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TAX POLICY FOR ECONOMIC RECOVERY AND GROWTH

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ABSTRACT

This paper identifies tax policy that both speeds recovery from the current economic crisis and contributes to long-run growth. This is a challenge because short-term recovery requires increases in demand while long-term growth requires increases in supply. As short-term tax concessions can be hard to reverse, this implies that policies to alleviate the crisis could compromise long-run growth. The analysis makes use of recent evidence on the impact of tax structure on economic growth to identify which growth-enhancing tax changes can also aid recovery, taking account of the need to protect those on low incomes.

JEL CLASSIFICATION: H20, H30, O40

KEYWORDS: Taxation, Tax Design, Tax Policy, Economic growth, Economic recovery

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1. Introduction

This paper examines the question of how to design tax policy that both speeds recovery from the current economic crisis and contributes to long-run growth. This is a challenge because short-term recovery requires increases in demand while long-term growth requires increases in supply. This difference is important as short-term tax concessions can be hard to reverse, implying that policies to alleviate the crisis could compromise long-run growth. It draws on the results of a recent OECD study on tax and economic growth, described in Johansson *et al* (2008).[2] The results of this study are used to identify the likely growth impact of alternative changes to tax structures that might be thought to speed economic recovery.

The OECD study focuses on tax structures (such as the tax mix or the rates and bases of individual taxes) rather than levels (as measured, for example, by the overall tax-to-GDP ratio) because cross-country differences in tax levels largely reflect societal choices as to the appropriate level of public spending, an issue that is beyond the scope of tax policy analysis. In addition, the focus on tax structures allows a consideration of revenue-neutral tax policy changes, and thus avoids the difficulty of taking account of how any changes in aggregate revenue might be reflected in changes in public expenditure. The importance of this second point can be seen by comparing (i) a tax revenue increase that finances increased infrastructure investment with (ii) a similar increase to finance increased social benefits. Policy (i) can be expected to have a better growth outcome than policy (ii), and therefore neither policy could be said to represent *the* effect of tax revenue on economic growth.

In practice, it is difficult to distinguish between the effects of tax policy on levels and on growth rates of GDP. Indeed, any policy that raises the level of GDP will increase the growth rate of GDP because changes in GDP levels take time. Also, transitional growth may be long-lasting, and so it has not proved possible to distinguish effects on long-run growth from transitional growth effects, although some elements of the tax system are likely to influence long-run growth. For instance, it is possible that tax changes that encourage innovation and entrepreneurship may have persistent long-run growth effects, while those that affect investment also can have long-

[2] The details of the empirical results, based on data from OECD countries, are presented in Arnold (2008) for the macro results, Vartia (2008) for the industry-level results and Schwellnus and Arnold (2008) for the firm-level results.

lasting effects on growth that fade out in the long-run. In contrast, tax changes affecting labour supply will have only a transitory effect on growth.

The remainder of the paper is organised as follows. Section 2 reports on the effects of changes in the tax mix between major categories of taxes at the macroeconomic level, drawing on the OECD study. Section 3 looks more deeply at the effect of taxes on productivity and investment, using both industry-level and firm-level data. Section 4 examines the tax policy implications of these results, together with findings related to more detailed aspects of the tax system. Section 5 uses these findings to examine the effects of various tax policy changes on both economic recovery and growth. Section 6 briefly considers impact of these tax policies on inequality. Section 7 looks at the question of how taxes should change after economic recovery. Finally, section 8 summarises the conclusions of the analysis.

2. The Overall Tax Mix

All OECD countries rely on a mix of taxes on consumption, property, personal income (defined in this chapter to include employee and employer social security contributions and payroll taxes) and corporate income. Setting the right mix is important, because the growth effects of collecting revenue from different sources can be very different. For example, Kneller *et al* (1999) find that taxes on income have a negative effect on growth while taxes on consumption have no effect.

In order to analyse the effect of the tax mix in detail and over as long a period as possible, estimates at the macro level were obtained by introducing a set of tax structure indicators into a panel regression of GDP per capita covering 21 OECD countries over the period 1970 to 2005 (for details see Arnold, 2008). The setup also takes into account the fact that more use of a given tax instrument reduces the amount of revenues that need to be raised from other taxes, when considering revenue-neutral tax changes. This is achieved by always omitting one element of the tax mix in each regression (indicated in the bottom line of Table 1) and this component is assumed to be absorbing changes in the other taxes that are included in the regression, to maintain revenue neutrality.

The interpretation of the results needs to take account of three important aspects of the estimation procedure. First, the estimated equations control for observed and unobserved differences between countries through country fixed effects. Hence the focus is on changes in the variables, examining how each country's GDP changes when its tax mix changes. This has the added advantage of capturing the effect that is of interest to policy makers: how will GDP respond if they change the tax mix? Second, as the estimates are based on the changes in the tax mix that have been observed in OECD countries, they show the effects of fairly modest changes in the tax mix and do not necessarily apply to more substantial changes. Finally, given the estimation equation, the results must be interpreted as effects on the long-run level of GDP, even though the estimation equation can be derived from both exogenous and endogenous kind of growth models.[3] As mentioned in the *Introduction*, there are not sufficient data available to test whether growth rates are affected beyond this level effect.

[3] The dependent variable of the estimated model is the level of GDP per capita, even though in the error-correction representation estimated here the dependent variable is the growth rate. See Arnold et al. (2007) for a formal derivation of the estimation equation from both Solow and Lucas-Uzawa style growth models.

Table 1 Estimated Cross-Country Effects of the Tax Mix on Long-run GDP per Capita†

The estimated empirical model is:

$$\Delta \ln y_{it} = -\Phi_i(\ln y_{it-1} - \theta_1 \ln s^k_{it} - \theta_2 \ln h_{it} + \theta_3 n_{it} + \sum \theta_j V^j_{it} - a_{it}) + b_{1i} \Delta \ln s^k_{it} + b_{2i} \Delta \ln h_{it} + b_{3i} \Delta n_{it} + \sum b_{ji} \Delta V^j_{it} + \varepsilon_{it}$$

Dependent Variable: Log GDP p.c.	(1)	(2)	(3)	(4)	(5)
Baseline Model					
Physical Capital	0.18 ***	0.25 ***	0.18 ***	0.16 ***	0.21
	(0.05)	(0.05)	(0.05)	(0.05)	(0.45)
Human Capital	1.19 ***	1.30 ***	1.18 ***	1.40 ***	1.57 ***
	(0.13)	(0.12)	(0.13)	(0.11)	(0.11)
Population Growth	-0.08 ***	-0.08 ***	-0.07 ***	-0.07 ***	-0.07 ***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Control variable					
Overall Tax Burden	-0.27 ***	-0.24 ***	-0.26 ***	-0.22 ***	-0.14 ***
(Total revenues / GDP)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Tax structure variables					
Income Taxes	-0.98 ***				
	(0.20)				
Personal Income Taxes		-1.13 ***			
		(0.19)			
Corporate Income Taxes		-2.01 ***			
		(0.32)			
Consumption & Property Taxes			0.93 ***		
			(0.20)		
Consumption taxes				0.74 ***	0.72 ***
(excl. property taxes)				(0.18)	(0.19)
Property taxes				1.45 ***	
				(0.43)	
Property taxes: Recurrent Taxes on Immovable Property					2.47 ***
					(0.84)
Property taxes: Other property taxes					-0.34
					(0.51)
Observations	696	675	696	696	698
Revenue-neutrality achieved by adjusting	Cons. & Prop. Taxes	Cons. & Prop. Taxes	Income Taxes	Income Taxes	Income Taxes

† In the estimated model, y refers to output per capita, s^k to the investment rate into physical capital, h to human capital, n to the population growth rate, respectively. The vector V contains a set of policy variables. All equations include short-run dynamics, country-specific intercepts and country-specific time controls. Standard errors are in brackets. *: significant at 10 % level; ** at 5% level; *** at 1 % level.

Table 1 reports the long-run effects of various revenue neutral tax shifts, based on the estimated dynamic equation, which also includes other basic growth determinants from a

'baseline model' as well as the overall tax burden as a control variable.[4] Column 1 shows a negative coefficient on the share of (personal and corporate) income taxes, indicating that an increase in the share of these taxes that is balanced by an decreased share of consumption and property taxes will reduce long-run GDP per capita and thus reduce growth. Column 2 looks at the different effects of personal and corporate taxes and shows that an increase in corporate income taxes (financed by an increase in consumption and property taxes) has a stronger negative effect on GDP per capita than a similar increase in personal income taxation.

Columns 3 to 5 report on a shift in the opposite direction: increasing consumption and property taxes while reducing income taxes. Column 3 shows a positive effect that is similarly-sized to the negative effect reported in column 1. Results reported in column 4 break up the effect of an increase in consumption and property taxes, allowing a reduction in income taxation. While both of them are associated with higher GDP per capita than relying on income taxes, the effect is significantly larger for property taxes. Column 5 separates recurrent taxes on immovable property from all other property taxes and the positive effect on GDP is significantly larger for recurrent taxes on immovable property than for all other property taxes and consumption taxes. Further analysis (not reported in Table 1) of the countries that separate data for recurrent taxes on immovable property into those levied on households from those levied on corporations suggests that taxes levied on households have the least adverse effect on GDP per capita. However, it should be noted that this result is based on about half the number of countries represented in the results reported in Table 1.

In summary, these results suggest a "tax and growth ranking" with recurrent taxes on immovable property being the least harmful (or most beneficial) tax instrument in terms of its effect on long-run GDP per capita, followed by consumption taxes (and other property taxes), personal income taxes and corporate income taxes. An idea of the possible magnitude of these differences is given by the estimates of the effect on GDP per capita of a shift of 1% of tax revenues from income taxes to consumption and property taxes. These suggest that such a

[4] This control variable is used to remove the bias that could result from a correlation between the tax mix and the overall tax burden. However, the value of the coefficient on this variable does not represent an accurate estimate of the effect of the overall tax burden on GDP because, as discussed in the *Introduction*, it takes no account of how any additional tax revenue might be spent.

revenue-neutral shift would increase GDP per capita by between a quarter of a percentage point and one percentage point in the long run depending on the empirical specification.

3. Tax Effects on Productivity and Investment

The results of the previous section suggest that corporate and personal income taxes are particularly harmful for growth. In order to understand this result more deeply and especially to examine the effects of these taxes on longer-term growth, the OECD study examined the effects of these taxes on total factor productivity (TFP) and investment. The necessary empirical evidence was obtained from both firm-level data covering a sample of 14 European OECD countries and industry-level data covering 21 industries in 16 OECD countries. Details of the data are provided in Schwellnus and Arnold (2008) and Vartia (2008).

Productivity

Estimating the effect of taxation on TFP based on firm-level and industry-level data is difficult as available tax indicators are not differentiated by firms or industries, although their impact may vary across them. An indirect way to test for these tax effects is to identify firm-specific and industry-specific characteristics relevant for different tax policies, and examine the interaction between these characteristics and the appropriate taxes. For example, the estimation assumes that one industry characteristic that affects the sensitivity of TFP to the corporate tax rate is the level of profitability. If the results of the econometric analysis support the hypothesis that the negative impact of taxes on TFP is stronger in certain industries due to these characteristics, then the estimated coefficient of the interaction term should be negative whereas if tax incentives have a stronger positive effect on TFP in industries with certain characteristics, the coefficient should be positive. One important caveat to this approach is that the estimated effect only captures the effect of a tax that is related to industry characteristics. Any direct effect of the tax on TFP (unrelated to the industry characteristics) is captured in the fixed effects.

The empirical results draw on a specification that captures two empirical regularities, namely technological catch-up with the leading firms/industries and persistence of TFP levels over time (Scarpetta and Tressel, 2002; Griffith *et al.*, 2006).

Table 2. Estimated Effects of Taxes on TFP

The estimated equation is

$$\Delta lnTFP_{i,t} = \delta_1 \Delta lnTFP_{F,t} + \delta_2 ln(TFP_{i,t-1}/TFP_{F,t-1}) + \delta_3 HK_{i,t} + \varphi Xi,t\text{-}1 + \beta Charac^{*} TAX_{i,t-1} + \gamma + \varepsilon$$

	Firm Level		Industry Level	
Dependent Variable: TFP growth	(1)	(2)	(3)	(4)
Basic Model				
Leader TFP Growth	0.173***	0.173***	0.04*	0.05**
	(0.019)	(0.019)	(0.02)	(0.02)
TFP Relative to Leader (t-1)	-0.190***	-0.190***	-0.01***	-0.01***
	(0.015)	(0.015)	(0.00)	(0.00)
Human capital (t-1)			0.01**	0.01**
			(0.00)	(0.00)
Anti-competitive regulation impact (t-1)			-0.01**	-0.01
			(0.01)	(0.01)
Interactions between characteristics & tax				
Profitability & tax	-0.307**		-0.04***	
	(0.128)		(0.01)	
Profitability & tax (Age<6&Empl<30)		-0.145		
		(0.176)		
Profitability & tax (Age<6&Empl>=30)		-0.275**		
		(0.130)		
Profitability & tax (Age>=6&Empl<30)		-0.285**		
		(0.127)		
Profitability & tax (Age>=6&Empl>=30)		-0.357***		
		(0.134)		
Entry rate & top personal income tax rate (t-1)				-0.04***
				(0.00)
Observations	287 727	287 727	2910	2910
Fixed effects:				
Sector	yes	no	yes	yes
Sector-size	no	no	no	no
Sector-age	no	no	no	no
Sector-size-age	no	yes	no	no
Country-year	yes	yes	yes	yes

In the estimated empirical model (i) $\Delta lnTFP_{i,t}$ denotes TFP growth in firm or industry *i in* year *t*, *(ii)* $\Delta lnTFP_{F,t}$ denotes TFP growth in the technological leader, which is the best practice firm in the firm-level results and the best practice country in the industry-level results *(iii)* $(TFP_{i,t-1}/TFP_{F,t-1})$ denotes the inverse of distance to the leader, *(iv)* $X_{i,t-1}$ denotes other non-tax variables, (v) Charac*$TAX_{i,t-1}$ denotes the interaction between industry or firm characteristics and tax, *(v)* γ *represents* fixed effects and ε is a random error. In the industry analysis TFP is based on an index approach, while in the firm-level analysis it is estimated as residuals from sector-specific production functions (see Schwellnus and Arnold, 2008, and Vartia, 2008, for details). Robust standard errors corrected for clustering are reported in parentheses. * denotes significant at 10%; ** at 5%; *** at 1%

Table 2 summarises the main empirical results concerning the influence of taxes on TFP at both the firm-level and the industry-level (see Schwellnus and Arnold, 2008, for details of the firm-level analysis, and Vartia, 2008, for details of the industry-level analysis).

The firm-level results are shown in the first two columns. Column 1 shows that lowering the statutory corporate tax rate is estimated to boost firm-level TFP in profitable industries. Column 2 shows that this negative effect of corporate taxes is similar across firms of different size and age classes, except for firms that are both small and young (where the effect is smaller and statistically insignificant). This may be due to some countries' exemptions or reduced rates targeted at start-up firms, which would reduce the amount of their corporate tax payments.

Column 3 reports the main empirical result obtained at the industry-level, again using the main statutory corporate tax rate as the measure of corporate taxation. This confirms that lowering corporate taxes is estimated to boost TFP in profitable industries.

An alternative to using the main statutory corporate tax rate in the estimation of the effect of corporate taxes on TFP would have been to use effective corporate tax rates. To test the difference that this would make, empirical analysis was undertaken using data on the effective tax rates computed by the Institute for Fiscal Studies (IFS) based on the methodology of Devereux and Griffith (2003). The empirical results (reported in Vartia, 2008) using industry-level data on a panel of 12 OECD countries covering 21 industries over the 1981-2001 period suggest that the average effective corporate tax (AETR) has a negative effect on TFP.

Column 4 reports the effects of top marginal income tax rates on TFP, based on the assumption that any effect will be stronger in industries with a high rate of new firm entry. This is partly because new firms are more risky and partly because new firms are more likely to be either unincorporated or closely held corporations, and so more likely to take account of the personal tax treatment of profits than is a publicly traded corporation. The results support this supposition by showing that top marginal personal income tax rates have a more negative effect on TFP in industries characterised by high firm entry rates.

Investment

The empirical results, both at firm and industry level, assessing the effect of taxes on investment were obtained by introducing the tax adjusted user cost in a standard investment equation with adjustment costs of capital (see Schwellnus and Arnold, 2008, and Vartia, 2008, for details). In addition to the standard user cost components (the required rate of return to the investment, the economic depreciation rate and anticipated capital gain/loss due to a change in

before-tax price of the asset) the tax-adjusted user cost takes into account taxes on profits and the present value of the tax savings from depreciation allowances. The industry-specific user cost is constructed as a weighted average of the asset-specific user cost where the weights are the share of each asset in total industry investment.

Table 3. Estimated Effects of Corporate Taxes on Investment: Firm-Level†

The estimated empirical model is

$$(I/K)_{icst} = \beta_1 (I/K)_{ics,t-1} + \beta_2 (I/K)^2_{ics,t-1} + \beta_3 (Y/K)_{ics,t-1} + \beta_4 (CF/K)_{ics,t-1} + \beta_5 UCtax_{cs,t-1} + \gamma_s + \gamma_{ct} + e_{icst}$$

Dependent Variable: Investment-to-capital ratio	(1)	(2)	(3)
Basic model			
Investment-to-capital ratio (t-1)	0.532***	0.531***	0.534***
	(0.026)	(0.026)	(0.026)
Investment-to-capital ratio squared (t-1)	-0.415***	-0.414***	-0.418***
	(0.025)	(0.025)	(0.025)
Output-to-capital ratio (t-1)	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Cashflow-to-capital ratio (t-1)	0.048***	0.048***	0.047***
	(0.003)	(0.003)	(0.003)
Tax adjusted user cost (t-1)	-0.829**	0.147	
	(0.410)	(0.689)	
Interactions between firm & sector characteristics & tax			
Profitability & tax adjusted user cost		-0.723**	
		(0.351)	
Tax adjusted user cost (Age<6&Empl<30)			-0.339
			(0.497)
Tax adjusted user cost (Age<6&Empl>=30)			-0.401
			(0.476)
Tax adjusted user cost (Age>=6&Empl<30)			-0.832*
			(0.437)
Tax adjusted user cost (Age>=6&Empl>=30)			-1.039**
			(0.430)
Long-run tax adjusted user cost elasticity	-0.69		
Observations	211,599	211,599	211,599
Fixed effects:			
Sector	yes	yes	yes
Size-age	no	no	yes
Country-year	yes	yes	yes
R^2	0.12	0.12	0.12

† In the estimated empirical model *(i)* $(I/K)_{ics,t}$ denotes the investment-to-capital ratio; *(ii)* $(I/K)_{ics,t-1}$ its lag; *(iii)* $(I/K)^2_{ics,t-1}$ its squared lag; *(iv)* $(Y/K)_{ics,t-1}$ the lag of the output-to-capital ratio; *(v)* $(CF/K)_{ics,t-1}$ the lag of the cashflow-to-capital ratio; *(vi)* $UCtax_{cs,t-1}$ the lag of the tax adjusted user cost and *(vii)* γ_s and γ_{ct} sector and country-year fixed effects, respectively. The estimation sample contains 12 European OECD countries and only observations with investment ratios between 0 and 1. Robust standard errors corrected for clustering at the country-sector level in parentheses. * denotes significant at 10%; ** at 5%; *** at 1%.

The main empirical findings at the firm-level are summarised in Table 3. Column 1 shows that increases in the tax-adjusted user cost of capital are found to reduce investment at the firm-level, while column 2 shows that this effect is larger for more profitable firms. A simulation experiment suggests that a reduction of the statutory corporate tax rate from 35% to 30% reduces the user cost by approximately 2.8%. Applying the estimated long-run tax adjusted user cost elasticity (from column 1), this implies a long-run increase of the investment–to-capital ratio of approximately 1.9%.

Column 3 shows that the size of the negative tax effect on investment appears to be similar for small and large firms (measured by the number of employees). In contrast, older firms' investment appears to be more negatively affected by increases in the tax-adjusted user cost than young firms, to the extent that it is only the effect on older firms that is statistically significant. One possible explanation is that young firms are generally less profitable than older firms and therefore less affected by corporate taxation. The other explanation may be that among young firms there is a disproportionately high share of small firms that benefit from exemptions or reduced rates.

The main results obtained at the industry-level are reported in Vartia (2008). Investment is clearly negatively affected by increases in corporate taxation but the long-run user cost elasticity is estimated to vary between -0.4 and -1, depending on the empirical specification. A simulation experiment indicates that a cut in the statutory corporate tax rate from 35% to 30% would increase the long-run investment-to-capital ratio by 1.0% or 2.6%, depending on the specification. These two estimates at the industry level lie on either side of the firm-level estimate.

4. Tax Policy Implications

The estimates presented in sections 2 and 3 can be seen an average effect for the countries whose data are included. This means that they cannot be used directly to predict what will happen in any particular country. The tax policy changes that are most likely to increase growth in any country will depend on its starting point, in terms of both its current tax system and the areas (such as employment, investment or productivity growth) in which its current economic performance is relatively poor. In addition, the estimates are based on the relatively small tax

policy changes that most OECD countries have undertaken and cannot be used to estimate the impact of larger changes. Nonetheless, the estimates do provide a basis for the serious consideration of a number of directions for tax reform.

In examining these directions, governments will need to take account of other factors apart from the growth of GDP. Issues of revenue sufficiency, equity, simplicity and compliance costs are just some examples of the factors that are often considered. Thus the suggestion that reducing corporate taxes can increase the level and, possibly, the rate of growth of GDP is not sufficient on its own to recommend the policy.

The results presented in section 2 suggest a "tax and growth ranking" with recurrent taxes on immovable property being the preferred tax instrument in terms of long-run GDP per capita, followed by consumption taxes (and other property taxes), personal income taxes and corporate income taxes. This ranking is consistent with earlier empirical results (e.g. Kneller *et al*, 1999) and is readily explained in theoretical terms. The growth effects of each type of tax are considered in turn below (see Johansson *et al*, 2008, for a more detailed discussion).

- *Recurrent taxes on immovable property* (especially residential property) are relatively good for growth because most OECD countries provide various tax preferences for owner-occupied housing (such as tax deductibility of interest on house loans and exemption from capital gains tax), which result in a misallocation of capital towards housing, away from other investments. In this situation, the pre-tax rate of return on housing investment is below the pre-tax rate of return on investment elsewhere in the economy. This implies that increasing recurrent taxes on immovable property will shift some investment out of housing into higher return investments and so increase the rate of growth.

- *Taxes on property transactions* – another major form of property tax – also have the benefit of shifting investment out of housing into higher-return activities. However, they have the disadvantage of discouraging housing transactions and thus the reallocation of housing to its most productive use, thus reducing growth. They also raise the cost of moving and in this way may lower labour mobility. Other property taxes – on financial transactions, inheritance and net wealth – can also distort the allocation of capital and/or the incentive to save. Thus,

property taxes in general are likely to be more harmful to growth than recurrent taxes on immovable property.

- *Consumption taxes* can affect labour supply by reducing the real value of wages but are otherwise seen as neutral. For example, they do not discourage savings and investment. Also, they are normally applied on a destination basis – applied to imports and refunded/exempted on export – and so do not affect the behaviour of firms that produce internationally traded goods. They can distort the behaviour of firms producing non-traded goods if applied at non-uniform rates, but the spread of general consumption taxes, such as VAT, means that consumption taxes are more uniform now than they used to be in most OECD countries although reduced VAT rates are still common. Thus, consumption taxes can be expected to have little negative effect on growth, although they do not have the advantages of recurrent taxes on immovable property.

- *Personal income taxes* are seen as more harmful to growth than consumption taxes for two reasons. First, they are generally progressive, with marginal tax rates (which discourage growth) that are higher than their average rates (which generate government revenues). This means that they discourage growth more per unit of tax revenue than consumption taxes, which are generally flat rate and not (or not very) progressive. Second, they typically tax the return to savings (interest or dividends) in addition to taxing the income from which savings are made, thus discouraging savings. While this second effect may not harm the growth of publicly quoted companies that can raise funds overseas, it can reduce the growth financing for small and medium-sized companies.

- *Corporate income taxes* can be expected to be the most harmful for growth as they discourage the activities of firms that are most important for growth: investment in capital and in productivity improvements. The negative effects on both investment and productivity growth in OECD countries are shown in section 3. Also, Hajkova et al (2006) show that they can reduce foreign direct investment. In addition, most corporate tax system have a large number of provisions that create tax advantages for specific activities, typically drawing resources away from the sectors in which they can make the greatest contribution to growth.

This "tax and growth ranking" means that growth could be increased, at least temporarily, without reducing tax revenue by a partial shift from income taxes to consumption and property taxes. Taxes on residential property are likely to be best for growth. However, few countries manage to raise substantial revenues from property taxes, with housing generally taxed more lightly than other assets. In practical policy terms, therefore, a greater revenue shift could probably be achieved into consumption taxes.

While recurrent taxes on immovable property are the best taxes to increase – from a growth point of view – corporate taxes appear to be the taxes that should be reduced most. However, lowering the corporate tax rate substantially below the top personal income tax rate can jeopardize the integrity of the tax system as high-income individuals will attempt to shelter their savings within corporations. This means that it often makes sense to think about reducing income taxes in a co-ordinated way.

Of course, changing the balance between different tax sources should not been seen as the only way in which tax structure can influence economic growth. Improving the design of individual taxes can also be important. For example, flattening the personal income tax schedule could be beneficial for GDP per capita, notably by favouring entrepreneurship. The OECD study suggests that the following changes are likely to promote long-term growth:

- The levying of the main consumption tax (VAT in most countries) at a single rate with as few exemptions as possible to minimise distortions and ease administration and compliance, while levying additional specific consumption taxes in cases where they can reduce environmental damage, discourage unhealthy consumption or encourage labour supply.

- The reduction of income taxes and social security contributions on low-wage workers in countries where these workers have inadequate incentives to work (because of the combined effects of the tax and benefit systems). The case for this is made particularly strongly by Brewer et al (2009).

- The reduction of employer social security contributions on low-wage workers, particularly in countries with a high minimum wage.

- The reduction of the top personal income tax rate, in order to encourage entrepreneurship and investment in education. The negative effect of high top personal income tax rates on productivity growth, through their effect on entrepreneurship, is shown in section 3.

5. Economic Recovery and Growth

In considering which of the tax policies suggested by a concern for growth would help speed the economic recovery, it is necessary to ask whether they would increase expenditure – on either investment or consumption - in the short-term. One important general consideration is how quickly the tax cuts can benefit the taxpayers; there is little point in cutting a tax rate now that will only reduce tax payments next year.

While cutting corporate tax is good for long-run growth, it is unlikely that cutting corporate tax rates will quickly increase investment. Cuts in the rate will be ineffective when businesses are making little or no profit, especially if it is expected that the rate will be increased by the time the investment starts yielding a profit. Also, businesses are more likely to increase investment in response to increases in demand and improved credit availability than a temporary tax cut. However, if corporate taxes are chosen as part of the tax cuts, it would be more effective to provide investment tax credits, especially if they are payable to firms in a loss position or can be carried forward to when the business regains profitability.

Cuts in the top personal income tax rate are also good for growth but, as with corporate taxes, they are unlikely to increase demand a great deal, as high income individuals are likely to save most of any tax cut, especially if it is expected to be temporary. In contrast, cutting personal income taxes for low-income households can be expected to be relatively effective as such households are likely to spend more of any tax cut than high-income families, even if the cut is only temporary. In countries where the taxes on low-income workers are relatively high, such a tax break would also stimulate labour supply and thus growth.

Although it may not be consistent with a pro-growth long-term tax agenda, it is sometimes argued that cutting consumption taxes is the best way of increasing consumption expenditures. However, this is unlikely to be as effective as income tax cuts for low-income households, because a cut in the main consumption tax rate gives greatest absolute benefit to those who spend

most: those on medium and high incomes, who are likely to save most of any tax cut. There is also the risk that the cut might not be fully passed on in lower prices for consumers. A temporary cut might be most effective in the short-run as it could induce people to purchase durable goods earlier than they had planned, provided they could afford it. Indeed, the *Symposium on the Economics of VAT Cuts* in the March 2009 edition of *Fiscal Studies* (with papers by Crossley et al, 2009, Barrell and Weale, 2009, and Blundell, 2009) suggests that it is the temporary nature of the current UK VAT reduction that will account for the bulk of any consumption increase. This suggests that an almost equal temporary increase in consumption could have been achieved, without any budgetary cost, by leaving the rate at 17.5% for a short period and announcing that it would rise to 20% after that.

Nonetheless, some governments will judge that a reduction in VAT (or sales tax) is an appropriate response to the crisis, perhaps as part of an overall package that includes help targeted at low-income households. In such cases, it is important that the reduction should take the form of a cut in the main rate rather than lowering the rate for particular products – such as energy or environmentally-friendly products - which would distort the allocation of resources in the economy and increase both compliance and administrative costs. Experience shows that it is very difficult to remove tax preferences once they have been introduced. For example, most OECD countries have found it politically easier to increase the main rate of VAT than to broaden its base by removing selective lower rates or exemptions.

It might be thought that reducing VAT on environmentally-friendly products would be a good long-run change to the tax system, and so the difficulty in reversing such a change is not a problem, but this is misguided. While such a VAT reduction will give an encouragement for consumers to buy more of such products it gives no such encouragement to businesses, beyond a normal response to meet consumer demand, as the VAT that they pay on inputs is normally refunded to them and so does not affect their profitability. A more cost-effective way of promoting these products – and one that would not add complexity to the VAT system – is to provide direct subsidies to these products. However, even this approach involves the dangers associated with 'picking winners'; the expense and environmental ineffectiveness of the subsidies to bio fuels demonstrates the harm that such a policy can produce. The most effective way for the tax system to improve the environment is to apply additional consumption taxes on

environmentally harmful products – a policy that automatically gives a market advantage to non-harmful products.

The need to avoid selective tax preferences is particularly strong in the case of housing. As house price falls have been a major symptom of the crisis in several countries, there is a temptation to provide special tax measures to limit (or even reverse) the fall. However, the long-term consequences of yielding to such temptation could be serious for several reasons. First, in many countries, the inflated house prices before the crisis have contributed to the seriousness of the current economic situation. Part of this house price inflation is probably due to the preferential tax treatment of owner-occupied housing (for example, exemption from capital gains tax), and so further tax concessions will simply create larger problems in the future. Second, most countries have found it particularly difficult to remove tax preferences for housing, and so any 'temporary' tax relief in this area is particularly likely to become permanent. Third, as discussed above, taxation of immovable property is the least harmful tax for economic growth. In fact, well-designed taxes on immovable property can even increase growth by reallocating capital away from tax-subsidised housing towards un-subsidised business activities that are more productive.

The only way that temporary tax concessions on housing could be beneficial would be a reduction in taxes on housing transaction that is linked to a future increase in recurrent taxes on housing. However, such a policy requires considerable political commitment as recurrent taxes on housing are generally unpopular.

In summary, the best tax cut for increasing demand and promoting long-run growth is a reduction in personal income taxes and social security contributions on low-income households. This will be particularly effective in countries where the cut can increase monthly incomes immediately, rather than waiting for a tax assessment at the end of the year.

6. Inequality

Any tax policy proposal needs to take account of its effects on income distribution, and it is particularly important to take account of effects on the poor during an economic recession, since this group tends to be the most adversely affected. For the poorest people in society, tax cuts are

unlikely to be much help as they are not paying much tax in the first place. These people are best helped by social benefits (or payable tax credits), if it is thought necessary.

Nonetheless, tax cuts that are targeted at those on modest incomes can improve the living standards of those families on the brink of poverty, both by directly increasing their disposable income and by giving them a greater incentive to work. In this context, the suggestion (above) to cut personal income tax and social security contributions for low-income families becomes even more attractive. It will stimulate demand, reduce poverty and increase labour force participation.

None of the other tax cut options discussed above would particularly benefit the poor: corporate tax reductions benefit shareholders, consumers and workers to varying degrees but are unlikely to particularly benefit those on low incomes; cutting high rates of personal income taxes or property taxes are likely to help the better off; while cuts in sales taxes apply across the population but give greater absolute gains to those who can afford to spend most.[5]

7. After Recovery

As economies emerge from recession, it is likely to be necessary to raise additional revenues. It will not be sufficient to restore them to pre-crisis levels unless permanent cuts in expenditure are planned, because there will have been an increase in government debt - arising from the reduced taxes and increased social benefits during the crisis and from possible increased government spending on infrastructure projects, bank recapitalisations and other crisis measures - that will need to be serviced and repaid.

This means that it will not be sufficient to simply reverse the earlier tax reductions, unless tax reforms have substantially increased GDP per head. Also, it might well be a good opportunity to change the structure of the tax system to promote economic growth. Thus, the tax increases after the crisis should focus on taxes that have been shown to be least harmful to growth: particularly recurrent taxes on immovable property and general consumption taxes.

[5] In countries that have made their sales taxes progressive, perhaps by lower rates on goods consumed heavily by the poor, the sales tax cuts could even help those on high incomes more than those on low incomes.

Countries vary widely in their use of recurrent taxes on immovable property. So, while it is unlikely that those countries with already high levels of such taxes will want to increase them, there is considerable scope for raising them in the other countries. However, this will require careful planning as such taxes usually belong to sub-national governments (although an increase in their revenues could be an advantage as many sub-national governments have been very adversely affected by the crisis) and there would need to be a simultaneous adjustment to the grants that central governments provide to sub-national levels. Moreover, these taxes are often unpopular and perceived as regressive, and the required proportional increases in the taxes would be large. Nonetheless, increases could be introduced gradually and regressiveness avoided by regular re-valuations and provisions for people who would have difficulty paying the tax from current income.

Increases in general consumption taxes are more likely to generate revenues on the scale required. However, many European countries already have high VAT rates and it might be unwise to raise their standard rates further. Nevertheless, many countries make considerable use of exemptions and lower (including zero rates) of VAT. Substantial revenues could potentially be obtained by gradually removing many of these provisions. Some of these VAT reductions are designed to reduce the apparent regressivity of the tax, but they are poorly targeted because rich people spend more than poor people on the goods these goods. From a distributional – as well as efficiency – point of view, it is better to have a uniform VAT on a broad base and use some of the additional revenues to assist low-income households, which would still leave a substantial revenue gain to the government.

8. Conclusions

This paper has presented empirical results that confirm theoretical beliefs that economic growth can be increased by gradually moving the tax base towards consumption and immovable property (especially residential property). It has also argued that growth can also be enhanced by improving the design of individual taxes.

In some cases, such as the reduction of corporate taxes and the top rate of personal income tax, it is unlikely that these growth-enhancing changes will help the recovery from the current crisis. At the same time, there are tax changes that are bad for growth, such as reductions in sales taxes (particularly if they take the form of exemptions and reductions) and property taxes, that would do little to speed recovery.

The tax change that shows the most promise in terms of both increased growth and economic recovery is the reductions of income taxes (including social security contributions) of those on low incomes. This would stimulate demand, increase work incentives and reduce income inequality.

Finally, the paper has argued that any necessary increases in revenue after recovery would be least harmful to growth if they were based on increasing recurrent taxes on immovable property and consumption taxes (especially if this took the form of reducing exemptions and rate reductions).

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