Welfare Effect of Consumption Taxes

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ABSTRACT

Tax reform is a recurrent topic, but most of the prevailing proposals are fail to promote either efficiency or equity. In this paper, we consider an alternative reform, a consumption tax reform. The results show that aggregate capital, labor and consumption are improved by replacing a labor income tax with a consumption tax.** Moreover, a progressive consumption tax alone can achieve a significant welfare gain, and the welfare gap between the rich and the poor is reduced.

Keywords: Incomplete markets, Consumption taxes, Welfare inequality

1 INTRODUCTION

Given the current government deficit, highly unequal distribution of tax burden and extremely complexness of the tax system, a tax reform is crucial. However, most of the tax reforms, which aim at adjusting income tax codes, are at the cost of either efficiency or equity. Therefore, many political and business commentators have argued that consumption tax reforms might be the solution to the efficiency-equity trade-off.

There's vast agreement*** that consumption taxes can exempt saving from taxation, thus boost aggregate capital and output. But whether consumption taxes can contribute to reduce welfare inequality is left unknown. Corriea (2010) argues that a consumption tax can lead to a lower level of inequality. But however, her results are obtained by the assumption that all taxes are flat and under a complete market setting, hence the aggregates are not affected. Therefore, in this paper, we consider an incomplete market. The numerical results show that with incomplete market, replacing a flat labor tax with a flat consumption tax can increase aggregates and reduce welfare inequality. This is because the consumption tax reform encourages saving, so the interest rate decreases while the wage rate increases, and by a larger amount than the increase in consumption tax. As a result, low-asset households, who largely depend on labor income, would have an income increased more than consumption tax, so consumption increases. Whereas high-asset households, who gain their income mainly through capital returns, might experience a decrease in income. The decline in income, accompanied by an increase in consumption tax, results a decrease in their consumption.

However, in a more realistic case, where the labor tax is progressive, the welfare inequality of levying a flat consumption tax instead of a progressive labor tax is actually enlarged. This results have been

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shown by some existing literatures, like Alig et al. (2001), Feenberg (1997) and Auerbach (1983) etc.. Although most of these works are under the framework of OLG model, the results of broadened welfare gap in both OLG model and Aiyagari (1994) model are straightforward to interpret. That is by eliminating a progressive labor tax, low-asset households, most of whom are also with low productivity, do not have much improvement in income, but are made to pay a higher consumption tax. Thus, the reform might make them worse off. High-asset households, who are more likely to have high labor efficiency, on the other hand, are no longer subject to a previous high labor tax. For theses households, an increase in income outweighs the increase in consumption tax, thus they are better off after the reform.

Regarding the welfare loss by switching from a progressive labor tax to a flat consumption tax, Seidman (1997) proposed UAS tax, in which he argues that consumption tax should be progressive. In principle, people should be taxed based on what they take from the economic pie, the more one takes, the less he leaves for the others. Therefore, a surcharge on top of a flat consumption tax is necessary, and this forms a progressive consumption tax. Moreover, Gentry (1997) also mentions that consumption taxes should be at least as progressive as labor taxes, but without a numerical confirmation. Thus, in this paper, we numerically implement the reform that moves from a progressive labor tax to a progressive consumption tax with the same progressivity under a balanced government budget. The welfare effect is quite significant and Gini indexes of consumption equivalent is brought down by 3%.

Though long-run consequence of a tax reform should be considered in a tax reform, short term effect is at the center of the issue. Thus, we also examine the transition path of the progressive consumption tax reform and find a appealing welfare gain in short-run; whereas the flat consumption tax reform leads in a welfare loss.

The rest of the paper is organized as follows. Section 2 presents the model. In Section 3, we first calibrate the model, then show the numerical results at steady states for different scenarios and during the transition paths. Section 4 concludes the paper.

2. THE MODEL

Households: Households are endowed with 1 unit of time each period, which they divide into consumption and leisure. The preference over sequences of consumption takes the form

$$\text{Max}\{c_t ; k_{t+1}; h_t\} \sum_{t=0} E_0 \beta^t u(c_t ; l_t)$$

where ct and lt are consumption and labor at period t respectively, $\beta \in (0;1)$ is subjective discount factor,and E0 denotes the conditional expectation at date 0. The period utility function u(c) satisfies Inada condition. Each period, households receive an idiosyncratic labor shock ε , which is i:i:d: across households and follows the Markov process with transition matrix p(εt+1 |εt). Therefore the budget constraint of a household is

$$(1+\tau_c)c_t + a_{t+1} = (1+r^{\tau})a_t + (1-\tau_w)w_t l_t \varepsilon_t$$

$$a_{t+1} \geq b$$

a_0 is given

Throughout the paper, we assume household cannot borrow, which means that the borrowing limit b is 0.

Production: There is a representative firm who borrows capital and labor from households to maximize profits according to max{Kt ;Lt} AF(Kt ;Lt)−(rt +δ)Kt −wLt , where δ is the depreciation rate. This maximization problem leads to rt = AFK(Kt ;Lt)−δ, wt = AFL(Kt ;Lt), where Kt and Lt denote aggregate capital and labor at period t, FK and FL are first order derivatives with respect to capital and labor respectively.

Government: The government has a consumption of G each period, and the revenue is collected from taxing consumption, capital and labor, G =τcCt +τartKt+τwwtLt. Assume that the government keeps a balanced budget.

Market clearing: The asset and labor markets clearing requires that the total asset and labor supplied by the households equals the total capital and labor that the firm uses for production. The good market clearing condition equates the total output to the sum of aggregate household investment and consumption, plus government consumption.

Equilibrium prices and allocations are characterized by firm demand functions, household and government budget constraints, market clearing conditions.

3 NUMERICAL RESULTS

This section presents the quantitative results of incomplete market models. First, we outline experiments and discuss the calibration for the benchmark economies. Then we study the effect of switching from labor income taxes to consumption taxes in different scenarios.

3.1 OUTLINE OF EXPERIMENTS AND CALIBRATION

Regarding the types of labor taxes, and labor choices, we conducted four groups of experiments. We study the effects of flat consumption tax reforms by starting from the simplest case where the labor tax is flat, and labor choice is inelastic. Then we show that the results are robust if labor supply is allowed to change. Later on, we consider a more realistic case, in which labor tax is progressive. As before, we discuss the economies with inelastic labor and elastic labor respectively. At last, we proceed to a progressive consumption tax reform in an economy, which initially has a progressive labor tax, and elastic labor supply. Period utility form is of King et al (1988) class (KPR henceforth), u(c; l) = (c(1−l)γ)1−σ/(1 - σ). We set relative risk averse parameter σ = 2 in all benchmarks. γ calibrated such that average hour worked is 0.3 in benchmark economies. The production function is Cobb-Douglas, F(K;L) = AKα L1−α , with α = 0:36 to match the capital's share in production. A is normalized so that output is equal to one in the deterministic steady state of benchmark economies. We calibrate b to match capital to output ratio of 3 at the stationary equilibrium in benchmark economies. The depreciation rate d is set to be 0:06, such that investment to output ratio is around 2. Table 1 shows the parameters in four benchmark economies.

Table 1: Parameters

Economy	Properties		Parameters		
	Labor Tax Type	Labor Choice	A	β	γ
Benchmark a	Flat	Inelastic	0.612	0.907	1.77
Benchmark b	Flat	Elastic	0.631	0.900	1.77
Benchmark c	Progressive	Inelastic	0.591	0.917	1.60
Benchmark d	Progressive	Elastic	0.675	0.912	1.60

3.2 STEADY STATES

A. FROM A FLAT LABOR TAX TO A FLAT CONSUMPTION TAX, INELASTIC LABOR

Anagnostopoulos and Li (2012) shows that with KPR utility flat consumption taxes do no distort saving decisions, thus the change in aggregate capital stems from the removal of labor taxes. Consider the partial equilibrium, in which interest rate and wage remain the same after the reform. Eliminating labor taxes increases labor income by 37%$^{+}$, implying that the stochastic part of income takes up a larger proportion in aggregate income. As a result, stronger precautionary motives stimulate more savings from all types of households, so aggregate capital raises. Back to general equilibrium, higher aggregate capital yields higher wage rate and lower interest rate. Shown in Table 2, on one hand, a 8:55% rise in wage rate further amplifies the uncertainty of income, thus more precautionary savings are spurred; On the other hand, a 27:17% drop in interest rate depresses households savings. But nevertheless, the impact on aggregate savings of a higher wage rate dominates that of a lower interest rate. Therefore, aggregate capital increases after the reform. Since capital is below the golden rule level, the increase in capital results in the raise in the sum of consumption and government revenue. Thus, given a fixed government spending, aggregate consumption follows aggregate capital, improving by 6:81%.

The changes in aggregate variables are broken down into details, displayed in Table 3. From an income point of view, a flat consumption tax reform favors households either with low assets or with high labor efficiency. This is because eliminating the labor tax can promote wage income but reduce capital returns. Households with low assets or high labor efficiency are usually with high labor-to-capital ratio. Thus the impact on income of a higher wage is stronger than a lower interest rate. With higher income, households have tendency to increase consumption.

Anagnostopoulos and Li (2012) also proves that with KPR utility, other things equal, the ratio of households, consumption under two consumption taxes is inverse to the ratio of the two taxes. That is, if the elimination of the labor tax alone, with no consumption tax, promises a household with type (a;ε) a consumption c0(a;ε), then after a consumption tax τc is adjusted to balance government budget, the household's consumption c1(a;ε) satisfies c1(a;ε) = 1/(1+τc) c0(a;ε). This property can provide some intuition to the impact on consumption of a flat consumption tax reform. The Table 3 shows that the reform raises shares in aggregate consumption for households in the first four asset quintile, while reduces the share for the top quintile. Consider households with no asset and the lowest labor efficiency. The removal of the labor tax increases wage, and thus total income by 8:55%. The numerical results shows that these households still have no saving after the reform. Therefore, all the increment of income is used to promote consumption, so consumption is increased by 8:55%. However, in order for the

government to maintain a balanced budget, a 28:99% consumption tax is levied. Thus the new consumption under the new consumption tax is 1=(1+28:99%) of the consumption after removing the labor tax but without a consumption tax. We proved with a complete market, after a flat consumption tax reform, wage increases more than that of consumption tax, and this result can be carried over to incomplete market models. Thus, consumption raises by 6:63% for households with no asset and the lowest labor shock. In general, households in lower asset quintile possess some asset both before and after the reform, but the amount is quite moderate. For example, the total asset held by the first four quintile is less than 10%. Thus, even households in low asset quintile are facing the decline in capital income, a more sizeable increase in wage than consumption tax is still possible to provide them with higher levels of consumption. The opposite occurs to households who belong to top asset quintile. If their labor efficiency, and thus labor income, are not high enough to cancel out the negative effect on consumption of a lower capital income and a higher consumption tax, then their consumption decreases. As shown in Table 2, with consumption being more equally distributed among households, Gini index of consumption drops.

Table 2: Steady State of *a*

	Parameters								
Economy	τ_c	τ_w	*r(e-2)*	*w*	*K*	*H*	*L*	*K/Y*	*C*
Benchmark	*0*	*0.269*	*6.00*	*0.551*	*4.32*	*0.30*	*1.67*	*3.00*	*0.830*
Reform	*0.290*	*0*	*4.37*	*0.599*	*5.43*	*0.30*	*1.67*	*3.47*	*0.886*

Table 3: Distribution of *a*

Distribution of Wealth									
	Gini			**Quintile**			**Top Groups**		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.834	2.80e-3	2.81e-3	2.17	5.86	91.97	47.70	24.0	13.4
FCT	0.855	2.88e-3	2.88e-3	1.76	4.09	94.14	51.25	25.82	14.36
Distribution of Consumption									
	Gini			**Quintile**			**Top Groups**		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.789	3.00	3.00	13.00	16.64	64.35	29.17	14.19	7.81
FCT	0.810	3.24	3.24	13.08	17.14	63.29	29.21	14.16	7.75

B. FROM A FLAT LABOR TAX TO A FLAT CONSUMPTION TAX, ELASTIC LABOR

When labor choice is brought into the picture, all the previous results go through: aggregate capital and consumption increases, Gini index of consumption decreases, except that we need to add one more dimension to our analysis.

Since Anagnostopoulos and Li (2012) shows that a flat consumption tax do not distort labor decision for KPR class of utility, the change in labor supply comes from the removal of labor tax. The elimination of labor tax rises wage rate, and with respect to different levels of assets and labor shocks, households' reactions to the rising wage are also different. For households with same labor efficiency, the income effect and the substitution effect of higher wage on labor-leisure decisions are the identical because with

the same labor shock, the increase in labor income and opportunity cost of leisure are the same. Therefore, if interest rate is unchanged, then labor supply should increase (decrease) by the same amount across households with different assets. However, encountering a decrease in interest rate, households with higher assets are also suffering from a shrinkage in capital income, resulting in a less increase or even a decrease in total income, so the budget is tightened. It follows that leisure reduces, labor supply increases. But for households with low asset holdings, they do not experience a big drop in capital income, so total income is still probably higher than pre-reform. Thus a relaxed budget might lead to higher leisure, and low labor supply. Our numerical results confirm this analysis, that Gini index of leisure decreases from 0.187 to 0.159. In general, the increase in labor supply of high-asset households outweighs the decrease of their counterpart. As a result, average hour worked rises by 0.011. Since households with high assets also tend to have high labor efficiency, the effective labor is increased by 0.068, a larger magnitude than that of average hour worked.

Comparing to the previous case, where labor supply is fixed, a higher effective labor further amplifies the stochastic part of income, therefore, precautionary savings increases by more.

C. FROM A PROGRESSIVE LABOR TAX TO A FLAT CONSUMPTION TAX, INELASTIC LABOR

In this experiment, we start from a benchmark economy, which has a progressive labor tax. The functional form of labor tax is adopted from Gouveia and Strauss (1994), who estimated the functional form of US income tax code. $T = \kappa 0\ (y-(y^{-\kappa 1} + \kappa 2)^{-1/\kappa 1})$, where y is labor income. Parameters$\kappa 0$ and$\kappa 1$ govern the average tax rate and the progressivity respectively, and$\kappa 2$ is used to balanced government budget. In this paper we adopt the values of parameters from Anagnostopoulos et al. (2010), who estimate$\kappa 0 = 0{:}414$, $\kappa 1 = 0{:}888$, and$\kappa 2 = 1{:}34$ following the same procedure as Guvenen et al. (2012), using PSID data covering the time period from 1983 to 2003.

The impact on aggregates of removing a progressive labor tax is similar to that of removing a flat labor tax. Because higher wage creates greater uncertainty over income, higher precautionary capital is accumulated to insure against a more volatile income.

But on individual level, the results are reversed. After the reform, the share in aggregate consumption decrease for the first four asset quintile, but increases for the households in top 20% of asset distribution, as well as the top groups. Consequently, Gini index of consumption increases. The explanation is straightforward: low-asset households are not benefit much from the elimination of labor tax because most of them also possess low labor efficiency, but paying a high consumption tax makes them worse off. In contrast, high-asset households are exempt from the pre-reform high labor tax, and are only subject to a relatively low consumption tax. Therefore, they are in favor of the flat consumption tax reform.

D. FROM A PROGRESSIVE LABOR TAX TO A FLAT CONSUMPTION TAX, ELASTIC LABOR

When labor supply is allowed to vary, the results of moving from a progressive labor tax to a flat consumption tax is consistent with the results obtained by a fixed labor; and the analysis of the effects on aggregate labor is analogous to that in b, where the labor tax is flat. Regardless of the type of the labor tax, as long as it is removed, wage rate increases and interest rate decreases. As a result, labor supply decreases for households with low assets, but increases for their counterpart with high asset possession. Thus Gini index of labor decreases. But the decrease in inequality of labor supply is by less amount when initial labor tax is progressive as oppose to initially a flat labor tax. This is because under a progressive labor tax region, low-asset households do not pay a labor tax as high as under a flat labor tax region, the elimination of the progressive labor tax causes a less improvement in labor income, so the income effect plays a less dominant role as compared to the elimination of a flat labor tax. The same argument can be applied to households with high assets: the removal of a progressive labor tax indicates a more sizeable improvement in labor income. Thus, income effect has stronger impact on their labor decision. As a result, the extent to which the poor reduces labor supply, and the amount by which the rich increases labor supply are both lower when initial labor tax is progressive. But in general, the increase in labor supply the the rich outweighs the decrease by the poor, aggregate labor increases after the reform. In comparison to the case with fixed labor, higher aggregate labor results in a greater boost in aggregate capital accumulation.

E. FROM A PROGRESSIVE LABOR TAX TO A PROGRESSIVE CONSUPTION TAX, ELASTIC LABOR

It has been mentioned in some existing literature that a progressive consumption tax might be the solution to welfare inequality[++], thus in this subsection, we consider a progressive consumption tax reform. Due to the fact that there is lack of literature discussing the optimal progressivity of consumption taxes, we apply the same functional form and progressivity as the labor tax to the consumption tax. Besides, we set k2 in consumption tax function the same as that in labor tax function, and adjust k0 to balance government budget. The aggregate variables are shown in Table 4.

As before, the elimination of a labor tax amplifies the stochastic part of income, such that aggregate capital increases. But a progressive consumption tax distorts savings, thus the increase in aggregate capital also comes from the disproportional consumption tax rate. The lagrangian multiplier of the budget constraints of a flat consumption tax is $u_c(c;l) /(1+\tau_c)$, and that of a progressive consumption tax is $u_c(c;l) / (1+T'_c (c))$, where $T'_c (c)$ is the marginal consumption tax rate with respect to consumption c. Suppose that the progressive consumption tax reform yields the same equilibrium as the previous flat consumption tax reform and consider low-asset households with the consumption c such that $T'_c (c) < \tau_c$. That is the marginal cost of saving under a progressive consumption tax region is higher than that under a flat consumption tax region. Intuitively, when facing a progressive consumption tax, households with low assets tend to reduce savings, whereas high-asset households save more.

Even though the discrepancy of capital holding is widened, which is indicated by the increase in Gini index of wealth, the progressive consumption tax enables households at the low ends of both wealth distribution and labor efficiency distribution higher levels of consumption. The first order condition under the progressive consumption tax is

$$uc(c;n)/(1+T'c(c)) = \beta E(1+r_T)\, uc(c';n')/(1+T'c(c')) \quad (6)$$

If the equilibrium allocations are the same as that under a flat consumption tax, and suppose that households with low assets and low labor efficiency and with the consumption such that $T'c(c) < \tau c$. Then the marginal cost of saving, the left hand side of (6), is likely to exceed the marginal benefit, the left hand side of (6). This is because with a better shock tomorrow, consumption increases, implying $T'c(c)$ is higher, which might exceedsτc. Therefore, in order for the Euler equation to hold, households should increase current consumption. In contrast, households with high assets and labor efficiency are more likely to have marginal cost of saving less than the marginal benefit, which suggests them to reduce consumptions. As a result, consumption is more equally distributed among households. Although Gini index of consumption is slightly higher after the progressive consumption tax reform, it is much lower than that of a flat consumption tax reform. If we take into account the increase in aggregate consumption, then households in low quintile have higher levels of consumption than pre-reform.

A higher marginal cost of saving for households with low assets and low labor efficiency also indicates a higher level of leisure. The intratemporal substitution between leisure and consumption is given by $u1(c;1-n)/(1+T'c(c)) = -u2(1-n)/w\varepsilon$. A higher marginal utility of consumption under progressive consumption tax region than a flat consumption tax region suggests a higher disutility of labor. Therefore, low income households increase leisure by reducing labor supply, and high income households perform the opposite, so Gini index of labor decreases. Aggregate labor is dominated by households with high labor efficiency, so total efficient labor increases by 6:25%.

Table 4: Steady State of *e*

			Parameters						
Economy	$(\kappa_{c0}, \kappa_{c1}, \kappa_{c2})$	$(\kappa_{l0}, \kappa_{l1}, \kappa_{l2})$	*r(e-2)*	*w*	*K*	*H*	*L*	*K/Y*	*C*
Benchmark	*(0,-,-)*	*(0.414,0.888,1.34)*	*5.98*	*0.643*	*5.81*	*0.300*	*1.92*	*3.00*	*1.04*
PCT	*(0.449,0.888,1.34)*	*(0,-,-)*	*3.07*	*0.743*	*5.43*	*0.316*	*2.04*	*3.88*	*1.27*

Table 5: Distribution of *e*

Distribution of Wealth									
	Gini	**Quintile**					**Top Groups**		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.825	0	0	2.01	6.63	91.35	42.22	19.66	10.44
PCT	0.845	0	0	1.86	3.99	93.98	47.17	22.05	11.66
Distribution of Consumption									
	Gini	**Quintile**					**Top Groups**		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.569	4.03	4.03	14.87	17.14	59.93	26.31	12.43	6.66
PCT	0.579	3.90	3.90	14.34	17.85	60.00	28.02	13.32	7.10
Distribution of Labor									
	Gini	**Quintile**					**Top Groups**		
Eco		1st	2nd	3rd	4th	5th	Top5%	Top2%	Top1%
Ben	0.185	24.15	24.15	22.88	19.08	9.75	3.29	1.56	0.839
PCT	0.165	23.30	23.30	22.47	20.96	9.97	3.69	1.78	0.952

3.3 TRANSITION

In this section, we present the transition paths of switching from a progressive labor tax to a flat consumption tax and to a progressive consumption tax respectively. In both reforms, we eliminate labor income tax once and for all. Then we adjust τc in the flat consumption tax case to maintain government spending; similarly we rebalance government budget by changing κ0 in the progressive consumption tax case, while keepingκ1 andκ2 fixed. In both case, average consumption tax rate has an immediate jump after the labor tax is eliminated. This is because both capital and labor remain at the low levels, in order to balance government budget, a higher-than-steady-state consumption tax is imposed. As more and more capital and consumption is accumulated, the consumption tax rate gradually decreases to the new equilibrium level. Because of the monotonic decrease in consumption tax rate, by Euler equation, interest rate keeps on dropping, which implies that aggregate capital experiences a smooth increase throughout the transition. Labor income increases right after the reform, substitution effect dominates income effect results in a sudden increase in labor supply. With the increase in wage income, substitution effect becomes less dominant, hence aggregate labor drops and eventually converges to the new equilibrium level. Aggregate consumption follows the same pattern as capital, except an abrupt drop at the beginning because of the unexpected raise in consumption taxes.

Besides the transition path of aggregate variables, we also present the welfare effect on individual levels. After the flat consumption tax reform, all the households with the lowest shock suffer from a welfare loss, because the increase in wage income cannot compensate the increase in consumption tax. Since interest rate is dragged down by a larger capital accumulation, the higher the asset, the greater the loss in capital income. And this transfers to a more sizeable welfare loss of households with high asset holdings. Because of the welfare loss by the biggest bulk of population, aggregate welfare decreases by 11:53%. As compared to the flat consumption tax reform, a progressive consumption tax reform causes a welfare gain for 42% of households with lowest labor efficiency. And there are more households with

other two levels of labor efficiency experience larger welfare gain. Consequently, aggregate welfare increases by 3:32%.

4 CONCLUSION

In this paper we study the effects of consumption tax reforms. In general, regardless of the types of labor tax and consumption tax, replacing a labor income tax by a consumption tax increases aggregate variables. There are two interpretations for this, first is that because higher wage increases the uncertainly of income, precautionary savings are stimulated; The other explanation is that financing government spending through a consumption tax exempt saving from taxation, therefore more capital is accumulated. This conclusion is in line with the argument by the advocates of consumption taxes. But with respect to welfare inequality, the results vary across experiments according to different assumptions about labor tax. If labor tax is flat before the reform, then a flat consumption tax can reduce the Gini index of consumption and leisure, and thus the inequality of welfare. Because the asset poor households have a wage income increases by a larger amount than consumption tax, and they are not subject to a decrease in capital income; whereas asset rich households, the benefit of higher wage income is cancel out by the shrinkage in the return of capital. However, if the labor tax is progressive, then imposing a flat consumption tax instead of of a progressive labor tax hurts the poor, because the poor are not benefit from much from the removal of labor tax large enough to guarantee a higher consumption and leisure. Thus welfare inequality increases. Because of this negative impact of a flat consumption tax reform on welfare, we consider a progressive consumption tax reform. Due to the fact that there is lack of studies of the optimal progressivity of consumption taxes, we apply the same progressivity as labor taxes to consumption taxes. The numerical results exhibits a sizeable welfare improvement of the progressive consumption tax reform. Our future work involves discussion of the optimal consumption tax rate and its progressivity.

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ENDNOTES

** The effect of replacing capital income taxes with consumption taxes is similar

*** Like Hall (1995), Seidman (1995), Kaldor (1995), etc…

+ In partial equilibrium, the raise in labor income comes from the decrease in labor tax, thus it is 1 1+0:269 = 37%

++ Feenberg (1997), Domenici et al. (1995), Frank (2005), Gentry (1997)

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APPENDIX

Figure 1: Transition