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Mr. Chairman: I am pleased to appear before this task force today to discuss the effects of weather on the federal budget and the national economy. In my remarks I would like to focus on four major topics:

- o Why the effects of weather are important to the budget process.
- o The budget accounts that are most severely affected by weather changes.
- o Macroeconomic effects of changes in the weather.
- o Some concluding remarks on the magnitude of the effects of weather.

#### Weather and the Budget Process

Weather is an uncontrollable variable that directly and indirectly affects the federal budget. Based on very preliminary analysis, this impact could be as much as several billion dollars in the year in which unfavorable weather occurs as well as additional billions during the next several years. Since this federal spending is primarily for disaster and emergency funds or for entitlement programs, it is obvious that the outlays and budget authority should not be delayed, but be available when the bad weather occurs. It would be beneficial, therefore, if these outlays could be "forecast" and included in the various budget resolutions. Failure to do this may at times necessitate additional budget resolutions or prevent the passage of desirable legislation.



## The Budget Accounts That are Most Severely Affected by Weather

The effects of weather on various budget accounts can be classified according to the type of weather sensitivity as follows: direct, indirect, and timing. Direct effects are those in which outlays and, at times, budget authority are affected directly by weather. Disaster payments to farmers for crop losses and unemployment compensation paid to workers who have been laid off because of a weather-related shortage of natural gas are examples. An indirect impact is one that changes budget outlays through the inflation rate as generally reflected in the Consumer Price Index (CPI). For example, a crop loss causes food prices to increase, which in turn increases the overall CPI. Ultimately, such a change in the inflation rate is reflected in the federal budget through the various indexed entitlement programs, such as social security, railroad retirement, etc. The final kind of weather-induced budget effects are those that affect the timing, but not the total level, of expenditures. These are primarily construction-related accounts in which bad weather restricts construction activity and federal outlays, but generally the activity and outlays are made up when the weather improves. Prime examples of this type of activity would be highway construction and the Environmental Protection Agency waste water treatment construction program.



Direct Effects. While there are numerous budget accounts that could be directly affected by weather, the sensitivity of most is only marginal. The exceptions to this are primarily the agriculture, disaster, and unemployment insurance accounts.

Agriculture Related Programs. In the agriculture function, the key weather-sensitive programs are price supports, disaster payments, federal crop insurance, and farm loans, including those for disaster-related emergencies. In general, with other factors constant, unfavorable weather (drought, flooding, hail) reduces crop production, increases prices, and, therefore, reduces price support outlays. The agriculture disaster-related programs are affected in the opposite direction. In order to approximate the budgetary impacts of a major crop failure, CBO has simulated an unfavorable weather scenario such as happened in 1974. The net result of this would be about a \$2.0 billion dollar decline in agriculture outlays in 1980. This net decline represents two effects that are partly offsetting: a decline of \$3.5 billion dollars for price support programs and an increase of \$1.5 billion in disaster-related programs.

Nonagriculture Disaster Programs. The nonagriculture-related disaster programs, those under the Federal Disaster Assistance Administration and Small Business Administration Disaster Loans, have averaged approximately \$746 million in outlays over the last





five years, with a low of \$334 million and a peak of \$1,625 million. This 1973 peak was mainly the result of hurricane damage. Consequently, based on the most recent historical experience, it is possible to have outlays in these programs increase a billion dollars due to particularly bad weather.

Unemployment Compensation. In order to estimate the potential effect of weather on federal unemployment compensation, CBO reviewed the experience in the severe winter of 1976-1977, with its natural gas curtailments. It is important to point out, however, that, although this situation was aggravated by the extremely cold winter, the underlying reasons for the natural gas shortage were inadequate underground storage capacity and allocation problems between interstate and intrastate markets. During this period, unemployment caused by the gas curtailment increased from 240,000 during the later part of January to a peak of about 1,200,000 on February 4. By the end of February, however, less than 160,000 workers were still unemployed because of the shortage. While approximately 20 states were affected by the curtailment, over 65 percent of the problem was concentrated in New York and Ohio, with the latter the hardest hit with over 45 percent of the total national impact.

Unfortunately, there is no information available that quantifies the effect of this work stoppage on the unemployment insurance account and, therefore, the budget. If it is assumed that



93 percent of the workers were covered by insurance, that they all waited one week to apply, and that all applied for the benefits, then the total federal budget impact could be somewhat over \$100 million dollars. It is probable, however, that the actual impact was substantially less since many workers continued to be paid, or were only off for a few days, or did not apply for the benefits.

Indirect Effects. Since weather often interrupts transportation, it may create a shortage of energy or materials that is reflected in increased prices. If such scarce materials represent a significant percentage of total national expenditures, these price changes would further induce an increase in the general price index. Such a rise in the overall price index would in turn be reflected in the federal budget in terms of increased future costs of the indexed and semi-indexed entitlement accounts. In order to approximate the magnitude of these potential indirect budgetary impacts, the unfavorable weather condition of 1976-1977 and related agriculture output reduction were analyzed. Results indicate that the crop failures would increase the Consumer Price Index for food 5 and 15 percent, respectively, in 1979 and 1980. This, in turn would push up the general price index by 1.3 and 4.1 percent, respectively, in the two years, as well as increase the unemployment rate 4.9 percent in 1980. These effects would increase federal outlays by approximately \$6 billion in 1980. Most of this increase is attributable to the unemployment change since the effect in the entitlement accounts



would take place mostly after 1980. For example, entitlements alone might increase \$6 to \$7 billion in 1982. In addition to increasing federal expenditures, the higher rate of inflation would increase tax receipts because of inflated wages and salaries. The net result of these indirect effects would be to increase the deficit in 1980 by \$2.5 billion.

Timing Impacts. In addition to those programs where outlays are directly or indirectly affected by weather, there are programs in which the monthly or even yearly flow of outlays is influenced by weather. For the most part, these are construction-related programs in which weather interferes with the activity and causes outlays to fall short during the period of bad weather. In general, however, the outlays will increase substantially when the weather improves and, with the exception of particularly bad years, will compensate for the shortfall. Consequently, such movements would seldom affect total outlays for a year, that is, most of the impact is seasonal during the year. Highway, military, mass transit, water resources, and waste treatment plant construction are the programs most affected.

#### Macroeconomic Effects

Not only does unfavorable weather have direct and indirect impacts on the federal budget, but it may also indirectly affect the overall economy. For example, if unfavorable weather should cause



reductions in agriculture output as discussed earlier, this crop loss would increase the price of food by 15 percent in 1980, and, in turn, increase the CPI by 4 percent. Such an increase in the overall price level would absorb disposable income that, in turn, would reduce real Gross National Product by \$12 billion (1972 dollars) in 1980. This eventually would cause the unemployment rate to increase 4.9 percent in that year. Thus, weather conditions can cause small repercussions in the overall economy through relative price changes, real income shifts, and production shifts.

#### CONCLUSION

This brief overview of the weather sensitivity of the federal budget suggests that, within a given fiscal year, the net effect on the overall federal budget can be several billion dollars. Specifically, in this CBO simulation, the agriculture crop failure actually created a direct decrease in agriculture outlays of some \$2.0 billion in 1980. It must be remembered, however, that this was a net estimate resulting from a decline of \$3.5 billion in the price support programs and an increase in agriculture disaster programs of \$1.5 billion. The indirect budget effects of the crop failure, created through changes in the CPI and unemployment, were estimated to increase outlays by \$6.2 billion in 1980, thereby leaving a \$4.2 billion net increase in outlays. In addition, however, the resulting inflation caused an increase in revenues of \$3.7 billion and, therefore, an overall increase in the deficit of only \$0.5 billion.





With respect to forecasting the potential weather-induced effects, it would be extremely difficult to project the size of the direct effects in order to include their costs in the budget resolutions. For entitlement programs, however, there is a lag between price changes and expenditure increases. Thus, weather-induced changes in the rate of inflation in a specific fiscal year would trigger entitlement program expenditure increases in the following year(s). From this standpoint, the effect of weather on entitlement programs (and other programs indirectly indexed to the rate of inflation) is generally incorporated into the current budget process. For example, an increase in the inflation rate caused by unfavorable weather in 1978 would imply an increase in entitlement program expenditures in the following years, and such changes are incorporated into the budget estimates provided by the Congressional Budget Office for the budget resolutions.

In final analysis, CBO believes that it would be difficult to produce budget estimates that are more reliable or that more accurately reflect expected weather changes. This conclusion is based on the following points: (1) The indirect effects of weather on future outlays through the inflation rate are currently incorporated into the budget estimates; (2) the direct effects are generally relatively small, that is, less than several billion dollars; (3) there is great uncertainty about the exact relationship between weather and many budget accounts; and (4) there are real limitations on the accuracy of weather forecasting.



Mr. Chairman, I would be happy to answer any questions that you or your task force members have.

