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**Taxes on Retirement Benefits, Consumption and
Saving in South Africa**

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Abstract

In this paper we empirically analyse the impact that the taxing of retirement benefits has on contractual saving and consumption behaviour in South Africa. By using a basic extended Ando-Modigliani life cycle model we show that contractual saving crowds out discretionary household saving. However, the results also suggest that the taxing of retirement benefits under the current tax structure may discourage individuals to save through retirement schemes and instead encourages increased levels of current consumption expenditure. We use time series data analysis on consumption per capita, disposable income per capita and pension and provident funds both public and privately administered. The econometric technique used is the OLS method of estimation. We find that estimates of retirement benefits are robust when regressed with the ratios of per capita government deficit and per capita consumer expenditure on durables. We find that it is also stable when regressed with the full Barro specification (which includes the ratios per capita government deficit, per capita durable consumption expenditure and the product of unemployment and per capita disposable income).

JEL Classification: H; H5; H55

Keywords: social security, pension funds, retirement, taxes, consumption, saving, South Africa

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1. Introduction

Since the early 1980s, saving rates around the world have been declining significantly thereby constraining investment and economic growth. With the ageing of the “Baby Boom” population more pressure is exerted on budgeting for increased social spending with many governments initiating reforms in their social security programs to ensure that individuals enjoy quality retirement with a smaller burden on government to care for the aged. Such social security program reforms include the privatisation of social security management with mandatory contributions. This is to ensure that those individuals with low income and discretionary saving that cannot provide for income during retirement through private insurance and other forms of security, at least be taken care of. In many of these cases governments allow different concessions for individuals, with the cost carried by government in terms of foregone revenue.

South Africa is now in the process of seeking ways to assist individuals in the lower income groups to be able to save for their retirement. This follows recommendations from the Katz Commission (1995) and the Smith Committee (1995), which recognized and emphasized the role of pension funds for retirement. Pension funds endeavour to enable their members to maintain their standard of living after retirement. This is important in view of increasing fiscal pressure to increase expenditure on social protection. Furthermore, since pension funds are treated as long-term savings institutions, their impact on the revenue base could be substantial.

The question is whether mandatory or compulsory saving for retirement constitutes an important way of national saving. There is a view that higher saving rates for some East Asian countries and China could be attributed, in part, to compulsory saving for retirement.

The rest of the paper is organised as follows: paragraph 2 deals with the need and practise of social security schemes. Paragraph 3 looks at tax treatment of pension funds in South Africa. Paragraph 4 investigates the effects of taxing pension and provident funds on consumption and saving using a simple life cycle model pioneered

by Ando and Modigliani (1963). In paragraph 5 some policy implications are drawn with conclusions in paragraph 6.

2. The Need and Practise of Social Security Schemes

2.1 Why Tax on retirement benefits?

The ageing of the population and unemployment constrain government expenditure aimed at providing minimum standards of living to that part of the population with low or no income and that, therefore, lacks accumulated savings for retirement or unemployment insurance. Providing for unemployment insurance could be even harder for the younger population seeking employment for the first time. Some countries have even made special provision for this group of the population (Heer, 2000). The voluminous literature on this topic testifies to the economic importance thereof a problem that merits urgent attention by policymakers.

In many countries the ageing of the population has been followed by a decline in national saving rates (Loayza, Schmidit-Hebbel and Servén, 2000). This complicates the performance of the economy even further, where governments extract tax revenue to finance expenditure in social insurance programs. As a result many governments make it mandatory to save for retirement in order to compel individuals to provide for their retirement. Thus, contributions to pension funds are regarded as crucial to provide for a reasonable standard of living during old age, but also as means to increase the rate of national saving.

Many countries rely on the availability of long-term saving instruments for retirement as an important vehicle to increase national saving (Krever, 2002). Since such funds are seen as long-term saving instruments, the question is what fiscal treatment should be given to them? One view is that these kinds of savings should be treated differently from other forms of savings, since they are usually supplied through tax incentive schemes. A second view is that such savings be treated similarly to other forms of savings, since they can be invested and income be derived from them. In the latter case, the question is to what extent these savings be taxed for taxes to comply with the

conditions of neutrality and the impact on the intrinsic value of the savings (Burman, 2002).

2.2 Requirement of a Good Tax System

Prior to a discussion of how taxes on benefits from retirement schemes may affect saving, the general principles of sound tax system should be considered:

1. **Efficiency:** to ensure that the tax system interferes minimally with economic activity thereby optimising the allocation of scarce resources. This means that the tax system should be such that it minimises distortions in the economy.
2. **Administration:** administrative costs borne by the revenue authority and compliance costs for taxpayers must be taken into account and should be minimised.
3. **Revenue adequacy:** the tax system should raise sufficient revenue for government to meet expenditure commitments.
4. **Equity:** tax levied must relate to the capacity to pay, that is individuals with similar capacities should carry an equal tax burden. This is known as the tax progressivity principle (see Jha, 1998).
5. **Stability:** the tax system should be such that stability in the revenue base is ensured. This will ensure easier government budgeting and also makes it easier for taxpayers to plan their expenditure ahead.

Of course, these principles are conflicting, thus, the main task of a policymaker is to identify and balance these conflicting objectives. In this case policymakers have to consider different tax structures for each principle.

2.3 Tax Schemes for Taxing Retirement Benefits

The most commonly used tax procedure on retirement benefits in OECD countries is the traditional EET (“Exempted” when contribution is made, tax “Exemption” on funds’ investment income and “Taxes” on received benefits) system, where accumulated benefits from pensions are fully taxed at retirement. This tax method for pension funds is not favourable in an environment where government is under financial pressure (as in most developing countries), and the level of contributions and pension assets is growing, since it defers tax revenue into the future (when individuals start receiving their benefits). Because of this limitation some countries have considered different types of tax structure like TEE (“Taxes” on contributions, tax “Exemption” on funds’ investment income and tax “Exemption” on benefits). In this way pensions are taxed when contributions are made and exempted when received. Thus the TEE tax system raises revenue at the time of contribution, but the revenue is less than in the case of EET, since in the latter case the tax includes the earnings on savings invested. However, both systems allow the individual to receive the equal benefits.

Other variants of tax treatment of retirement saving are ETT (“Exempt”, “Tax”, “Tax”) and TTE (“Tax”, “Tax”, “Exempt”) systems. These two systems provide the same benefits to individuals but revenue is higher with the ETT than with the TTE. With these two forms of tax treatment the individuals receive less benefits compared to those received under EET or TEE tax treatment. However, government revenue is higher under ETT and TTE than under EET and TEE³.

Atkinson, Creedy, and Knox (1998) conclude that when comparing the Australian approach of tax treatment of retirement benefits (TTT) to the EET of OECD countries, the latter performs better with regard to accumulated benefits. However, revenue collection is delayed in the case of the OECD with the net effect on individuals pending in part on their earning profiles. The Australian tax structure affects the size of retirement benefits, but it advances revenue from such savings. Nevertheless, the authors agree that there are minimal differences between the OECD and Australian tax

³ For more details see Dilnot, A. (1992): Taxation and Private Pension Funds: Costs and Consequences. In OECD, Private Pension and Public Policy. OECD, Paris.

structures, when assessed in terms of the aggregate measures (Kakwani index) of lifetime income, used to assess the progressivity within the cohort of full time workers.

Thus, the tax system that any government chooses depends on the policymakers' objectives. If the objective is to collect more revenue, obviously the ETT or TTT (the Australian one) will be preferable, but if the objective is to provide the individuals with better standards of living during retirement, then the OECD (EET system) seems to be preferred from the view point of the well being of retired individuals.

The evaluation of the tax treatment of retirement benefits is important in terms of the national policy objective for retirement funding. In fact, the system through which provision is made for retirement must have sufficient internal coherence to ensure long-term sustainability, since it is very sensitive at the individual level. To ensure these objectives, many governments offer different incentives to the different assets in which pension funds invest, allowing for investment diversification and avoiding arbitrage between different funds and investment in assets.

3. Tax treatment of Pension Funds in South Africa

Retirement schemes have to be sustainable in the long-term to ensure that individuals benefit from the contributions they make while earning income during their lifetime. To meet the general principles identified by the Smith Committee (1995) government committed itself to the following tax treatment of retirement savings:

- (i) Consistent treatment of private and public sector funds;
- (ii) Neutrality between forms of retirement provision;
- (iii) Minimisation of opportunities for tax arbitrage;
- (iv) An incentive for lifetime annuities; and

- (v) Taxation of income as it arises rather than when it is paid out.

The system of taxing retirement saving in South Africa is partly influenced by the need to expand the revenue base, as in the Australian case. The Katz Commission (1995) estimated that the government lost R11 billion in revenue on average per year because of the generous tax treatment of pension funds. Thereby, the Katz Commission recommended:

- (i) The overall contribution rate to retirement funds, capped at 22.5 per cent (with 7.5 per cent per employee contribution, qualifying as tax deduction and 15 per cent per employer);
- (ii) Tax on retirement funds at a rate of 30 per cent on their taxable income, calculated in the same way as the rate for long-term assurers; and
- (iii) On death, or at withdrawal or retirement, the lump sum value of the benefit is calculated and the annuity is taxed on a progressive scale, after some deduction, to encourage individuals with lump sum benefits in excess of R120, 000 to convert the benefits into annuities.

Retirement Schemes in South Africa consist of: Pension funds, provident funds, and retirement annuity funds, registered under the provision of the Pension Funds Act 1956 (Treasury, 2002). These funds are subject to ETT (“Exempt” “Tax” “Tax”) tax system, that is, exempted when a contribution is made, taxed on the fund’s investment income and taxed on the benefits. “The retirement industry currently has about 8,349,318 members, of which 7,025,125 are active. It is estimated that assets worth R720 billion are managed by retirement funds” (Business Report, 2004). This illustrates the potential revenue (most of the revenue comes from the funds’ investment income – the intermediate stage) that government can collect under this system.

By exempting contributions for pension funds from taxation, the ETT system defers the tax revenue from the contribution period to the period of maturity of the investment made by funds. The returns on investment of pension funds are taxed at 18 per cent, which

according to Fedusa (Federation of Unions of SA), is “extremely onerous” (Business Report, 2004). According to Fedusa the actual taxing system affects the “saving and investment culture negatively”. The implication thereof could be that due to the population ageing and unemployment, in the long-term, government revenue is eroded, which puts pressure on expenditure, since less investment leads to unemployment and more unemployed increases unemployment insurance payouts.

Retirement funds are taxed at 25 per cent after the deduction of a portion of income, attributable to liabilities in respect of pensioners or annuities, while the benefits received from retirement funds are taxable at the hands of the individual beneficiary. Annuities received from a pension fund or retirement annuity fund, form part of individual gross income and are taxed according to personal income tax tables, while according to the schedule of the Income Tax Act of 1962 (Sephton, 1990), a portion of the lump sum benefits is tax-free.

The question is how the structure of taxes on pension and retirement funds impacts on saving for retirement and consumption in the life cycle behaviour of individuals. In general, saving for retirement can be affected by taxation in the same way as other forms of savings are. Taxes reduce the returns on investment on certain assets (thus resulting in a bias towards investment in assets that are less taxed or tax-exempt) and lowering the purchasing power of individuals. This more severely affects low-income groups, whose capability to save for retirement is almost non-existent. Thus, an adequate form of tax treatment through incentives to save for retirement, also for low-income groups, is of utmost importance to induce individuals to save for their retirement. Some authors argue (see for example Krever, 2000) that individuals with higher incomes tend to save even without inducement (compulsory or mandatory), while individuals with low-income find it difficult and they treat the inducement to save as a tax. Therefore, such an inducement really only encourages the middle-income group to increase their savings for retirement (Krever, 2002).

However, an inducement to save for retirement as referred to by the Katz Commission can also have adverse results with even those in the middle class who are potential savers substituting future for current consumption. In South Africa, over 70 per cent of those in

formal employment are members of private retirement funds (Treasury, 2002). Compulsion or inducement to save for retirement, accompanied by marketing, could have an important impact on those not formally employed for example in the informal sector, domestic servants, self-employed and others. In reality these latter groups constitute the majority of the population (given the unemployment figures in South Africa) and determine the future burden of government expenditure on old age protection.

One way to induce individuals to save for their retirement is to implement a tax credit for contributions to retirement funds, expressed as a percentage of the contribution to the fund. Given the constraints on the budgets of developing countries like South Africa, and the fact that the higher income groups should be able to save to provide for their retirement without inducements, the latter group of individuals could be excluded from the benefits of a tax credit, to ensure that it effectively benefits only those in need.

4. The Effects of the tax regime on pension and provident funds on saving

In order to understand how the tax treatment of pension benefits affects savings, the traditional life cycle model is used.

Ando-Modigliani (1963) first assumes that the utility of an individual depends on his/her planned bequest, and that it is a homogenous function of planned bequests and planned consumption. Secondly, “the resources the individuals channel for bequest are an increasing function of the individual’s resources, relative to the average level of resources of his/her age group and the relative size distribution of resources within each age group is stable over time”. These assumptions foresee the need for individuals to maintain their standard of living over the entire life cycle. This justifies why saving for retirement has become an important matter for research to ascertain to what extent it can affect the individual’s consumption-saving behaviour over his/her entire lifespan.

Ando-Modigliani (1963) specified the consumption function as a function of labour disposable income and non-labour or property income. Using the Ando-Modigliani specification, many other studies have been carried out. Feldstein (1974), in one of the most cited studies, extended the Ando-Modigliani specification to include the effect of social security wealth on consumption. Barro (1978) proposed another modification to the

study by Ando-Modigliani (1963) and the Feldstein (1974) specifications to include the effect of per capita government surpluses and real per capita consumer expenditure on durable goods. He suggested that unemployment be entered into the equation as the product of the unemployment rate and the level of real per capita disposable income.

In this study we adopt the Feldstein (1974) specification to investigate the extent to which the schedule of taxing retirement savings applied in South Africa, affected saving between 1970 and 2003. However, non-labour income mentioned in the earlier specifications will not be used separately due to the identification difficulties. Thus, consumption is taken as a function of disposable income and pension and provident benefits (both official and privately administered), which is set out as follow:

$$\text{ConsPC} = f(Y_d\text{PC}, Y_d\text{PC}(-1), \text{TBENPC})$$

Where ConsPC is real per capita consumption, $Y_d\text{PC}$ is real per capita disposable labour income and TBENPC is real per capita total pension and provident fund benefits. To test for the sensitivity of pension and provident funds in this model we re-estimate the consumption equation above, taking into account the Barro (1978) suggestion. Thus we enter the product of the unemployment rate and per capita disposable income ($Y_d\text{UNPC}$), the government surplus/deficit per capita ($g\text{defPC}$) and per capita consumer expenditure on durables ($C\text{durgPC}$). The model assumes that individuals can borrow against their pension funds according to the Pension Funds Act of 1956 (Sephton, 1990).

4.1 Data and Empirical Results

All data used for this study are taken from South African Reserve Bank (SARB) Quarterly Bulletin and data on population were sourced from the World Development Indicator (2005), comprising a range of 34 years. The data on officially administered pension schemes date from 1990, which obviously constitutes a serious constraint to the analysis regarding time-series. The variable disposable income includes income from property. This constraint complicates the assessment of the effects of non-labour income on consumption and its substitution effects in South Africa.

We tested unit roots for all variables in the model. The results of Augmented Dickey-Fuller and KPSS tests show that all variables are $I(0)$ except the interacted unemployment variable and both total and privately administered pension benefits, which are $I(1)$. The results of the long-run equation obtained from the Engle-Granger two steps estimation procedure are shown in Table 1, with all variables in natural logarithms. Table 2 shows the adjustment coefficients. The results show that total and privately administered pension benefits play no role in the adjustment process and the speed of adjustment is -0.35 , in other words if there is a 1 per cent shock in the explanatory variables 35 per cent of consumption is adjusted in the first period.

These results are similar to the results from the basic extended life cycle model by Feldstein (1974 and 1995). Because of this similarity we decided to only use results from the Feldstein extended model (Table 3) to evaluate the effect of pension contributions and return on such investments on saving and consumption in South Africa. The results in Table 3 show that almost all household disposable income in South Africa is spent on consumption (0.98). The marginal propensity to consume the total payout from retirement funds both privately and officially administered funds (Regression 1) amounts to about 0.06, which is more than double the marginal propensity (0.028) for US found by Feldstein (1995), and is statistically significant. These results suggest that such benefits have a significant impact on consumption in South Africa and that the way in which they are taxed will impact strongly on saving via consumption during the life cycle of individuals.

We further analysed the effect of retirement benefits by differentiating between different retirement schemes. Regression 1 (Table 3) is re-estimated in Regression 2 and 3 substituting total benefits paid, by the benefits paid by each of the different types of schemes. Thus, in Regression 2 (with benefits from pension and provident funds privately administered, TPAPPPC) we show that the marginal propensity to consume the benefits from such funds now increases to 0.11, which is almost double the marginal propensity to consume as measured in Regression 1 and it is statistically significant. The results show that for each rand paid as benefit by a privately administered pension fund, 11 cents will be spent on consumption.

In Regression 3 (Table 3) we replace the total benefits TBENPC by benefits paid by officially administered pension and provident funds (TPPFAPC). The results show that the marginal propensity to consume is now -0.33 but it has the wrong sign and is not significant statistically. It therefore seems as if only contractual savings to privately administered funds have a meaningful impact on discretionary saving.

To analyse the effects of taxes on benefits paid by retirement schemes on savings for retirement, the channels through which they impact on consumption and saving have to be specified. Our approach is that a tax on benefits reduces the expected benefits (returns) on such investment and that depending on the level of taxation, individuals will seek other forms of savings, like buying property or investing in assets other than pension and provident funds. Thus, as is indicated later on, the tax treatment given to pension funds in South Africa can have an adverse effect on saving for retirement through the pension schemes, depending on how individuals perceive their benefits during retirement.

4.2 Consumption and Saving Effects of Pension and Provident Funds in South Africa

Using the coefficients estimated in the previous paragraph (as in Feldstein, 1974) we calculated the effects of pension and provident funds on savings during 1996 (one year after the Katz Commission and Smith Committee) and 2003, eight years later.

The results of these calculations show that the total benefits received from pension funds contributed to increased consumption of R1.56 billion in 1996, and R2.77 billion in 2003, implying a reduction in saving of the same amount by those who received retirement benefits. These effects amounted to a R25.8 billion reduction in consumption due to pension contributions and a R420 million reduction in saving for the year 1996. These reductions amounted to R40 billion in consumption and R651 million in discretionary savings in 2003.

The combined effects of benefits from and contributions to pension and provident funds on saving in South Africa, in 1996, were R1.889 billion and in 2003 it increased to R3.28 billion. This implies that household potential discretionary saving was reduced by 5.8 per cent in 1996 and 10.4 per cent in 2003. These results are comparable to findings from studies for many other countries. Feldstein's (1995) study for the US for example,

indicated that programs aimed at retirement saving crowd out personal saving. The decline in household saving in South Africa is also supported by time-series analyses done by Aron and Muellbauer (2000) and Prinsloo (1994, 2002).

Ehrlich and Kim (2005) analysed the effects of different programs of retirement schemes and found that provident funds provide a better retirement deal for the aged than social security financed payroll taxes. However, in the South African case where contributions are capped as a percentage of remuneration, its effects are likely to be similar to those of social security in other countries. In either case both programs lower the disposable income, which is at the centre of household decision-making during their lifetime earnings. In South Africa, however, it is not possible to separate the effects of provident funds from those of pension funds, since both of them are lumped together. Thus, these results could be regarded as directly comparable to the pure social security programs financed by payroll taxes as in the US.

The results, in Regression 2, show that discretionary household saving is crowded out more than when private and public funds are combined. When the results from this Regression (shown in the fifth row of Table 3) are applied to the monetary values of privately administered funds, it shows that consumption increased by R2.0 billion in 1996 and by R3.6 billion in 2003, which implies a reduction in saving by the same amount. By repeating the exercise for privately administered funds we find that the combined effects on saving was R3.0 million and R5.2 billion for 1996 and 2003 respectively, which implies a reduction in potential saving of 4.0 per cent for 1996 and of 6.8 per cent for 2003 (reductions are lower than when the two privately and officially administered pension are added together).

These results indicate the dominant effect of the pension and provident funds privately administered. Clearly, not being able to separate pension from provident funds, may lead to a serious bias in the analysis due to the fact that provident funds may have a different impact on saving and consumption in the life cycle of individuals.

4.3 Tests for Sensitivity of Social Security in the Model.

It has been argued that unemployment, the government deficit and consumer expenditure on durable goods may also influence the implied impact of social security on saving. To take these factors into account we re-estimate our Regression 1 in Table 3, with the interacted unemployment-per capita disposable income (Y_dUN). The finding, in Table 4, shows that the coefficient of total benefits paid declines from 0.055 to 0.036 but remains statistically significant, while the coefficient of the interacted unemployment variable has the wrong sign and magnitude although statistically significant. This result is similar to the result found by Feldstein (1995) in terms of robustness of the coefficient of the variable representing social security but differs in terms of significance from the interacted variable. We re-estimate Regression 2 with the interacted unemployment variable and find that the coefficient of pension and provident funds privately administered, drops from 0.11 to 0.09 but remains statistically significant, while the coefficient of the interacted variable is positive and insignificant (see Table 4).

We then re-estimate Regression 1 with the real per capita government deficit ($gdefPC$) and find that the coefficient of retirement benefits (total) only marginally changes from 0.055 to 0.053 while remaining significant. The coefficient of the government deficit, however, is positive and statistically significant. Re-estimating Regression 2 with the real per capita government deficit, we find that the coefficient of pension and provident funds privately administered, is essentially unchanged and the coefficient of the government deficit is positive and statistically significant. Next we repeat the exercise, by estimating Regression 1 with the per capita consumer expenditure on durable goods ($CdurgPC$) and the results show that the coefficient of retirement benefits (total) does not change much and remain significant, while the coefficient of consumer durable goods is positive but not statistically significant. Including the per capita consumer expenditure on durable goods in Regression 2, the result shows that the coefficient of pension and provident funds privately administered increases slightly to 0.12, but that the coefficient of $CdurgPC$ is not significant.

The results we find are mixed and some are comparable to that of Feldstein's and others studies while other results are not. We repeat the exercise for both Regressions 1 and 2 (Table 4 – full tests 7 and 8) with the Barro (1978) full specification and we find that the coefficient of pension (total) declines slightly to 0.04, with the coefficient of expenditure

on durable goods not significant. The coefficient of pension and provident funds privately administered in the full Barro (1978) specification, reduces to 0.05 and remains statistically significant, while the coefficients of the government deficit and consumer expenditure on durable goods are not significant. In Table 5 we present the sensitivity test of the results from the Engle-Granger two steps estimations and they reproduce essentially the same effects on saving and consumption as those reported above.

5. Policy Implications

The policy implications for South Africa of the matter discussed in this paper are similar to those found by other studies for other countries. First, since social security payment reduces discretionary savings, it implies that any policy changes, like increasing the social security tax contribution, may contribute to the crowding out of discretionary saving. The point is that since individuals tend to maintain their consumption patterns during their lifetime according to the life cycle hypothesis, any changes in the tax regime affecting the discounted value of retirement benefits will change savings in the opposite direction of the policy change. Thus, the benefits they foresee from savings via retirement schemes is heavily influenced by after-tax retirement benefits. But this only seems to be achievable when government makes available incentives to encourage contributions to retirement schemes.

It could be viable to increase tax credits for retirement contributions for low-income groups, with fewer credits for higher income groups, which should lead to a re-distribution of income between the different groups. Clearly, policies should be instituted to also encourage individuals in the informal sector (informal sellers, domestically employed, self-employed, etc. who normally constitute a burden to the government during old age) to join retirement schemes through credible institutions.

6. Conclusion

In this research we analyse the effects of taxing retirement savings currently used in South Africa, through the extended traditional life cycle model of Ando-Modigliani (1963). Our

results suggest that social security on average crowded out discretionary savings in South Africa by 4.3 per cent in 1996, and by 7.5 per cent in 2003. These results are comparable with findings from other studies from other countries.

We conclude that the way in which benefits are taxed crucially affects saving behaviour with the possibility that consumption expenditure is fuelled by negative changes in saving due to individual perceptions on the discounted real after-tax value of their retirement savings. We support the view that those who are outside of formal employment should be encouraged to save for their retirement through credible institutions. However, if more members of retirement schemes are to be registered, the tax incentives will have to be investigated to see whether those at the lower end of the scale should receive proportionally more than those at the higher end of scale.

Table 1: Dependent variable – lnConPC – Long-run Coefficients

Variables	Regression 1	Regression 2	Regression 3
LnYdPC	0.933 (0.0066)	0.905 (0.0086)	1.014 (0.0217)
LnTBENPC	0.060 (0.0068)		
LNRTPAPPC		0.090 (0.0090)	
LNTPPFAPC			-0.028 (0.0347)

(Standard errors in parenthesis)

**Table 2: Dependent variable - D(InConcPC) – ECM:
Adjustment Coefficients**

Variable	Regression 4	Regression 5
ResTBENPC(-1)	-0.351 (0.1334)	
ResTPAPPPC(-1)		-0.495 (0.1269)
D(InYdPC)	0.469 (0.1112)	0.442 (0.1075)
D(InConsPC(-1))	0.324 (0.1429)	0.411 (0.1233)
D(InConsPC(-4))	-0.230 (0.1314)	

(Standard errors in parenthesis)

**Table 3: Dependent Variable - Per Capita Consumption (ConsPC)
– Feldstein (1974, 1995) Specification**

Variables	Regression 1	Regression 2	Regression 3
YdPC	0.984 (0.1798)	0.931 (0.1595)	0.656 (0.3337)
YdPC(-1)	0.445 (0.1518)	0.401 (0.1360)	0.486 (0.2888)
TBENPC	0.055 (0.0063)		
TPAPPPC		0.112 (0.0111)	
TPPFAPC			-0.333 (1.4004)

(Standard errors in parenthesis)

**Table 4: Dependent variable – ConsPC
(Sensitivity Tests for model in Table 3)**

Variables	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Full test 7	Full test 8
YdPC	0.911 (0.1736)	0.847 (0.1667)	0.972 (0.1893)	0.895 (0.1596)	0.821 (0.1550)	0.869 (0.1648)	0.709 (0.1743)	0.672 (0.1946)
YdPC(-1)	0.439 (0.1434)	0.343 (0.1393)	0.448 (0.1546)	0.407 (0.1342)	0.325 (0.1301)	0.409 (0.1346)	0.388 (0.1348)	0.406 (0.1492)
TBENPC	0.036 (0.0105)	0.053 (0.0056)	0.056 (0.0075)				0.037 (0.0099)	
TPAPPPC				0.088 (0.0209)	0.108 (0.0105)	0.122 (0.0135)		0.047 (0.0187)
YdUN	12.4672 (5.8786)			7.963 (5.9185)			16.21 (7.3840)	22.92 (7.7246)
GdefPC		0.503 (0.1706)			0.383 (0.1607)		0.333 (0.1803)	0.335 (0.2051)
CdurgPC			0.115 (0.360)			0.423 (0.3272)	0.632 (0.4046)	0.648 (0.4575)

(Standard errors in parenthesis)

**Table 5: Dependent variable - InConsPC
(Sensitivity tests for model in Table 1)**

Variables	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Full test 7	Full test 8
LnrealYdPC	0.927 (0.0096)	0.937 (0.0055)	0.882 (0.0373)	0.905 (0.0099)	0.911 (0.0074)	0.819 (0.0363)	0.886 (0.0408)	0.837 (0.0370)
LnTBENPC	0.051 (0.0128)	0.059 (0.0055)	0.068 (0.0087)				0.06 (0.0107)	
LNTPAPPPC				0.089 (0.0183)	0.088 (0.0077)	0.109 (0.0113)		0.099 (0.0148)
LnydUN	0.033 (0.0385)			0.003 (0.0379)			0.023 (0.0383)	0.011 (0.0345)
GdefPC		0.00005 (0.00001)			0.00004 (0.00001)		0.00004 (0.00001)	0.00003 (0.00001)
LnCdurgPC			0.057 (0.0417)			0.092 (0.0375)	0.053 (0.0409)	0.076 (0.0371)

(Standard errors in parenthesis)

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