

BUSINESS REVIEW

Federal Reserve Bank of Philadelphia

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**THE CASINO INDUSTRY
IN ATLANTIC CITY**

Thomas P. Hamer

. . . The casinos have increased employment and relieved unemployment, but they haven't made Atlantic City a year-round resort.

**DEPOSIT INSURANCE
CREATES A NEED
FOR BANK REGULATION**

Mark J. Flannery

. . . Since their depositors are insured, banks could be tempted to take excessive risks in the absence of regulation.

**DID THE TAX CUT REALLY CUT TAXES?
A FURTHER NOTE**

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The Casino Industry in Atlantic City: What Has It Done for the Local Economy?

by Thomas P. Hamer*

"Outside of making Atlantic City the queen that it once was, it [casino gambling] means employment People will get off the unemployment lines." Assemblyman Howard Kupperman.

"We have to expand to a 52-week economy we have no year-round attraction." Thomas Coggins, Jr., President, Chamber of Commerce of Greater Atlantic City. †

Hoopla and hopes surrounded the opening of the first Atlantic City casino in May of 1978. Nearly four years later, the dice are rolling at eight more casinos, and several others are under construction. But some critics don't believe that casinos have done enough for the local economy.

Have the benefits from casinos lived up to

*Thomas P. Hamer of Glassboro State College received his Ph.D. in economics from the Claremont Graduate School. He specializes in construction and use of small-area econometric models. The present article, prepared at the request of the Philadelphia Fed, applies such a model to the economy of Atlantic City and its environs.

†Testimony before the New Jersey State Assembly, State Government and Federal Interstate Relations Committee, April 14, 1976.

the promises? How do recent economic data for Atlantic City and the immediately surrounding area compare with what the data would have been if the casinos had not come along?

So far as jobs are concerned, the past three years' numbers look pretty good. Total average annual employment in Atlantic County is substantially higher than it would have been without casinos, and unemployment insurance claims have stabilized instead of continuing their earlier upward trend. But the seasonal employment swings that have plagued the shore economy as long as residents can remember haven't gone away. Atlantic City still booms in the summer and busts in the winter. If this old resort is going to make much further progress toward re-

covery, it will have to cope with seasonality.

THE WAY IT WAS

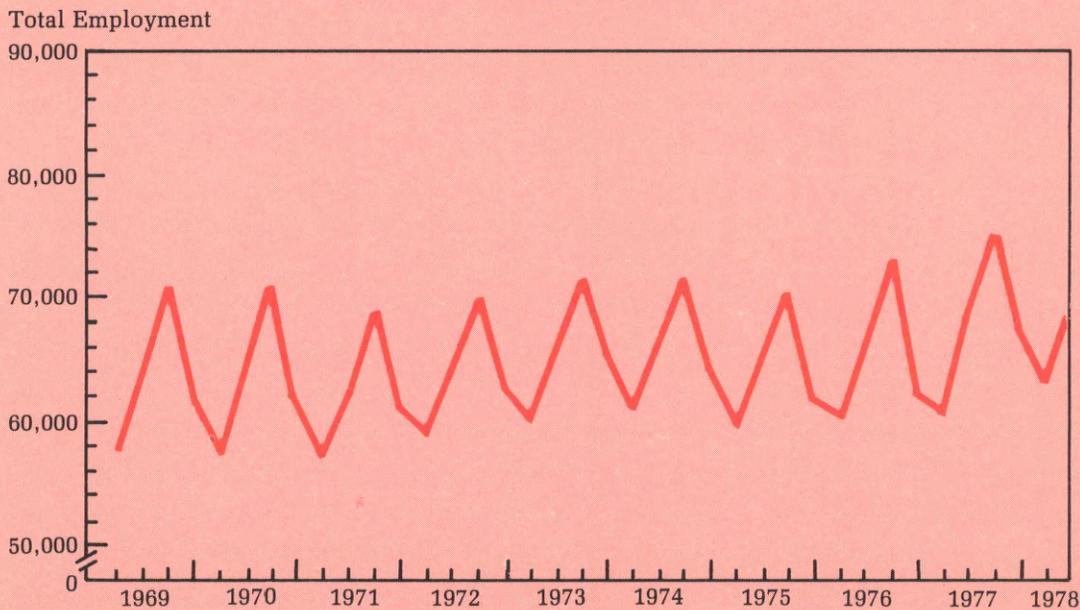
Stagnation characterized the Atlantic County economy for the decade before casinos. Employment grew at only a third of the national rate, and population grew only marginally. Atlantic City itself lost over 10 percent of its residents. Obviously, the picture wasn't a bright one when casinos appeared on the scene.

Mixed Activity. Of course, not every industry was affected in quite the same way. Some were stronger, others weaker. Some were more resistant than others to movements in the business cycle. And business in some industries was much less seasonal than

in others.

In the lodging industry (actually in Standard Industrial Classification 70, which includes hotels, motels, and other lodging places), average monthly employment declined by over 40 percent from 1968 to 1977. Employment in manufacturing overall declined greatly during the 1973-75 recession, and although by 1977 durables jobs had recovered to their former level, jobs in nondurables were off by a whopping 28 percent. Employment in construction also was severely affected by recessions, so that despite some recovery it declined by 12 percent for the ten years. Transportation and public utilities employment saw a smaller decline but a decline nonetheless. These slippages were

FIGURE 1
SEASONALITY BITES THE CONTINUITY
OUT OF EMPLOYMENT



SOURCE: State of New Jersey, Department of Labor and Industry.

hardly offset by gains in trade, services, finance, and government.

Further, Atlantic City had to deal not only with stagnation and sensitivity to the business cycle but also with seasonal fluctuations (Figure 1). Shore jobs always have been far scarcer in the winter than in the summer. Over the ten years before casinos, employment in the winter (first quarter) averaged only 82 percent of employment in the following summer (third quarter)—an average seasonal change of 12,500 jobs each year.¹ In the lodging industry the pattern was even more severe, worsening as time passed. The

ratio of lodging-industry employment in the winter to that in the summer decreased from 65 percent in 1968 to 47 percent in 1977, averaging 55 percent over the decade.

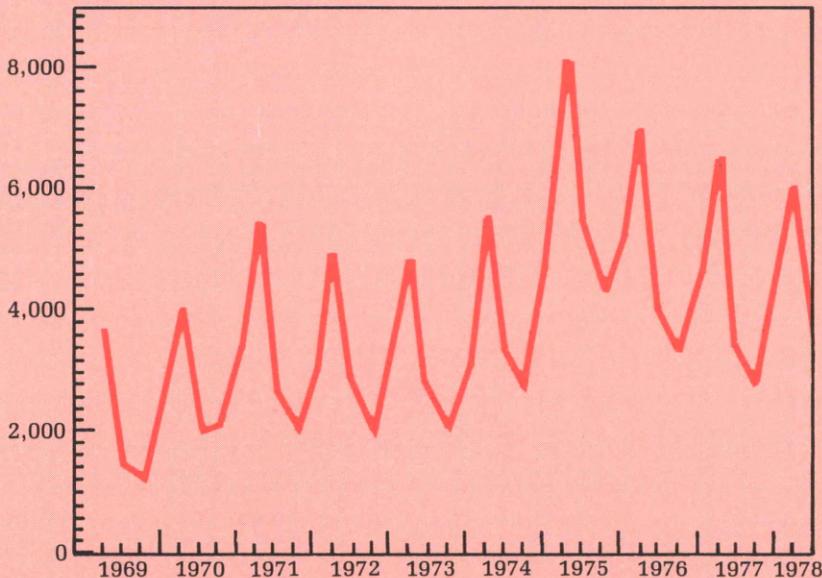
These weaknesses in the Atlantic County economy showed up clearly in the unemployment figures.² The monthly unemployment insurance (UI) claims more than doubled over the precasino decade, peaking at 8,200 during the 1975 recession (Figure 2). Unemployment claims fluctuated even more than total employment: on average, winter

¹Average monthly total nonfarm employment.

²Average monthly insurance claims of county residents who are totally unemployed and eligible under one of three programs: regular, Federal employee, and veteran. Extended benefit claims are excluded.

FIGURE 2
RECESSION COMPOUNDS THE EFFECT
OF SEASONALITY ON UNEMPLOYMENT CLAIMS

Unemployment Insurance Claims



SOURCE: State of New Jersey, Department of Labor and Industry.

claims outran summer claims by more than two to one. By 1977, some 4,000 more people were on unemployment in the winter than in the summer.

In short, Atlantic City's deteriorating facilities and fading attractions drove the tourists elsewhere. Lodging business fell off, and other industries declined as well. The old spa developed a pervasive case of economic malaise.

To the Rescue. Casinos had been proposed as a stimulus for the local economy for quite some time, but their approval came neither easily nor all at once.

The issue of casinos first appeared on New Jersey ballots in November of 1974. The 1974 proposal, however, would have let casinos be licensed anywhere in New Jersey. The threat of widespread legalized gambling and the lack of pressing economic need helped defeat the issue three to two.³

By 1976, those campaigning for casinos were better organized and better financed, and the issue was focused on Atlantic City and its economic plight. The 24 months between the two referenda had seen more inflation and a soaring unemployment rate. Backers urged that casinos could provide an economic fix for the area. Also, the 1976 proposal specified that the potential evils of legalized gambling were to be contained within the 12 square miles of Atlantic City. The voters of New Jersey said Yes to this proposal and to the hope of turning the city around.

Memorial Day weekend of 1978 marked the opening of the Resorts International Hotel and Casino. Since then casino openings and employment have accelerated. Caesar's Boardwalk Regency broke Resorts' year-long monopoly in June of 1979. Both of these

facilities were renovated hotels whose erstwhile grand ballrooms were stuffed with the gadgetry of gambling. The delay of new construction caused Bally's Park Place casino not to open until December of 1979. But after a nine-month lull, four additional casinos opened in rapid succession: the Brighton (now the Sands), Harrah's Marina, and the Golden Nugget in 1980, and then the Playboy in 1981. Employment in hotels and other lodging places leaped from less than 2,000 in the first quarter of 1978 to over 22,000 in the first quarter of 1981 (Figure 3). Thus enormous economic forces were unleashed in Atlantic County in a very short period of time.

Rosy predictions are one thing. But when the casino stone finally was dropped into the Atlantic County pond, no one could say for sure what sort of ripples it would make. The future isn't easy to predict, and the best-laid plans can go astray. Further, local economies are especially complex and fragile entities—not least of all when they are in decline.

What has happened to date has come to pass because of a wide range of influences interacting with one another. So far as jobs are concerned, the main mechanism at work has been the local labor market. And the workings of this market are likely to be decisive in determining what happens to jobs and joblessness in Atlantic County from this point forward.

THE LABOR MARKET AT WORK

What happens when a new industry appears in a local labor market or an old industry experiences sudden and spectacular growth?

One typical effect is the multiplier effect: people are hired, and as more money is earned, more is spent. Wage earners will spend some of their wages where they earn them, and so these wages will generate further local employment.

Also, a growth industry is likely to need more facilities, or at least renovated ones,

³This is not to say that there weren't other issues such as regulatory control by the state and the impact on the state's finances. See Public Hearing before Assembly State Government and Federal and Interstate Relations Committee on ACR-126, April 14, 1976, pp. 6-7.

FIGURE 3
CASINOS OPEN AT A FASTER PACE

Year and Quarter	Casinos and Opening Months	Employment in Hotels and Other Lodging Places (SIC 70) Not Seasonally Adjusted
1978 I		1,711
II	Resorts International, May	4,065
III		5,787
IV		5,019
1979 I		5,459
II	Caesar's Boardwalk Regency, June	9,184
III		12,168
IV	Bally's Park Place, December	11,842
1980 I		13,730
II		14,964
III	Sands, August	18,058
IV	Harrah's Marina, November	
	Golden Nugget, December	21,393
1981 I		22,772

SOURCE: Quarterly employment is the simple average for three consecutive months; employment is that covered by unemployment insurance. Data are from the State of New Jersey, Department of Labor and Industry.

and this demand will be reflected in construction hiring. The industry will need to hire its own employees, too, and it will need to be supplied by vendors. All these newly employed people will have fatter pay envelopes that will finance stronger purchases of consumer goods and services. Thus employment in wholesale and retail trade, services, transportation, food processing, and banking should rise.

Another positive employment effect is unique to service industries such as lodging, where the ultimate consumer must come to the provider. Service industries increase local foot and road traffic. Buyers who come to town for one service typically do not spend all of their money in one place; they spend some of it in local restaurants, for example, some in shops, and some in jitneys. These positive ripples should boost business

at a whole range of service establishments.

Competition for labor, however, can reduce employment in some industries, offsetting the positive effects somewhat. Workers with appropriate skills will dive for the lucrative construction jobs and other growth industry jobs, and only employers who are benefiting from the general expansion will raise wages to retain workers or attract replacements. Other employers will be faced with increasing numbers of unfillable vacancies, probably concentrated along industry lines.

Increased competition for capital and land also can cut into the demand for labor. Local employers who don't benefit from the boom will have to compete with the expanding firms for loans at local banks. Those that can't get loans may lay people off and slow down their operations. Some firms even may

find more profit in closing down and selling the land at inflated prices than in trying to stay open. Thus the voracious appetite for resources in the growing sectors could starve out the marginal firms. While the gains still should outweigh the losses, the net positive effect on employment could wind up being smaller than anticipated.

Further, more employment may not translate into less unemployment. Much of what happens to residents who are unemployed when the boom occurs depends on what other people do. Increased employment opportunities may bring other residents into the workforce: housewives, students, and retirees, for example, may be attracted to substitute wage earning for housework, classes, and leisure. Also, nonresidents may migrate into the area to get the new jobs. If these resident and nonresident additions to the workforce are more employable than the old UI claimants, the number of claims will not drop. In fact, it could rise if some of the new additions to the workforce are hired and then laid off or dismissed.

The seasonality of the shore labor market also can operate to drive up the number of UI claims. Employers in seasonal industries may pay unusually high wages to attract workers when business is good, in effect compensating workers for accepting jobs with a built-in layoff schedule. The workers will get higher unemployment payments because of their higher wages, and the employer will feel little compunction at layoff time. The result will be very high seasonal UI claims.

A growth industry changes many other things which affect people's welfare besides job prospects. Higher property values, rental costs, and taxes may induce many pensioners to take their transfer payment income elsewhere. Further demographic changes may come from the influx of younger people and their families. But changes in employment and unemployment remain of prime importance to the overall health of the regional

economy, as can be seen in the case of Atlantic City's experience with casinos.

CAPTURING THE CASINO EFFECTS

Like other regional economies, that of Atlantic County is tied closely to fairly widespread trends, including national ones. What happens in the local economy depends in large part on what happens in the national economy. Thus any attempt to capture the effects of casino openings must go beyond merely making lists of before and afters in the local economy. It must ask what would have happened in Atlantic County without casinos, and it must rely on information about both the local economy and the national economy.

To make the relevant comparisons, an econometric model of the precasino economy has been constructed to estimate what would have happened without casinos. Based on conditions in the precasino years, the model makes forecasts of employment and of unemployment insurance claims for the twelve quarters beginning with the first casino opening.

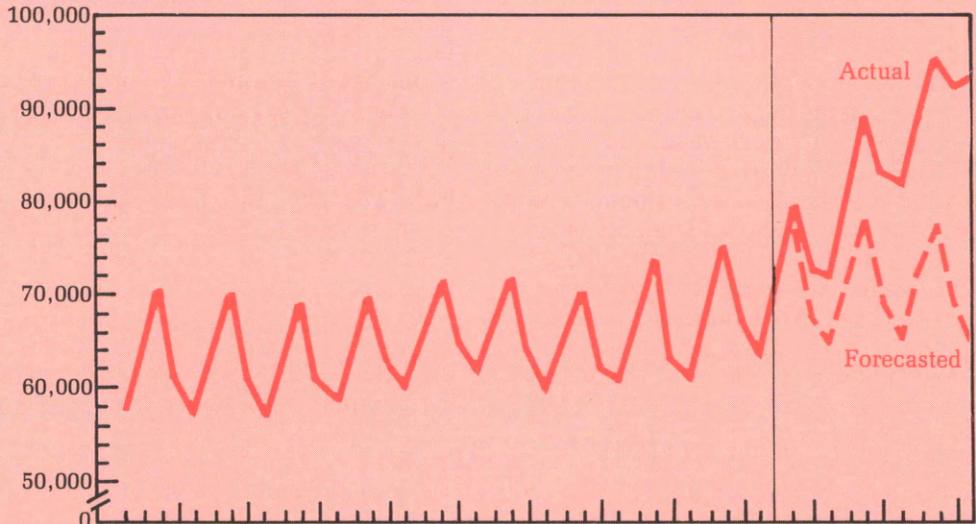
Jobs and Joblessness. The forecasted values of employment and of UI claims differ considerably from actual historical values (Figure 4). Compared to what would have been, the casino industry has meant large increases in employment in the lodging industry (as expected), and it has induced increases in construction as well. Construction of casinos caused a frenzy of activity that peaked in the last two quarters of 1979, with employment in the construction industry running about 5,000 above would-have-been levels. By the first quarter of 1981, this gain was down to about 2,000 as fewer casinos were actively under construction.

Other industries also experienced employment changes over time, and although their changes were not that much higher than the forecast to be significant statistically, they may well have been related to casino growth. Growth above the forecast levels occurred in

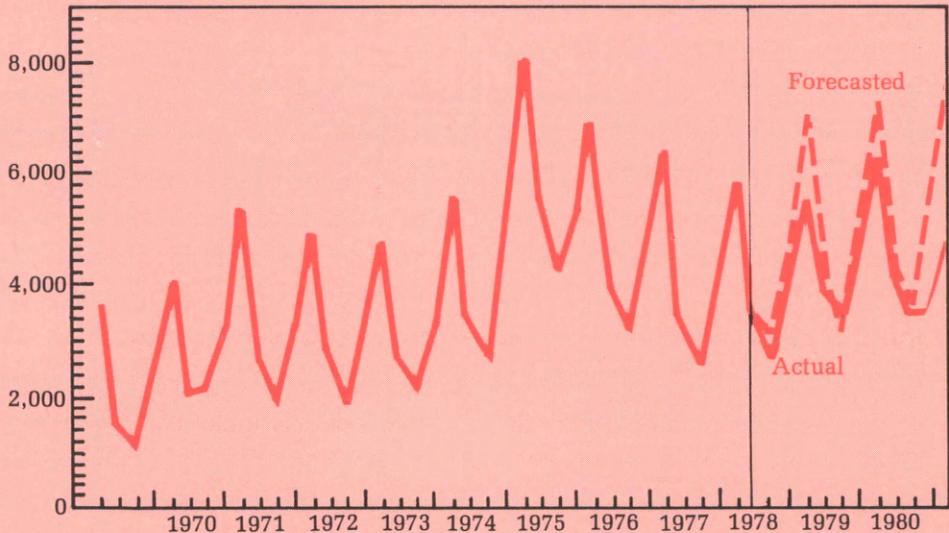
FIGURE 4

**CASINOS BOOST EMPLOYMENT, CUT UI CLAIMS
IN ATLANTIC COUNTY**

Total Employment



Unemployment Insurance Claims



SOURCE: State of New Jersey, Department of Labor and Industry.

nondurables manufacturing, transportation, trade, and other services, especially toward the end of the casino-building period. And the largest losses in durables manufacturing and the government sector coincided with the peak levels of construction employment.

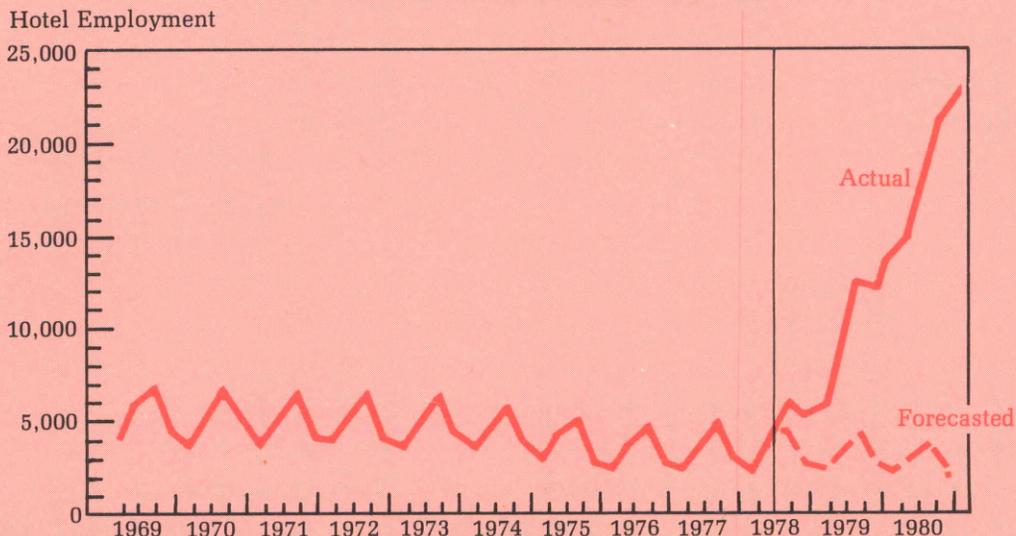
Adding up the pluses and minuses, the change in the monthly average of total employment has grown by leaps and bounds.⁴ For the last quarter of the comparison period average casino employment was about 21,000

⁴In the second quarter of 1978, the employment differences in the five expanding industries of nondurables manufacturing, construction, transportation and public utilities, trade, and other services far outran declines. Durables manufacturing, finance, insurance, and real estate, and government had maximum negative differences of 1,889 when construction peaked in the fourth quarter of 1979, but the five gainers were up by 6,574. By the first quarter of 1981, the five gainers were up by 9,264 while the other three had negative differences of 1,026.

above would-have-been levels (Figure 5), and the difference in all the other sectors was about 8,000. Thus the casinos have been responsible for bringing in over 29,000 new jobs.

What sort of net effect has this hiring had on unemployment? The State of New Jersey reported that 6,134 residents of Atlantic County made unemployment insurance claims in the first quarter of 1978. By the first quarter of 1981 claims had fallen to 5,240. This may not look like much of a drop, and some observers have used these numbers as proof that legalized gambling has not done enough to help the area. What the model shows, however, is that *casinos kept unemployment insurance claims from rising to over 8,500 by the first quarter of 1981 from the continued effects of stagnation and recession. Thus despite increases in the labor force, the original residents of Atlantic*

FIGURE 5
CASINOS SPUR SPECTACULAR JOB GROWTH
AT ATLANTIC CITY HOTELS



SOURCE: State of New Jersey, Department of Labor and Industry.

County had at least 3,300 fewer claims than they would have had without casinos in the first quarter of 1981. This adds up to a significant benefit for the original residents. Moreover, if some of the claims were made by new residents, as seems likely, then the original residents must have benefited even more than the numbers might suggest on first reading.

Further, while the argument for casino gambling focused first on the welfare of Atlantic City itself and then on other places in New Jersey, it would be reasonable to expect some reverberations on the economy of Southeastern Pennsylvania. As time goes

on, economic linkages could become increasingly important for employment and unemployment in both Atlantic City and Philadelphia (see SPINOFF EFFECTS ON PHILADELPHIA).

Seasonality. How about changes from season to season? Employment in Atlantic County has generally peaked in the third quarter and fallen to a low in the first quarter. Seasonal fluctuations in total employment remain in the range of 80 percent to 86 percent: in the off season, one or two of every ten employees will be out of work. Thus the percentage swings in employment overall don't appear to have been modified

SPINOFF EFFECTS ON PHILADELPHIA

Philadelphia is about 60 miles from Atlantic city: it is the closest major metropolitan area. Has Atlantic City's resurgence had any effect on Philadelphia's economy?

While the available information is somewhat sketchy, it doesn't appear that Philadelphia is providing a large part of the demand for either labor or supplies. One of the arguments for casino legislation in New Jersey was that the casino owners would employ local people and make purchases locally whenever they could—in Atlantic City if possible, otherwise elsewhere in New Jersey. Thus construction workers were first hired and trained in Atlantic County. To fill expanding needs, many unemployed union craftsmen, carpenters for example, transferred from other areas of the state, including the Camden area. But few transferred from Pennsylvania.

New Jersey is given preference also for procurement of hotel materials, furnishings, food, and beverages. Construction materials and furnishings tend to be one-time purchases from manufacturers having locations across the country. The continuing purchases of food and beverages often are made outside Atlantic County for want of wholesale grocers there. Legal requirements dictate in-state liquor purchases, but casino purchasing agents may buy food in the Philadelphia area as well as in northern New Jersey. A rough estimate, however, is that only 5 percent to 10 percent of these continuing food purchases come from Pennsylvania.

The demand for bus transportation has skyrocketed as the casinos have striven to bring day-trippers to Atlantic City. Subsidies paid to bus companies by casinos insure high traffic from nearby metropolitan areas. Given that many of the bus companies and support services are in the Philadelphia area and elsewhere in Eastern Pennsylvania, the heightened traffic is beneficial. But in arranging this temporary exodus to the gambling parlors, Atlantic City is competing with Philadelphia restaurants, night clubs, and theaters for the entertainment dollar.

The proximity of casinos may attract more meetings and conventions to Philadelphia, since Philadelphia visitors will find it convenient to mix casino play with business. Yet with thousands of new hotel rooms, a refurbished convention center, and improved air and rail transportation, Atlantic City could successfully compete with Philadelphia. Conventions and business meetings might come to Atlantic City leaving Philadelphia with the consolation role of a transportation center.

While these linkages to the Philadelphia area economy can be identified, they are not easy to measure in the short run. It remains to be seen whether Philadelphia will gain more than it loses from having the casinos so close by. Packaging Philadelphia and Atlantic City together for tourism—a cooperative enterprise—could tilt the balance in favor of an economic benefit for both.

by the advent of legalized gambling.

In the lodging industry the severity of seasonal fluctuations increased steadily from 1968 to 1977, so that by the end of the period almost one-half of lodging employees were out of work in the off season. It would be nice to be able to say that this seasonality in the lodging industry has been reduced by the advent of casinos. But no such reduction can be discerned.

Finally, seasonal swings in unemployment insurance claims have become slightly less severe. Claims in the winter (first quarter) averaged about two and one-half times as many as in the summer (third quarter) before casinos. Now about twice as many claims are made in the off season. Thus there seems to have been some improvement, but the strong seasonality of UI claims hasn't gone away.

Seasonality of both employment and unemployment has been made harder to measure by the schedule of casino openings. If casinos opened on a regular basis, say a new casino every fourth month, the pattern of seasonality might show through more clearly. Because openings have not been spaced evenly, the effect on seasonality is obscure. But fine measurements aside, seasonality certainly remains endemic to Atlantic City's economy.

IMPLICATIONS FOR POLICY

Compared to what would have been, then, legalized gambling has created a boom in Atlantic County. Employment has grown vigorously instead of stagnating, and unemployment insurance claims have remained stable rather than rising. These benefits are

reflected in a recent release of the U.S. Department of Commerce which shows that, in 1979, Atlantic County had a larger personal income growth rate than any other SMSA in the country.

Casino employees could be hurt, though, by the seashore's old nemesis—the employment seasonality that goes with seasonality in climate. The casinos have to find a way to beat the weather.

In Nevada, the Reno and Lake Tahoe areas have severe winters like those in Atlantic City. These two mature gambling areas also have very severe seasonal fluctuations—unlike Las Vegas which, with a milder climate, has a more nearly constant level of operation. If the Atlantic City casinos remain exclusively summertime entertainment, then the economic fix they brought will mean higher employment but also high seasonal volatility and therefore many layoffs.

To compensate for the bad winters, the casinos must draw on the millions of potential customers within a few hundred miles. Already hordes of private buses are running day and night to bring in day-trippers, but these buses may not be enough. Government action may be needed to encourage improvement of rail and air access to Atlantic City if the full benefits of higher employment are to be realized.

In short, while much may remain to be done in or for the economy of Atlantic County, the casinos have lived up to their advance billing—so far. Employment is up, unemployment restrained. That may not be everything promised and hoped for, but it's far from inconsiderable.

Technical Appendix

The econometric model is designed for a small region like Atlantic County and has ten structural equations and one identity. Nine of the equations relate quarterly nonfarm wage and salary employment in establishments in each of nine industries to the quarterly seasonally adjusted level of real gross national product (GNP) and to time. The theory is that the level of national economic activity is pervasive in its effect. That is, it affects the level of employment in the usual export industries, such as manufacturing, and several others in the county involved in the tourist business, such as hotels and motels, retail trade, and transportation. Time is used to indicate long-run trends. The identity is simply the adding up of employment in the nine sectors to give total nonagricultural employment. The tenth equation explains the unemployment insurance claims of Atlantic County residents with three variables: total nonfarm employment, the first difference of total nonfarm employment, and time.

The model is estimated with seasonally adjusted quarterly data from the first quarter of 1968 to the first quarter of 1978. Forecasts are then produced for the following twelve quarters. The forecasted values are translated to seasonally unadjusted values for comparison with the historical values.*

Serial correlation of errors was a significant problem, and therefore a Cochrane-Orcutt type procedure in the SAS programming package was used.

The estimated equations are:

$$\begin{array}{l} \text{Quarterly employment} \\ \text{in durable goods} \\ \text{manufacturing} \end{array} = 15,033.55 + 9.09 \text{ GNP L3} - 310.30 \text{ Time} \\ \begin{array}{l} (t = 9.94) \\ (t = 8.38) \\ (t = -8.46) \end{array}$$

$$\begin{array}{l} \text{Autocorrelation: Rho (1 period lag)} \\ (t = -2.19) \end{array} = -.33$$

$$38 \text{ obs.} \quad R^2 = .67 \quad F = 36.27$$

$$\begin{array}{l} \text{Quarterly employment} \\ \text{in nondurable goods} \\ \text{manufacturing} \end{array} = 38,760.34 + 9.13 \text{ GNP L1} - 587.99 \text{ Time} \\ \begin{array}{l} (t = 10.92) \\ (t = 4.16) \\ (t = -7.34) \end{array}$$

$$\begin{array}{l} \text{Autocorrelation: Rho (1 period lag)} \\ (t = -5.43) \end{array} = -.66$$

$$38 \text{ obs.} \quad R^2 = .75 \quad F = 53.86$$

$$\begin{array}{l} \text{Quarterly employment in} \\ \text{lodging places} \end{array} = 29,936.49 + 4.22 \text{ GNP L3} - 418.20 \text{ Time} \\ \begin{array}{l} (t = 8.73) \\ (t = 1.70) \\ (t = -4.99) \end{array}$$

$$\begin{array}{l} \text{Autocorrelation: Rho (1 period lag)} \\ (t = -1.46) \end{array} = -.23$$

$$38 \text{ obs.} \quad R^2 = .80 \quad F = 69.99$$

*The results of this modeling effort have been tested by Nicholas Carlozzi of the Philadelphia Fed using seasonally unadjusted data and an alternative model structure. The conclusions reached in the paper are generally robust to these changes in data and model structure.

Quarterly employment in contract construction = 14, 075.47 + 4.63 GNP L1 - 222.41 Time
 (t = 4.65) (t = 2.39) (t = -3.19)

Autocorrelation: Rho (1 period lag) = -.59
 (t = -4.50)

38 obs. $R^2 = .28$ F = 6.73

Quarterly employment in transportation and public utilities = 8, 172.71 + 2.58 GNP L1 - 106.80 Time
 (t = 5.56) (t = 2.70) (t = -3.12)

Autocorrelations: Rho (1 period lag) = -.64
 (t = -4.07)

Rho (2 period lag) = -.21
 (t = -1.14)

Rho (3 period lag) = .25
 (t = 1.59)

38 obs. $R^2 = .23$ F = 5.18

Quarterly employment in wholesale and retail trade = 10, 690.96 + 5.68 GNP L1
 (t = 10.30) (t = 6.61)

Autocorrelation: Rho (1 period lag) = -.47
 (t = -3.25)

38 obs. $R^2 = .55$ F = 43.66

Quarterly employment in finance, insurance, and real estate = -11, 586.07 + 207.12 Time
 (t = -10.27) (t = 13.48)

Autocorrelation: Rho (1 period lag) = -.70
 (t = -5.97)

38 obs. $R^2 = .83$ F = 181.80

Quarterly employment in services (includes mining, excludes lodging places) = -14, 387.53 + 345.30 Time
 (t = -4.45) (t = 7.84)

Autocorrelation: Rho (1 period lag) = -.46
 (t = -3.16)

38 obs. $R^2 = .63$ F = 61.49

$$\begin{aligned} \text{Quarterly employment} &= -24,035.41 + 492.72 \text{ Time} \\ \text{in government} & \quad (t = -9.84) \quad (t = 14.81) \end{aligned}$$

$$\begin{aligned} \text{Autocorrelation: Rho (1 period lag)} &= -.63 \\ & \quad (t = -5.00) \end{aligned}$$

$$38 \text{ obs.} \quad R^2 = .86 \quad F = 219.35$$

$$\begin{aligned} \text{Quarterly unemployment} &= -12,013.69 + 464.27 \text{ Time} - 0.28 \text{ TOTL1} \\ \text{insurance claims} & \quad (t = -2.67) \quad (t = 5.71) \quad (t = -2.618) \\ & \quad -0.17 \text{ DTOT} \\ & \quad (t = -1.88) \end{aligned}$$

$$\begin{aligned} \text{Autocorrelation: Rho (1 period lag)} &= -.50 \\ & \quad (t = -3.54) \end{aligned}$$

$$37 \text{ obs.} \quad R^2 = .55 \quad F = 13.55$$

In these equations:

'Quarterly' refers to the average of figures for three consecutive months.

GNP L1 = quarterly real GNP lagged one quarter,

GNP L3 = quarterly real GNP lagged three quarters,

Time = a trend variable having a value of 68.00 for the first quarter of 1968 and incremented by .25 for each successive quarter,

TOT L1 = total employment lagged one quarter, and

DTOT = total employment in the current quarter less total employment lagged one quarter.

The model results show that employment in some industries was higher with casinos than it would have been without them (see POSITIVE DIFFERENCES overleaf), while in other industries employment was lower (see NEGATIVE DIFFERENCES overleaf). As noted in the text, not all the differences were statistically significant.

The number of unemployment insurance claims also showed negative differences, which were significant. UI claim numbers in this study have been adjusted to take into account procedural changes made by the State of New Jersey.

Beginning in January, 1978, the State of New Jersey modified its determination of the number of UI claimants that are residents of Atlantic County. An improved survey of actual claims led to increased numbers of claims. Dual procedures were used in 1978, and the difference was an increase of 144 claims in the quarterly average. The results in this study in terms of UI claims are made with adjustments for this change. The same difference pattern for 1978 was used for 1979, 1980, and 1981, since the UI claims were stable during this time.

POSITIVE DIFFERENCES: HISTORICAL GREATER THAN FORECASTED

		Hotel & Motel	Non-durable Manufacturing	Construction	Transportation & Public Utilities	Trade	Services Except Hotel & Motel	Total
1978	II	929	145	432	-32	242	63	1,774
	III	1,612	28	399	-130	602	-216	2,069
	IV	2,573	144	1,299	-35	690	832	5,324
1979	I	3,454	269	2,117	102	361	1,776	7,183
	II	6,083	171	3,380	195	-516	846	9,250
	III	8,098	312	4,498	202	-967	97	10,767
	IV	9,467	-33	4,959	376	325	947	14,152
1980	I	11,892	172	2,342	471	983	2,336	17,009
	II	12,122	185	2,440	459	163	425	15,248
	III	14,431	423	2,758	508	403	-596	17,120
	IV	19,290	378	2,652	519	2,014	477	23,888
1981	I	21,247	551	2,122	549	1,341	4,701	29,486

NEGATIVE DIFFERENCES: HISTORICAL LESS THAN FORECASTED

		Durables Manufacturing	Finance, Insurance & Real Estate	Government	Unemployment Insurance Claims
1978	II	-73	-86	154	-511
	III	-67	-163	2	-402
	IV	-51	-53	-76	-809
1979	I	-118	-206	-573	-1,373
	II	-200	111	-820	-237
	III	-339	-110	-1,025	261
	IV	-465	-273	-1,151	-716
1980	I	-246	-174	-768	-1,009
	II	-302	-252	9	-449
	III	-354	-372	-81	-307
	IV	-520	-357	-565	-2,188
1981	I	79	-484	-621	-3,332

Deposit Insurance Creates a Need for Bank Regulation

by Mark J. Flannery*

Many bank managers and owners have long complained that they are overregulated by a plethora of government agencies. The thrust of their complaint is that they could do a better job—that is, become more profitable or increase their bank's market value—if left unencumbered by regulations limiting portfolio choice, capital adequacy, holding company formations, deposit rates, and so forth. They are doubtless correct. Yet banking in the U.S. possesses institutional characteristics that require at least some of the regulations currently in place. In particular, Federal deposit insurance gives insured bankers

an artificial incentive to undertake more risk than they would in an unregulated and uninsured free market. Bankers insured by the Federal Deposit Insurance Corporation (FDIC) can benefit *privately* by undertaking risks that the *society* as a whole considers excessive.

Restrictive bank regulations can thus be viewed as an effort to undo (or at least to limit) the distortive impact of deposit insurance on bank decisions. This view of bank regulation is certainly not all-encompassing, since numerous regulations pre-date FDIC and others are not directly related to bank risk taking. Nonetheless, considering the impact of FDIC insurance on bank behavior can often provide a useful framework for evaluating bank regulations and regulatory reform.

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THE FEDERAL DEPOSIT INSURANCE SYSTEM

Congress introduced nationwide bank deposit insurance by creating the FDIC in the Banking Act of 1933.¹ By yearend 1980, 98.2 percent of all commercial banks in the U.S. were insured by FDIC. If an insured bank fails, FDIC promises to repay its depositors' losses, up to a maximum of \$100,000 per account. Today, coverage extends to 79.9 percent of all bank deposit balances in the U.S. In return for this insurance coverage, each insured bank pays FDIC an annual premium set by statute at .083 percent of total deposit balances.² FDIC uses this income to pay its expenses (including any insurance claims from failed banks' depositors) and to maintain an adequate insurance reserve fund. After providing for operating expenses, losses, and necessary additions to its reserve fund, FDIC is required to refund 60 percent of its remaining premium income to insured banks. In recent years, such refunds have lowered the net cost of FDIC deposit insurance to .03 percent or .04 percent of a bank's total deposits—less than half the statutory rate.

As with any insurance operation, FDIC's reserve fund is its first line of defense in the event of bank failures. At yearend 1980, this fund amounted to \$11 billion, or 1.16 percent of total insured deposits. Unlike private insurers, FDIC also possesses a unique second line of defense behind its reserve fund—a \$3-billion credit line from the U.S. Treasury. Although the government's formal

commitment to support FDIC ends here, many economists and regulators believe that the Federal Reserve and the Treasury would continue to provide almost limitless support to FDIC in the event of serious bank failures. This gives the taxpaying public a substantial indirect interest in the FDIC insurance fund's viability.³

Despite the fact that FDIC closely resembles private insurance companies in many regards, FDIC's fixed-rate premium structure is unusual, and this constitutes the *raison d'être* for other banking regulations. Private insurers use a variety of methods to calculate the level of premia they charge, but all have the same goal: providing adequate funds to cover future losses. Setting adequate premium levels requires an accurate assessment of the likely losses associated with each contract.

Insurance companies that cover automobiles, homes, and personal property generally charge a premium that varies with the perceived risk of the activity being underwritten. A seventeen-year-old urban male driver with three recorded accidents pays more for auto insurance than the elderly couple who live in a rural area and drive only on Sundays. Why? Because the insurance company anticipates that the teenager is more likely to have an accident and file an insurance claim. Greater perceived risk requires higher auto insurance premia if the company is to stay in business.

³An example of this connection between FDIC and the general public occurred in 1974. During that spring and summer, Franklin National Bank was in serious danger of failing. Rather than close the bank and pay off its insured depositors, FDIC wanted to find another bank to acquire Franklin National. To keep the troubled bank afloat while FDIC sought a suitable merger partner, the Federal Reserve Bank of New York extended sizable loans at a below-market interest rate. This action cost the Federal Reserve Bank an estimated \$25 million. Since Federal Reserve operating surpluses are returned to the Treasury, U.S. taxpayers ultimately paid this cost. See Joseph F. Sinkey, "The Collapse of Franklin National Bank of New York," *Journal of Bank Research* (Summer 1976), pp. 113-122.

¹Although this article explicitly discusses only commercial banks, the same arguments apply to savings and loan associations, mutual savings banks, and credit unions.

²Note that banks with some accounts in excess of \$100,000 are paying for insurance coverage their depositors won't receive. Since larger banks more often have large customers, the effective cost of their deposit insurance (per insured deposit dollar) appears higher than it is for small banks.

Life insurance companies assess premia in a slightly more complicated fashion. Take the case of term insurance, which pays off only if the insured dies during the policy's term. Term insurance premia increase with an individual's age because, according to the annuity tables, older people are more likely to die during the contract period, exposing the insurance company to a loss. Like the automobile insurer, life insurance companies charge their higher risk customers more. At the same time, however, most insurance companies try to avoid the highest risk applicants in each age group by requiring applicants to undergo a physical examination. People in relatively poor health are denied coverage.

These examinations protect the insurance company against a phenomenon known as adverse selection. A person in poor health knows he is more likely to die than the average person his age in the general population. If all people the same age could purchase insurance for the same premium, those in worse health would be more likely to buy a policy. The average policy holder would therefore be more likely to die than the average person in the population, and the life insurance company would find itself paying for greater death benefits than it had expected from its annuity tables.⁴

FDIC's premium structure is like the life insurance company's in one way: each bank must initially demonstrate an acceptable level of financial health in order to qualify for FDIC coverage. But FDIC also requires frequent checkups (bank examinations) as a condition of continued coverage. This need constantly to reexamine insured banks arises because the provision of deposit insurance

itself encourages the bank to become riskier than it was before becoming insured.

DISTORTIONS CAUSED BY FDIC INSURANCE

Consider first a bank with no deposit insurance. If it goes bankrupt, the shareholders will lose their entire investment and depositors will be less than fully repaid. Knowing this, each potential depositor should assess the riskiness of a bank's operations.⁵ While a riskier loan portfolio is likely to mean higher returns for the bank, it also raises the prospects for bankruptcy. Depositors and stockholders will require compensation for bearing that risk in the form of a higher return on their funds. Thus the willingness of bank managers to make risky loans is held in check by the concern of depositors and stockholders for the safety of their funds. Indeed, free market advocates contend that the ability of people to shift funds from one bank to another ensures that banks will undertake a socially correct amount of risk.

Now consider the impact of fixed-premium deposit insurance on the bank's risk-taking decision. It is easiest to begin with an assumption that 100 percent of all bank deposits are covered and banks have no stockholders.⁶ If the bank fails, FDIC stands ready to repay depositors in full, so depositors no longer care how risky the bank's asset portfolio

⁵Whether depositors do or can evaluate bank risk is an entirely different issue, related to the initial reasons for Federal government provision of deposit insurance. See Ian McCarthy, "Deposit Insurance: Theory and Practice," *IMF Staff Papers* (September 1980), pp. 578-600.

⁶A large school of thought contends that FDIC in fact has extended insurance coverage to all bank liability holders by its decisions to arrange mergers (technically called a "purchase and assumption") rather than closing failed institutions outright. See David B. Humphrey, "100% Deposit Insurance: What Would It Cost?" *Journal of Bank Research* (Autumn 1976), pp. 192-198 or Gary Leff, "Should Federal Deposit Insurance Be 100 Percent?" *Bankers Magazine* (Summer 1976), pp. 23-30.

⁴Some insurance companies write policies for people without requiring a physical. This insurance is more expensive (has a higher premium) because the company knows it will suffer adverse selection. Healthy people are more likely to purchase lower cost policies that require a physical.

really is. So long as people retain faith in FDIC's ability to make payments, the bank's borrowing (deposit) costs are the same no matter how risky its asset portfolio. One natural check on bank risk taking has thus been eliminated. Since riskier assets offer higher expected returns and since deposit costs don't vary with the bank's perceived risk, the bank maximizes expected profits by purchasing the riskiest available assets. This decision becomes perfectly rational from the bank's private perspective once deposit insurance has been procured. In other words, *banks have a clear incentive to become more risky when FDIC begins promising to absorb their default losses* (see Appendix).

This example overstates the argument by ignoring two important considerations. First, the bank's deposits and other liabilities are not fully (100-percent) insured by FDIC. Some depositors will therefore demand higher interest rates when the bank's underlying portfolio risk rises, making the banker's ability to profit by undertaking socially excessive risks smaller than it would be with 100-percent insurance coverage. Second, banks do have stockholders, and these owners are concerned about their risk exposure. Their aversion to risk will provide some limit to the manager's willingness to make ever riskier loans. FDIC insurance will still distort the private incentive to bear risk, however, by reducing the increase in deposit costs that would normally accompany greater bank portfolio risk.

Economists refer to distortions such as those resulting from FDIC deposit insurance as externalities, since one individual's actions affect the well-being of other people. An externality can be either good or bad. Picking up litter in a public park, for example, constitutes a good externality: the clean view is enjoyed by people *other than* the do-gooder. A factory whose chimney dumps soot onto nearby residents' drying laundry is a bad externality. The factory could burn cleaner fuel or install stack scrubbers, but

these actions would mean lower profits.⁷ The outcome—air pollution—illustrates how government regulation—pollution control—can improve overall social welfare even though it imposes a real burden on private parties such as factory owners.

Just as factories would ignore their polluting effects in the absence of regulation, banks will ignore the extra risk they impose on society as a result of not having to be concerned about the safety of depositors' funds. In response, bank regulators have taken steps to limit the risk that insured bankers are allowed to undertake. Effective regulations will reduce bank profits relative to what they would be without regulations (though with deposit insurance), but society should be made better off because of the diminished amount of bank risk taking.

BANK REGULATIONS AS A RESPONSE TO DEPOSIT INSURANCE

Many types of banking regulations can be interpreted as efforts to counteract the distortive effects of fixed-premium deposit insurance. With the introduction of one distortion (the insurance), others are required to prevent too great a departure from the socially ideal result that an unregulated market mechanism would yield. (The fact that FDIC received extensive regulatory powers in conjunction with its insurance

⁷From the factory owner's own (selfish) perspective, spewing soot is the optimal decision. It maximizes her profits. Suppose, however, it would cost \$10 per year to eliminate the soot, which would make the neighbors feel \$15 better off. The *socially* optimal decision would be to eliminate the soot. Pollution control laws are intended to bring about the desired result. Since the factory owner finds it privately more profitable to pollute, her profits will decline as a result of enforcing these regulations. (If profits do not decline, either the regulations are ineffective or the factory owner was operating inefficiently to begin with.) Despite the factory owner's loss, the society as a whole—factory plus neighbors—will be made better off under a proper set of pollution restrictions.

responsibilities is consistent with this view.) Not all regulations and portfolio restrictions arise because of deposit insurance, but it often provides a useful framework for evaluating new or existing regulations.

Asset Limitations. Banks are subject to a large number of restrictions on the type or quality of assets they may hold in their portfolios. Banks may not own stocks or significant amounts of real estate; unsecured loans may not exceed 10 percent of a national bank's net worth (the lending limit); equipment leases must be conservatively valued; the quality of bank loans is evaluated carefully by bank examiners (see BANK EXAMINATIONS overleaf). Recently, the Federal regulators promulgated far-reaching restrictions on bank activities in the financial futures markets that many industry observers contend limit banks' ability to profit in these markets.⁸ In each instance, the regulations limit bank expansion into areas that are presumed to be relatively risky. Would bankers be better off (more profitable) without such restrictions? Almost certainly the answer is Yes. Eliminating regulations won't make banks worse off, because they could choose the same portfolios if they wanted.

If banks choose new portfolios, it must be because expected profits are higher. Risk may also be increased, though, and the intent of these asset restrictions is to prevent insured banks from undertaking too much risk from society's point of view.

Capital Adequacy. A bank whose acquisition of risky assets is blocked by regulations could increase its shareholders' expected returns by lowering its equity cushion. Earnings from the same volume of assets would then accrue to a smaller number of shareholders, raising the expected return to each one. Since bank equity serves as a buffer to absorb losses, lowering the equity

cushion also exposes the FDIC to greater risk. A smaller proportional loss on assets would more readily bring on bankruptcy, raising the probability of an FDIC payout. Bank regulations try to prevent this by imposing minimum capital (net worth) ratios that all banks must meet to be considered sound.

The issue of adequate bank capitalization has been hotly debated and is the subject of often bitter dispute between bankers and regulators.⁹ It should be. If capital regulations did not constrain bankers (that is, lower their expected return on equity), they wouldn't complain, but neither would the regulation be successfully counteracting the distortive effects of FDIC insurance.

Bank Holding Company Permissible Activities. In some other countries, banks are closely affiliated with a myriad of financial and nonfinancial firms via holding companies or overlapping ownership and management. In the U.S., Congress has limited bank holding companies to activities "so closely related to banking as to be a proper incident thereto" (Bank Holding Company Act, 1970 Amendments). While there may be other reasons for these limitations, bank safety is a prime concern. To allow banks to become closely affiliated with firms in nonbanking lines of commerce, the regulators fear, would expose the banking subsidiary to unacceptable risks of at least two sorts. First, the public might confuse a troubled holding company or nonbank subsidiary firm with the bank itself and then withdraw deposits and cause a liquidity crisis. Second, the bank may extend unsound loans to other holding company subsidiary firms in an effort to forestall disaster in the

⁸Not surprisingly, some of the futures exchanges are most critical of these regulations.

⁹For more on this subject, see Ronald Watson, "Insuring Some Progress in the Bank Capital Hassle," *Business Review*, Federal Reserve Bank of Philadelphia (July 1974), pp. 3-17, or Robert Taggart, "Regulatory Influences on Bank Capital," *New England Economic Review* (September 1977), pp. 37-46.

BANK EXAMINATIONS AND CAPITAL ADEQUACY

On-site FDIC bank examinations play an important part in identifying bank behavior that is considered overly risky. An examination evaluates many dimensions of bank operations, including liquidity, earnings, and the quality of management. In addition, asset quality and capital adequacy receive considerable attention:

“One of the most important aspects of the examination process is the evaluation of loans, for, in large measure, it is the quality of a bank’s loans which determines the risk to depositors.” (*FDIC Manual of Examination Policy*, Section H, p. 1.)

“Some qualifications are necessary, but in general the degree of protection afforded depositors is closely related to the strength of a bank’s capital position. For this reason many important phases of the bank examination procedure have as their purpose the determination and analysis of a bank’s capital.” (*FDIC Manual of Examination Policy*, Section D, p. 1.)

Examiners’ loan quality evaluations can heavily influence the level of capital considered adequate for a particular bank.

Loan losses are a routine, if unpleasant, aspect of any bank’s operations. In recognition of this, bankers carry a Loan Loss Reserve in the capital account. This Reserve represents the banker’s best guess of the loans on her books that will not be repaid. If this evaluation is accurate, the bank’s balance sheet fairly reflects the value of its assets. (In particular, bank capital—the residual difference between assets and liabilities—is correctly recorded on the balance sheet.) If the Loan Loss Reserve understates likely future losses, however, the bank’s books tend to overvalue loan assets and hence overstate the true capital position.

The loan examination process constitutes an effort to verify the adequacy of the Loan Loss Reserve account. The loan examiner generally selects a subset of the bank’s loan population for scrutiny, emphasizing relatively large loans and those with recent payment problems. Some examined loans will (usually) be criticized by the examiner, reflecting her opinion that the loan is somewhat unlikely to be repaid in full. In other words, the examiner does not consider the asset to be of bankable quality. The examiners take the bank’s reported (book) capital position and *subtract* out a portion of the loans that have been criticized. If the bank’s Loan Loss Reserve was at least sufficient to cover the examiner’s estimated likely loan losses, there is no change in the bank’s reported capital position. Otherwise, the bank’s balance sheet overstated the true degree of protection afforded the depositors (and the FDIC). Examiners may require that some loans be written off, or that the Loan Loss Reserve account be increased through retained earnings. In any case, the regulator’s determination of bank capital adequacy will be based on the reported book capital *adjusted* for the examiner’s estimate of likely loan and security losses.

This connection between loan evaluation and capital adequacy can sometimes make the bank examination process acrimonious. Examiners have the primary power to criticize a bank’s activities as too risky, and this criticism affects the bank’s need for additional capital. Since more capital reduces the expected rate of return to equity holders, bank management views this process as intrusive. It is. Banks and FDIC hold differing views on the issue of bank risk taking. On-site examinations constitute a prime tool by which FDIC monitors and controls its insured banks’ activities.

nonbanking firms.

Interest Rate Ceilings. Bank competition for selected types of deposit funds has also been limited by regulation over the years. Congress prohibited the payment of interest on demand deposit (checking) accounts in 1933, and it empowered the Federal Reserve to set maximum permissible rates payable on time and savings deposits (Regulation Q). The initial intent of both these rules was to limit bank risk taking. Banks were viewed as bidding against one another for deposit funds, then being forced to invest in risky assets in order to earn enough to cover their deposit costs.

Over the past ten or fifteen years, financial markets have developed an impressive array of devices aimed at circumventing Regulation Q. Faced with this new, unregulated competition, banks often become unable to acquire deposits in sufficient quantity at the

regulated rates. While deposit rate regulation was introduced as a means of limiting bank risk exposure, it has instead become a threat to bank stability. This development was recognized by Congress when it voted in March, 1980 to eliminate Regulation Q ceilings by 1986. (This process has already begun, under the control of the Federal Depository Institution Deregulation Committee.)

It is impossible to identify precisely how much these various regulations reduce the additional risks banks take in response to their deposit insurance. The key point, however, is that insurance and regulation are *linked* activities. If one side is subjected to reforms—take deregulation as an example—then unless something is done with the present insurance scheme society will be left to bear more risk (see REFORMING DEPOSIT INSURANCE).

REFORMING DEPOSIT INSURANCE

If the existing deposit insurance system requires such a myriad of restrictive bank regulations, why not change the system and remove the regulatory burden? Either of two significant reforms would eliminate some of the current system's distortions, but each would be difficult to implement in practice.

First, Federal deposit insurance could be eliminated entirely. Eliminating FDIC would strengthen the impact of market forces on bank risk-taking decisions, allowing at least some bank regulations to be removed. At the same time, however, depositors would find themselves exposed to more risk, and they would have to evaluate their investment decisions more carefully. Imposing this burden on small depositors seems to contradict the initial spirit of the Federal insurance program. A middle course here would reduce the extent of FDIC coverage, for example from \$100,000 back down to \$20,000 or \$10,000. Deposit costs would then reflect bankers' asset decisions more closely, while small savers, for whom investment and information evaluation costs are presumably most burdensome, would still benefit from insurance protection.

A second possible reform would be to make the insurance premium paid by banks vary according to the riskiness of their portfolios. (The Federal Savings and Loan Insurance Corporation has recently announced its intention to pursue a policy of this sort.) Just as automobile insurance companies charge more to insure unsafe drivers, riskier banks would pay a higher price for insurance than safe banks. With a perfectly accurate method of assessing the risk of a bank's portfolio, a variable premium system would mimic the private market. It would give bankers the socially correct incentives to undertake risks while extending the benefits of Federal deposit insurance to bank depositors. The problem here is that any practical system for measuring risk would be imperfect, overestimating the risk of some activities while underestimating others. (This is also true of other existing types of insurance.) If bankers and their customers felt a particular activity was really less risky than FDIC did, the bankers would find it unprofitable to undertake

these investments because the expected return would not cover deposit costs plus the variable insurance premium. Alternatively, an FDIC premium that bankers considered too low for some particular type of risk would generate too much risk taking of this sort.

Distortions to bank asset portfolios would not disappear under a variable rate system, but they probably would be smaller. Some existing bank regulations could be modified accordingly or eliminated. Offsetting these gains, however, would be the increased complexity of determining an appropriate FDIC premium rate for each bank. Accurately comparing the effects of a risk-related FDIC premium versus the current system is a formidable task but one that bears further study.

CONCLUSION

Bankers benefit substantially from fixed-rate FDIC insurance, which allows them to procure a large supply of funds at a low (that is, riskless) interest rate regardless of their assets' riskiness. Severing the connection between portfolio risk and deposit costs leads banks to undertake risks they otherwise wouldn't, secure in the knowledge that they get all the benefits of a good outcome while suffering less than all of any losses that may occur. To counteract this distortion, regulators impose portfolio restrictions, capital standards, and so forth on insured banks as a means of limiting the risk FDIC is forced to insure against. These regulations limit bankers' freedom and may reduce bank profits. Yet neither of these observations

implies that the attendant regulations are socially bad, only that they are effective. If bankers felt no pain from regulators' actions, the regulations could not be affecting bank behavior!

Is there too much corrective regulation? This is a very difficult question to answer. It requires a careful comparison of society's losses (in terms of lower output) from the restrictions placed on bank decisionmaking versus the social benefits of a safer financial environment. To date, no one has made much of an attempt to grapple with this big issue. Until some answers are generated, it will be quite difficult to say how much regulation (or deregulation) is ideal from society's point of view.

APPENDIX . . .

A SIMPLE EXAMPLE OF HOW FDIC INSURANCE CAN DISTORT BANK RISK-BEARING INCENTIVES

This example is set in a highly simplified world. The bank finances its asset acquisitions by issuing a single type of deposit liability, and it has no net worth. Uncertainty is limited to the fact that either of two possible states of the world may occur in the future. Bank assets return their higher value in the good state, and their lower value in the bad state. At the time investments are made, each future state of the world is considered equally likely to occur. (That is, each has a probability equal to 1/2.)

EXAMPLE 1: Determining the Deposit Rate and Equity Market Value.

This first example serves to illustrate the basic components of bank valuation. Assume the bank buys a one-period asset today for \$900. If state number 1 occurs, the bank's asset will be worth \$1,000, while in the second possible state the asset's value will be \$2,000. The bank finances itself by issuing a deposit liability of \$900, giving it an initial balance sheet:

Assets	Liabilities
900	900
	0 Net Worth

At the end of one time period the bank will collect on its assets, pay off the depositors, and go out of business. The riskless market rate of interest is 6 percent per year.

The value of the firm's equity can be calculated from the expected value of its future profits, assuming *risk neutrality* on the part of the owners and depositors.* First consider the depositors. Even in the bad future state of the world the bank will be able to pay off depositors their principal plus interest at the riskless rate (\$954). The deposit rate will therefore be 6 percent. Risk-neutral owners will value the bank's equity at the net present value of expected future earnings after interest payments. Ignoring the discount rate:

$$\begin{aligned}
 \text{Value of equity} &= \frac{1}{2} (\text{profit in state 1}) + \frac{1}{2} (\text{profit in state 2}) \\
 &= \frac{1}{2} (1000 - 900(1.06)) + \frac{1}{2} (2000 - 900(1.06)) \\
 &= \$546.
 \end{aligned}$$

In other words, the right to receive this bank's (uncertain) end-of-period profits would be worth \$546.

*A person is risk neutral if she will take a fair bet. For example, consider a game where the dealer flips a coin, promising to pay the player \$1.00 if heads come up, but nothing in the event of tails. A risk-neutral person would pay up to 50¢ to play this game—the expected (mean) value of the winnings. A *risk-averse* person would pay less than 50¢; a *risk-loving* person would pay (a maximum of) more than 50¢.

EXAMPLE 2: Risk Bearing With Deposit Insurance.

Now consider the situation where the firm has the opportunity to buy an additional asset for \$300. The firm will have to borrow \$300 to acquire the asset, resulting in the balance sheet,

Assets	Liabilities
900	900
+300	+300

	0 Net Worth

The new asset will be worth \$100 in state number 1 and \$500 in state number 2, giving it an expected return of 0 percent [$\frac{1}{2}(100) + \frac{1}{2}(500) = 300$, the asset's purchase price]. No one should wish to purchase such an asset when the riskless market rate is 6 percent. Nonetheless, it will be shown that a bank whose deposits are insured at a fixed premium would be willing to buy this asset.

At the end of the period, the firm's total assets will be worth \$1,100 (\$1,000 for the initial asset plus \$100 for the new one) in state number 1 and \$2,500 (the initial \$2,000 plus \$500) in state number 2. Bankruptcy will result if state number 1 occurs: depositors will not be paid interest (or even repaid all the principal). FDIC insurance is now valuable to the bank's owners. Suppose FDIC promises to repay the bank's depositors in full (including interest) in return for a \$1.00 premium (.083 percent of the \$1,200 deposits). Insured depositors will lend to the bank at the riskless rate of 6 percent, making the value of equity:

$$\begin{aligned}
 &= \frac{1}{2}(1100 - 1200(1.06) - 1) + \frac{1}{2}(2500 - 1200(1.06) - 1) \\
 &= \frac{1}{2}(1100 - 1273) + \frac{1}{2}(2500 - 1273).
 \end{aligned}$$

Since expenses in the first state of the world are greater than earnings, the owners expect to receive no return for this period and will default on their obligations—that is, the firm will be declared bankrupt. (Because of deposit insurance, however, all deposits will still be paid off.) Even though the firm is worth nothing if state number 1 occurs, owners will bid a positive price for the firm's equity because profits will be positive if state number 2 occurs:

$$\begin{aligned}
 \text{Value of equity} &= \frac{1}{2}(0) + \frac{1}{2}(2500 - 1273) \\
 &= \$613.50.
 \end{aligned}$$

With deposits insured by FDIC, the owners of the bank will undertake to buy the new asset because the value of their equity rises from \$546 (without the new asset) to \$613.50. Why does this occur? Because the owners receive *all the profits* in the good state of the world but *have only limited liability* in the bad state of the world.

EXAMPLE 3: Risk Bearing Without Deposit Insurance.

Now suppose the bank's deposits are not insured. If the bad state of the world occurs, the firm goes bankrupt and the depositors as a group receive only \$1,100 for their \$1,200 of deposits. To compensate for this possible loss, the depositors must be offered a rate of return (R) in the good state of the world high enough to make their *expected* return on deposits equal to or greater than the risk-free rate. That is, for deposits of \$1,200, depositors must be promised a rate R such that:

$$\begin{aligned}
 \frac{1}{2}(1100) + \frac{1}{2}(1200(1 + R)) &\geq 1200(1 + .06) \\
 R &\geq 20.3 \text{ percent.}
 \end{aligned}$$

Risk-neutral depositors would accept a promised return of 20.3 percent; risk averse depositors would demand more.

With this higher promised deposit rate, the value of the bank's equity after it purchases the \$300 asset will be:

$$= \frac{1}{2} (0) + \frac{1}{2} (2500 - 1200 (1 + .203))$$

$$= \$528.02.$$

Undertaking this new investment without deposit insurance therefore would make the firm's value drop below its initial value (\$546). The bank would not invest in the asset, which is the socially correct decision.

These examples could be made considerably more realistic by increasing the number of possible future states, introducing positive net worth and several classes of depositors, allowing risk-averse depositors or bank owners, and so forth. None of these changes would alter the basic conclusions. The important implication of this example is that a bank will undertake risky projects with a fixed-premium insurance program that it would not normally undertake. The bank has an incentive to take on greater risks because it does not pay FDIC a premium that fully reflects the social cost of the bank's risk taking.

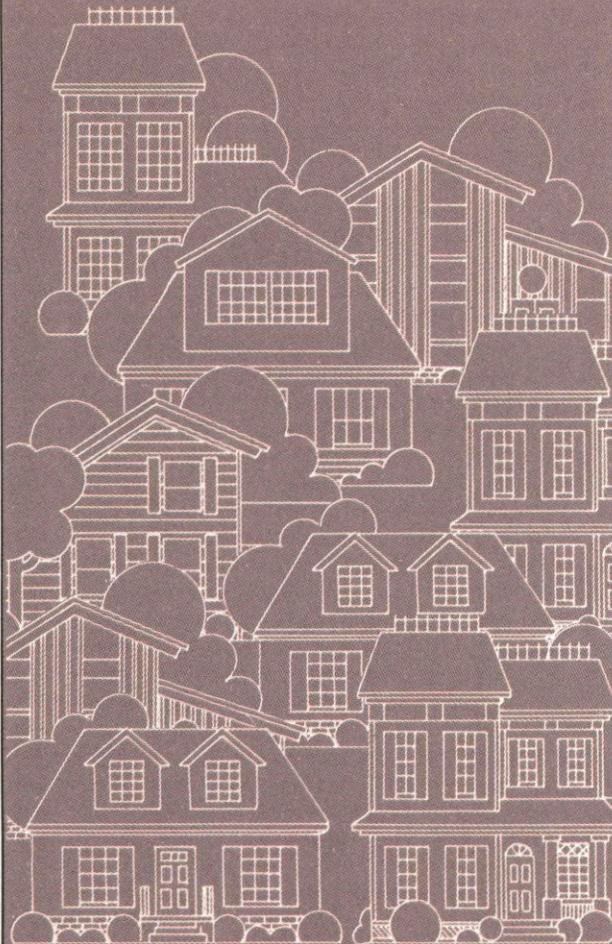
SUGGESTED READINGS

The notion that FDIC insurance distorts bank risk-taking decisions has been developed by John H. Kareken and Neil Wallace, "Deposit Insurance and Bank Regulation: A Partial-Equilibrium Exposition," *Journal of Business* (July 1978), pp. 413-438; Robert C. Merton, "On the Cost of Deposit Insurance When There Are Surveillance Costs," *Journal of Business* (July 1978), pp. 439-452; and William F. Sharpe, "Bank Capital Adequacy, Deposit Insurance and Security Values," *Journal of Financial and Quantitative Analysis* (November 1978), pp. 701-718.

Reasons for Federal provision of deposit insurance and alternative ways of setting premia for that insurance are discussed in Kenneth E. Scott and Thomas Mayer, "Risk and Regulation in Banking: Some Proposals for Federal Deposit Insurance Reform," *Stanford Law Review* (May 1971), pp. 857-902.

FROM THE PHILADELPHIA FED . . .

Charting Mortgages



Department of Consumer Affairs
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This new pamphlet compares creative mortgage financing methods with the conventional mortgages. Copies are available without charge from the Department of Public Services, Federal Reserve Bank of Philadelphia, 100 North Sixth Street, Philadelphia, Pennsylvania 19106.

Did the Tax Cut Really Cut Taxes? A Further Note

Stephen A. Meyer and Robert J. Rossana

The previous issue of this Review contained our analysis of the three-year personal income tax cut adopted in 1981.¹ We concluded that the phased-in twenty-five percent cut in personal income tax rates will have little effect on people's behavior, because few taxpayers will face lower tax rates in 1983 than they did in 1980, or in 1978. Bracket creep caused by continuing inflation, plus rising social security payroll taxes, mean that families in most tax brackets will face the same or higher marginal tax rates on a given real income in 1983 than in 1980 or 1978. Thus it is unlikely that the personal income tax cuts adopted in 1981 will improve incentives to work or save.

Mechanical errors in converting total income into taxable income led to errors in the tax rate tables in our earlier article. In particular the marginal tax rates for families who take the standard deduction were incorrect; the correct marginal tax rates are lower, across the board, than those we reported originally. Similarly, the original article overstated, slightly, the marginal tax rates that will apply in 1983 to families who itemize deductions and understated them for 1981. In this note we provide the *correct* marginal tax rates. Tables 3 and 4 presented here *replace* Tables 3 and 4 in the earlier issue of this Review.

Table 3 reports what marginal tax rates would have been for families who take the standard deduction, if Congress had not adopted the 1981 tax package. The rise in marginal tax rates for families who itemize would have been virtually the same. As we

¹Stephen A. Meyer and Robert J. Rossana, "Did the Tax Cut Really Cut Taxes?" *Business Review*, Federal Reserve Bank of Philadelphia, November/December 1981, pp. 3-12.

TABLE 3
MARGINAL TAX RATES
WITHOUT TAX CUT

AGI (1981\$)	1978		1979		1980		1981		1982		1983	
	Fed.	Tot.										
13000	.19	.25	.18	.24	.18	.24	.21	.28	.21	.28	.21	.28
15000	.22	.28	.21	.27	.21	.27	.21	.28	.24	.31	.24	.31
17000	.22	.28	.21	.27	.24	.30	.24	.31	.24	.31	.28	.35
19000	.25	.25	.24	.30	.24	.30	.28	.35	.28	.35	.32	.39
22500	.28	.28	.28	.28	.28	.28	.32	.39	.32	.39	.37	.44
27500	.32	.32	.32	.32	.32	.32	.37	.37	.37	.37	.43	.43
40000	.42	.42	.43	.43	.43	.43	.49	.49	.49	.49	.49	.49

N.B. Fed. = Marginal rate from Federal tax code.

Tot. = Sum of Federal marginal rate and social security rate.

Data apply to joint return of four person household using standard deduction. Tax rates are rounded to the nearest percent.

reported in our earlier article, marginal tax rates would have risen, across the board, had the 1981 tax bill not been passed. Table 4 provides the correct marginal tax rates, contained in the 1981 tax act, that will apply from 1981 to 1983. We present tax rates for families who use the standard deduction and for those who itemize deductions. These corrections do not change the conclusions in the original paper to any significant extent. The corrected tax rates, as well as those reported in the original paper, show that few families will face lower marginal tax rates in 1983 than they did in 1980 or in 1978.

Among families who take the standard deduction, those in the lowest income groups that we studied (\$13,000 to \$17,000 in 1978 dollars) will face the same total marginal tax rates in 1983 as they did in 1980. Families in the middle income groups (\$19,000 to \$27,500 in 1978 dollars) will face higher total marginal tax rates in 1983 than they did in 1980.

The few families in the \$40,000 (in 1978 dollars) income group who take the standard deduction will face a slightly lower marginal tax rate in 1983 than they did in 1980, in contrast to the original table.

For families who itemize deductions, those in the lowest income group will see a slight drop in their total marginal tax rate from 1980 to 1983, while those in the \$15,000 and \$17,000 (in 1978 dollars) groups will face constant marginal tax rates. Families in the middle income groups (\$19,000 and \$22,500 in 1978 dollars) will face higher tax rates. Higher income families (those in the \$27,500 to \$40,000 range, in 1978 dollars) will actually see a slight decline in their marginal tax rates from 1980 to 1983, contrary to our original results. But even these families will face higher marginal tax rates in 1983 than they did in 1978.

The overall conclusions of the original article largely remain. Although the 1981 tax

TABLE 4
MARGINAL TAX RATES AFTER REAGAN TAX CUT

Household Of Four Filing Jointly
 (Using Standard Deduction)

AGI (1978\$)	1980		1981		1982		1983	
	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.
13000	.18	.24	.21	.27	.19	.26	.17	.24
15000	.21	.27	.21	.27	.22	.29	.20	.27
17000	.24	.30	.24	.30	.22	.29	.23	.30
19000	.24	.30	.28	.34	.25	.32	.25	.32
22500	.28	.28	.32	.38	.28	.35	.30	.37
27500	.32	.32	.37	.37	.33	.33	.35	.35
40000	.43	.43	.48	.48	.44	.44	.40	.40

Household Of Four Filing Jointly
 (Itemizing Deductions)

AGI (1978\$)	1980		1981		1982		1983	
	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.
13000	.18	.24	.18	.24	.16	.23	.15	.22
15000	.18	.24	.21	.27	.19	.26	.17	.24
17000	.21	.27	.21	.27	.22	.29	.20	.27
19000	.21	.27	.24	.30	.22	.29	.23	.30
22500	.24	.24	.28	.34	.25	.32	.25	.32
27500	.32	.32	.32	.32	.33	.33	.30	.30
40000	.43	.43	.42	.42	.39	.39	.40	.40

N.B. Tax rates are rounded to the nearest percent.

cut ensures that tax rates in 1983 will be lower than they would otherwise have been, tax rates in 1983 will be the same as or higher than they were in 1980, with few exceptions.

Bracket creep and higher social security taxes will offset the 25-percent reduction in personal income tax rates for families in a majority of brackets.

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