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In This Issue

A Regional Perspective on the 'Great Moderation'

Mexican Migrants Stay in Border Comfort Zone

Spotlight: Waco's Economy

On the Record: Putting People into Economic Policy



President's Perspective



or centuries, economic sages have warned us in different ways that governments with the power to control their nations' money would most certainly misuse it. To promote economic stability and prosperity, many have advocated delegating that power to a central bank that operates independently of political influences.

Among these illustrious scholars is a humble and soft-spoken Norwegian named Finn Kydland, who shared the 2004 Nobel Prize in economics with his colleague Ed Prescott. I am proud to say that Finn has been consulting with the Dallas Fed's Research Department for 14 years.

Kydland and Prescott demonstrated the dangers of too much discretion in monetary policymaking. They identified a paradox of "optimal" monetary policy: It will not always appear to be optimal. Future monetary policymakers will therefore be tempted to re-

When individuals and firms have faith that monetary policymakers will stick to the rules over time, they can better anticipate the future.

place it with an alternative that seems better suited for the circumstances of the day.

Capitalism thrives under a stable set of rules that everyone understands and obeys. Knowing this, Kydland and Prescott showed how unsettling a change in monetary policy rules can be. People will then expect the next set of rules to be replaced. And the next, and all the rules that follow. By changing these rules, monetary policymakers tarnish their reputations and lose their ability to credibly implement the best policies. They will be limited to suboptimal policies that lead to poor economic outcomes.

Kydland and Prescott argued that the best approach to monetary policy is strict adherence to a set of transparent rules from year to year and decade to decade, even when alternative policies appear better. When individuals and firms have faith that monetary policymakers will stick to the rules over time, they can better anticipate the future and make economic decisions accordingly.

Even with the best intentions, few political leaders would be able to resist the intense pressure to stray from the rules. Many central banks have failed to resist these pressures, too. Properly designed independent central banks are positioned to maintain discipline and follow the rulebook. Even in trying times, they will be calm and steady, untainted by the passion of the moment and immune to political exigency and interference.

I invite you to learn more about Finn Kydland and his work in this issue's "On the Record" interview.

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Richard W. Fisher President and CEO Federal Reserve Bank of Dallas



The Great Moderation impacted job growth across nearly all regions over a fairly short period of time.

A Regional Perspective on the 'Great Moderation'

By Evan F. Koenig and Nicole Ball

U.S. economic growth has been much steadier the past 24 years than it was the preceding 24. One result of this "Great Moderation" has been less time spent in recession: Our economy contracted for a total of 59 months between 1960 and 1983, compared with only 16 months between 1984 and 2007. The number of recessions fell from five to two.

Proposed explanations include better monetary policy, fewer adverse shocks to energy supplies, financial innovation and deregulation that have made credit more readily available and improvements in supply-chain management that have helped manufacturers and retailers maintain tighter control of inventories.

In a recent article, we looked at an industry-by-industry breakdown of the Great Moderation.¹ Here, we look at regional patterns. Are some sections of the country especially large contributors to national jobs volatility? If so, they may give early warning of national employment swings.

We also focus on the decrease in Texas job-growth volatility and compare the industries chiefly responsible for this decline with those responsible for the greater stability of the nation as a whole. We show that although changes in Texas and the nation have made the two more similar, the correlation between state and U.S. job growth remains low.

Timing Differences

U.S. job growth became less volatile beginning in first quarter 1984, and five of nine Census Bureau divisions, containing nearly 60 percent of the nation's jobs, experienced sharp volatility declines within one quarter of the national date (*see map*).

Volatility in the South Atlantic division, with another 17 percent of the nation's jobs, declined a year later. Five quarters later still, job growth in the West North Central division stabilized. One quarter after that, job growth in the West South Central division which includes Texas and Louisiana became less volatile. New England was the laggard: Its job growth didn't stabilize until second quarter 1991.

Whatever its cause, the Great Moderation obviously impacted job growth across nearly all regions over a fairly short period





Chart 1

Smallest Get Bigger, Biggest Get Smaller

(Regional share of national employment in early and late periods) 1984-2007 (Dercent)





1984-2007 (percentage points)



of time. Within three years, Census divisions accounting for 94 percent of the nation's jobs transitioned to the new, more stable pattern.

It seems doubtful that innovations in inventory control and supply-chain management would have spread so widely, so quickly. Although an energy shock probably helped delay the West South Central's moderation, it's hard to find evidence that greater energy-price stability played a broader role in the Great Moderation. By elimination, that leaves Great Moderation explanations that emphasize financial deregulation, financial innovation and improved monetary policy.

Regional Volatility Contributions

We can determine each region's impact on the Great Moderation by comparing how much it contributes to national job-growth volatility before and after the national break. For convenience, we call the prebreak interval (1960–83) the early period and the postbreak interval (1984–2007) the late period.

Three factors determine a region's contribution to swings in national employment growth: (1) How big the region is relative to the nation; (2) the volatility of the region's job growth; and (3) the correlation between regional and national job growth.

Relative size. In the early period, shares of national employment range from 4.2 percent (Mountain) and 5.5 percent (East South Central) to 19.1 percent (Middle Atlantic) and 20.1 percent (East North Central). The West South Central region is in the middle of the pack at 9 percent.

By the late period, the smallest regions see

their shares of total employment increase, while the largest regions see their shares shrink (*Chart 1*). The result is a narrower range of job shares—from 5.6 percent (New England) and 5.8 percent (East South Central) to 16.9 percent (East North Central) and 18.3 percent (South Atlantic). The West South Central region remains in the middle—at 10.4 percent of national employment.

Regional volatility. If one region

grows in relative size, another must shrink. Regional job-growth volatility faces no such constraint, and in fact, volatility declines in every region between the early and late periods. The result is a much smaller dispersion of regional volatilities—2.3 to 3.7 percentage points before 1984 versus 1.5 to 2.3 after 1984. The most volatile region in the late period (New England) is no more volatile than the least volatile region in the early period (Middle Atlantic).

The largest declines, by far, occur in regions that were initially the most volatile (*Chart 2*). From the early to late period, volatility falls from 3.7 to 1.7 percentage points in the East North Central and from 3.4 to 1.7 points in the East South Central.² The West North Central region also experiences a large decline—from 2.7 to 1.5 points.

The two regions that were most volatile in the early period and whose volatility fell most are among the nation's most manufacturing focused. As of 1990—the earliest year an industry breakdown of regional employment is available—manufacturing's share of jobs was 20.8 percent in the East North Central and 21.9 percent in the East South Central region. The national average was only 16.2 percent.

These large declines are consistent with earlier studies that point to manufacturing as the sector in which the Great Moderation has had the biggest impact.

Regional correlation. When it comes to the correlation between regional and national growth, the early period shows two distinct groups: the West South Central and Mountain regions, both with 0.75 correlations, and the remaining regions, with correlations between 0.86 and 0.93.

Not much changes in the late period except in the West South Central region, where the correlation drops from 0.75 to 0.54. In both early and late periods—but especially the late period—West South Central job growth is tied only loosely to the national economy.

The falling correlation between West South Central and national job growth has a lot to do with oil prices. Because of its relatively heavy energy-extraction activity, the region tends to differ from the rest of the nation in its response to global energy shocks. The collapse of oil prices in first quarter 1986 curtailed the region's job growth without having much impact on the nation.³

The correlation between West South Central and national job growth is 0.62

when we measure from the region's volatility break date in third quarter 1986 rather than the national break in first quarter 1984. Recalculating from Texas' break in fourth quarter 1987 raises the correlation coefficient to 0.78—roughly the same as the 1960–83 period, but lower than every region except the Mountain.

Total contribution. Multiplying relative size, volatility and correlation determines each region's total contribution to national job-growth volatility.

In the early period, the heavily industrialized East North Central region's large size, high volatility and high correlation make it far and away the largest contributor to U.S. job volatility (*Chart 3*). The smallest contributors—the Mountain, New England, East South Central, West South Central and West North Central regions—are characterized by small size, medium volatility and low correlation.

Going from the early to the late period, the largest contribution decline comes from the East North Central region, which shows a sharp, 54 percent fall in volatility and a 15 percent reduction in relative size. This pattern—a large decline in volatility mediated by a modest upward or downward adjustment to relative size—is typical. Only in the West South Central does a decline in the correlation with national job growth have an important stabilizing effect.

How About Texas?

Statistical tests show the break in Texas' job-growth volatility occurs in fourth quarter 1987, roughly three years after the national break. For Texas, as for the West South Central region as a whole, the delay can be linked to the adverse effects of the 1986 oil-price collapse.

Different industries explain the volatility declines in Texas and the U.S. (*Chart 4*).⁴ For the nation, goods-producing industries account for 99 percent of the volatility reduction. The private service-providing industries' contribution increases slightly between the early and late periods, but this is offset by a reduced contribution from government. For Texas, the goods industries aren't nearly as dominant, accounting for 73 percent of the total decline in volatility reduction. The private service industries contribute 22 percent.

Differences between Texas and the nation are notable at a finer level of industry analysis, too. For the U.S., durable manufacturing accounts for 67 percent of the total volatility reduction, and nondurable manufacturing accounts for 19 percent. In Texas, these industries account for 27 percent and 8 percent, respectively.

Other important Texas volatility reductions come from construction (18 percent) and natural resources and mining (16 percent). The latter finding isn't surprising, given that the early Texas sample is marked by the energy boom and bust.

Within the national service supersectors, a big increase in volatility comes from "other services"a catch-all category that includes the professional and business services and the leisure and hospitality industries.5 In contrast, this category's impact on Texas' volatility is small. Similarly, the trade, transportation and utilities supersector contributes more to Texas' Great Moderation than to the nation's.6

Have Texas and the nation become more or less alike in terms of industry contributions to job-growth volatility? We compare industry volatility contributions from second quarter 1970 through fourth quarter 1983, when job growth was volatile in both Texas and the nation, and from fourth quarter 1987 through fourth quarter 2007, after job growth had moderated in both. The comparison reveals that Texas and the nation are far more similar in the late period than in the early period (Chart 5).

In the early period, natural resources and mining; trade, transportation and utilities; and other services (and private services as a whole) make substantially larger contributions to job-growth volatility in Texas than the nation. Durable and nondurable manufacturing, along with education and health and, to a lesser ex-

Chart 3

All Regions Contribute to Volatility Decline

(Regional contribution to national job-growth volatility in early and late periods)

1984-2007 (percentage points)



Chart 4

Sources of Volatility Decline Differ for Texas and Nation

(Industry contribution to total volatility decline between early and late periods)

Texas (percentage points)



tent, information services, make smaller contributions in Texas.

In the late period, differences shrink markedly. Only private services as a whole remains a noticeably larger source of jobgrowth volatility for Texas than for the nation. Industry convergence occurs in relative size, volatility and correlation measures. In the early period, for example, Texas has somewhat larger shares of employment than the nation in the natural resources and mining, construction, and trade, transportation and utilities industries and notably smaller shares in the durable goods manufacturing and other-services industries. In the late period, no significant differences remain.

Industry volatilities follow a similar pattern. Early on, job growth in the natural resources and mining industry is much less volatile in Texas than in the nation. Construction is also less volatile in Texas than in the nation, while Texas' other-services

(Industry contribution to volatility)

Sources of Volatility: Texas vs. the Nation

Larger contibution

to Texas volatility

Chart 5

1.8

1.6

1.4

A. Early period

Texas (percentage points)

Goods-producing

Mfg. durable goods

Mfg. nondurable goods

Natural resources & mining

Construction

growth shows substantial excess volatility. In the late period, Texas and national volatilities are generally closer to each other than before.

Early-period correlations between industry job growth and aggregate job growth are often very different in Texas than in the nation. For example, the correlation between aggregate growth and growth in natural resources and mining is far higher in Texas than the nation. In the late period, these differences shrink markedly. The biggest change between the two periods is in the education and health supersector, where the national correlation falls sharply and the Texas correlation rises a bit.

> Although Texas has become more like the nation in both industry composition and the contributions each industry makes to aggregate job-growth volatility, this doesn't mean the state's job growth has become more highly correlated with the nation's. In fact, the correlation rises only modestly, from 0.73 to 0.80, between 1970–83 and 1987–2007.

South Atlantic Best Barometer

Although the Great Moderation has left our region looking more like the rest of the country, if one had to choose an area to monitor as a barometer of the national economy, it would probably be the South Atlantic region rather than Texas or the West South Central region.

The South Atlantic region accounts for more variation in national job growth (31 percent) than any other census division, and job growth there has the highest correlation with national job growth (0.93). The West South Central region, in contrast, accounts for only 11 percent of the variation in national job growth and—even excluding the immediate aftermath of the 1986 oil-price collapse—has the lowest correlation with national growth (0.62).

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Notes

¹ See "The 'Great Moderation' in Output and Employment Volatility: An Update," by Nicole Ball and Evan F. Koenig, Federal Reserve Bank of Dallas *Economic Letter*, Vol. 2, No. 9, September 2007.

² We measure volatility by the standard deviation of quarterly job growth. The standard deviation is one-fourth the width of a band that captures 95 percent of the job-growth data.
³ See Table 3 in "Energy Prices and State Economic Performance," by Stephen P.A. Brown and Mine K. Yücel, Federal Reserve Bank of Dallas *Economic Review*, Second Quarter 1995, pp. 13–23. The Brown–Yücel data imply that a 10 percent oil-price decline, hitting in the 1980s, would have lowered employment 1.44 percent in the West South Central region and 0.24 percent in the Mountain region. All other regions are modestly helped by the oil-price decline. The price of crude oil fell 52 percent between fourth quarter 1985 and second quarter 1986.

⁴ We calculate these industry contributions for Texas and the nation for both early and late sample periods. For Texas, the early period runs from second quarter 1970 through third quarter 1987 and the late period from fourth quarter 1987 through fourth quarter 2007. (Texas jobs data disaggregated by industry begin in 1970.) For the nation, the corresponding periods are first quarter 1960 through fourth quarter 1983 and first quarter 1984 through fourth quarter 2007. For Texas and the nation, we then calculate the change in each industry's volatility contribution as a percentage of the total change in job-growth volatility.

⁵ We lump these industries together to facilitate comparison with Texas, where data are not available over the entire period at as fine a disaggregation level as for the nation.

⁶ The underlying story behind the fall in volatility contribution is a bit different for each Texas industry. In the case of natural resources and mining, the fall reflects a lower correlation with overall job growth, reduced industry volatility and a shrunken job share, in that order. In construction, most of the decline stems from reduced industry volatility, with assists from smaller size and a lower correlation. In manufacturing, reductions in industry volatility and size are responsible for much of the decline. The trade, transportation and utilities industry's Texas volatility contribution falls mostly because of its reduced volatility and secondarily because of a lower correlation with total Texas job growth.



Spot Light Waco's Economy It's Come a Long Way from Cotton, Dr Pepper

Nestled near the confluence of the Brazos and Bosque rivers, Waco was settled in 1849 at the site of a village once home to the Waco Indian tribe. The town was primarily agrarian, with a flourishing cotton plantation economy, until the early 1870s, when a 474-foot suspension bridge across the Brazos and



the arrival of the railroad turned it into a prominent jumping-off point for pioneers heading west. The addition of two

other railroads in the 1880s made the city a

transportation hub for agricultural goods, and Waco began to boom with textile and flour mills, foundries, bottling companies and banks. Three colleges soon opened their doors, among them the present-day Baylor University. A Waco pharmacist invented Dr Pepper, America's oldest major soft drink brand, during this decade.

Over the years, Waco's entrepreneurial spirit energized its economy following downturns and attracted businesses from a broad range of industries. Today, the onetime cotton town is an urban center with a population of about 228,000 and an economy closely linked to the Texas business cycle. Waco's unemployment has risen and fallen with the state's (*Chart 1*).

No major industry accounts for more than a fifth

of the Waco metropolitan area's total employment (*Chart 2*). With 18 percent of the area's 109,000 jobs, the largest sector is education and health services. Baylor, Waco's largest private employer, combines with two other higher-education institutions to provide stability and growth to the local economy. Job creation in the education services industry rose 2.6 percent last year.

In health care, the area's two major hospitals are undergoing vast expansions.



In fact, the Hillcrest Baptist Medical Center project ranked among the 10 largest breaking ground in Texas in 2006.

Manufacturing is among Waco's mainstays, accounting for about 14 percent of area jobs. Electronics and food manufacturers are the dominant employers and include Cargill Foods, Masterfoods USA, Pilgrim's Pride, Sanderson Farms and L-3 Communications. Although manufacturing employment has slid since 2005, average weekly factory wages have continued to rise.

Waco's housing market looks like many others in the state. From 2001 to 2006, single-family building permits doubled, and home sales grew at a swift pace. But building and sales activity peaked in late 2006, and permits were down 15 percent in April 2008 from year-earlier levels. Home inventories have climbed to 9.4 months, exceeding the state average of 6.3 months. Home prices are about where they were in 2007.

Diversity and stability have given Waco steady but unspectacular growth—no booms, no busts. From 1997 to 2000, for example, state job growth was 13.5 percent, while Waco payrolls rose by 7.8 percent. Between March 2001 and July 2003, when Texas lost 2.3 percent of its jobs, employment in Waco contracted 1.4 percent.

—Laila Assanie

OnThe Record A Conversation with Finn Kydland Putting People into Economic Policy

Finn Kydland, a Dallas Fed consultant since 1994, shared the 2004 Nobel Prize in economics with Edward C. Prescott for their groundbreaking work incorporating decisionmaking by individuals, households and firms into economic models.

Q. More than three years have passed since you won the Nobel Prize. What do you remember from that particular moment in your life?

A. All of it is still fresh in my mind, everything that led up to it, starting with the day it was announced, breaking the news to my wife, talking to my mother, who told me that six or seven journalists had already been to her house in Norway, and seeing from the published interviews how cool she was about it. I was in Norway at the time, giving some lectures, and all of those things stand out in my mind as much as being in front of the king of Sweden and accepting the medal.

Q. Tell me a bit about the actual ceremony.

A. A key event takes place two days before the awards ceremony. You give a lecture. You have about 40 minutes to talk about your work or anything you think is significant in relation to the work or why you got the Nobel Prize. That's actually the highest-pressure thing because there'll be anywhere from 500 to 1,000 people in the auditorium, and it's broadcast to anywhere in the world where people care to listen to such lectures.

Once that's over, then everything is just fun. On the actual day, the first thing was the awards ceremony, with a lot of pageantry that led up to receiving the medal from the king. When everyone had received the medal, we were whisked off to a big dinner for more than a thousand people. At the end of the dinner, the winners got to speak with the king and queen for five minutes, and then it was off to the dancing.

Q. How has your life changed since you've won the prize?

A. I do get different kinds of invitations now. I used to go to universities and present my research. Now, I also get invited to give key-

note addresses at conferences or particular events, and these are sometimes in quite exotic places, like Shanghai, Taipei, South America and Petra in Jordan.

But I think the most important thing is that I now have easier access to research funds. In particular, I got funding for an institute at the University of California, Santa Barbara, where I teach, called the Laboratory of Aggregate Economics and Finance, or LAEF. I spent half a day looking for a name that would create an acronym that would be pronounced the same as "Leif" Eiriksson, the great Norwegian explorer who was the first European to discover America.

That's what the institute is about—exploration and discovery. We put on conferences that focus on a particular issue, a particular question, and they turn out to be very lively. We had one on households, gender and fertility and one on Latin America's total factor productivity puzzle.

Q. Can you give us a layperson's version of the work that won you the Nobel?

A. The shortest way to describe it is that Ed Prescott and I showed how to put people into economic models and therefore policy. The award was for work we did in the midto late 1970s. In those days, macroeconomic models tended to be systems of equations in which researchers used statistical techniques to determine the parameters for consumption functions, investment functions, labor supply functions, labor demand functions and so on.

Around 1973, a two-page story in *BusinessWeek* expressed excitement about the idea you could use optimal control theory, a tool applied in physics, engineering and other sciences, to control the aggregate economy. This was just around the time that Prescott and I started our work, and we basically showed that using such techniques in that context isn't a good idea.

Q. What's the better idea?

A. We were explicit about the decisions facing rational people. Many of the most important decisions are very forward-looking accumulating physical capital, accumulating human capital, buying long-term bonds and so on. We included these kinds of decisions in our models.

We put our framework to use in several contexts, and we actually won the Nobel Prize for two things. One was the application of our framework to business cycles, where we supposed there were no other sources of change beyond technological shocks that raise productivity. How much of the business cycles still remained? We determined that these kinds of shocks account for about two-thirds of post–World War II economic fluctuations.

The Nobel committee also mentioned the time inconsistency of optimal policy. Being explicit about households' and businesses' decisionmaking allows you to incorporate the fact that so many important decisions are forward-looking. They depend, for example, on what decisionmakers think the government is going to do in the future. An "The first thing was the awards ceremony, with a lot of pageantry that led up to receiving the medal from the king."

optimal policy would have to take into account the effect of future policy on current decisions.

When that future arrives, those decisions have already been made and there's an unfortunate incentive for governments to abandon the optimal policy and replace it with one that is better only under the naïve assumption that households and businesses won't see it coming. If the public anticipates the policy switch, the government is forced to implement a policy that is time consistent—there's no incentive to later repudiate it—but potentially much worse than the time-inconsistent policy.

Q. What are some of the policy implications that come out of this thought process?

A. While it's important to determine the best policies, you have to be consistent over time, and that's difficult in the face of this discovery that optimal policy is time inconsistent. When they reevaluate policies in the future, policymakers will no longer have the incentive to take into account the effect on decisions that have already been made. In the long run, the prediction is that you'll be worse off.

So how can you commit policymakers to carrying out consistent policies? We limit their discretion with rules designed to encourage time consistency. It seems to work better in the context of monetary policy than fiscal policy. In monetary policy, the attempts to isolate central bank policy from political pressure by, say, making the central bank independent, have been a good thing.

In some countries, it's clear that the central bank is very much under pressure from the rest of the government. If the bank's

head doesn't do what the other policymakers want him to do, he's simply replaced. There are many countries in which the tenure of the central bank head has been on the order of a year or less. In Argentina, for example, there were years in which the central bank head was replaced five times.

Q. Obviously, that kind of instability can throw off economic performance.

A. Latin America is a very interesting example of an area that used to be quite well-to-do—at least some of those nations. Over the past 100 years, they've consistently lagged further and further behind. And there's a lot to learn from trying to see why that is. Even for the past 20 years, one of the most depressing graphs I've looked at shows the physical capital stock in Argentina. The sum of factories, machines, office buildings and so on per working-age person declined by 20 percent from 1982 to the early 2000s.

Q. And these declines have something to do with policymakers' inability to take into account how people anticipate changes in economic policies?

A. Sometimes there are signs that leaders mean well, such as in the early 1990s in Argentina. But success becomes difficult if you have lost credibility among the people and among investors, not just domestically but also among foreigners who otherwise might have put their money in the

country. If you lose that credibility, it's very hard to regain it. And the credibility can easily be lost if you succumb to what I might call the time-inconsistency disease.

Q. What are your research interests these days?

A. They go along several lines. I'm still interested in studying particular nations. I've looked at Argentina, and it's a great contrast to a country like Ireland. I think there's a lot to learn from a very successful nation like Ireland and why in other cases, things go so disastrously wrong, as they've done in Argentina.

In the past two or three years, I've been trying to look for mechanisms through which money may play a role in the real economy. The models with explicit households and businesses initially applied to real economies—what happens to consumption, investment, labor input and so on. I guess I concentrated on the real economy because I view that as most important, but it's clear that one can build monetary factors into the economy. It's difficult, however, to get monetary factors to have much of a role in the real economy unless you cheat a little and assume price rigidity—something that I'm reluctant to do.

Another interesting project has to do with investment in durable household capital, such as residential construction and purchases of automobiles. It used to be that mortgages and car loans were made at fixed interest rates. And the question is whether monetary policy in such a circumstance actually may have had a role in the real economy. That's still an ongoing project, and given the current situation, I wish we had gotten further on it.

Mexican Migrants Stay in Border Comfort Zone

By Pia Orrenius and Madeline Zavodny

Limited access to migrant networks and strong geographic preferences may underlie border migrants' willingness to settle for lower wages on the border rather than seek higher wages by venturing into the U.S. interior. As Mexican immigration to the U.S. rose sharply between 1980 and 2000, a growing number of migrants chose to stay in cities along the border rather than travel inland for better job opportunities.

The Mexican-born share of the U.S. population in the border region rose from about 10 percent in 1980 to more than 15 percent in 2000, with most of the increase taking place in the 1990s. Overall, the Mexican-born share of the U.S. population in 2000 was just 3.3 percent.

Without the more affluent San Diego, per capita income on the U.S. side of the border is \$22,302, or 61 percent of the national average.¹ What factors drive Mexican migration into one of the poorest regions in the U.S.? Why would Mexican migrants pass up more lucrative labor markets in the U.S. interior for life on the border?

Most of what we know about Mexican migration to the U.S. focuses on migrants' experiences in traditional gateway destinations, including Los Angeles, Chicago and Houston. Much less is known about Mexicans who choose to migrate to U.S. border cities. Research suggests border migrants are very different from interior migrants in terms of English fluency, education, occupational distribution and earnings.²

Using data from the Mexican Migration Project (MMP), a long-running survey of Mexican households, we take a fresh look at border migrants' sociodemographic characteristics and migration patterns. We also consider whether migrants who work along the border earn significantly lower wages than those who work in the U.S. interior and why that might be the case.

The results suggest that limited access to migrant networks and strong geographic preferences may underlie border migrants' willingness to settle for lower wages on the border rather than seek higher wages by venturing into the U.S. interior.

Tracking Mexican Migrants

Since 1982, the MMP has surveyed about 200 randomly selected households in each of 114 migration-prone Mexican communities, gathering basic migration and demographic information for all household members as well as complete migration histories for household heads. The MMP data, while not representative of all Mexican migrants to the U.S., is one of the few sources of information on the characteristics and time-varying migration behavior of undocumented and return migrants from Mexico.³

Our analysis focuses on first and last U.S. trips made by males and females ages 12 and over who migrated to the U.S. for work between 1980 and 2005. Survey participants reported on many dimensions of their migration, including where they were in the U.S. and for how long, their occupation and wage, and their legal status. Household heads were also asked about their English fluency and family's migration experience. Fourteen percent of all individuals surveyed had at least one qualifying trip, creating a sample of roughly 17,000 trips.

During the sample period, 7.4 percent of trips were to the U.S. border and the remainder were to the U.S. interior. We define the following cities as border destinations: San Diego; Yuma and Tucson, Ariz.; Las Cruces, N.M.; and El Paso, Laredo, McAllen and Brownsville, Texas.⁴

Top destinations for migrants to the U.S. interior were Los Angeles (26.7 percent), Chicago (10.7 percent), Houston (4.5 percent), Dallas (4.1 percent), California's Orange County (3.6 percent) and Fresno, Calif. (3.1 percent).

Between 1989 and 1997, the data show a rising share of trips to U.S. border cities vis-à-vis the U.S. interior (*Chart 1*). The spike in border migration in 1995 is particularly striking. It coincides with the "Tequila Crisis," the Mexican economic downturn

that saw the peso's value drop 49 percent and gross domestic product (GDP) contract 7.1 percent in one year. During this time, the border was an escape valve for Mexicans hurt by the recession.

The drop-off in border migration after 1997 is largely an artifact of the MMP data. The sample sizes become smaller toward the end of the time period as communities fall out of the sampling frame. The decline is particularly severe for border migrants because they're so few.

Migrant Characteristics

Compared with interior migrants, border migrants have more years of education, tend to come from slightly smaller families and are more likely to have been domestic migrants, moving within Mexico before deciding to work in the U.S.

Border migrants are less likely to report that they speak no English. They typically come from communities with less migration experience, so they have a shorter collective migration history overall and access to fewer migrant networks.

Networks are typically defined as relatives who have migration experience and may even live abroad. These connections provide information to potential migrants about crossing the border and finding employment and housing in the U.S. Networks should matter less to border migrants than to interior migrants. Visa requirements aren't as stringent, so it's easier for Mexican newcomers to enter U.S. border cities, and Spanish is widely spoken, making information more accessible.

Mexican migrants who live along the border are much more likely to be from northern Mexico, with 53 percent from northern nonborder states and 22 percent from border states.⁵ Migrants to the U.S. interior, meanwhile, tend to be from central and western Mexico and from communities with significantly more parent and sibling migrant networks.

The border region likely attracts Mexican migrants who prefer to stay close to home, either because they have family in the northern Mexican states or because they're unwilling to risk venturing into the relative unknown of the U.S. interior. Going past border checkpoints into the interior requires legally admitted migrants to fill out additional forms and illegal entrants to circumvent the Border Patrol, which is stationed along all major roads and highways leading to the interior.

Because the border is a closer and safer destination, it may not be surprising that females are a disproportionate share of migrants to U.S. border cities (*Chart 2*). This trend has also been shaped by the nature of border labor demand. Maquiladoras have traditionally relied on a predominantly female workforce and have acted as a magnet drawing them from all parts of Mexico. Female migrants have also found work opportunities plentiful along the U.S. side of Compared with interior migrants, border migrants have more years of education, tend to come from slightly smaller families and are more likely to have been domestic migrants.

the border in domestic service industries and, more recently, retail and hospitality.

Border migrants are significantly less likely to cross into the U.S. illegally. The region's high concentration of Border Patrol and other immigration and customs officials suggests the area attracts migrants who can cross the border legally, such as those who have temporary visas, including tourist visas or border crossing cards.⁶

The share of illegal trips has been consistently lower among migrants to border cities than migrants to the interior (*Chart 3*). The only exception was when the share of illegal immigration to the interior hit a historic low in the immediate aftermath of the 1986 amnesty—more formally, the Immigration Reform and Control Act.

Another interesting difference between border and interior migration is the business cycle's influence. Border migration is much more sensitive than interior migration to changes in U.S. and Mexican economic conditions. A migration regression analysis shows that a 10 percent increase in U.S. employment leads to a 15 percent increase in migration to border cities relative to interior destinations.

In addition to U.S. employment, Mexican GDP and interest rates have a significant effect on border migration as well. Relative to interior migration, a 1 percent decline in Mexican GDP and a 10 percent increase in Mexico's short-term interest rate each lead to a 0.4 percent rise in border migration.

Jobs and Pay

The border economy's characteristics help shape the region's labor demand and supply. Despite a high incidence of poverty and low education levels, the area has experienced rapid employment growth. The number of jobs has risen an average of 2.3 percent a year since 1990, compared with 1.4 percent for the U.S., helping push border unemployment rates down from double to single digits.⁷ Border unemployment reached unprecedented lows in the 2000s.

Since the North American Free Trade Agreement's passage in 1993, border job growth has expanded significantly in transportation, government, finance and real estate, and retail and wholesale trade. Many of the new job opportunities are tied to the rise in Mexico–U.S. trade, population growth on both sides of the border, and the strength and stability of Mexico's currency. A strong peso has sustained a growing influx of Mexican shoppers to U.S. border retailers since the late 1990s.

The transformation of the border economy has meant a dramatic decline in the percentage of workers in agricultural occupations and a rise in the fraction of migrants involved in service- and sales-related employment.

The share of border migrants who worked in agriculture declined from 60 percent in 1980 to less than 10 percent in 2004 (*Chart 4*). During the same period, the fraction working in sales nearly tripled to 33 percent. Similarly, the share in service occupations more than doubled, rising from 20 percent in 1980 to over 40 percent in the mid-1990s.

The concentration of migrants who are professionals is slightly higher along the border than in the interior. An important subgroup among Mexican professionals is factory owners, managers and executives, many of whom likely work in maquiladoras

in Mexico while living on the U.S. side of the border.

What about pay? Wage regressions show border migrants earn 16 percent less than interior migrants. The border wage penalty appears to be largely related to the nature of border labor supply.

Female migrants in the interior earn 25 percent less than men with similar characteristics, but on the border, the female wage deficit is 41 percent. Some of the earnings differential is due to the type of jobs Mexican immigrant women along the border tend to hold—nannies, housekeepers and retail workers.

Illegal immigrants in the interior earn about 13 percent less than similar workers who cross the border legally, but illegal immigrants on the border earn 29 percent less. Undocumented workers presumably face a border-related wage penalty because they have to compete with a large binational pool of workers who have similar skills and backgrounds but can work legally in the U.S.

Wages are significantly higher for workers with more years of education, although an additional year of education is associated with only a 1 percent rise in wages. While education is relatively scarce on the border, the regression suggests that returns to education aren't higher on the border—at least not for Mexican migrants. This result could be related to the limited transferability of education credentials or the low quality of schooling in migrants' origin communities.

In sum, the need for fewer migrant networks and a desire for proximity to Mexico probably outweigh the wage penalty in border migrants' minds and help account for their concentration in these areas. The cost of living is also lower along the border, which somewhat shrinks the real wage gap with the interior.

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Notes

This article is based on research Orrenius and Zavodny conducted with Leslie Lukens of the University of Texas at Austin. Their article, "Differences Between Mexican Migration to the U.S. Border and the Interior: Evidence from Mexican Survey Data," is forthcoming in *Labor Market Issues Along the U.S.-Mexico Border: Economic and Demographic Analyses*, ed. Marie T. Mora and Alberto Dávila, University of Arizona Press.

¹ If San Diego is included, per capita income on the U.S. side of the border is \$30,904, or 85 percent of the U.S. average.
² See "English Skills, Earnings, and the Occupational Sorting of Mexican Americans Along the U.S.-Mexico Border," by Alberto Dávila and Marie T. Mora, *International Migration Review* 34, Spring 2000, pp. 133–57.

 ³ For information and data, see Office of Population Research, Princeton University, http://mmp.opr.princeton.edu.
 ⁴ Tucson and Las Cruces are not generally considered border cities since they are not located adjacent to Mexico. However, The need for fewer migrant networks and a desire for proximity to Mexico probably outweigh the wage penalty in border migrants' minds and help account for their concentration in these areas.

they are in counties that are adjacent to the border and, given our small sample sizes, we chose to include them as border cities.

⁵ The majority of MMP migrants are from western states, including Jalisco, Guanajuato, Michoacán, Colima and Aguascalientes—states in a region that has traditionally contributed large numbers of migrants to the U.S. The other MMP states include Baja California Norte, Chihuahua and Nuevo León (border states); Sinaloa, Durango, Nayarit, Zacatecas and San Luis Potosí (northern states); and Oaxaca, Puebla, Guerrero, Hidalgo, Tlaxcala, Veracruz and the state of México (central states).

⁶ Being able to cross the border legally does not mean that these migrants can work legally in the U.S., although many of them work anyway. It is also common to overstay these visas, at which point the migrant loses legal status.

⁷ See "Border Region Makes Progress in the 1990s," by Eric Dittmar and Keith R. Phillips, Federal Reserve Bank of Dallas *Vista*, December 1999.

QUOTABLE: "New technologies that doubled energy efficiency could have the same effect on energy prices as a doubling of supply."

- Stephen P. A. Brown, director of energy economics and microeconomic policy

TEXAS TRADE: Air Shipments Up for Imports, Exports

In moving such high-value products as semiconductors and aircraft components, airfreight provides a small but important barometer of Texas' international trade.

Seasonally adjusted Department of Transportation data, which measure cargo in pounds, show that air shipments from Texas to markets abroad increased 70.7 percent in the five years ending in December 2007. The state's gain substantially topped the nation's 51.5 percent.

Texas-bound foreign cargo also exceeded the national average, rising 41.6 percent over the period, about 60 percent of the growth rate of outbound freight. For the U.S., incoming international airfreight increased by 19.5 percent, slightly more than a third of outbound shipments' growth rate.

December 2002 and December 2007 bracket a period in which the trade-weighted value of the dollar, coming off its February 2002 peak, declined 19.1 percent in real terms. A weaker dollar makes U.S. exports cheaper for foreigners but imports more expensive for American consumers.

Air cargo numbers suggest Texas exports are getting a larger than average boost from a weaker dollar, a trend also seen in the broader data, which include truck, rail and waterborne shipments. At the same time, Texas' airfreight imports have been less sensitive to the dollar's value.

-Mike Nicholson

ENERGY: New Texas LNG Terminals Put on Hold

Texas' energy industry is thriving, but changing market conditions will delay the construction of five of the seven liquefied natural gas (LNG) terminals approved for the state. They're now estimated to go online in 2011 and 2012, three years later than planned.

Texas is the country's largest natural gas producer, accounting for more than 30 percent of the U.S. total. The petrochemical industry, heavily dependent on natural gas supplies, provides the state's workers with nearly 143,000 jobs and \$11 billion in wages. As a result, the LNG terminals have faced little opposition.

In summer 2005, the Asian LNG price was well below

the Henry Hub spot price for natural gas, creating an incentive to build new facilities for cheaper imports. The Federal Energy Regulatory Commission cleared proposals for six new Texas LNG terminals. Adding them to one previously approved Texas terminal would create a massive 14.7 billion cubic feet a day in new capacity.

Now, companies backing five of the proposed terminals have put the projects on hold. A weakening U.S. industrial sector has lowered demand for natural gas. Meanwhile, overseas LNG prices have risen, reducing the potential advantages of imported gas.

—Jessica Renier

AGRICULTURE: Texas Rice Acreage Grows with Prices

Texas rice farmers expect to reverse recent trends and plant more rice in 2008, a year of global shortages and rising prices.

In 2008, the state's rice farmers will plant 160,000 acres, up from 150,000 in 2006 and 146,000 in 2007 but still well below the 2000–07 average of 192,000. Planting peaked at 600,000 acres in 1980.

With acreage declining, the state's rice output fell by a third from 2000, when Texas farmers produced 7.5 percent of the U.S. crop. In 2007, production of 956.5 million pounds represented 4.8 percent of the U.S. total.

Like wheat and corn, rice has become more expensive as part of a wave of global food price increases. Drought and speculative hoarding have contributed to shortages that have led such major rice producers as India, Vietnam and Egypt to restrict exports.

Futures prices for unmilled rice surged 36 percent in five weeks to a record high on April 23 and have remained elevated. In April, U.S. rice prices were almost 50 percent higher than they were a year earlier. The U.S. typically exports half its rice crop.

Texas produces a hybrid cultivar, which is long grain much like the Indian basmati rice that currently has export limits. So the state's farmers should benefit from higher prices and less foreign competition.

—Jessica Renier

RegionalUpdate **Texas Economy Still Slowing; Energy, Exports Are Bright Spots**

he Texas economy has slowed since January but continues to outperform the nation. While signals remain mixed, there is increased sentiment that Texas economic growth may remain tepid until 2009.

Payroll employment rose at a 1.3 percent annual rate in April, below recent trends but substantially better than national payroll employment growth, which turned negative in January (Chart 1). The manufacturing sector shed jobs in March and April due to sluggish demand and high inventories.

Texas' performance also remains strong relative to the U.S. on the unemployment front. The state unemployment rate fell to 4.1 percent in April, almost a full point below the national figure.

Texas construction employment grew at a 3.8 percent annual rate in April after growing 2.2 percent in the first quarter. Construction contract values continued their January swoon, however, falling 5.5 percent in March and 1.2 percent in April. The decline was

broad-based across residential, nonresidential and nonbuilding construction (Chart 2).

Texas existing-home sales remained strong during the initial portion of the national slowdown in 2006 but are now falling at about the same rate as the U.S. as a whole. The declines are broad-based geographically, with all major metro areas declining substantially over the past six months (*Chart 3*).

Encouragingly, inventories decreased slightly in April, and Texas homes continue to sell more quickly than homes are selling nationally. The Office of Federal Housing Enterprise Oversight home price index for Texas also bucked national trends by edging up slightly in the first quarter-a positive signal for the housing market.

Energy, Exports Strong

The Texas energy sector remains the single most prominent source of economic strength. The Texas rig count continues to hover near 20-year highs as oil prices soar to new heights. In real terms, energy prices are the highest they have ever been.

Real Texas exports grew 3.9 percent in the first quarter, substantially stronger than in fourth quarter 2007. U.S. exports also rose during the first quarter but at a lower rate.

The Texas Manufacturing Outlook Survey suggests that regional price pressures are on the rise. More than two-thirds of firms reported higher raw material prices in May, and almost two-thirds foresee continued increases over the next six months. This translated into a significant number of firms raising their finished-good prices.

The Texas Leading Index has taken a turn for the worse, with key components negative over the past three months (Chart 4). While the leading index's decline doesn't portend recession, it does reinforce the notion that the Texas economy is unlikely to grow at a substantially faster pace over the near term.

—Jason L. Saving and Mike Nicholson

adjustments by the Federal Reserve Bank of Dallas.

SOURCES: McGraw-Hill Construction; F. W. Dodge; seasonal and other adjustments by the Federal Reserve Bank of Dallas

Chart 4 Texas Leading Index Components (three-month change) February–April 2008

SOURCE: Federal Reserve Bank of Dallas

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