorities: National Clinical Topics (Task 1).
8. The data are limited to care received by fee-for-service Medicare patients; thus, the results cannot be generalized to the 15 percent of Medicare beneficiaries enrolled in managed care plans.

Table 2
State-Level Scores and Regional Means by Category of Care

	Category of care (percent)			Category of care (percent)	
	Preventive	**Diagnostic**		**Preventive**	**Diagnostic**
Northeast Region	55.99	65.99	Florida	53.90	68.00
	(4.40)	(3.30)	Georgia	53.50	56.64
Connecticut	55.10	67.01	Kentucky	49.90	60.28
Maine	61.05	69.32	Louisiana	45.30	55.52
Massachusetts	59.35	69.09	Maryland	52.20	64.00
New Hampshire	57.10	69.11	Mississippi	53.50	49.33
New Jersey	47.30	61.34	North Carolina	57.60	63.21
New York	51.70	61.57	Oklahoma	54.85	58.56
Pennsylvania	56.45	63.58	South Carolina	57.95	61.75
Rhode Island	55.35	64.44	Tennessee	57.05	56.20
Vermont	60.55	68.49	Texas	56.20	62.62
			Virginia	60.65	63.62
Midwest Region	55.02	64.37	West Virginia	49.75	57.62
	(3.12)	(4.30)			
Illinois	56.25	56.69	**West Region**	59.61	61.39
Indiana	50.25	60.84		(4.41)	(3.35)
Iowa	60.60	68.40	Alaska	48.75	56.94
Kansas	52.60	63.72	Arizona	66.15	60.29
Michigan	54.60	63.76	California	57.65	61.43
Minnesota	58.65	67.85	Colorado	63.85	61.45
Missouri	57.30	62.54	Hawaii	61.40	66.09
Nebraska	57.80	63.85	Idaho	58.30	63.07
North Dakota	52.80	71.99	Montana	59.60	62.07
Ohio	51.95	59.47	Nevada	55.00	59.81
South Dakota	53.10	64.78	New Mexico	61.45	56.49
Wisconsin	54.35	68.51	Oregon	62.85	64.37
			Utah	57.30	62.85
South Region	53.61	59.37	Washington	60.95	66.65
	(4.83)	(4.78)	Wyoming	61.65	56.56
Alabama	55.05	55.81			
Arkansas	50.10	53.27	**United States**	55.89	62.73
Delaware	60.60	64.96		(4.79)	(4.74)
District of Columbia	43.30	57.97			

Note: Standard deviations are shown in parentheses.
Source: CMS

sampling methods used by the CMS to collect data, the data are separated into two categories for analysis: preventive and diagnostic care. An aggregated state-level quality indicator score is created for each category. This aggregated score is a weighted average of the individual quality indicators, with the sample size for each individual quality indicator used as the weight. The state-level quality indicator scores, as well as the regional means, are reported in Table 2. The South had the lowest average score for quality of care in both categories, the West outperformed the other regions in terms of preventive care, and the Northeast had the highest diagnostic care score.

Table 3

**Sample Means and Nonlinear Least Squares Regression Results
(Dependent Variable: Quality of Care Score)**

Variable	Sample Mean (standard deviation) (1)	Preventive Coefficient (standard error) (3)	Diagnostic Coefficient (standard error) (4)
Constant		−4.9911*	0.5724
		(1.6976)	(1.5319)
Medical system characteristics			
Number of physicians/100,000	239.45	−0.0933	1.1335*
	(0.8626)	(0.5676)	(0.5166)
Number of nurses/100,000	876.80	0.0933	0.0924
	(1.8366)	(0.1675)	(0.1526)
Population characteristics			
Per capita income	28,403.9	1.1055*	0.6911
	(4,451.6)	(0.5522)	(0.5046)
Per capita income squared		−0.1846*	−0.1162
		(0.0910)	(0.0837)
Poverty rate	12.1941	−0.6775	−1.9652*
	(3.1950)	(1.0166)	(0.9144)
Percent over age 65	12.7027	1.6055	2.3130**
	(1.9313)	(1.3775)	(1.2664)
Medicare population characteristics			
Percent black	7.8714	−0.9049*	−1.0019*
	(11.0617)	(0.3952)	(0.3573)
Percent female	58.3219	5.8272*	−2.3756
	(1.8509)	(2.1866)	(1.9859)
Regional dummy variables			
South	0.3333	0.0661	0.0196
	(0.4761)	(0.0920)	(0.0849)
Midwest	0.2353	−0.0524	0.0061
	(0.4284)	(0.0754)	(0.0704)
West	0.2549	0.3795*	−0.0914
	(0.4401)	(0.1100)	(0.0994)
R^2		0.5017	0.6129
N	51		

Note: * indicates significance at the 5 percent level; ** indicates significance at the 10 percent level.
Source: Author's calculations using data from *Statistical Abstract of the United States: 2000*; U.S. Bureau of the Census; U.S. Bureau of Economic Analysis

The means for the independent state-level variables, which were obtained from several sources, are reported in the first column of Table 3. Data on the number of nonfederal (those not employed by the federal government) physicians and nurses per 100,000 members of the population are from the *Statistical Abstract of the United States: 2000*. The poverty rate for each state is the average over the 1997–99

period and is from the Bureau of the Census. State per capita income data for 2000 are from the Bureau of Economic Analysis. The percentage of each state's population enrolled in the Medicare program is estimated by the percentage of the population over age sixty-five, and state racial and gender distributions are from Bureau of the Census estimates of the population aged sixty-five to eighty-five.[9]

Empirical Analysis

The values for the dependent variables range from zero to one; thus, a logistic transformation is used to avoid the possibility of predicting values that fall outside this range. The nonlinear least squares estimation technique is used to estimate the parameters of the following regression equation for each separate quality indicator:

$$(1) \quad R_{js} = \frac{e^{X_s' B}}{1 + e^{X_s' B}} + \varepsilon_{js}.$$

R refers to the overall quality-of-care score in the category of interest, j (preventive or diagnostic), for state s, and X includes the characteristics of the medical system, the overall population, and the Medicare population within state s that are deemed to be related to the quality of medical care received. The error term, ε_{js}, is assumed to be independent and identically distributed with mean zero and an unknown variance-covariance matrix, Σ (Gallant 1987).

State medical system characteristics include the number of physicians and nurses per capita. Increasing the number of physicians should improve the quality of medical care because physicians are ultimately responsible for care; increasing the number of physicians should also improve access to services. In addition, the current U.S. nursing shortage is believed to have adversely affected the quality of patient care (Hopkins 2001); thus, we expect that the coefficient on the number of nurses per capita will also be positive.

For the diagnostic and preventive measures employed in this study, the patient must make the decision to seek out medical care. Thus, adherence to an established quality-of-care standard is a function not only of the care proffered but also of the characteristics of the Medicare beneficiaries. The medical care provider should be able to influence a patient's decision to participate in this type of care, but the patient's characteristics will also influence the level of acceptance. Therefore, the quality of care for these categories is expected to be affected by the characteristics of the Medicare population.

It is well documented that blacks have lower levels of utilization of medical care even after income is taken into account (Mayberry, Mili, and Ofili 2000). Pertinent to this analysis, Gornick et al. (1996) found that blacks had lower levels of utilization of preventive care. The explanations for these racial differences vary from limited access due to discrimination to lower levels of demand due to a distrust of the system (Weddington et al. 1992). Thus, in this study the coefficient on the percentage of a state's Medicare population that is black is expected to be negative.

Evidence in the literature suggests that older females are more likely to obtain preventive services than are older males. Thus, the variable controlling for the percentage of the Medicare population that is female in each state is expected to be positively related to quality (Johnson-Lans and Bellemore 1997).

The quality of medical care may also be influenced by the characteristics of the overall population of a state. For example, states with lower average income, and thus a lower tax base, may not be as willing or able to invest in a higher quality of

care. In addition, states with higher poverty rates may have relatively higher numbers of uninsured or publicly insured. This fact may limit investment in medical care facilities and, in turn, reduce the quality of medical care for Medicare beneficiaries.

Finally, the percentage of a state's population that is aged sixty-five and older is used to proxy for the Medicare-eligible population. States with a large Medicare population may have economies of scale in education and outreach that will lead to higher-quality care. Conversely, medical providers may be reimbursed at a lower rate for Medicare patients than for privately insured patients. Increasing the percentage of patients who are covered by Medicare may lead medical care providers

If indeed an ounce of prevention is worth a pound of cure, then improvements in the utilization of preventive and diagnostic services may slow the growth rate in health care expenditures.

to use cost containment strategies that reduce the quality of patient care. Therefore, the expected sign of this coefficient cannot be determined a priori.

Results

The nonlinear least squares estimates of equation 1 are presented in the second and third columns of Table 3. The only coefficient that is statistically significant in both categories is the percentage of the Medicare population that is black. The marginal effect of a 1 percent increase in the percentage of a state's Medicare population that is black is to lower the quality of preventive and diagnostic care by 0.53 and 0.55 percentage points, respectively.[10]

Preventive care. In addition to the percentage of the state population that is black, per capita income (and its square), the percent female, and the West region have statistically significant coefficients. A $1,000 increase in per capita income would increase the quality-of-care score by 0.14 percentage points. The significant sign on the percent female is positive, as expected, because women have been shown to be more likely to engage in preventive behavior.

Diagnostic care. In addition to the percentage of the Medicare population that is black, the number of physicians, the poverty rate, and the percentage of the population that is eligible for Medicare are associated with the quality of diagnostic care. The coefficient on the number of physicians is positive and statistically significant, suggesting that an increase in the number of physicians by 100 for every 100,000 members of the population leads to a 0.07 percentage point increase in the quality of diagnostic care.

A 1 percent increase in the poverty rate lowers the quality of diagnostic care by 1.31 percentage points while increasing per capita income by $1,000 leads to a 0.11 percentage point increase in the quality of diagnostic care. Finally, increasing the percentage of a state's Medicare population by 1 percent increases diagnostic care by 1.45 percentage points. This finding suggests there may be economies of scale associated with the provision of diagnostic care.

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9. The poverty statistics were obtained from www.census.gov/hhes/poverty/poverty99/pv99state. html (November 21, 2003). Data on state per capita income for 2000 were obtained from www.bea. doc.gov/bea/regional/spi/ (November 21, 2003). "Population Estimates for States by Age, Race, Sex, and Hispanic Origin: July 1, 1999" (ST-99-43) were obtained from www.census.gov/population/ estimates/state/sasrh/sasrh99.txt (February 5, 2005).
10. As a result of using the logistic transformation, the coefficients do not represent the true effect of the independent variables. The marginal effects are the average of the marginal effects estimated across the states.

Conclusion

While all states have room for improvement, this study shows that the quality of preventive and diagnostic medical care was lower, in general, for southern states. The observed state-level differences are attributed, in part, to socioeconomic and demographic characteristics. In particular, the percentage of a state's Medicare population that is black is inversely related to the quality of medical care. However, we are unable to determine whether racial disparities in utilization of these services are solely the results of blacks' utilizing lower levels of services or whether utilization levels were lower for all Medicare beneficiaries in states that have proportionally larger black populations.

Access to individual-level data within states would allow researchers to make these determinations and provide a direction for future work. Most importantly, understanding the causes behind racial disparities in the quality of medical care will enable the CMS to promote the goal of delivering the highest quality of care to all Medicare beneficiaries and slow the growth rate in health care expenditures (Etchason et al. 2001).

REFERENCES

American Cancer Society. 2003a. *Breast cancer facts & figures 2003–2004*. Atlanta: American Cancer Society.

———. 2003b. *Cancer prevention & early detection facts & figures 2003*. Atlanta: American Cancer Society.

American Diabetes Association (ADA). 2005. Diabetes statistics for men. *All About Diabetes*. <www.diabetes.org/diabetes-statistics/men.jsp> (February 25, 2005).

Centers for Disease Control and Prevention (CDC). 2002a. Influenza and pneumococcal vaccination levels among persons aged >65 years—United States. *Morbidity and Mortality Weekly Report* 51, no. 45:1019–24.

———. 2002b. Pneumococcal disease. In *Epidemiology & prevention of vaccine-preventable diseases (The Pink Book)*. 7th ed. Atlanta: CDC.

———. 2003. National diabetes fact sheet. *Diabetes Public Health Resource*. <www.cdc.gov/pubs/pdf/ndfs_2003.pdf> (February 25, 2005).

———. 2004a. Diabetes: Disabling, deadly and on the rise. *Chronic Disease Prevention*. <www.cdc.gov/nccdphp/aag/aag_ddt.htm> (February 25, 2005).

———. 2004b. The national breast and cervical cancer early detection program—reducing mortality through screening. *2003 Fact Sheet*. <www.cdc.gov/cancer/nbccedp/about.htm> (February 25, 2005).

Centers for Medicare and Medicaid Services (CMS). 2002. Interventions that increase the utilization of Medicare-funded preventive services for persons age 65 and older. *Healthy Aging Initiative*. <http://cms.hhs.gov/healthyaging/2a4.pdf> (February 25, 2005).

———. 2004. National health expenditures and selected economic indicators, levels and average annual percent change: Selected calendar years 1980–2012. <www.cms.hhs.gov/statistics/nhe/projections-2002/t1.asp> (February 25, 2005).

Christensen, Damaris. 2002. Mammograms on trial. *Science News* 161, no. 17:264–67.

Etchason, Jeff, Brian S. Armour, Elizabeth Ofili, George Rust, Robert Mayberry, Lawrence Sander, and M. Melinda Pitts. 2001. Racial and ethnic disparities in health care. *Journal of the American Medical Association* 285, no. 7:883.

Fedson, D.S., A. Wajda, J.P. Nicol, G.W. Hammond, D.L. Kaiser, and L.L. Roos. 1993. Clinical effectiveness of influenza vaccination of Manitoba. *Journal of the American Medicine Association* 270, no. 16:1956–61.

Gallant, A. Ronald. 1987. *Nonlinear statistical models*. New York: John Wiley and Sons.

Gornick, Marian E., Paul W. Eggers, Thomas W. Reilly, Renee M. Mentnech, Leslye K. Fitterman, Lawrence E. Kucken, and Bruce C. Vladeck. 1996. Effect of race and income on mortality and use of services among Medicare beneficiaries. *New England Journal of Medicine* 335, no. 11:791–99.

Herman, Christopher, John Chen, and Kevin P. High. 1998. Infections in the elderly: Pneumococcal penicillin resistance and the cost-effectiveness of pneumococcal vaccine. *Infectious Medicine* 15, no. 4:233–75.

Hopkins, Mary Elizabeth. 2001. Critical condition. *NurseWeek* 2, no. 4:17–20.

Jencks, Stephen F., Timothy Cuerdon, Dale R. Burwen, Barbara Fleming, Peter M. Houck, Annette E. Kussmaul, David S. Nilasena, Diana L. Ordin, and David R. Arday. 2000. Quality of medical care delivered to Medicare beneficiaries: A profile at state and national levels. *Journal of the American Medical Association* 284, no. 13:1670–76.

Johnson-Lans, Shirley, and Fred Bellemore. 1997. Gender and race as factors in health care utilization. *International Advances in Economic Research* 3, no. 2:193–205.

Mayberry, Robert, Fatima Mili, and Elizabeth Ofili. 2000. Racial and ethnic differences in access to medical care. *Medical Care Research and Review* 57, supplement 1:108–45.

Meltzer, Martin I., Nancy Cox, and Keiji Fukuda. 1999. Modeling the economic impact of pandemic influenza in the United States: Implications for setting priorities for intervention. <www.cdc.gov//ncidod/eid/vol5no5/melt_back.htm> (February 25, 2005).

National Committee for Quality Assurance. 2001. Breast cancer screening. *Health Choices*. <www.healthchoices.org/stayinghealthy/5.asp> (February 25, 2005).

National Diabetes Information Clearinghouse (NDIC). 2003. National diabetes statistics. <http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm> (February 25, 2005).

National Network for Immunization Information (NNII). 2004. Vaccine information: Pneumococcal disease. <www.immunizationinfo.org/vaccineInfo/vaccine_detail.cfv?id=9> (February 25, 2005).

Nichol, K.L., K.L. Margolis, J. Wuorenma, and T. Von Sternberg. 1994. The efficacy and cost effectiveness of vaccination against influenza among elderly persons living in the community. *New England Journal of Medicine* 331, no. 12:778–84.

Olsen, Ole, and Peter C. Gotzsche. 2001. Cochrane review on screening for breast cancer with mammography. *The Lancet* 358, no. 9290:1340–43.

Sisk, Jane E., Alan J. Moskowitz, William Whang, Jean D. Lin, David S. Fedson, A. Marshall McBean, Joseph F. Plouffe, Martin S. Cetron, and Jay C. Butler. 1997. Cost-effectiveness of vaccination against pneumococcal bacteremia among elderly people. *Journal of the American Medical Association* 278, no. 16:1333–39.

Taplin, S.H., W. Barlow, N. Urban, M.T. Mandelson, D.J. Timlin, L. Ichikawa, and P. Nefcy. 1995. Stage, age, comorbidity, and direct costs of colon, prostate, and breast cancer care. *Journal of the National Cancer Institute* 87, no. 6:417–26.

Weddington, W., L. Gabel, G. Peet, and S. Stewart. 1992. Quality of care and black American patients. *Journal of the National Medical Association* 84, no. 7:569–75.