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The Crippling Flaws in the New Jersey Fast Food Study

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EXECUTIVE SUMMARY

Economists have long believed that raising the minimum wage results in fewer entry-level employment opportunities and displaces the least skilled from the job market. In recent months, proponents of a higher minimum wage have returned to one study which they claim shows the opposite -- that higher minimum wages do not reduce, and may even *increase*, employment. This New Jersey fast food study, conducted by Princeton economists David Card and Alan Krueger, has been cited by everyone from the Secretary of Labor on national television to key Democrats debating the issue on the floor of the U.S. Senate.

Normally, the fact that politicians refer to an economic study does not make news. But this case is different: *the New Jersey fast food study has been proven wrong*. It is based on seriously flawed employment data. The data set used in the New Jersey study bears no relation to numbers drawn from the payroll records of the restaurants the New Jersey study claims to cover.

The New Jersey study was wholly discredited more than a year ago when this new information came to light. The media reported on the study using terms such as "snake oil," "dubious numbers," "grossly inaccurate," and "plain wrong." For months, no public figure dared mention the study to support a higher minimum wage. Today, however, leading policymakers are again citing the New Jersey study as fact. These individuals have chosen to ignore reality, intentionally misleading the public and attempting to set public policy on the basis of discredited research.

It is time to set the record straight -- again. The attached document can be summarized in three simple statements:

- The New Jersey fast food study has been re-estimated using payroll records rather than the badly flawed telephone surveys used in the original study. The results, compiled by independent economists, are not surprising: *there was significant job loss* stemming from New Jersey's decision to increase the state's minimum wage in 1992.

- Since the release of the first edition of this report (April 1995), additional problems have been identified in the Card-Krueger data set -- particularly in their attempts to measure price fluctuations as a response to increases in labor costs.

- *The data base used in the New Jersey fast food study is so bad that no credible conclusions can be drawn from the report.*

The truth about the New Jersey fast food study is clear and irrefutable. The data and the conclusions of the study are seriously flawed. It is unconscionable for those who set national minimum wage policy to ignore this evidence and mislead the American people.

Richard B. Berman
Executive Director
Employment Policies Institute

When it comes to debating the minimum wage, one study has come up repeatedly over the last two years — the New Jersey fast food study conducted at Princeton University. In 1995, this report was wholly discredited after economists, policymakers, and the public learned that the data set upon which the study was based is fatally flawed. For nearly a year after this stunning revelation, proponents of a higher minimum wage stopped mentioning the New Jersey fast food study.

The New Jersey study has been proven wrong, but some policymakers continue to use it as "proof" that a higher minimum wage does not cause job loss.

Now it's back. The New Jersey study has been proven wrong, but some policymakers continue to use it as "proof" that a higher minimum wage does not cause job loss. To correct the record, this report highlights the catastrophic flaws in the New Jersey fast food study and points out new problems that have come to light since the study was first discredited more than a year ago.

Why Is This Important?

Labor Secretary Robert Reich, the country's leading proponent of a higher minimum wage, recently cited the New Jersey study on national television, saying: "Instead of cutting jobs, a small increase in the minimum wage in New Jersey *increased* the number of jobs."[1]

Senator John Kerrey (D-MA) recently cited the New Jersey study on the Senate floor and proclaimed, "New Jersey experienced an increase in jobs" after the 1992 state minimum wage hike.[2] Senator Ted Kennedy, in an interview on *The Newshour with Jim Lehrer*, said: "In New Jersey, the Krueger study... showed that actually [the minimum wage hike] increased employment."[3]

The proliferation of references to the New Jersey study indicates that leading policymakers are prepared to set national minimum wage policy based on the results of the New Jersey report.

However, the flaws in the original research are so extensive that *no conclusions* can be drawn from the study. The data set used in the study has been proven to be horribly detached from reality, and the work has become a source of bemusement for many economists.

It is important to note that the conflict over the New Jersey study has nothing to do with "dueling economists." Even a casual observer can recognize the catastrophic errors in the research. And given the publicity these shortcomings have received, one must question the motives of anyone continuing to use the study as credible evidence in the minimum wage debate.

Background

In September 1994, two Princeton economists, David Card and Alan Krueger, published a study examining the fast food industry in New Jersey after the state raised its minimum wage to $5.05 in 1992, while neighboring state Pennsylvania kept the federal rate of $4.25. They concluded there was no significant job loss. In fact, according to their analysis, "employment *increased* in New Jersey relative to Pennsylvania"[4] following the mandated wage hike.

The New Jersey study consistently reports employment losses where none actually took place and employment gains far in excess of their true values.

These findings rocked the economics profession to its core. Advocates of a higher minimum wage latched onto this "new evidence" as a stunning refutation of conventional wisdom. The media reported this unconventional "man-bites-dog" story as fact. Unfortunately, nobody bothered to examine the data — until early 1995.

After the Employment Policies Institute published the first edition (April 1995) of this report outlining the serious flaws in the New Jersey fast food study, the minimum wage debate shifted dramatically. Numerous media reports produced scathing criticism of the study, its authors, and the politicians who were using the flawed report to push for a new hike in the minimum wage. Labor Secretary Reich, who had cited the study almost daily in his effort to raise the minimum wage, abruptly stopped referring to the flawed work. Secretary Reich went so far as to change his message completely: where he once claimed a minimum wage hike would "actually increase jobs," he changed to saying a "modest" wage hike would cause "negligible job loss." Having been wholly discredited, the New Jersey fast food study dropped out of the public arena in 1995.

When President Clinton renewed his calls for a higher minimum wage in February and March 1996, however, his allies returned to the New Jersey fast food study, seeking economic "support" for their position. But the evidence has not turned in their favor — the study is still ludicrously flawed. In fact, over the past twelve months, new evidence has come to light further supporting the argument that the New Jersey fast food study *cannot be utilized — pro or con — in any intellectually honest debate* on this important issue.

What's Wrong with the Data?

To collect data for the New Jersey study, the report's authors conducted a series of telephone interviews with managers and assistant managers of fast food restaurants in New Jersey (which raised its minimum wage in 1992) and adjacent eastern Pennsylvania (where the minimum wage was unchanged). Card and Krueger surveyed establishments from four fast-food restaurant chains

— Burger King, Wendy's, Kentucky Fried Chicken, and Roy Rogers. The resulting data set is available from the authors.

Card and Krueger report the number of employees in each restaurant for two "waves" of surveys — one in early 1992 (before the minimum wage hike took effect in New Jersey), the other in November 1992, several months after the minimum wage rose. Serious flaws in the data are obvious at first glance. Even a cursory review of the data reveals numerous major anomalies which defy reasonable explanation.

Anomalies in Card-Krueger Data		
Restaurant/Zip Code "Block"	**Number of Employees**	
	February 1992	**November 1992**
	Full Time / Part Time	**Full Time / Part Time**
BURGER KING in 076XX	0 / 35	29 / 14
WENDY'S in 072XX	0 / 30	35 / 30
KENTUCKY FRIED CHICKEN in 077XX	13 / 12	1 / 10
BURGER KING in 080XX	6.5 / 20	30 / 25
KENTUCKY FRIED CHICKEN in 082XX	0 / 11	22 / 4
BURGER KING in 078XX	3 / 60	0 / 15
WENDY'S in 185XX	30 / 10	0 / 30
KENTUCKY FRIED CHICKEN in 075XX	0 / 7	14 / 0
ROY ROGERS in 189XX	27 / 12	0 / 30
BURGER KING in 190XX	50 / 35	15 / 18
KENTUCKY FRIED CHICKEN in 075XX	0 / 7	14 / 0
WENDY'S in 070XX	15 / 35	40 / 31
KENTUCKY FRIED CHICKEN in 070XX	0 / 22	25 / 15
WENDY'S in 074XX	8 / 14.5	25 / 8

Table 1

For instance, Card and Krueger report that a Burger King outlet in New Jersey had six full-time workers in February, but by November, it had added 23 *more* full-time workers — an implausible shift in the operations of this restaurant. A Burger King in Pennsylvania reportedly went from 50 full-time workers in February to 15 in November, and from 35 part-time employees in February to just 18 in November — a truly radical shift.

A Wendy's in Pennsylvania had 30 full-time people on staff in February, but by November *all full-timers had apparently quit or been terminated without replacements — zero* were reported in the Card-Krueger data! Another Wendy's — this one in New Jersey — had zero full-time

employees in February, but by November had hired *35 full-time workers* without any change in the number of part-timers on staff. (See table above.)

It is difficult to imagine any rational explanation for such incredible shifts, even after accounting for seasonal sales differences. The companies and franchisees involved characterize such reported shifts as "ludicrous." Yet these and similar anomalies are found throughout the data, raising serious doubts about the New Jersey study. From the start, it was clear that the measurements upon which this study is based were erratic at best. But the depth of the flaws is shocking.

In early 1995, EPI researchers collected payroll records from many of the restaurants surveyed in the Card-Krueger study. When the New Jersey study's data set was compared to actual payroll records, the original numbers were shown to be anything but realistic. The New Jersey study consistently reports employment losses where none actually took place and employment gains far in excess of their true values. The initial EPI analysis covered 25% of the franchised units in the Card-Krueger data set, finding very few instances in which the Card-Krueger numbers even closely resemble the actual payroll records. In fact, with one-third of the observations, the Card-Krueger data set fails to identify the correct *direction* of employment change — whether it was a job loss or a job gain!

Not only are the Card-Krueger numbers wrong, they are often **catastrophically** wrong.

A more detailed explanation of how the data collection methods resulted in such huge errors can be found in the appendix to this report.

What Does the Correct Data Say?

When the Card-Krueger methodology of comparing New Jersey and Pennsylvania employment patterns is carried out using the correct payroll data, one finds significant job loss in New Jersey's fast food sector after the minimum wage hike.

It is well-known that fast food restaurants in this region staff up for the holiday season towards the end of the year. These establishments experience a significant increase in sales as compared to February, when the first inquiry "baseline" was developed for the New Jersey study. The question — and the premise of the entire Card-Krueger analysis — is, did employment increase *less* in New Jersey than it would have if the minimum wage had not changed? The unequivocal answer: yes.

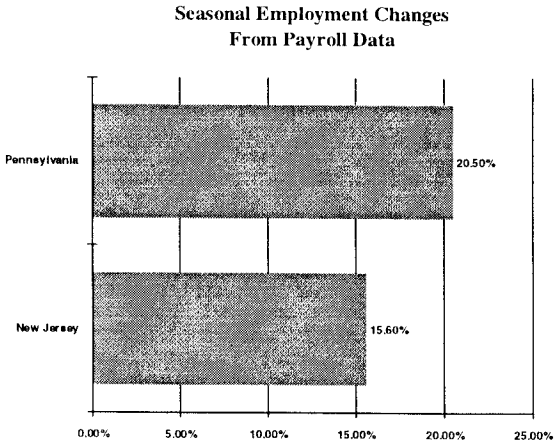


Chart 1

From February (a seasonal low point for employment) to November (a seasonal high point), the EPI-collected payroll data shows that employment grew 5% *more* in the Pennsylvania restaurants surveyed, where the minimum wage did not change, than in New Jersey. Card and Krueger argue forcefully that the only difference between the New Jersey and Pennsylvania economies was the higher minimum wage in New Jersey. Based on their own arguments, one must conclude that the higher minimum wage caused this 5% gap between the two states.

Can These Findings Be Verified Independently?

The serious flaws in the New Jersey fast food study have been verified by independent economists. Michigan State University economist David Neumark and William Wascher, Senior Economist at the Board of Governors of the Federal Reserve System, used data from payroll records of the surveyed restaurants to re-evaluate the Card-Krueger findings. Neumark and Wascher compiled their own findings in a research paper that has been submitted for publication in an academic journal. (The Neumark-Wascher research was conducted independently and was not funded by any group currently involved in the minimum wage debate.)

The Neumark-Wascher findings are compelling, as the following three excerpts show:

"whereas CK's [Card-Krueger's] data imply that the New Jersey minimum wage increase led to an increase in full-time-equivalent employment in fast-food restaurants in New Jersey relative to the Pennsylvania control group, our preferred difference-in-differences estimate using payroll data implies that the minimum wage increase led to a statistically significant 4.6 percent decline in fast food employment in New Jersey relative to the Pennsylvania control group."[5]

"[CK's] results using the telephone survey data always indicate positive effects of minimum wages on labor demand....Our results using the payroll data always indicate negative effects of minimum wages on labor demand."[6]

"[CK] stated that they found 'no evidence that the rise in New Jersey's minimum wage reduced employment at fast-food restaurants in the state,' that 'the increase in the minimum wage increased employment,' and that their findings 'are difficult to explain with the standard competitive model.' We think it is clear that all three of these conclusions are contradicted by the payroll data."[7]

In addition to their analysis of the payroll data itself, Neumark and Wascher verified all of the data collected by EPI for the analysis above. The Neumark-Wascher analysis includes an even larger payroll data set than the one used in the EPI analysis, as Neumark and Wascher collected payroll records from more than 150 additional fast food restaurants after EPI released its initial findings.

Have These Findings Been Challenged?

In the twelve months since EPI revealed the flaws in the New Jersey fast food study, no plausible challenge to these arguments has surfaced. The message is irrefutable.

One organization, the union-supported Economic Policy Institute (EcPI), did release a report claiming the Neumark-Wascher analysis actually confirms the original Card-Krueger finding that New Jersey's minimum wage hike did not reduce employment![8] The EcPI's report was dismissed by Dr. Neumark, who labeled EcPI's interpretation of his paper "absurd." The Neumark-Wascher paper clearly documents on multiple occasions that the payroll data show statistically significant job loss, while the Card-Krueger study implied statistically significant job gains.

Are There Additional Questions about the New Jersey Study?

Since the flaws in the employment data utilized in the New Jersey study were first publicized in March 1995, additional information has come to light about other data used in the Card-Krueger study. In addition to collecting employment data, Card and Krueger also collected price data. In their study, they concluded the data "suggest that pre-tax prices rose 4-percent faster [in New Jersey vs. Pennsylvania] as a result of the minimum wage increase in New Jersey -- slightly more than the increase needed to pass through the cost increase caused by the minimum-wage hike."[9]

Unfortunately, it appears their price data are as bad as their employment numbers, calling into question any conclusions drawn from the price data as well.

For example, consider the information in Table 2, which includes the Card-Krueger data on the price of a hamburger in every company-owned Wendy's restaurant in Pennsylvania reported in the Card-Krueger data set. Collecting data on the price of a hamburger should be the simplest of questions — all the person being interviewed had to do was look up at the menu board. But the same careless survey techniques (see Appendix) that plagued the employment data surfaced here as well.

Rather than specifying its survey question, the Card-Krueger study asked "What is the price of a regular hamburger?" But what is a "regular hamburger" in a fast food chain that serves at least five or six varieties of hamburger? Is it the smallest burger available, the company's "signature" burger, or the top-selling burger on the menu?

Price Data: All Company-Owned Wendy's Outlets in Pennsylvania from the Card-Krueger Survey	
Price of "Regular" Hamburger	
February	**November**
$1.65	$0.95
$0.95	$1.79
$1.75	$0.94
$0.90	$0.90
$1.01	$0.94
$0.84	$0.79
$0.85	$0.90

Table 2

According to Card and Krueger, the same "regular" burger could be bought in eastern Pennsylvania for anywhere from $0.84 to $1.79 — a difference of 113 percent! Yet between February and November, if we are to believe the Card-Krueger study, the highest-price outlet chopped its price by 46 percent. Another unit decided that $1.79, rather than $0.95, was the right price for a regular burger — an 88% increase in an industry where price increases of 5% are considered difficult to maintain!

The major variation in responses reflects the different interpretations in the identification of a "regular hamburger" by survey respondents. Again, as with the employment inquiries, the Card-Krueger survey simply did not ask questions which could have led to reliable answers. Yet their study draws conclusions based on a statistical analysis of data riddled with inaccuracies and radical, illogical shifts.

Setting the Record Straight

The Card-Krueger New Jersey study has, unfortunately, worked its way into mainstream debates over the minimum wage. The statistical analysis in the New Jersey study is advanced and sophisticated, but the end result is clear: garbage in, garbage out. The employment-related analysis in the New Jersey study is little more than an academic exercise that carries *no* real-life implications. Clearly, the New Jersey report provides no "evidence" that would warrant throwing out decades of research measuring job loss after a mandated wage hike.

The statistical analysis in the New Jersey study is advanced and sophisticated, but the end result is clear: garbage in, garbage out.

The record must be corrected. The minimum wage affects millions of entry-level employment opportunities and employees nationwide. It impacts labor costs across the country. The critical errors in this study have been clearly identified. It would be unfortunate if key policymakers chose to ignore these stunning revelations, opting instead to set national policy on the basis of worthless conclusions drawn from the catastrophically flawed New Jersey report.

For more information on the New Jersey report or the minimum wage issue in general, please contact Thomas K. Dilworth of the Employment Policies Institute at 202-347-5178.

Appendix

Collecting/Analyzing the Data

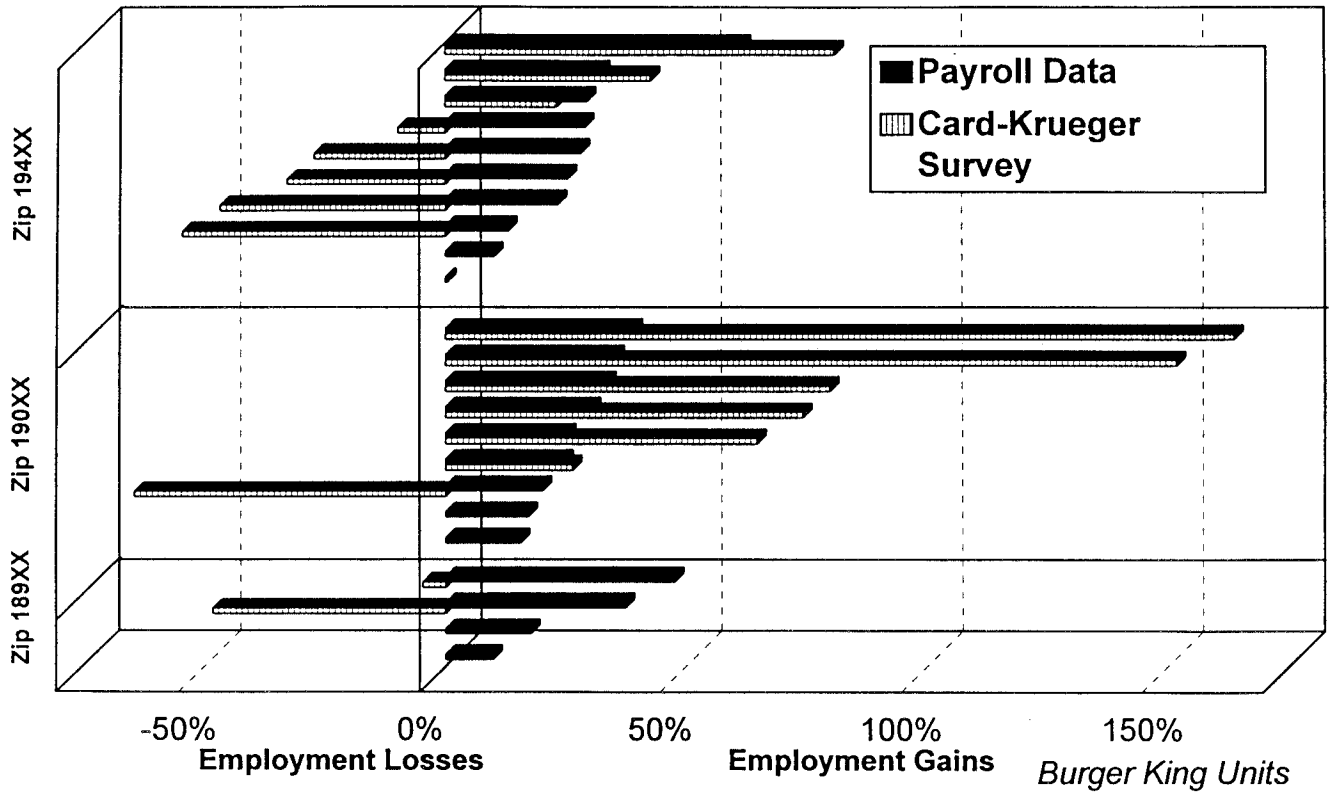
The publicly available Card-Krueger data set was "sanitized" insofar as it provides only the first three digits of the zip code for the establishments surveyed in the study. (Economists often sanitize data to protect confidentiality.) Thus, any analysis of the data set must be based on the regions defined by these zip code "blocks" — the regions in which all zip codes begin with the same three digits. *Using actual payroll records* from fast-food establishments surveyed for the New Jersey study, the Employment Policies Institute recreated portions of the Card-Krueger data set. To ensure that each Card-Krueger unit being compared to payroll records was accurately matched, EPI researchers collected data on every similar unit in the appropriate zip code block. (While it is impossible to "match" employment records on a unit-by-unit basis due to the sanitazation of the Card-Krueger data set, it is easy to compare restaurants' employment on a "group-by-group" basis.)

After identifying franchised restaurants within the zip code "blocks" found in the Card-Krueger data, EPI researchers requested payroll records for the two time periods studied in the New Jersey report — February and November 1992. Surprisingly, in one region of New Jersey, this comparison revealed no clear matches between the Card-Krueger numbers for franchised Burger King establishments and the actual payroll records for those restaurants. A similar random comparison of Wendy's units in New Jersey yielded the same result.

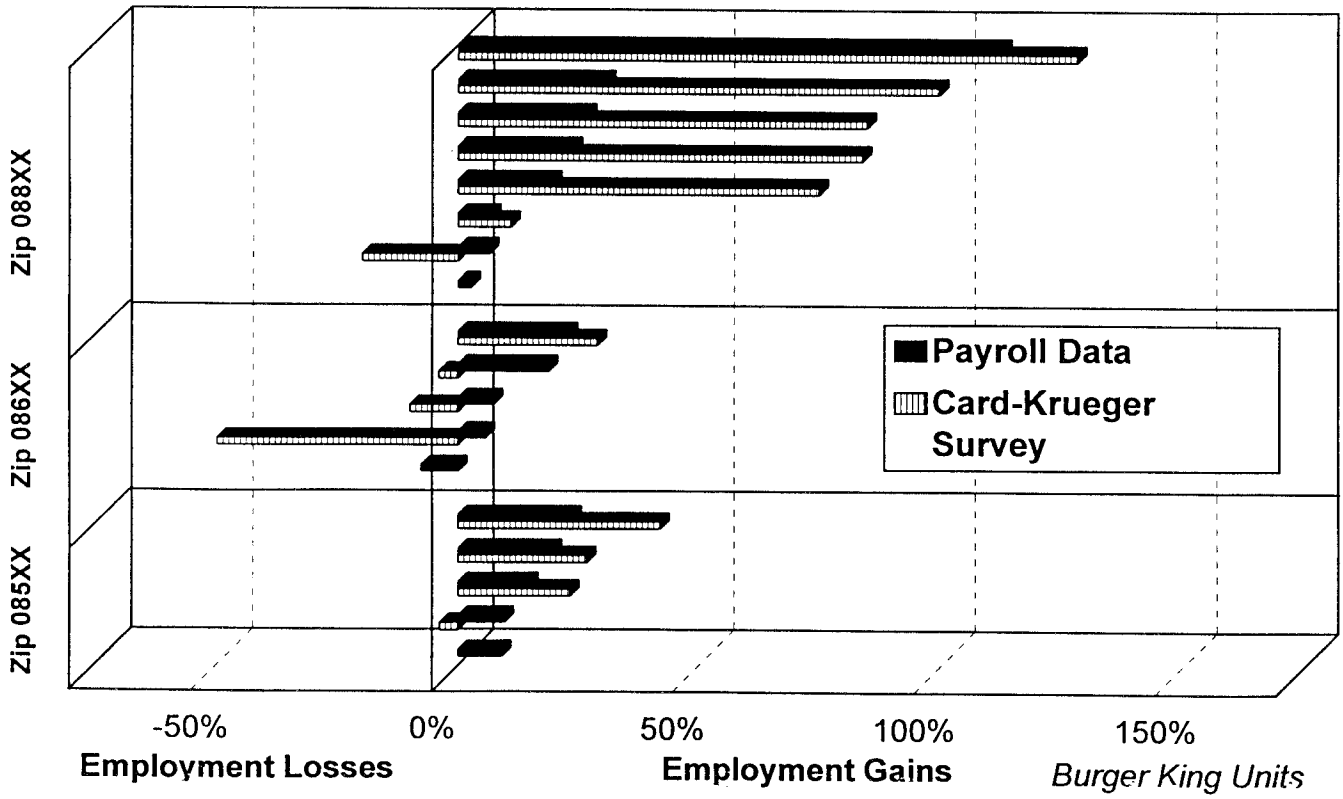
For a number of reasons, the bulk of the EPI analysis then focused on west-central New Jersey and east/central Pennsylvania. The economy in these areas is clearly linked by geography, separated only by the Delaware River. Card and Krueger argue that the only distinguishing factor between New Jersey and Pennsylvania employment in 1992 was the minimum wage. This should be particularly true in the Central Jersey/East-Central Pennsylvania area, where comparisons can literally be made "right across the river." In addition, this region includes the area in and around Princeton, N.J., where Card and Krueger worked when they conducted the New Jersey study. The EPI analysis concentrated on Burger King units — which make up 40% of the Card-Krueger data set — and Wendy's units.

The Card-Krueger data set consistently reports employment losses where none actually took place and employment gains far in excess of their true values. Although the EPI analysis covered 25% of the franchised units in the Card-Krueger data set, there are very few instances in which the Card-Krueger numbers even closely resemble the actual payroll records. In fact, with one-third of the observations, the Card-Krueger data set fails to identify the correct direction of employment change — whether it was a job loss or a job gain!

1. Card-Krueger *vs.* Payroll Data: Penn.



2. Card-Krueger *vs.* Payroll Data: N.J.



As Graphs 1 and 2 show, the employment changes in the Card-Krueger data set are spread over a wide range, while the payroll data — reflecting the accurate employment numbers for the period studied — is generally confined to a fairly narrow range. In the region of Pennsylvania defined by zip code 190XX, Card and Krueger reported significant gains in employment for several units, and a serious decline in jobs at another unit. In contrast, payroll records show modest increases in employment throughout the region, generally due to standard seasonal sales variations. Likewise, in the part of New Jersey defined by zip code 088XX, Card and Krueger reported a number of significant increases in employment, none of which are close to the generally modest seasonal increases found in payroll records.

In short, the Card-Krueger data set does not square with reality. Fully 15% of the entire Card-Krueger data set (which included company-owned and franchised units) was examined during this process — a sufficiently large sample to discredit the entire set of employment numbers used for the New Jersey study. A separate, independent analysis (discussed earlier in this report) examined a larger portion of the Card-Krueger data set.

How Could This Happen?

With most of the reports on the New Jersey study focused on its treatment of job loss, observers are surprised to learn that only *one* of the 24 questions in the survey is even related to minimum wage employment. (The others deal primarily with employee benefits and price levels for certain products.) Even more surprising is that *it was impossible for this single question to generate reliable data!*

Although the primary goal of the study was to measure the employment impact of a higher minimum wage, Card and Krueger only asked the following question about entry-level employment: *How many part-time and full-time employees are employed in your restaurant, excluding managers and assistant managers?* On the surface, this may seem to be a solid question, but when placed in perspective, this question represents an exceptionally unsophisticated attempt at measuring employment changes. Consider the following:

The survey never asked **how many *hours* were being worked** in the restaurant, only how many *employees* were working. Yet hours worked is the most important measure of overall employment in a restaurant. In fact, it is the only accurate measure! The authors did convert their data into Full Time Equivalents (FTEs), but because they never measured hours, this was a crude "conversion" at best.

Because of high turnover in the fast-food industry, it is unlikely the surveyors spoke with the same manager in November that they had interviewed in February for their "pre" and "post" wage hike interviews. Why is this important? Because the question asked was so broad that respondents to the survey were allowed to incorporate their own interpretations of the question in the answers.

For example, the survey asked how many part-time and full-time employees the restaurant employed. But the survey fails to define two key parameters:

- What is the **time frame** for the question? Does it mean the number of employees working on the **current shift**? The number working **today**? Working **this week**? The total number **on the payroll** — including those who are on vacation or who work only during school holidays? Without this crucial information, the manager in one Burger King might give the number of employees working that day, while the manager in the Wendy's down the street might give the number she thinks she remembers scheduling for the entire week. In effect, a rubber ruler was used to measure employment, with each respondent allowed to interpret the inquiry differently. This is the only possible answer for the reported wide swings in employment reported by Card-Krueger.

- How is part-time defined? Is it **anything under 40** hours per week, as defined in the Fair Labor Standards Act? Anything **under 35 hours** — as the Bureau of Labor Statistics defines it? Is full-time defined as **37.5 hours**, as in some labor contracts? Or is full-time defined as **30 hours per week**, as in the 1993-94 Clinton health care reform proposal? Without a definition of full- and part-time, managers responding to the survey were again allowed to use their own interpretation of the question.

Given the authors' propensity to rely on managers' interpretations of the question, they would have had to survey the same individual during both waves of their survey if they were to salvage anything resembling reliable data from the exercise. Unfortunately, there is no indication in the survey instrument that Card and Krueger made *any* attempt to interview the same source. And the nature of the business dictates that different managers must have responded (differently) in many cases. Obtaining proper data through this question was impossible — *any consistent data could only be the result of random coincidence*!

The survey was conducted via telephone conversations with managers and assistant managers. Anyone familiar with operations in a fast-food restaurant knows that these managers were almost surely not sitting in a quiet back office with payroll records spread out in front of them. More likely, they were in the front of the restaurant, watching employees, handling problems, and trying to answer the surveyor's questions *all at the same time*. In some cases, it is conceivable that these managers were interrupted from cooking burgers or frying chicken in order to handle the phone call from a surveyor for this study!

Without a photographic memory for the intricate details of payroll records, these managers couldn't possibly come up with accurate numbers off the top of their heads in such an environment. And in the case of assistant managers — who are almost always focused on front-line operations rather than scheduling, hiring, etc. — the surveyors were speaking with individuals who spend little (if any) time examining payroll records and "counting employees." Apparently, the authors of the New Jersey study never even bothered to qualify the survey respondents to determine if they were giving their answers based on memory or on payroll records.

Clearly, the single inquiry Card and Krueger used to develop information on minimum wage employment was inadequate. In order to gain the proper information for this kind of analysis, the

authors should have asked detailed questions about hours worked — how many hours worked by full-time workers, total hours worked in part-time positions, total hours worked by managers on non-management (*e.g.*, front line) duties. And the questions should have included clear definitions of full- and part-time work.

With the comedy of errors outlined above, it is no wonder that the data used in the New Jersey study contain inexplicable fluctuations and bear little resemblance to the reality spelled out in actual payroll records. These serious mistakes and omissions have resulted in a study doomed to become a textbook example of how *not* to collect data. More importantly, mistakes made when the study was designed more than four years ago have now forced leading policymakers and economists to revise positions that had been based on the "merits" of the New Jersey study.

Notes

[1] Secretary Robert Reich. *This Week with David Brinkley*. ABC-TV Network. April 14, 1996.

[2] Kerry, Senator John. *Congressional Record.* March 26, 1996. No. 43. S2851.

[3] "Minimum Wage." *The Newshour with Jim Lehrer.* WETA-TV (PBS) Network. March 28, 1996.

[4] Card, David and Alan Krueger. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." *The American Economic Review*, September 1994. p. 776.

[5] Neumark, David and William Wascher. "The Effect of New Jersey's Minimum Wage Increase on Fast-Food Employment: A Re-Evaluation Using Payroll Records." January 1996 (Revised). Awaiting Publication. pp. 22-23.

[6] Neumark... p. 23.

[7] Ibid.

[8] Schmitt, John. "The Minimum Wage and Job Loss: Opponents of Wage Hike Find No Effect," Washington DC: Economic Policy Institute, January 1996.

[9] Card ... pp. 787-88.