Further Discussion of Temporary Payroll Tax Cut During Recession(s)

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We focus on three aspects of a cut in payroll taxes as a stabilizer in a recession:

 (1) Why any policy that aims at increasing employment in a recession should try to reduce the tax burden on employment.

 (2) Whether any payroll tax cut should be divided between the tax liabilities of the workers and firms.

 (3) What is the plausible impact of a temporary payroll tax cut on employment and total hours.

(1) Any stimulus policy will act through shifting the allocation of work and spending – consume more today than otherwise, work more today than otherwise, or invest more today than otherwise. So it is worth asking why a temporary tax cut should be applied to payroll taxes. A key motivation is that business cycle accounting attributes the drop in employment during recessions to a sharp increase in an implicit "tax" (distortion) on working during recessions. See, for example, Hall (1997) or, more recently, Chari, Kehoe, McGrattan (2007). This distortion in the static first order condition, sometimes called the Hall residual, could reflect wage rigidities, pricing rigidities, or other distortions. Absent a deeper structural understanding, we believe it makes sense for any policy that aims at expanding employment in recessions to focus on counteracting this Hall residual.

The Hall residual was stressed earlier by Mankiw, Rotemberg, and Summers (1985), who showed that one cannot justify the simultaneous drops in consumption and hours worked during recessions based on observed wage movements. The more recent papers bypass wage setting by substituting the marginal product of labor for the real wage (i.e., they go to the social planner's problem):

$$mpl \cdot u_c(c,l) = u_l(c,l)$$

where c is consumption, l is leisure (the complement of hours worked), and mpl is the marginal product of labor. If we assume Cobb-Douglas production, one can proxy cyclical movements in the marginal product of labor mpl by those in observed average product of labor $apl = y/n$, where y is real output and n is hours worked. The average product of labor is weakly positively correlated with hours worked at best; the correlation is actually quite negative for the last 20 years. So the problem noted by Mankiw *et al.* persists – one cannot justify simultaneous drops in consumption and hours worked in recessions based on the observed cyclicality of labor productivity.

For a closed economy, a temporary cut in payroll taxes can be equivalent to a temporary cut in sales tax rates. But for an open economy a temporary cut in payroll taxes is more effective for increasing employment. For instance, consider the extreme of a small open economy. If the temporary sale tax cut has little wealth effect and leisure and consumption are separable in preferences, then hours would be completely unaffected—the increase in consumption would reduce the marginal utility of consumption by the full magnitude of the cut in sales tax. So the marginal utility of leisure must remain unchanged. In this extreme case, a temporary sales tax would boost imports of consumption goods but not domestic employment.

(2) On the merits of cutting the employer vs. employee share of payroll taxes, first imagine that the Hall residual is an exogenous wedge but that otherwise wages are flexible and firms and workers are on their frictionless labor demand and supply schedules. In this event the distinction is of no consequence, of course. Our thinking is that two possible deviations from these stark assumptions make it appealing to cut both the employer and employee portions:

First, sticky wages would argue for cutting the employer portion of the payroll tax. We assume the wage that is sticky is the wage exclusive of employer payroll taxes but inclusive of employee payroll taxes. This is true with or without search frictions. With search frictions, Hall (2005) has argued that the job finding rate is highly procyclical because sticky wages make the employer surplus from matches highly procyclical. Cutting the employer portion should increase employer surplus, giving a boost to the job finding rate and lowering the separation rate.

Second, lumpy hiring and firing costs may leave some employers in the inaction region on hiring. See Caballero, Engel and Haltiwanger (1997) and Davis, Haltiwanger and Faberman (2006) for micro evidence of lumpy employment adjustments. Employers in the inaction region may "pocket" a cut in the employer portion of payroll taxes in the short run – while wages adjust. A similar scenario could occur if firms are constrained on the product demand side due to sticky prices. As employers may have lower marginal propensities to consume (MPCs) than workers, the goods demand stimulus might be smaller from employer tax cuts. The higher MPCs of employees, not to mention progressivity, would argue for cutting the employee portion. Parker (1999) finds that households do respond in their consumption expenditures to a temporary cut in payroll taxes. He examines tax variations of various timing, most notably how spending responds when some households hit the cap on social security taxes later in the calendar year. He estimates a marginal propensity to spend of one-half. We do not have a comparable estimate to point to for the MPC for employees under the cap, but imagine it could well be higher.

(3) What follows are calculations for the likely impact on employment and total hours of a temporary cut in the payroll tax.

Let $(1-\tau)mpl$ denote the after-tax marginal product of labor, where τ is the marginal tax rate on labor income (from payroll taxes and all other taxes). A one percentage point reduction in τ is associated with a $1/(1-\tau)$ percent increase in $(1-\tau)$. When calculating the impact of an x percentage point cut in the payroll tax, we approximate the percent impact on $(1-\tau)$ by the ratio $x/(1-\tau)$. We take a reasonable/conservative number for this ratio to be

$x/(1-\tau) = 1.4x$, which assumes a marginal tax rate of 30 percent. This seems conservative given the payroll tax alone is 15.3 percent.

We calculate the elasticity response of employment and hours first assuming that: (a) wages are flexible, (b) consumers ignore any wealth effect from the temporary tax cut, (c) the real interest rate is little affected (small open economy), so consumption is little affected, and (d) the short-run impact on capital is negligible. We then discuss at the end how the answer might differ if we relaxed assumptions (a), (b) or (c).

Assume stable (*ceteris paribus*) labor demand and labor supply curves. Then the response of total labor input to a one percent increase in $(1-\tau)$ is $\dfrac{1}{1/\varepsilon_s + 1/\varepsilon_d}$, where ε_s and ε_d are the respective elasticities of labor supply and demand.

We would argue that ε_s is one (or maybe even a little larger). The labor literature has historically used an elasticity of 0.2 to 0.5, but that applies to the intensive margin of hours per week, or maybe hours per month or quarter for the employed. The relative elasticities of the extensive (employment) and intensive (hours per worker) margins can be judged by the relative responses of the two margins to shifts in labor demand. Movements in the extensive margin are arguably about twice as large as the intensive (based on Hall and Lilien, 1979, and more recent data). That would imply an overall elasticity of about three times that from the micro literature for the intensive margin, or about 0.6 to 1.5. Furthermore, recent work suggests a considerably larger elasticity for the intensive margin. Pistaferri (2003) based on anticipated wage changes for workers, estimates that elasticity at 0.7 and Kimball and Shapiro (2008), based on survey responses to hypothetical events, put it close to one. So these would imply total labor supply elasticities (intensive and extensive) above one. In a structural macro model with only an extensive margin, Chang and Kim (2006) find that the cross-sectional distribution of wage rates relative to consumption rates suggest an extensive elasticity, alone, of about one.

There are fewer empirical efforts aimed at estimating the labor demand elasticity. Calibrated models often employ very large elasticities. For instance, with constant returns, Cobb-Douglas production and no adjustment costs, the elasticity is $1/(1 - \text{labor's share of income})$. So, for a labor share of two-thirds, this is very large at three. We would not want to ignore adjustment costs; we take the relevant number to be considerably smaller. But we believe it is reasonable to assume that the labor demand is elastic. *Completely inelastic labor demand has some fairly unrealistic empirical implications.* In particular, it implies that short-run marginal cost is really very steeply increasing in the labor-capital ratio. With flexible prices, this would imply that prices project with a very high elasticity on labor-capital ratios. But we (e.g., Bils and Chang, 2000) do not see this even for annualized data that show nearly a one-for-one price pass through for an industry's relative wage and material price changes. Even disallowing price flexibility, such a drastically steep marginal cost curves would have highly counterfactual predictions for very countercyclical inventory investment, because it would imply quite dramatic intertemporal movements in marginal cost. For these reasons, we take one as a conservative figure for the short-run elasticity of aggregate labor demand.

The discussion above implies a response in total labor hours of $\frac{1}{1/\varepsilon_s + 1/\varepsilon_d} = \frac{1}{1/1 + 1/1} = \frac{1}{2}$ percent for each percent increase in $(1-\tau)$. The expected response in employment is about two-thirds of this, or 0.33 percent for each percent increase in $(1-\tau)$. The remainder, 0.17 percent increase, is through the intensive margin of hours per worker.

Suppose we consider then a 6 percentage point cut in the payroll tax for 2009. (That's about 40 percent of the payroll tax, or just under half the social security component.) We calculate this as raising the after-tax wage by about 1.4(0.6) = 0.084, or 8.4%. The implied percent increase in total hours would then be half this, or 4.2%, with a 2.8% increase in employment and a 1.4% increase in hours per worker. This is large. For national employment of 145 million, this would imply a positive impact on employment of about 4 million workers. (For a worker working 2000 hours a year, the positive impact on the intensive margin would be 28 hours per year.) We might want to scale this down a bit, but only a bit, based on not all wages being subject to payroll taxes because of the cap at about $100,000. But this should not lessen the impact much, especially on the extensive margin.

If we drop the assumption of little response in consumption to the tax change (consumers treat transitory tax cut like wealth effect, or, extra output drives down real interest rate encourages consumption) then the analysis is affected. Then the tax cut has the elements of a standard lump-sum cut in taxes aimed at stimulating consumption spending. Under flexible wages, the impact on employment will be diminished. The increase in consumption will reduce labor supply, driving up wages, causing a smaller expansion in hours and employment. We believe this channel matters; but the ability of the temporary cut in payroll taxes to stimulate net exports lessens its impact.

If wages are sticky then it matters whether the temporary cut in payroll tax is aimed at employer or employee payments, as mentioned above. To the extent the employee tax is cut, it would act more like a traditional stimulus tax-cut of sending checks out to consumers. We expect that to have less positive impact on employment under sticky wages. But if it is required that an important share of the cut (half, anyway) falls on the employer, this is less of a concern. Furthermore, it is important to recognize that wage rates for new hires display quite large cyclical movements (Pissarides, 2007, Bils, Chang, and Kim, 2007, Kudlyak, 2008, Haefke, Sonntag, and Rens, 2008, among others).

If, for these reasons, the temporary payroll tax cut inherits some of the nature of a traditional stimulus tax cut, then the impact on employment of a cut of 6 percentage points would be reduced from our 4 million figure above. *This is because the traditional form of stimulus tax cut (such as the 2008 version) is less effective at raising employment.* But we believe the positive impact on employment of such a cut (6 percentage points) should be very large, we believe at least half of our 4 million number (2 million) and perhaps considerably larger.

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