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Free Trade with Mexico Likely Will Reduce Pollution

Contrary to the fears of many environmentalists, a North American Free Trade Agreement (NAFTA) is likely to reduce air pollution in Mexico, according to NBER Research Associates **Gene Grossman** and **Alan Krueger**. Some environmentalists have argued that NAFTA would expand economic activity, which would lead to more pollution. But in **Environmental Impacts of a North American Free Trade Agreement** (*NBER Working Paper No. 3914*), Grossman and Krueger report that although the concentrations of sulfur dioxide (SO_2) and smoke, two important pollutants, rise with per capita gross domestic product (GDP) at low levels of income, they decrease with GDP growth at higher levels of income. A third pollutant, suspended particles, declines steadily as income increases.

For this study, Grossman and Krueger examine measures of pollution in cities located in 42 countries with various levels of per capita income between 1977 and 1988. They find that the turning point in the relationship between pollution and per capita GDP comes at about $5000. In other words, for incomes above $5000, pollution actually falls as per capita GDP rises. In 1988, Mexico's GDP was $4996, and it has risen since then. This means that any added GDP growth in Mexico brought about by free trade is likely to reduce SO_2 and smoke pollution.

Freer trade should increase Mexico's demand for a cleaner environment by raising Mexican incomes, the authors suggest. They note that beginning in 1990, the Mexican government reduced the lead content of gasoline, ordered several power stations to burn natural gas instead of sulfur-generating fuel oil, and shut down oil refineries and private firms that were major sources of air pollution. Further increases in Mexican income likely would lead to additional steps to reduce pollution.

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Grossman and Krueger also point out that a free trade agreement probably would reduce the generation of toxic waste in Mexico. Opening U.S. and Canadian markets to goods from Mexico would allow Mexicans to produce those goods in which they have a comparative advantage. Specifically, the authors cite research predicting that liberalized trade, in the absence of increased capital flows, should decrease Mexico's production of chemical, rubber, and plastic products, all of which generate great amounts of toxic waste per unit of output. Freer trade also would cause Mexico to produce more agricultural goods and more labor-intensive manufactured goods, both of which are "cleaner" than the average. Some of the reduction in toxic waste would be offset by increased pollution from stepped-up production of electrical equipment. Still, the net effect would be a small decline in toxic waste, Grossman and Krueger estimate.

What about some environmentalists' claim that weaker controls on pollution in Mexico will cause high-polluting industries to move there from the more heavily regulated Canada and the United States? Grossman and Krueger cast doubt on this idea, noting that pollution abatement costs for the average U.S. manufacturing industry are only 1.4 percent of value added. Even in industries with above-average costs of reducing pollution, the gain from moving to take advantage of cheaper labor far outweighs the cost of regulation.

Not surprisingly, the authors also find that the differences in the costs of pollution control explain very little of the variation in current bilateral trade. Similarly, differences in pollution control costs add nothing to explaining which goods U.S. manufacturers assemble duty-free in Mexico for export to the United States. The dominant factor in determining U.S.–Mexico trade and plant location is the importance of unskilled labor to an industry's production. DRH

R and D Spending Responds to Tax Changes

In 1981, Congress enacted tax legislation designed to stimulate additional R and D spending in the United States. The Tax Reform Act of 1986 subsequently removed some of these tax incentives. According to a new NBER study by **James Hines,** the1986 tax change may have been responsible for a reduction of between $1.4 billion and $2.2 billion in annual R and D expenditure in the United States by 1989. This reduction represents 2–3 percent of total R and D in the United States. In return, the 1986 tax changes raised about $1.2 billion in new revenue from multinationals engaged in R and D in the United States.

In **On the Sensitivity of R and D to Delicate Tax Changes: The Behavior of U.S. Multinationals in the 1980s** (*NBER Working Paper No. 3930*), Hines compares the experiences of two different groups of multinational manufacturing firms. One group of firms was unaffected by the 1986 tax change, while firms in the second group faced an additional tax cost (averaging about five cents) for every dollar of R and D expenditure after 1986. In response, the R and D expenditures of firms in the second group grew by about 5 percent less than did R and D by firms in the first group.

The tax rules discouraging R and D spending apply to U.S. multinational firms with foreign sales. From 1981–6, American firms were allowed to deduct all of their R and D costs incurred in the United States against their U.S. income. Since 1986, firms have been required to prorate their R and D costs based on the fraction of their worldwide sales made in the United States.

As a result, an American firm that sells 25 percent of its output abroad would not be permitted to deduct all of its R and D costs in the United States against its U.S. income. But, since foreign governments do not permit American firms to deduct U.S. R and D costs in paying taxes to them, some fraction of a firm's R and D expenses cannot be deducted for tax purposes at all, thereby making R and D more expensive.

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Hines examines the behavior of 116 large U.S. manufacturing firms from 1984–9. Together, these firms account for over one-third of the privately financed R and D in the United States. Some of the firms were in special tax situations that left them unaffected by the 1986 tax change, while others were affected by it.

By comparing the two types of firms, Hines can measure the responsiveness of R and D to the aftertax price of R and D. The tax component of aftertax prices changed by about 5 percent for all manufacturing firms, he finds. But the price change was more substantial, and the R and D response more dramatic, for firms in such high tech areas as machinery and scientific instruments.

U.S. tax policy faces the difficullty that, while Congress usually is eager to encourage R and D, certain members feel that some of the benefits of R and D undertaken by multinationals may accrue to foreigners who buy the goods created by the R and D (and to foreign governments that tax the proceeds of the sales). As a consequence, the Tax Reform Act of 1986 reduced the tax benefits accorded U.S. multinationals with extensive foreign sales. This tax change was responsible for about $1.2 billion in additional tax revenue each year, but reduced R and D expenditures by U.S. multinationals by between 100 and 200 percent of that amount.

Crime or Jobs for Urban Youth?

The proportion of disadvantaged young black men with criminal records grew so large in the 1980s that crime became a major determinant of their economic life, according to NBER Research Associate **Richard Freeman**. He finds that one-fifth of black men aged 16 to 34, and as many as three-fourths of black high school dropouts aged 25 to 34, had criminal records in the 1980s. That creates "a sizable relatively permanent population of offenders and ex-offenders outside the mainstream of society—an 'underclass' by most meanings of the word," he notes.

In **Crime and the Employment of Disadvantaged Youths** (*NBER Working Paper No. 3875*), Freeman points out that over two-thirds of the young men arrested for criminal activity in 1989 were not black. Thus, a substantial, although smaller, proportion of non-black male dropouts also came under the supervision of the criminal justice system in the 1980s.

In 1989, 2 percent of all 16-to-34-year-old men were incarcerated, and another 5 percent or so were either on parole or on probation. But for blacks those figures were 7 percent and 13 percent, respectively, Freeman notes. Further, incarceration and probation have long-term adverse effects on the employment of young men, Freeman observes. Those in jail at the outset of the 1980s were markedly less likely to work throughout the decade than other young men. The more crimes committed, or the higher the income from crime, the smaller is the chance of having a legitimate job.

"Traditional programs to help the disadvantaged . . . will not suffice to bring these men into the mainstream economy. The incentives/opportunities for crime must also be reduced."

The decision to engage in crime has at least a short-run economic rationale in terms of high hourly pay, Freeman finds. Men with limited skills earn about twice as much per hour from crime as they could from legitimate work, and possibly much more. Even in such low-unemployment cities as Boston at the peak of the "Massachusetts Miracle" in 1989, economic opportunities were insufficient to deter large numbers of disadvantaged youths—both white and black—from crime. In a 1989 survey of youth in two poor Boston neighborhoods, 80 percent of blacks and 67 percent of whites thought that "many young men find that dealing drugs is a good way to make money." Only 55 percent of out-of-school youths from the poorest neighborhoods of Boston were working at that time.

Indeed, one important contributing factor to choosing crime may have been the huge drop in the real earnings and employment prospects of less-educated young men in the 1980s. One survey found that 63 percent of disadvantaged youths in poverty areas in 1989 said they could make more "on the street" engaged in crime than at work. "The fall in real earnings reduced the opportunity cost of crime, and may have convinced many youths that they have no future in the legitimate job market," Freeman writes.

"As a result," Freeman continues, "traditional programs to help the disadvantaged—job training, education, affirmative action, area economic development, even full employment—will not suffice to bring these men into the mainstream economy. The incentives/opportunities for crime must also be reduced and programs devised to rehabilitate ex-offenders."

DRF

Monetary Expansion Helped End the Great Depression

From 1929 to 1933, real GNP in the United States fell by about 9 percent per year, with a cumulative decline of 35 percent. But between 1933 and 1937, real GNP rose by 8 percent annually, resulting in a cumulative increase of 33 percent. After another downturn in 1937, growth spurted again, so that the annual growth rate of real GNP between 1938 and 1942 was 12 percent, leading to a total increase of 49 percent. In a new study for the NBER, Research Associate **Christina Romer** concludes that growth in the money supply was the source of the rapid periods of recovery during the Great Depression.

In **What Ended the Great Depression?** (*NBER Working Paper No. 3829*), Romer notes that the money supply (M1) grew by nearly 10 percent per year between 1933 and 1937, and at an even higher rate in the early 1940s. Such large and persistent rates of money growth were unprecedented in U.S. economic history, and provided the stimulus for the extremely high growth in output during the mid- and late 1930s. In contrast to modern money growth, which is controlled primarily by the Federal Reserve, the money growth of the mid- and late 1930s was caused by capital flight from an increasingly unstable Europe, and by Roosevelt's policies toward exchange rates and gold inflows.

To estimate the effect of this rapid growth in the money supply, Romer calculates the rate of economic growth that would have occurred if the money supply had grown at the same rate during the mid-1930s as during the 1920s. She finds that real GNP would have been 25 percent lower in 1937, and 50 percent lower in 1942, than it actually was.

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By contrast, fiscal policy contributed almost nothing to the recovery from the Great Depression, Romer finds. Only in 1942 was there a noticeable difference between actual output and the output that would have been produced under the fiscal policies of the 1920s. According to Romer, the explanation for this limited effect was the size of the fiscal stimulus during this period: the annual increase in the federal deficit (relative to GNP) was typically less than one percentage point during the mid-1930s, and was actually negative in some years.

In spite of the stimulus provided by rapid growth in the money supply, output remained far below its potential until 1942. Because potential GNP continued to grow after the onset of the Depression, GNP was about 38 percent below its potential in 1935 and 26 below potential in 1937. Thus, even though the unemployment rate fell by more than 4 percentage points in both 1934 and 1936, serious excess capacity and high unemployment persisted throughout the decade. The unemployment rate peaked at 23 percent in 1932, but remained at 10 percent as late as 1940. Only in 1942 did the economy return to full employment.

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