

## Appendix C Sensitivity Analyses

To examine the sensitivity of the experiment results to assumptions about labor supply elasticity, we repeated the simulation experiments using a number of different labor supply elasticities for low- and high-income households. We focused on the labor supply responsiveness of low- and high-income groups, since these are the groups most affected by the tax and transfer experiments examined here.

In the first set of scenarios, we held the compensated wage elasticities constant and varied income elasticities from the small to large values reported in table C-1. In one run, we assumed that higher income households had a larger reaction to changes in income, while poorer households responded less. In another run, the opposite was tested—elastic income response by the low-income households, with inelastic response by the high-income households. In the second set of scenarios, we held income elasticities constant and varied wage elasticities from the small to large values reported in table C-1. The most extreme wage elasticity case identified by economists is the possibility of backward-bending labor supply curves. This phenomenon occurs when an individual's reaction to rising wages is to work fewer hours. We considered this possibility by running simulations examining a negative uncompensated wage elasticity.

The primary observation generated by the sensitivity analysis is that though elasticity assumptions had dramatic effects on labor supply, these labor supply effects did not translate into dramatic changes in household income or consumption. The neoclassical assumption about labor market behavior embedded in the model requires that changes in labor supply trigger changes in the wage rate sufficient to equate labor supply and demand. As a result, increases in labor supply and the number of jobs did not result in large increases in labor income—wage-rate adjustments counterbalance the potential growth in labor income. In addition, wage adjustments for a particular skill level affected all labor income for all households supplying labor of that particular level. As a result, all households in the model, whether or not they actually adjusted their own labor supply, experienced changes in their wage rate and their labor income because of changes in aggregate labor supply.

## Cut in Food Stamps: Sensitivity Analysis to Labor Supply Elasticities

Table C-2 presents the results of the sensitivity analyses for the simulation experiment in which Food Stamp Program funding is cut by \$5 billion. The first row in the table presents the central base-case numbers (as reported in the body of the report) for comparison with the sensitivity results. In the first block of scenarios, we adjusted the compensated wage elasticity while holding income elasticities at the central-case value. Wage elasticities had little impact on low-income household labor supply or welfare. This is because the policy shock on low-income households was an income effect from the cut in food stamps. For high-income households the policy shock was an after-tax wage adjustment, so wage elasticities were more important than income elasticities, though there was an income effect related to the change in nonlabor income. For the high-income households, doubling the wage elasticities doubled the labor supply response, compared with the central-case scenario. With high wage elasticities for both low- and high-income households, the increase in real household consumption resulting from the increased labor supply was \$1,550 million. This increase was \$616 million higher than the increase generated under the base-case scenario. However, all of this increase accrued to high-income households.

The scenarios with backward-bending labor supply responses for high-income households resulted in a reduction in high-income labor as the wage rate increased. In comparison with the base case, the gain in real household income was small.

In the second block of scenarios, we adjusted income elasticities for low- and high-income households while holding uncompensated wage elasticities at the central-case value (compensated wage elasticities were adjusted to maintain uncompensated values). Income elasticities had a large effect on low-income households (the group experiencing the large cut in food stamp income) and a much smaller impact on high-income households (for whom income elasticities applied primarily to general equilibrium changes in capital income). In the food stamp cut experiment, low-income household labor supply increased by almost 22,000 jobs when the income elasticity was increased to -0.4, compared with 5,100 jobs in the central case with an income elasticity of -0.1. However, the potential gains in income from

an increase in employment were offset by a decrease in wages, as reflected in the constant real-consumption loss experienced by low-income households. For high-income households, an increase in income elasticity from -0.1 to -0.04 increased high-income labor by only 12,933 jobs, compared with 11,839 in the base case. When both low- and high-income households were given high income elasticities (-0.4), the high-income household labor supply response was dampened by the increase in low-income household labor supply. The large increase in low-income household labor supply contributed to lowering the wage rate for some occupations that both types of households supply (though in high-income households, lower skill jobs tend to be held by second earners).

### **Cash-out Food Stamps: Sensitivity Analysis to Labor Supply Elasticities**

Table C-3 presents the results of the sensitivity analyses for the simulation experiment in which food stamp benefits are converted to cash. Again, the first row in the table presents the central base-case numbers (as reported in the body of the report) for comparison with the sensitivity results. In this policy scenario, there were no direct wage or income effects to drive a change in household labor supply. Instead, the impact of the simulations on wages and income arose through changes in the distribution of production and labor demand.

In the first set of scenarios, we adjusted wage elasticities and held income elasticities constant at central-case values. Variation of the wage elasticities had a noticeable but small impact on the labor supply and consumption

of households. For low-income households, the scenarios with low wage elasticities led to slight increases in labor supply relative to the central case and, due to wage changes, even smaller impacts on real consumption. This result was driven by the fact that even though wages for low-skill labor rose as a result of the cash-out, wages for mid-skill labor fell by even more. With low wage elasticities, low-income households (who supply almost an equal amount of low- and mid-skill labor) responded less to the larger wage decrease than they did in the base case. With high wage elasticities and falling mid-skill wages, low-income households reduced their labor supply relative to the base case. The impact on low-income household consumption was similar to the base case.

For the high-income households, doubling wage elasticities increased their labor supply response (a reduction in labor supply) by 50 percent, compared with the central-case scenario. It appears that with high wage elasticities, the reduction in household labor supply in reaction to the decrease in mid-skill wages was larger than the increase in household labor supply in reaction to the smaller increase in high-skill wages. The loss of real household consumption was only slightly larger than in the central case.

In the scenarios with backward-bending labor supply responses for high-income households, a decrease in the net wage led to an increase in high-income household labor. Real income did not change very much in comparison with the base case.

As it turns out, the income effects were so small that the impact of alternative income elasticities on household labor supply was negligible, as illustrated in the third block of scenarios.

**Appendix table C-1—Labor supply elasticities for sensitivity analysis**

Household type	Central case			High-elasticity values			Low-elasticity values		
	Income	Uncompensated wage	Compensated wage	Income	Uncompensated wage	Compensated wage	Income	Uncompensated wage	Compensated wage
Single adult no children:									
Low-income	-0.100	0.050	0.150	-0.4	0.5	0.9	-0.01	0.01	0.020
Mid-income	-.100	.050	.150						
High-income	-.100	.050	.150	-.4	.1	.5	-.01	-.05	-.040
Single adult with children:									
Low-income	-.100	.125	.225	-.4	.2	.6	-.01	.01	.020
Mid-income	-.100	.125	.225						
High-income	-.100	.125	.225	-.4	.2	.6	-.01	-.1	-.090
Married couple no children:									
Low-income—									
Husband	-.025	.050	.075	-.1	.1	.2	-.01	.005	.015
Wife	-.200	.400	.600	-.8	.8	1.6	-.08	.04	.120
Mid-income—									
Husband	-.025	.050	.075						
Wife	-.200	.400	.600						
High-income—									
Husband	-.025	.050	.075	-.1	.1	.2	-.01	-.01	0
Wife	-.200	.400	.600	-.8	.8	1.6	-.08	-.08	0
Married couple with children:									
Low-income—									
Husband	-.025	.050	.075	-.1	.1	.2	-.01	.005	.015
Wife	-.200	.400	.600	-.8	.8	1.6	-.08	.04	.120
Mid-income—									
Husband	-.025	.050	.075						
Wife	-.200	.400	.600						
High-income—									
Husband	-.025	.050	.075	-.1	.1	.2	-.01	-.01	0
Wife	-.200	.400	.600	-.8	.8	1.6	-.08	-.08	0
Elderly	-.100	0	.100						

**Appendix table C-2—Labor supply sensitivity analysis for food stamp cut**

Scenario	Change in labor supply				Change in real consumption			
	All households	Low-income	Mid-income	High-income	All households	Low-income	Mid-income	High-income
	----- <i>Thousand jobs</i> -----				----- <i>Million dollars</i> -----			
1. Base case-central value income and wage elasticities	23,178	5,081	6,258	11,839	928	-4,965	1,404	4,489
2. Central income elasticities and wage elasticities set at:								
a. low values for low-income households and high values for high-income households	37,963	5,071	7,711	25,181	1,546	-4,961	1,550	4,957
b. high values for low-income households and negative (backward bending) values for high-income households	4,177	5,211	4,489	-5,523	133	-4,970	1,215	3,888
c. low values for low-income households and negative (backward bending) values for high-income households	4,082	5,107	4,494	-5,519	131	-4,970	1,215	3,886
d. high values for low- and high-income households	37,909	5,013	7,715	25,181	1,544	-4,961	1,550	4,955
3. Central uncompensated wage elasticities and income elasticities set at:								
a. low values for low-income households and high values for high-income households	15,503	1,037	6,648	7,817	645	-4,965	1,342	4,269
b. high values for low-income households and low values for high-income households	40,240	21,953	5,352	12,934	1,445	-4,968	1,497	4,916
c. low values for low- and high-income households	20,413	1,030	6,450	12,933	864	-4,964	1,396	4,432
d. high values for low- and high-income households	32,989	21,994	5,297	5,699	1,127	-4,971	1,420	4,678

**Appendix table C-3—Labor supply sensitivity analysis for food stamp cash-out**

Scenario	Change in labor supply				Change in real consumption			
	All households	Low-income	Mid-income	High-income	All households	Low-income	Mid-income	High-income
	----- <i>Thousand jobs</i> -----				----- <i>Million dollars</i> -----			
1. Base case-central value income and wage elasticities	-3,654	-83	-1,970	-1,600	-614	-24	-308	-282
2. Central value income elasticities and uncompensated wage elasticities set at:								
a. low values for low-income households and high values for high-income households	-5,311	3	-2,320	-2,993	-683	-24	-324	-334
b. high values for low-income households and negative values (backward bending) for high-income households	-1,547	-248	-1,545	245	-527	-23	-288	-216
c. low values for low-income households and negative values (backward bending ) for high-income households	-1,323	-1	-1,558	236	-520	-23	-286	-210
d. high values for low- and high-income households	-5,520	-222	-2,307	-2,991	-689	-24	-326	-340
3. Central value compensated wage elasticities and income elasticities set at:								
a. low values for low-income households and high values for high-income households	-4,079	-89	-2,055	-1,936	-631	-24	-312	-295
b. high values for low-income households and low values for high-income households	-3,549	-58	-1,957	-1,534	-610	-24	-307	-279
c. low values for low- and high-income households	-3,579	-90	-1,955	-1,534	-611	-24	-308	-280
d. high values for low- and high-income households	-4,051	-55	-2,057	-1,939	-631	-24	-312	-295