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TESTING THE RICARDIAN EQUIVALENCE THEOREM IN THE
FRAMEWORK OF THE PERMANENT INCOME HYPOTHESIS

by

FAİK BİLGİLİ

A dissertation submitted to the Graduate Faculty in Economics in partial fulfillment
of the requirements for the degree of Doctor of Philosophy, The City University of
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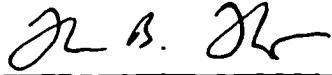
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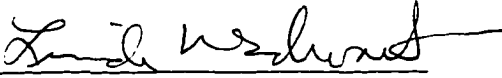
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This manuscript has been read and accepted for the Graduate Faculty in Economics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

TESTING THE RICARDIAN EQUIVALENCE THEOREM IN THE FRAMEWORK OF THE PERMANENT INCOME HYPOTHESIS

by

Faik Bilgili

Adviser: Professor Thom B. Thurston

The purpose of this paper is to test the Ricardian Equivalence Theorem (RET). This testing first requires a consumption function whose basic assumptions are consistent with those of the RET. Therefore I conducted the tests within the Permanent Income Hypothesis with rational expectations (PIH).

The basic statement of the RET is that the choice between tax and debt finance is irrelevant to resource allocation in the economy. The debt finance just postpones the current taxes, provided that government expenditures are given and that population growth is constant. Therefore government bonds are not net wealth, since they bring in higher taxation in the future.

If this statement is true, today's consumption decisions would be independent of some fiscal variables such as lump sum taxes, government debt outstanding or the budget deficit given that government expenditures are fixed. The PIH consumption function also implies that change in consumption cannot be forecast by the change in lag(s) of any

variable including the change in those fiscal variables. Thus, the test of RET is a nested test of the PIH. Among twenty countries that were chosen based on data availability, the result of this paper is that the RET holds in all countries and that the PIH holds in majority of the countries. The failure of the PIH occurs in developing countries except Finland. When pooled data set for all countries is used, the PIH again fails whereas the RET holds only if Chile is excluded from the data set.

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I. INTRODUCTION

One of the most discussed issues in economic literature is the effect of government deficits on consumption and investment. The Ricardian Equivalence Theorem (RET) suggests that, given government expenditures and population growth, the shifts between bond financing and taxation have no effect on the allocation of resources between private consumption and investment.

An alternative theory is that a decrease (increase) in tax revenues is associated with an increase (decrease) in private consumption and, therefore, an increase (decrease) in interest rates and a decrease (increase) in investment. This argument rests on the hypothesis that there is a positive correlation between current consumption and current income. A decrease in taxes will increase disposable income, thereby increasing private consumption. The RET notion, on the other hand, is that, given government consumption, a change in taxes fails to change private consumption levels, since individuals have rational expectations. Individuals with rational expectations see that today's tax cut will be exactly offset by tomorrow's tax increase. Such individuals do not consider today's tax cut as an increase in their disposable income, and, as a result, they will not change their consumption level.

The purpose of this study is to test the RET using the Permanent Income Hypothesis (PIH) consumption function that allows us to measure the effect, if any, of income, taxes, debt and the deficit on the level of private consumption. According to the PIH, lagged and currently predicted values of income, tax and deficit with zero innovations do

not jointly have any effect on consumption behavior with given government expenditures.

The plan of this study is as follows. Section II derives a consumption function consistent with the Permanent Income Hypothesis (PIH) and explains the implications of the PIH for RET. Section III presents a survey of the existing empirical consumption literature. The seminal works of Hall (1978) and Flavin (1981) test the PIH. They both state that change in consumption is unpredictable but their results conflict at the 0.05 level of significance. Hall finds that the null hypothesis that the coefficients on four lags of the income variable are jointly equal to zero is accepted at the 0.05 level, but rejected at the 0.10 level. Flavin finds excess sensitivity of consumption by finding that the eight lags of change in income jointly have significance on the change in consumption at the 0.05 level.

Bernheim (1987) tests the RET by employing an aggregate consumption function equation in which disposable income, budget surplus, debt, private wealth, interest rate are the explanatory variables. His null hypothesis is that the sum of the coefficients of disposable income and the budget surplus are equal to each other, which corresponds to the RET. His conclusion is against the RET. His own testing method, however, does not explicitly consider the rational expectations notion of the consumption function.

Seater and Mariona (1985) regress per capita consumption on the real per capita variables of permanent income (the stochastic steady state values of real GNP) and transitory income (the difference between permanent and real GNP), permanent and transitory government expenditures, tax revenue, transfers, debt, social security wealth and the average marginal tax rate and short and long after-tax real interest rates. Their

finding is individual and joint insignificance of the fiscal variables, thus supporting the RET. They also test the PIH. If the PIH is true, in their model, two restrictions should be met. First, the coefficient of transitory income is expected to be less than that of permanent income. Second, government expenditures, and interest rates are expected to have a negative effect on consumption. Their conclusion supports the PIH except for the first restriction.

Section IV.1 presents an econometric method of testing the excess sensitivity of consumption to income, tax and debt. The PIH states that consumption should respond only to the innovations of current income, taxes and debt and not to their lagged values. If, however, consumption responds to the predictable movements in variables in which innovations are zero, this would represent excess sensitivity of consumption. The excess sensitivity of consumption to taxes, government debt outstanding or deficit would be a measure of the failure of the RET as well as of the PIH.

In section IV.2, unit root and cointegration tests are presented for the variables of twenty countries, to avoid biased estimation results. The variables were found nonstationary but cointegrated; therefore, it sufficed to regress the variables in their levels rather than in differences in the VAR system.

Section V. presents the empirical evidence on the excess sensitivity of consumption to income, tax and debt, and excess sensitivity of consumption to income, tax and deficit, for twenty countries. Income, tax and debt jointly have some effect on consumption mostly in developing countries, whereas tax and debt jointly do not have an effect in all countries except Chile. The same tests were run by replacing government debt with the deficit; the result is the same. The RET thus held in all countries except Chile, and the

PIH held in the majority of the countries. The estimations were performed on the pooled data set as well. The PIH fails in the pooled data sets from all, developed and the developing countries while the RET holds in data sets for all and developed countries. The RET holds also in pooled data set for developing countries alone when Chile is excluded. All these estimations were conducted within the system in which coefficients were estimated in one step and two steps. For the most part these two estimation techniques give the same results.

II. THE MODEL

I begin with an intertemporal utility function of an infinitely-lived consumer with rational expectations,

$$U(t) = u(C_t) + \frac{E_t[u(C_{t+1})]}{(1+\rho)} + \frac{E_t[u(C_{t+2})]}{(1+\rho)^2} + \dots + \frac{E_t[u(C_{t+i})]}{(1+\rho)^i} = E_t \sum_{i=0}^{\infty} u(C_{t+i})(1+\rho)^{-i} \quad (1)$$

where $U(t)$ is total utility and C_t is per capita consumption, $i = 0, 1, 2, \dots, \infty$. E_t denotes the expectations operator conditional on information available at time t .

The utility function, u , satisfies the usual concavity conditions, with $u' > 0$, $u'' < 0$ and ρ is the discount rate; $0 < \rho < \infty$. Eq. (1) assumes that population growth is zero. The right hand side of the eq. (1) is the expectation of the discounted value of total consumption, conditional on information available at time t . The budget constraint is,

$$W_{t+1} = (1+r)(W_t + Y_t - T_t - C_t) \quad (2)$$

$$W_t = K_t + B_t \quad (3)$$

where r is real interest rate, W is wealth, K is capital, Y is labor income and B is bonds.

The transversality conditions for the optimization problem are

$$\lim_{i \rightarrow \infty} E_t [K_{t+i}(1+r)^{-i}] = 0 \quad (4)$$

$$\lim_{i \rightarrow \infty} E_t [B_{t+i}(1+r)^{-i}] = 0 \quad (5)$$

Taking into account these conditions, wealth evaluation becomes,

$$W_t = C_t + T_t - Y_t + (1+r)^{-1} W_{t+1}$$

$$W_t = C_t + T_t - Y_t + (1+r)^{-1} [C_{t+1} + T_{t+1} - Y_{t+1} + (1+r)^{-1} W_{t+2}]$$

$$\begin{aligned}
W_t = & C_t + T_t - Y_t + (1+r)^{-1} [C_{t+1} + T_{t+1} - Y_{t+1} (1+r)^{-1} (C_{t+2} + T_{t+2} - Y_{t+2} \\
& + \dots + (1+r)^{-1} (C_{t+i-1} + T_{t+i-1} - Y_{t+i-1} + (1+r)^{-1} (W_{t+i})) \dots] \\
W_t = & \sum_{i=0}^{\infty} (1+r)^{-i} E[C_{t+i} + T_{t+i} - Y_{t+i}]. \tag{6}
\end{aligned}$$

The consumer budget constraint then becomes

$$\sum_{i=0}^{\infty} R^{-i} E(C_{t+i}) = K_t + B_t + \sum_{i=0}^{\infty} R^{-i} E(Y_{t+i}) - \sum_{i=0}^{\infty} R^{-i} E(T_{t+i}) \tag{7}$$

where $R = 1+r$ is the gross interest rate. Maximization of eq.(1) subject to eq.(7) by lagrangian gives the Euler equation;

$$L = U(t) + \lambda \left[K_t + B_t + E_t \sum_{i=0}^{\infty} R^{-i} (Y_{t+i} - T_{t+i}) - E_t \sum_{i=0}^{\infty} R^{-i} C_{t+i} \right], \tag{8}$$

$$E[u'(C_{t+i})] = \lambda \left(\frac{R}{\delta} \right)^{-i}, \tag{9}$$

where $\delta = (1+\rho)$ is the discount rate. Therefore, the time path or change in consumption depends on r and ρ . Eq. (9) implies that expected marginal utility of consumption at any time is constant. And if $r = \rho$, then

$$u'(C_t) = E_t[u'(C_{t+1})]. \tag{10}$$

By assuming a quadratic utility function,

$$E(u) = E \sum_{i=0}^{\infty} \left[\delta^{-i} \left(C_{t+i} - \frac{a}{2} C_{t+i}^2 \right) \right], \quad a > 0 \tag{11}$$

the marginal utility of the consumption at t and $t+1$ are

$$\frac{\partial E(u)}{\partial C_t} = 1 - aC_t, \quad \frac{\partial E(u)}{\partial C_{t+1}} = E_t(1 - aC_{t+1}).$$

If the individual is optimizing his/her consumption function then

$1 - aC_t = E_t[1 - aC_{t+1}]$, since $E_t[1 - aC_{t+1}] = 1 - aE_t[C_{t+1}]$, the resulting equilibrium will be $C_t = E_t[C_{t+1}]$. (12)

Hence, with quadratic utility, consumption is determined according to the certainty equivalence behavior.¹ By substituting the certainty equivalence behavior in eq. (12) into the budget constraint, eq. (7), and rearranging it, the consumption function will be as follows.

$$C_t = \frac{r}{R} \left[K_t + \sum_{i=0}^{\infty} R^{-i} E_t(Y_{t+i}) \right] + \frac{r}{R} \left[B_t - \sum_{i=0}^{\infty} R^{-i} E_t(T_{t+i}) \right] + u_t, \quad (13)$$

or $C_t = \frac{r}{R} \left[W_t + \sum_{i=0}^{\infty} R^{-i} E_t(YD_{t+i}) \right] + u_t$, (13)'

where rR^{-1} is the annuity value and YD_t is disposable income. Therefore C_t is proportional to permanent income that is equal to annuity values of the capital stock at time t and expected discounted present value of future labor income, plus annuity value of the bond stock at time t , less the annuity value of expected discounted present value of taxes. If we assume that there is no transitory consumption, the disturbance term u_t will be zero.

The first term on the right hand side of eq. (13) is Flavin's definition of permanent income that is equal to the annuity value of net worth. Net worth is equal to the sum of

¹ If utility is quadratic, marginal utility is linear ($u''' = 0$) in consumption, uncertainty about future income has no affect on expected marginal utility and hence no affect on consumption behavior. But if the third derivative of utility function is positive, $u''' > 0$, marginal utility falls less rapidly as consumption increases. Therefore an increase in uncertainty results in an increase in expected marginal utility for a given value of expected consumption. In this case expected marginal utility becomes greater than the marginal utility of expected consumption,

$$E_t[u'(C_{t+1})] > u'(E_t[C_{t+1}]) \text{ or } E_t[u'(C_{t+1})] > u'(C_t) \text{ since } C_t = E_t[C_{t+1}].$$

Therefore a zero third derivative implies the certainty equivalence behavior. Individuals make decision under uncertainty by acting as if their future incomes were certain to equal their means.

real wealth and the present discounted value of current and future labor income.² In eq.(13) the permanent income is equal to the sum of the first term explained above, plus the annuity value of bonds at time t and the expected present discounted values of current and future taxes. Eq. (13) can be used to evaluate the RET within the PIH.

The term of *Ricardian Equivalence* comes from the statement that whether government taxes or borrows, the effect is the same, given that government expenditures are fixed. Today's borrowing will result in an increase in future taxes and the present value of borrowing of the government (present value of increase in future taxes) is equal to the increase in disposable income due to the tax cut. Therefore an infinitely-lived rational consumer does not consider government bonds to be part of "net wealth".³ Hence the individual will have this expectation of "equivalence":

$$B_t - E_{t-1}(B_t) = \sum_{i=0}^{\infty} R^{-i} [E_t(T_{t+i}) - E_{t-1}(T_{t+i})] \quad (14)$$

Therefore consumption will be unchanged as a result of a tax cut, with given government expenditures. Robert Barro (1974 and 1979), a leading New Classical Economist, reintroduced Ricardo's (1951) idea in modern terms. Barro claims that an infinite-lived representative consumer can readjust his/her current consumption behavior by looking at outcomes of the government's current actions. For instance, if government runs a larger deficit by cutting current taxes, the consumer increases his/her saving,

² Flavin (1981). Flavin, however, formulates PIH as $C_t = r \left[w_t + \sum_{i=0}^{\infty} R^{-(i+1)} E_t Y_{t+i} \right]$. This difference comes from her wealth evaluation formula of $W_{t+1} = (1+r)W_t + Y_t - C_t$. In other words in her formula saving ($Y_t - C_t$) does not earn interest (pp. 977-978), since Y_t is paid at the end of period. Besides this, I define W explicitly as the sum of K and B and add present value of future taxes into the equation.

³ Barro (1974).

because today's tax cut generates an increase in the present value of future taxes.

National saving remains the same, since an increase in private saving offsets the decrease in government saving. Therefore, in this analysis, a tax cut will not affect the consumption path, national saving and, hence, interest rates. Barro in his analysis assumes that the government expenditures are given; the infinitely-lived representative consumer can perfectly foresee future taxes; and taxes are lump sum.

There are some objections to the RET and the PIH which can be summarized as follows:

1. Finite-lived consumers rather than infinitely-lived consumers. If the tax burden falls far in the future, then the present value of future taxes may be smaller than the increase in disposable income caused by a tax cut. This may motivate an increase in consumption.

Barro asserts that this argument may not hold true if the consumers take care of their children by leaving bequests for them. If parents have an altruistic behavior, they can leave their wealth to their children so that the budget constraint is not based on only one lifetime. Any increase in income because of a tax cut, hence, can be bequeathed to younger generations. As a result of bequests, then finite lives could convert to infinite lives. This result, of course, is not realistic but rather an analytical convenience that has been commonly accepted as a tool in analyses that use the budget constraints.

2. Liquidity constraints. In some cases consumers would like to spend more now, based on their future income, but they cannot reach this consumption level because of liquidity constraints or imperfections in financial markets. If the loan markets are

imperfect, consumers who have liquidity constraints are not able to borrow to meet their consumption demand.

Barro's answer is that there might be two groups. The first group, mostly large businesses, might have access to credit markets; whereas the second group consists of households and relatively low income consumers who do not have such access. The second group pays a higher interest rate, since loans to these people involve higher transaction costs. Then second group's discount rate is equal to its marginal borrowing rate, since its members equate their marginal rate of return on investment to their discount rate. An interest rate higher than the discount rate postpones today's consumption whereas a discount rate higher than the interest rate gives more weight to today's consumption. The government borrowing rate is equal to that of the first group, since together they dominate the credit market. Further, assume that the share of tax cut and future tax liabilities between the first and second group is equal. Since the second group's discount rate exceeds the interest rate, the present value of future tax liabilities (due to tax cut) of this group falls short of their share of tax cut. Therefore with a tax cut the second group increases its consumption. As its consumption increases, its discount rate (the marginal borrowing rate) will tend to decrease.⁴ Therefore the second group will increase its demand for credit.

Hence, Barro states that a government issue of public debt can be a useful form of financial intermediation. The government can induce the first group to hold more than its share of the public debt. The second group, thus, holds less debt than its share and they

⁴ The first order conditions for optimization implies that the expected consumption exceeds the current consumption as long as the interest rate exceeds the discount rate.

obtain a kind of credit or loan from the first group after an increase in the second group's demand for investment. Thus loans between the first and second groups take place, although credit markets are imperfect.

3. Uncertainty. Martin Feldstein (1976) shows that when households are unsure about their future income levels, or because of the complexity in estimating the future tax liabilities, a current tax cut might result in an increase in consumption. Barro's answer⁵ is that a deficit-financed tax cut does not have a real macro effect. In an economy with perfect credit markets, consumers want to hold extra debt, because they consider this extra debt as a perfect guarantee against the uncertainties of future taxes on incomes.

4. If taxes are not lump-sum. Andrew Abel (1986) concludes that future taxes on capital income rather than labor income or progressive taxes on bequests induce consumers to increase their consumption. The RET holds only if taxes are not distorting. A distorting tax can change the preference between working and leisure time by changing their relative prices. Therefore changes in marginal tax rates on income or on capital or any other form of taxes rather than lump-sum taxes are very likely to undermine RET.

Since the purpose of this study is to investigate the RET within PIH, I specifically used eq. (13) in which taxes, bonds and income variables are shown separately. This implication of RET is consistent with the PIH since both theorems are consistent with each other in many respects. Both assume that consumers have rational expectations and infinite lives, and that the subjective discount rate and market interest rate are the same ($r = \rho$), individuals borrow and lend at the same interest rate as the government.

⁵ Barro (1989, pp. 214 - 215). See also Chan (1983).

In terms of the expected results, the two theorems also have common implications. If RET is true, the change in government fiscal policies i.e., the switch between today's borrowing and tomorrow's taxing, given government expenditures, does not have an effect on current consumption by eq. (14). If PIH is true, it will be shown later that a change in right hand side variables in eq. (13) are not expected to change the path of consumption.

The PIH estimates that saving is the optimal forecast of the present value of future declines in labor income.⁶ The RET claims that an increase in income through a tax cut today will result in private saving. This increase in private saving will offset the fall in public saving.⁷ In a sense today's saving is an indication of a decline in future income. Therefore the results of the PIH and the RET are expected to be consistent with each other. In the next section, we will summarize several studies of testing methods and results of the PIH and RET.

⁶ See Campbell (1989, p.1251), Campbell and Deaton (1989, p.359) Campbell and Mankiw (1991, p.726). In order for this result to hold, in eq.(13) the annuity value is assumed to be approximately equal to 1.

⁷ Barro (1989, p.205).

III. THE EVIDENCE FROM SEVERAL TESTING PROCEDURES OF THE PIH AND THE RET

Since Hall's seminal work with the Euler equation, (Hall, 1978), there has been a massive amount of research on consumption. Hall claims that the conditional expectation of future marginal utility is a function of today's level of consumption alone; all other information is irrelevant.⁸ Since one period lagged consumption incorporates all necessary information for the current consumption, lagged income and other variables should have no additional power in forecasting current consumption. Then PIH implies that only consumption lagged one period should have a non-zero coefficient on current consumption. Consumption follows a random walk; therefore changes in consumption are unpredictable.

$$C_t = E_{t-1}[C_t] + u_t \quad (15)$$

or $C_t = C_{t-1} + u_t$, since $E_{t-1}[C_t] = C_{t-1}$

Therefore current consumption is predictable by only one period lagged consumption alone. He regresses current consumption on lagged values of consumption .

$$C_t = \alpha_0 + \alpha_1 C_{t-1} + \alpha_2 C_{t-2} + \alpha_3 C_{t-3} + \alpha_4 C_{t-4} + u_t, \quad (16)$$

where C_t is per capita consumption of non durable goods. He finds that the computed F statistic for $H_0: C_{t-2} = C_{t-3} = C_{t-4} = 0$ is 1.7, less than the tabled F value 2.7 at the 0.05 level, and therefore he accepts the hypothesis. The other regression he runs is:

⁸ Hall (p.972).

$$C_t = \alpha_0 + \alpha_1 C_{t-1} + \alpha_2 Y_{t-1} + \alpha_3 Y_{t-2} + \alpha_4 Y_{t-3} + \alpha_5 Y_{t-4} + u_t \quad (17)$$

where Y_t is per capita disposable income. The hypothesis that the coefficients on four lags of the income variable are jointly equal to zero is accepted at the 0.05 level, but rejected at the 0.10 level. His conclusion is that there is a statistically marginal and numerically small relation between consumption and very recent levels of disposable income. This evidence casts a certain amount of doubt on the PIH.⁹

Another important study of the PIH is Flavin's excess sensitivity test.¹⁰ According to the PIH, predictable changes in income should not be related to changes in consumption. She works with an eight-order specification of the lag and runs the regressions.

$$Y_t = m_1 + \rho_1 Y_{t-1} + \rho_2 Y_{t-2} + \dots + \rho_8 Y_{t-8} + u_{1t}, \quad (18)$$

$$\Delta C_t = m_2 + k\Phi u_{1t} + B_0 \Delta Y + B_1 \Delta Y_{t-1} + \dots + B_7 \Delta Y_{t-7} + u_{2t}, \quad (19)$$

where C_t is per capita consumption on non-durables, Y_t is per capita labor income and B_0, B_1, \dots, B_7 are excess sensitivity parameters. Her finding rejects the hypothesis that $B_0 = B_1 = \dots = B_7 = 0$, disconfirming the PIH.¹¹ Flavin estimates B_0 in two steps in the system that consists of eqs.(18) and (19). This estimation gives not only significance but also the size of the excess sensitivity of change in consumption to the change in current income. Without a two-step regression in a system, the coefficient B_0 might represent the response of consumption to the innovations in current income as well as the response of consumption to the predicted income in which innovations are zero. Hall and Flavin

⁹ Hall (p.984).

¹⁰ Flavin (1981).

¹¹ Flavin (1981, p.999).

reach conflicting empirical conclusions on the significance of income on consumption at the 0.05 level. At the 0.10 level, Hall rejects the PIH by rejecting the hypothesis that coefficients on lags of income are jointly equal to zero, as Flavin rejected it at the 0.05 level. The origins of the difference of the results at 0.05 can be attributed to different sample periods and to the number of the lags. Flavin uses data on non-durable goods consumption from 1949:3 to 1979:1, with eight lags of change in income. Hall also uses data on non-durables. His data starts at 1948:1 and finishes at 1977:1 with one lag of consumption and four lags of income.

Some other studies also test the PIH by asking whether permanent income follows a random walk,¹² and whether permanent income variance innovations are larger than those of current income, or by seeing if innovations in income are smaller than those in consumption.¹³

There are several studies that call the RET into question. Martin Feldstein (1982) tested the effects of US tax policy on consumption during the period 1930-1977. He concluded that a tax cut results in an increase in consumption, provided government expenditures are fixed (Sachs and Larrain: 1993). Lawrence Summers and James Poterba (1987) study an implication of the RET that private saving increases with the budget deficit, so that national saving does not change. They find that private saving remained the same after tax-cuts in the 1980's.

B. Douglas Bernheim (1987) uses a broad empirical consumption function to study macro effects of the fiscal variables on the level of consumption. He shows the existence

¹² Mankiw and Shapiro (1985).

¹³ Campbell and Deaton (1988) and Francis X. and Rudebusch (1991).

of a close relationship between the deficit and aggregate consumption. He summarizes some studies that use data mainly for the USA, and finds that a deficit gives rise to a consumption increase of \$0.20 to \$0.50 for every dollar of deficit increase. The regression he ran is

$$C_t = \alpha_0 + \alpha_1(Y_t - T_t) + \alpha_2(T_t - G_t - rD_t) + \alpha_3G_t + \alpha_4D_t + \alpha_5W_t + \alpha_6X_t + e_t, \quad (20)$$

where C_t is consumption, Y_t is national income, T_t is tax revenues, G_t is government spending, D_t is debt, W_t is private wealth, r is the interest rate, X_t is a vector of other exogenous variables at time t , and e is the stochastic error term. All variables are in aggregate levels. The first term is disposable income, the second is the government surplus. The null hypothesis is $\alpha_1 = \alpha_2$, which would hold under the RET. In his cross-country analysis of several developed and developing countries, Bernheim finds statistically significant effects of deficits on consumption. By taking 12 and 6 year averages (1972 - 1983) for each country and running cross-sectional regressions he finds that a \$1 deficit-financed tax cut caused an increase in aggregate consumption of \$0.33 to \$0.44.

The main criticism of Bernheim's result is that his model does not take into account intertemporal utility maximization and rational expectations. Results from a consumption function that does not use expectations can not be compared with results of the PIH. Thus, the implications of his finding are not clear for the PIH with rational expectations.

Seator and Mariona (1985) include a permanent income variable in their consumption equation

$$C_t = b_0 + b_1 Y_t^p + b_2 (Y_t - Y_t^p) + b_3 G_t^p + b_4 (G_t - G_t^p) + b_5 AMTR_t + b_6 RS_t + b_7 RL_t + b_8 T_t + b_9 TR_t + b_{10} D_t + b_{11} SSW_t + u_t \quad (21)$$

where C_t is real per capita consumption, Y_t^p is permanent income, Y_t is current income, G_t^p is permanent government expenditures, G_t is current government expenditures, RS_t and RL_t are short and long term after-tax interest rates, $AMTR_t$ is the average marginal tax rate, T_t tax collections, D_t is the market value of government debt, TR_t is transfers and SSW_t is the social security wealth at time t. All variables are measured in real per capita values. The sample period is 1929 - 1975 (for USA).

They proxy permanent income Y_t^p with the normal level of income. Normal levels of income are the stochastic steady state values of real GNP (Y_t) computed from an ARIMA model for Y_t . Transitory income is calculated as the difference between real GNP and the permanent income, $Y_t - Y_t^p$.

Expected signs of the coefficients are $b_3, b_4, b_5, b_6, b_7 < 0 = b_2 < b_1$ (PIH implications) and $b_8 < 0 < b_9, b_{10}, b_{11}$ and these fiscal variables are expected to be jointly insignificant on consumption (tax discounting or RET implications). Their findings support the PIH results except that consumption shows sensitivity to transitory income. They find that the coefficients on T, TR, D and SSW are jointly and individually equal to zero. This finding supports the RET. Their explanation for sensitivity of consumption to temporary income is the liquidity constraint. If there is a liquidity constraint, individuals who face it would be able to increase their consumption if government reduced current taxes and raised future taxes. But this also implies failure of the RET. Their results are, however, consistent with the RET by finding insignificant effects of fiscal variables on

consumption. Although they use permanent components of income and government expenditures, they take into account only the current values of these fiscal variables tax revenue, transfers, debt, social security wealth in testing the RET.

These test results have been controversial in terms of either statistical results or different theoretical and econometric models applied to the consumption function. In the next section we will establish the econometric method for the consumption function that will be used in this study.

IV. THE ECONOMETRIC METHOD

IV.1 EXCESS SENSITIVITY OF CONSUMPTION

The main purpose of this study is to test RET with an explicitly defined PIH. The model should be the one that is derived for both PIH and RET. Such a model should be consistent with the assumptions of both theories, and should make possible separate tests for the PIH and the RET as well as a joint test so that one can see if these two theories are consistent with each other. Besides the concern for a more accurate definition of the PIH that is consistent with a representative consumer's consumption behavior whose characteristics have been explained above, the appropriate variables should be included in a time series econometric model. The projection of one time series on another results in biased results in existence of unit roots, if they are not cointegrated. If time series are not stationary, we cannot apply the conventional t and F test statistics. However if series are integrated in the same order, they might be cointegrated. Such a cointegration relationship indicates that conventional t and F test statistics results are not biased, even if the variables are not stationary. Thus, after constructing the null hypothesis to test RET and PIH, I first run stationary tests. If they are nonstationary, then a cointegration test is run. The consumption function in eq.(13) at $t + 1$ is

$$C_{t+1} = rR^{-1} \left[K_{t+1} + B_{t+1} + \sum_{i=0}^{\infty} R^{-i} E_{t+1}(Y_{t+i+1}) - \sum_{i=0}^{\infty} R^{-i} E_{t+1}(T_{t+i+1}) \right] + u_{t+1} \quad (22)$$

$$C_{t+1} = rR^{-1} \left[R(K_t + B_t + Y_t - T_t - C_t) + \sum_{i=1}^{\infty} R^{-i} E_{t+1}(Y_{t+i}) - \sum_{i=1}^{\infty} R^{-i} E_{t+1}(T_{t+i}) \right] + u_{t+1} \quad (23)$$

Multiplying consumption at time t by R , and rearranging this, yields

$$RC_t = r(K_t + B_t) + r(Y_t - T_t) + r \left[\sum_{i=0}^{\infty} R^{-(i+1)} E_t(Y_{t+i+1}) - \sum_{i=0}^{\infty} R^{-(i+1)} E_t(T_{t+i+1}) \right] + Ru_t, \quad (24)$$

subtraction of (17) from (16) yields

$$\Delta C_{t+1} = rR^{-1} \sum_{i=0}^{\infty} R^{-i} (E_{t+1} - E_t)(Y_{t+i+1} - T_{t+i+1}) + \eta_{t+1}, \quad (25)$$

where the error term $\eta_{t+1} = u_{t+1} - Ru_t$. If expectations are rational (meaning that $(E_{t+1} - E_t)(Y_{t+i+1} - T_{t+i+1}) = 0$), then as the PIH implies, changes in income, taxes, capital stock and holdings of government bonds will not affect the changes in consumption given that government expenditures are fixed. In eq. (25) consumption responds to the revisions in future income and taxes. If consumption changes by more than revisions in permanent income caused by innovations in current income and taxes, this amount will stand for the "excess sensitivity" of consumption to changes in income and taxes. Excess sensitivity can be tested by seeing whether consumption responds to even predictable changes in income and taxes.

Considering the VAR system below, I can define the effects of innovations on future values of these variables as impulse response functions or dynamic multipliers. For simplicity, assuming it is a first order VAR system,

$$\mathbf{x}_t = \mathbf{k} + \Phi_1 \mathbf{x}_{t-1} + \mathbf{e}_t \quad (26)$$

where \mathbf{x}_t is an $n \times 1$ vector containing each of n variables included in the system.

\mathbf{k} is an $n \times 1$ vector of intercept terms.

Φ_1 are $n \times n$ matrices of coefficients, $i = 1, 2, \dots, p$; and

e_t is an $n \times 1$ vector of error terms (unanticipated component of the series).

By iterating eq.(19) backward to obtain

$$x_0 = k + \Phi_1 x_{-1} + e_0$$

$$x_1 = k + \Phi_1 x_0 + e_1$$

$$x_2 = k + \Phi_1 x_1 + e_2$$

$$\vdots$$

$$x_t = k + \Phi_1 x_{t-1} + e_t$$

We can calculate the x_t recursively as follows,

$$x_t = k + \Phi_1 (k + \Phi_1 x_{t-2} + e_{t-1}) + e_t$$

$$x_t = (I + \Phi_1) k + \Phi_1^2 x_{t-2} + \Phi_1 e_{t-1} + e_t$$

And after n iterations,

$$x_t = (I + \Phi_1 + \dots + \Phi_1^n) k + \sum_{i=0}^n \Phi_1^i e_{t-i} + \Phi_1^{n+1} x_{t-n-1} \quad (27)$$

Convergence requires that as n goes to infinity Φ_1^n will vanish. Stationarity requires that the characteristic roots, or eigenvalues of Φ_1 lie within the unit circle. Assuming the stationarity condition is met, the solution for x_t is,

$$x_t = \mu + \sum_{i=0}^{\infty} \Phi_1^i e_{t-i} \quad (28)$$

Eq.(28) is moving average representation of eq.(26). Writing eq.(26) and eq.(28) in matrix form, I obtain (26)' and (28)'

$$\begin{bmatrix} Y_t \\ T_t \\ B_t \end{bmatrix} = \begin{bmatrix} k_1 \\ k_2 \\ k_3 \end{bmatrix} + \begin{bmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ T_{t-1} \\ B_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \end{bmatrix} \quad (26)'$$

$$\begin{bmatrix} Y_t \\ T_t \\ B_t \end{bmatrix} = \begin{bmatrix} \bar{Y} \\ \bar{T} \\ \bar{B} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{bmatrix}^i \begin{bmatrix} \varepsilon_{1,t-i} \\ \varepsilon_{2,t-i} \\ \varepsilon_{3,t-i} \end{bmatrix} \quad (28)'$$

where Y_t is income, T_t is tax revenue and B_t is the bonds held by the individual at time t .

$\bar{Y}, \bar{T}, \bar{B}$ stand for the means of Y_t, T_t and B_t , respectively. p_{kj}^i is the coefficient of k th

equation, j th variable at time i in the VAR system. The coefficients p_{kj}^i can be used to

generate the effects of $\varepsilon_{1,t-i}, \varepsilon_{2,t-i}, \varepsilon_{3,t-i}$ on $\{Y_t\}, \{T_t\}$ and $\{B_t\}$ sequences.

$$\frac{\partial Y_t}{\partial \varepsilon_{1,t}} = p_{11} \text{ is the instantaneous effect of one unit change in } \varepsilon_{1,t} \text{ on } Y_t.$$

$$\frac{\partial Y_{t+i}}{\partial \varepsilon_{1,t}} = p_{11}^i \text{ is the effect of one unit change in } \varepsilon_{1,t} \text{ on } Y_{t+i}. \text{ It is also referred to as}$$

the impulse-response function or dynamic multiplier. The cumulative effect of one unit

change in $\varepsilon_{1,t}$ on Y_t through time is given by,

$$\sum_{i=0}^{\infty} \frac{\partial Y_{t+i}}{\partial \varepsilon_{1,t}} = \sum_{i=0}^{\infty} p_{11}^i. \quad (29)$$

And the present value of this cumulative effect is

$$\sum_{i=0}^{\infty} R^{-i} [p_{11}^i] = \frac{1}{1 - R^{-1} p_{11}}, \text{ provided that } |R^{-1} p_{11}| < 0,$$

where, $R^{-1} = \frac{1}{1+r}$ = discount factor. Finally the sum of cumulative effects of

$\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}$ on $\{Y_t\}$ is given by,

$$\sum_{i=0}^{\infty} \left[\frac{\partial Y_{t+i}}{\partial \varepsilon_{1,t}} + \frac{\partial Y_{t+i}}{\partial \varepsilon_{2,t}} + \frac{\partial Y_{t+i}}{\partial \varepsilon_{3,t}} \right] = \sum_{i=0}^{\infty} p_{11}^i + \sum_{i=0}^{\infty} p_{12}^i + \sum_{i=0}^{\infty} p_{13}^i. \quad (30)$$

The present value of these cumulative effects on $\{Y_t\}$ is

$$\sum_{i=0}^{\infty} R^{-i} [p_{11}^i + p_{12}^i + p_{13}^i], \quad (31)$$

The present value of the sum of cumulative effects of $\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}$ on $\{T_t\}$ is given

by

$$\sum_{i=0}^{\infty} R^{-i} [p_{21}^i + p_{22}^i + p_{23}^i], \quad (32)$$

And present value of sum of cumulative effects of $\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}$ on $\{B_t\}$ is

$$\sum_{i=0}^{\infty} R^{-i} [p_{31}^i + p_{32}^i + p_{33}^i]. \quad (33)$$

Let eq.(31), eq.(32) and eq.(33) be Ω_1 , Ω_2 and Ω_3 respectively. Note that Ω_1 is the present value of the of sum of the cumulative effects of $\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t}$. When the current forecast errors are realized, the sum of the present value of revisions in future income, taxes and bonds is

$$\Omega_1 \mathbf{e}_t + \Omega_2 \mathbf{e}_t + \Omega_3 \mathbf{e}_t \quad (34)$$

where $\mathbf{e}_t = \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \end{bmatrix}$.

And the revision in permanent income is

$$rR^{-1} [\Omega_1 + \Omega_2 + \Omega_3] \mathbf{e}_t \quad (35)$$

If there is excess sensitivity of consumption to variables in the VAR, it implies that consumption responds even to predictable changes in income, taxes and bonds whose innovations are zero. If there is no excess sensitivity of consumption to the variables, it

means that consumption changes only by the revision in permanent income given by eq.(35). By the introduction of the actual changes in income, taxes and bonds that represent predictable changes in the VAR system, the "excess sensitivity" can be tested with the following equation,

$$\Delta C_{t+1} = m + rR^{-1}[\Omega_1 + \Omega_2 + \Omega_3]e_t + b_0\Delta Y_{t+1} + b_1\Delta T_{t+1} + b_2B_{t+1} + e_{t+1}, \quad (36)$$

Eq. (36) is the unrestricted version of the model. The coefficients b_i are the excess sensitivity parameters. Under the PIH, b_i should be zero. The problem with this test using eq. (36) is that ΔC_{t+1} might respond to innovations in $\Delta Y_{t+1}, \Delta T_{t+1}, \Delta B_{t+1}$ rather than to the predicted parts of these variables in which innovations are zero. Then such a response could be interpreted as excess sensitivity. To avoid this problem we can calculate the sensitivity parameters from the parameters estimated by the VAR. In other words, one can first estimate the parameters by the VAR system shown in eq. (37) below, and then use these parameters to test for excess sensitivity in the consumption function in eq. (38) below. By assuming, for simplicity, a first order VAR, differences in income, taxes and government debt can be defined as follows

$$\begin{aligned} \Delta Y_{t+1} &= k_1 + (p_{11}-1)Y_t + p_{12}T_t + p_{13}B_t + \varepsilon_{1,t+1} \\ \Delta T_{t+1} &= k_2 + p_{21}Y_t + (p_{22}-1)T_t + p_{23}B_t + \varepsilon_{2,t+1} \\ \Delta D_{t+1} &= k_3 + p_{31}Y_t + p_{32}T_t + (p_{33}-1)B_t + \varepsilon_{3,t+1} \end{aligned} \quad (37)$$

Then, eq. (36) can be estimated by substituting parameters estimated by the VAR

$$\begin{aligned} \Delta C_{t+1} &= m + b_0k_1 + rR^{-1}\Omega_1e_t + b_0\varepsilon_{1,t+1} + b_0[(p_{11}-1)Y_t + p_{12}T_t + p_{13}B_t] \\ &\quad + b_1k_2 + rR^{-1}\Omega_2e_t + b_1\varepsilon_{2,t+1} + b_1[p_{21}Y_t + (p_{22}-1)T_t + p_{23}B_t] \end{aligned}$$

$$+ b_2 k_3 + rR^{-1} \Omega_3 e_t + b_2 \varepsilon_{3,t+1} + b_3 [p_{31} Y_t + p_{32} T_t + (p_{33} - 1) B_t] + e_{t+1}, \quad (38)$$

where the $\Omega_i e_t$'s are the present value of the revision in the expected path of future values of the variables; income, taxes and deficit at time t . The $\varepsilon_{i,t+1}$'s are the forecast errors (innovations) of the variables at time $t+1$ and e_{t+1} is the measurement error in the consumption function at time $t+1$. By assumption, $\varepsilon_{i,t+1}$ and e_{t+1} are contemporaneously correlated but serially uncorrelated. Finally, excess sensitivity can be tested by the following reduced form,

$$\begin{aligned} \Delta C_{t+1} = & c + b_0 [(p_{11} - 1) Y_t + p_{12} T_t + p_{13} B_t] \\ & + b_1 [p_{21} Y_t + (p_{22} - 1) T_t + p_{23} B_t] \\ & + b_2 [p_{31} Y_t + p_{32} T_t + (p_{33} - 1) B_t] + \eta_t \end{aligned} \quad (39)$$

where $c = m + b_0 k_1 + b_1 k_2 + b_2 k_3$, and

$$\eta_t = rR^{-1} [(\Omega_1 + \Omega_2 + \Omega_3)] e_t + b_0 \varepsilon_{1,t+1} + b_1 \varepsilon_{2,t+1} + b_2 \varepsilon_{3,t+1} + e_{t+1} \quad (40)$$

The coefficients b_0 , b_1 and b_2 in eq. (39) are estimated in two steps within the system that consists of the VAR system, eq. (37), and eq. (39). This estimation procedure gives both the magnitude and the significance of excess sensitivity of change in consumption to the change in income, tax and government debt. In other words, the coefficients b_0 , b_1 and b_2 are the responses of the change in consumption to the change in predicted income, tax and debt in which innovations are zero. Statistically significant coefficients from eq.(36) might also be interpreted as excess sensitivity of consumption. This excess sensitivity, however, might stem from the innovations due to new information about variables. In this case, the significance and the magnitude of the coefficients of

predictable income, tax and debt, in which innovations are zero, can not be measured. Such a result would be ambiguous in determining the acceptance or failure of the RET and the PIH, since according to PIH consumption responds to innovations.

Therefore, I will estimate the coefficients within the system by a two-step procedure. I will also estimate the coefficients jointly within the system in one step. This second procedure enables one to see if there are differences in test results obtained by least squares in two steps and iterative least squares in one step. Obtaining the same results would be a verification of the statistical accuracy of the parameters obtained from two-step estimation.

If b_1 of eq.(39) is statistically significant, it means that consumption responds to the variables by more than changes in consumption warranted by the innovations in the variables. If the PIH is true, coefficients of the actual changes, b_0 , b_1 and b_2 will be jointly zero. If the RET is true, b_1 and b_2 will be zero.

IV.2 UNIT ROOT and COINTEGRATION ANALYSES.

Before estimating eq. (39), unit root tests will be conducted to determine the order of integration of the variables. Annual Private Consumption and GDP data were drawn from World Bank Data CD-ROM 1995 for the period 1960 to 1993. The Tax Revenues, Government Debt Outstanding data and budget deficit were drawn from World Bank Data CD-ROM 1995 and IFS CD-ROM 1995 for the period 1970 to 1993. Nominal annual values were divided by the GDP deflator and population to derive real per capita values. RCONS, RGDP, RTAX, RDEBT and RDEF stand for real per capita private consumption, real per capita GDP, real per capita tax, real per capita debt and the real per capita deficit, respectively. The countries chosen based on availability of data are: Belgium, Canada, Chile, France, Egypt, El Salvador, Finland, Germany, India, Italy, Japan, Malaysia, Pakistan, South Africa, Singapore, Sweden, UK, USA, Turkey and Venezuela. The unit root tests will be run by the following equations

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \varepsilon_t \quad (41)$$

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + b_1 t + \varepsilon_t \quad (42)$$

$$\Delta^2 Y_t = \alpha_0 + \delta \Delta Y_{t-1} + \varepsilon_t \quad (43)$$

$$\Delta^2 Y_t = \alpha_0 + \delta \Delta Y_{t-1} + b_1 t + \varepsilon_t \quad (44)$$

Where Y_t stands for any variable among RCONS, RGDP, RTAX, RDEBT and the RDEF. In Table 1, LB_{resids} columns under each variable are the Ljung-Box test statistic results of white noise tests for residuals from eqs.(41) and (42). The error term ε_t is white

noise, if it is serially uncorrelated and its expected mean is equal to zero. If ε_t does not seem to be white noise, an Augmented Dicky Fuller (ADF) test will be implemented. The number of lags of ADF are increased until ε_t becomes white noise.

The RCONS equations whose residuals became white noise by 1-lag ADF are: eqs. (41) and (42) of Belgium, eqs. (41) and (42) of Canada, eq. (41) of El Salvador, eqs. (41) and (42) of Finland, eqs. (41) and (42) Malaysia, eq. (42) of Pakistan, and eqs. (41) and (42) of the UK.

The RGDP equations whose residuals became white noise by 1-lag ADF are: eqs. (41) and (42) of Belgium, eq. (41) of Canada, eqs. (41) and (42) of El Salvador, eqs. (41) and (42) of Finland, eqs. (41) and (42) of Malaysia, eq. (42) of Pakistan, eqs. (41) and (42) of Singapore and eqs. (41) and (42) of the UK.

The RTAX equations whose residuals became white noise by 1-lag ADF are: eq. (41) of Sweden, eq. (42) of South Africa and the eqs. (41) and (42) of Turkey. The RDEBT equations whose residuals became white noise by 1-lag ADF are: eq. (41) of Egypt, eq. (41) of France, eqs. (41) and (42) of Sweden and the eqs. (41) and (42) of US. The countries whose RDEF variable became white noise by 1 lag ADF are Canada, Egypt, Italy and the Venezuela. All other equations' residuals were found white noise without including any lag term.

In Table 2, the first two columns under each variable show the Dicky-Fuller test statistic results for the coefficient δ , from eqs. (41) and (42). All DF and ADF test results indicate that all variables for each country are nonstationary except, RCONS eq. (41), RGDP eq. (41), RTAX eqs. (41) and (42), RDEBT eqs. (41) and (42) of Chile,

RCONS eq. (41) of Singapore, RDEBT eq. (41) of Turkey, RCONS eqs. (41) and (42), RGDP eqs. (41) and (42) of UK and the RDEF eqs. (41) and (42) of Venezuela.

Table 3, gives the results of regressions of eq. (43) and eq.(44). In Table 3, "*" implies I(2) and "***" implies I (0) variables. All other variables are I(1). The variables of Chile are I(0), the variables of Finland, Singapore and the Sweden are I(2) and eq. (44) of each variable of UK are I(2). The rest of the results show I(1) variables.

Cointegration tests for the variables RGDP, RTAX and RDEBT were performed in order to decompose these variables into anticipated and unanticipated parts by estimating these variables in levels in a VAR system. If these variables are cointegrated, the VAR estimation based on the levels would be more appropriate than the estimation based on differences .The Johansen cointegration test ¹⁴ will be run. Eq. (26) can be rewritten in its first difference as

$$\Delta \mathbf{x}_t = \mathbf{c} + (\Phi - \mathbf{I}) \mathbf{x}_{t-1} + \mathbf{e}_t \quad (45)$$

$$= \mathbf{c} + \Psi \mathbf{x}_{t-1} + \mathbf{e}_t \quad (46)$$

where Φ is an $n \times n$ matrix of parameters and \mathbf{I} is an $n \times n$ identity matrix. The number of non-zero eigenvalues of Ψ will determine the number of cointegrating vectors. I apply the Johansen methodology that determines the number of non-zero eigenvalues by the maximum likelihood method. One or more linear combinations of these variables might be stationary, whereas variables in \mathbf{x}_t are non-stationary in levels as seen in tables 1 and 2. If there exists such a stable linear combination, estimation of VAR based on the level of the variables would suffice. ¹⁵ The statistical implication of this in this model is that

¹⁴ Johansen (1987)

¹⁵ If variables are cointegrated, the VAR estimation based on differences rather than levels is inappropriate.

one can first run a VAR as in eq. (37) and then use these parameters obtained from the VAR in the consumption function in eq. (39). If the variables in VAR system in eq. (37) were not cointegrated, the excess sensitivity parameter estimates from eq. (39) would be biased.

The estimated eigenvalues are given in the first column of Table 4-B. λ Trace and λ Max test the number of eigenvalues, r , that are statistically different from zero. In the three variable case, $n = 3$, λ Trace tests the hypothesis that there is no cointegration, against alternative that there are 1, 2, or 3 cointegration vectors. If $H_0: r = 0$ is rejected against $H_1: r > 0$, then $H_0: r \leq 1$ is tested against hypothesis $r = 2$ or 3. The λ Max is more specific than the λ Trace test, whose null hypothesis is that there are no cointegrating vectors against the hypothesis that there is one cointegrating vector.

Since calculated values of λ Trace exceed the tabled critical value of 35.06 at the 0.05 level, the test statistics for each country result in rejection of no cointegration among variables and accept one of the alternative hypothesis that there are one or more cointegrating vectors. Furthermore, the same test statistics indicate that the alternative hypothesis that there are two or three cointegrating vectors should be accepted at the 0.05 level for Chile, Finland, Italy, Malaysia, Singapore, South Africa, Sweden, Turkey and the USA. Finally the λ Trace test statistic indicates that $H_1: r = 3$ is accepted at the 0.05 level for Malaysia and the USA.

The λ Max test shows that the $H_0: r = 0$ (against $H_1: r = 1$) is rejected at the 0.05 and 0.01 levels for each country except Germany and India. The $H_0: r = 1$ (vs. $H_1: r = 2$) is

See Engle and Yoo (1991), Enders (1995), Sims (1980), Doan (1992), Harvey (1992, pp.: 469-70).

rejected at 0.05 for Chile, Finland, Italy, Malaysia, Singapore, South Africa, Sweden, Turkey and the USA. The $H_0: r = 2$ (vs. $H_1: r = 3$) is rejected at 0.05 for Malaysia and the USA.

Cointegration tests were also run for RGDP, RTAX and the RDEF. The results are given in Table 4-C. The test statistics for each country result in rejection of no cointegration among variables and accept one of the alternative hypothesis that there are one or more cointegrating vectors. Also the same test statistics indicate that the alternative hypothesis that there are two or three cointegrating vectors will be accepted at 0.05 for Belgium, Chile, Egypt, Finland, India, Italy, Pakistan, South Africa, Sweden, Turkey and USA. Finally the λ Trace test statistic indicates that $H_1: r = 3$ will be accepted at 0.05 level for Belgium, Chile, India and Turkey.

Results of λ Max show that the $H_0: r = 0$ (against $H_1: r = 1$) is rejected at 0.05 and 0.01 for each country except Belgium and Sweden. λ Max test statistics are significant for countries Belgium and Sweden at 0.10 level. The $H_0: r = 1$ (vs. $H_1: r = 2$) is rejected at 0.05 for Chile, Egypt, Finland, India, Italy, Pakistan, South Africa, Turkey and the USA.

In conclusion, Table 4-B and Table 4-C show that there is at least one cointegrating vector among the variables for each country. Since variables are cointegrated, they should be estimated in levels.¹⁶ Hence, when variables are cointegrated, the parameters that were obtained from the VAR estimation based on levels can be used to measure the excess sensitivity parameters.

¹⁶ Engel and Granger (1991).

Table 1: Ljung-Box Test Statistic Results from eq. (41) and eq. (42).

Countries	RCONS*		RGDP*		RTAX**		RDEBT**		RDEF**	
	LB _{resids}		LB _{resids}		LB _{resids}		LB _{resids}		LB _{resids}	
	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4
Belgium	2.73	4.23	3.85	5.66	7.99	9.69	6.26	4.98	6.26	4.98
Canada	11.0	12.7	9.87	12.6	4.37	5.23	4.00	5.04	4.00	5.04
Chile	4.79	5.51	4.96	5.78	1.01	0.77	5.54	6.25	5.54	6.25
Egypt	6.53	5.93	6.87	3.70	2.01	1.01	3.53	1.55	3.53	1.55
El Salvador	12.5	13.1	5.66	8.14	7.06	9.94	10.8	10.7	10.8	10.7
Finland	2.97	6.08	4.27	8.69	11.4	12.7	5.73	6.41	5.73	6.41
France	8.13	9.20	9.55	10.0	8.19	8.34	5.64	14.2	5.64	14.2
Germany	13.9	14.2	12.0	12.7	3.35	3.88	4.43	3.18	4.43	3.18
India	3.03	2.50	4.74	3.83	3.36	3.40	4.78	3.20	4.78	3.20
Italy	4.69	4.15	5.36	4.94	3.96	2.26	5.84	7.66	5.84	7.66
Japan	3.67	3.85	6.54	6.58	8.24	9.04	6.20	7.31	6.20	7.31
Malaysia	6.51	6.81	7.87	7.47	8.28	8.88	1.92	2.88	1.92	2.88
Pakistan	10.9	6.77	11.0	5.62	3.61	11.2	1.81	3.61	1.81	3.61
S. Africa	6.83	8.17	10.3	11.9	4.60	7.44	6.49	6.78	6.49	6.78
Singapore	8.55	8.56	4.22	3.59	10.9	10.8	5.08	5.73	5.08	5.73
Sweden	12.3	14.3	10.7	12.5	4.74	15.1	6.34	3.69	6.34	3.69
Turkey	2.09	9.65	2.99	8.49	5.04	6.11	5.69	5.21	5.69	5.21
UK	9.18	9.52	8.73	9.39	8.96	11.9	9.69	13.5	9.69	13.5
USA	11.1	8.89	9.72	10.1	5.41	11.9	12.3	11.2	12.3	11.2
Venezuela	6.40	6.60	5.34	6.49	0.30	2.51	2.26	2.54	2.26	2.54

*: χ^2 , df=8, **: χ^2 , df=6

significance 0.01 0.05 0.10

χ^2 , df=8 20.09 15.50 13.36

χ^2 , df=6 16.81 12.59 10.64

Table 2: Unit Root Test Statistic Results from eq. (41) and eq. (42).

Countries	RCONS		RGDP		RTAX		RDEBT		RDEF	
	DF		DF		DF		DF		DF	
	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4	eq4
Belgium	-1.51	-3.04	-1.48	-2.84	-1.04	-1.49	1.40	-0.53	-1.75	-1.59
Canada	-1.89	-2.52	-1.98	-1.06	-0.62	-1.01	1.61	-0.51	-2.25	-2.35
Chile	-4.48	-2.36	-4.52	-2.31	-6.45	-5.76	-6.48	-4.60	-2.349	-2.096
Egypt	0.75	-0.38	0.72	-0.49	-0.15	-1.82	-1.59	-2.96	-2.62	-2.57
El Salvador	0.22	-1.47	-0.77	-1.95	-0.06	-1.99	-1.42	-1.08	-2.04	-3.77
Finland	-3.00	-3.46	-2.76	-3.54	-1.37	-1.49	1.33	-1.47	-1.69	-1.66
France	-1.46	-1.83	-1.55	-1.77	-1.32	-1.37	1.41	-0.69	0.62	0.17
Germany	0.65	-1.45	0.41	-1.64	0.03	-1.31	-1.23	-2.13	-1.50	-2.14
India	-0.79	-2.27	-0.55	-2.01	0.88	-1.15	-0.79	-0.36	-0.83	-0.59
Italy	-1.21	-2.50	-1.23	-2.57	-1.62	-2.39	-0.70	-1.95	-2.31	-4.37
Japan	-2.84	-3.05	-3.54	-3.48	1.07	-0.80	-3.03	-3.09	-2.66	-2.52
Malaysia	-0.04	-3.57	0.20	-2.62	-1.28	-1.58	-1.02	-0.92	-1.43	-1.75
Pakistan	-0.67	-3.27	-0.64	-3.20	-1.03	-1.68	-2.16	-1.86	-2.35	-3.91
S. Africa	0.63	-1.72	0.44	-1.65	-0.03	-2.35	-0.52	-1.79	-1.22	-3.14
Singapore	5.84	1.88	2.27	0.50	1.65	-0.13	6.66	1.95	-1.89	-1.96
Sweden	-1.74	-1.34	-1.81	-1.23	-2.46	-2.08	-2.30	-1.77	-1.33	-1.26
Turkey	-2.21	-3.21	-2.02	-2.76	-1.28	0.69	-3.67	-2.28	-1.94	-2.90
UK	-3.68	-3.84	-3.85	-3.93	-1.58	-1.71	-1.44	-2.36	-2.04	-2.47
USA	0.67	-1.57	-0.78	-2.67	-1.03	-2.43	-2.05	0.97	-1.88	-2.61
Venezuel	-0.03	-1.40	0.62	-1.04	-0.55	-2.43	-1.36	-1.56	-4.52	-4.40

significance 0.01 0.05 0.10

DF,eq 31 -3.75 -3.00 -2.62

DF,eq 32 -4.38 -3.60 -3.24

Table 3: Dicky-Fuller Test Statistic Results from eq. (43) and eq. (44).

Country	RCONS		RGDP		RTAX		RDEBT		RDEF	
	eq.(43)	eq.(44)	eq.(43)	eq.(44)	eq.(43)	eq.(44)	eq.(43)	eq.(44)	eq.(43)	eq.(44)
Belgium	-3.59	-6.41*	-3.68	-6.90*	-3.13	-5.65*	-3.18	-6.26*	-4.39	-4.40
Canada	-3.12	-7.51*	-3.61	-3.76	-3.71	-3.86	-5.00*	-4.87*	-3.57	-3.48
Chile	4.48**	-4.52	-4.52**	-4.66	-6.45**	-5.76**	-6.48**	-4.60**	-2349	-2096
Egypt	-4.20	-5.29	-4.05	-5.27	-4.56	-5.12	-4.19	-4.43	-5.35	-5.21
El Salvador	-4.45	-5.41	-6.89*	-6.88*	-3.94	-4.26	-4.49	-4.50	-7.16	-7.04
Finland	-6.54*	-6.55*	-6.60*	-6.62*	-5.73*	-5.68*	3.45*	3.21*	-4.09	-4.02
France	-4.24	-4.16	-4.14	-4.07	-3.04	-5.06*	-5.99	-7.15	-5.09	-5.35
Germany	-3.46	-4.97*	-3.66	-3.61	-4.90*	-3.32	-4.12	-3.86	-5.09	-4.97
India	-5.54	-5.44	-4.94	-4.87	-3.22	-4.00	-3.11	-4.33	-3.74	-4.96
Italy	-6.39	-6.33	-7.01	-6.91	-5.65	-5.60	-3.92	-3.73	-7.53	-6.86
Japan	-6.76	-6.67	-7.00	-6.89	-4.83*	-4.64*	-5.52	-5.41	-7.22	-7.16
Malaysia	-5.66*	-5.54*	-3.62	-3.69	-3.12	-3.03	-3.99	-4.09	-3.79	-3.85
Pakistan	-3.84	-3.84	-3.67	-3.66	-3.67	-3.78	-3.24	-3.76	-6.32	-6.43
S. Africa	-3.88	-4.23	-3.72	-4.04	-3.41	-4.31*	-3.95	-4.20	-5.42	-5.49
Singapore	-7.39*	-7.28*	-6.07*	-6.04*	-4.25*	-4.23*	-6.29*	-6.30*	-5.19	-5.04
Sweden	-4.59*	-4.54*	-5.78*	-5.74*	-5.12*	-5.08*	-3.80*	-3.79*	-5.15	-5.15
Turkey	-10.04	-9.64	-9.08	-8.76	-5.14*	-5.02*	-4.91	-5.21	-6.19	-6.04
UK	-3.34	-6.01*	-3.44	-6.33*	-3.57	-6.28*	-4.01	-6.52*	-4.99*	-5.32*
USA	-3.77	-3.75	-4.50	-4.47	-4.02	-3.89	-2.82	-3.48	-4.68	-4.58
Venezuela	-6.25	-6.36	-5.31	-5.56	-4.47	-4.66	-3.60	-3.70	-4.09	-3.98

significance 0.01 0.05 0.10

DF,eq 33 -3.75 -3.00 -2.62

DF,eq 34 -4.38 -3.60 -3.24

* indicates I(2) variables,

** indicates I(0) variables. All other variables are I(1).

Table 4-A: The Null and Alternative Hypothesis by Johansen Methodology.*

λ Max Test		The level of significance		
Ho:	H1	0.01	0.05	0.10
$r = 0$	$r = 1$	26.40	21.89	19.79
$r = 1$	$r = 2$	19.83	15.75	13.78
$r = 2$	$r = 3$	12.74	9.09	7.56
λ Trace Test		The level of significance		
Ho:	H1	0.01	0.05	0.10
$r = 0$	$r > 0$	40.19	35.06	32.09
$r \leq 1$	$r > 1$	24.98	20.16	17.95
$r \leq 2$	$r > 2$	12.74	9.09	7.56

Table 4-B: Cointegration Test for RGDP, RTAX and RDEBT by Johansen Methodology.

Countries	λ_i	λ Max	λ Trace
	$\lambda_1 = 0.7844$	29.15	40.90
Belgium	$\lambda_2 = 0.4465$	11.24	11.75
	$\lambda_3 = 0.0265$	0.51	0.51
	$\lambda_1 = 0.8242$	27.82	38.64
Canada	$\lambda_2 = 0.4903$	10.78	10.82
	$\lambda_3 = 0.0025$	0.04	0.04
	$\lambda_1 = 0.9751$	62.81	96.31
Chile	$\lambda_2 = 0.7951$	29.95	33.50
	$\lambda_3 = 0.3200$	6.56	6.56
	$\lambda_1 = 0.8067$	24.65	37.98
Egypt	$\lambda_2 = 0.5869$	13.26	13.33
	$\lambda_3 = 0.0049$	0.07	0.07
	$\lambda_1 = 0.8825$	40.69	56.24
El Salvador	$\lambda_2 = 0.5260$	14.18	15.55
	$\lambda_3 = 0.0695$	1.37	1.37
	$\lambda_1 = 0.8911$	31.04	56.03
Finland	$\lambda_2 = 0.7024$	16.97	24.98
	$\lambda_3 = 0.4360$	8.02	8.02
	$\lambda_1 = 0.8526$	32.55	47.55
France	$\lambda_2 = 0.5484$	13.51	15.00
	$\lambda_3 = 0.0836$	1.48	1.48
	$\lambda_1 = 0.7281$	19.54	35.72
Germany	$\lambda_2 = 0.6459$	15.57	16.19
	$\lambda_3 = 0.0401$	0.61	0.61

* Enders (1995).

	$\lambda_1 = 0.7096$	19.78	37.27
India	$\lambda_2 = 0.5785$	13.82	17.49
	$\lambda_3 = 0.2048$	3.67	3.67
	$\lambda_1 = 1.000$	227.03	255.84
Italy	$\lambda_2 = 0.8331$	28.65	28.82
	$\lambda_3 = 0.0104$	0.17	0.17
	$\lambda_1 = 0.8340$	30.52	42.68
Japan	$\lambda_2 = 0.4322$	9.62	12.16
	$\lambda_3 = 0.1385$	2.54	2.54
	$\lambda_1 = 0.9622$	52.43	82.97
Malaysia	$\lambda_2 = 0.7111$	19.87	30.54
	$\lambda_3 = 0.4868$	10.67	10.67
	$\lambda_1 = 0.9166$	34.77	47.66
Pakistan	$\lambda_2 = 0.5179$	10.21	12.89
	$\lambda_3 = 0.1737$	2.67	2.67
	$\lambda_1 = 0.9559$	59.29	87.31
Singapore	$\lambda_2 = 0.7012$	22.95	28.02
	$\lambda_3 = 0.2342$	5.03	5.07
	$\lambda_1 = 0.9964$	90.07	122.13
South	$\lambda_2 = 0.7657$	23.21	32.10
Africa	$\lambda_3 = 0.4260$	8.88	8.88
	$\lambda_1 = 0.7731$	28.18	52.61
Sweden	$\lambda_2 = 0.6411$	19.47	24.43
	$\lambda_3 = 0.2219$	4.96	4.96
	$\lambda_1 = 0.8785$	40.05	61.99
Turkey	$\lambda_2 = 0.5680$	15.95	21.94
	$\lambda_3 = 0.2707$	6.00	6.00
	$\lambda_1 = 0.8593$	37.26	46.46
UK	$\lambda_2 = 0.3820$	9.14	9.20
	$\lambda_3 = 0.0028$	0.05	0.05
	$\lambda_1 = 0.9943$	87.97	129.38
USA	$\lambda_2 = 0.7802$	25.75	41.40
	$\lambda_3 = 0.6017$	15.65	15.65
	$\lambda_1 = 0.8798$	40.25	49.88
Venezuela	$\lambda_2 = 0.2808$	6.26	9.63
	$\lambda_3 = 0.1624$	3.37	3.37

**Table 4-C: Cointegration Test for RGDP, RTAX and RDEF
by Johansen Methodology.**

Countries	λ_i	λ_{Max}	λ_{Trace}
	$\lambda_1 = 0.6602$	20.51	49.47
Belgium	$\lambda_2 = 0.6208$	18.42	28.96
	$\lambda_3 = 0.4258$	10.54	10.54
	$\lambda_1 = 0.9599$	54.69	72.56
Canada	$\lambda_2 = 0.5411$	13.24	17.87
	$\lambda_3 = 0.2382$	4.63	4.63
	$\lambda_1 = 0.9751$	62.79	99.35
Chile	$\lambda_2 = 0.7382$	22.78	36.56
	$\lambda_3 = 0.5553$	13.78	13.78
	$\lambda_1 = 0.9665$	50.93	83.03
Egypt	$\lambda_2 = 0.8547$	28.94	32.10
	$\lambda_3 = 0.1901$	3.16	3.16
	$\lambda_1 = 0.9792$	73.56	88.91
El Salvador	$\lambda_2 = 0.5394$	14.73	15.35
	$\lambda_3 = 0.0321$	0.62	0.62
	$\lambda_1 = 0.9181$	42.53	71.91
Finland	$\lambda_2 = 0.7434$	23.13	29.38
	$\lambda_3 = 0.3079$	6.26	6.26
	$\lambda_1 = 0.9991$	119.43	147.38
France	$\lambda_2 = 0.7687$	24.89	27.94
	$\lambda_3 = 0.1643$	3.05	3.05
	$\lambda_1 = 0.9229$	51.16	64.33
Germany	$\lambda_2 = 0.4611$	12.36	13.07
	$\lambda_3 = 0.0346$	0.70	0.70
	$\lambda_1 = 0.9278$	42.06	79.76
India	$\lambda_2 = 0.8222$	27.63	37.70
	$\lambda_3 = 0.4671$	10.07	10.07
	$\lambda_1 = 0.9416$	48.29	76.30
Italy	$\lambda_2 = 0.7129$	21.21	28.01
	$\lambda_3 = 0.3297$	6.80	6.80
	$\lambda_1 = 0.7780$	25.58	41.61
Japan	$\lambda_2 = 0.4865$	11.33	16.03
	$\lambda_3 = 0.2413$	4.70	4.70
	$\lambda_1 = 0.9764$	67.40	79.88
Malaysia	$\lambda_2 = 0.4386$	10.39	12.48
	$\lambda_3 = 0.1094$	2.08	2.08

	$\lambda_1=0.9839$	70.18	96.52
Pakistan	$\lambda_2=0.7525$	23.74	26.33
	$\lambda_3=0.1417$	2.60	2.60
	$\lambda_1=0.9351$	51.96	72.73
Singapore	$\lambda_2=0.6648$	20.77	20.77
	$\lambda_3=0.0000$	0.00	0.00
	$\lambda_1=0.9086$	38.28	71.29
South Africa	$\lambda_2=0.7976$	25.56	33.02
	$\lambda_3=0.3725$	7.46	7.46
	$\lambda_1=0.6457$	20.73	45.56
Sweden	$\lambda_2=0.5486$	15.91	24.83
	$\lambda_3=0.3598$	8.92	8.92
	$\lambda_1=0.9656$	67.38	126.73
Turkey	$\lambda_2=0.8954$	45.16	59.35
	$\lambda_3=0.5082$	14.19	14.19
	$\lambda_1=0.8929$	42.44	57.80
UK	$\lambda_2=0.4054$	9.88	15.35
	$\lambda_3=0.2505$	5.48	5.48
	$\lambda_1=0.8941$	40.42	62.92
USA	$\lambda_2=0.6804$	20.53	22.50
	$\lambda_3=0.1037$	1.97	1.97
	$\lambda_1=0.8932$	44.74	55.27
Venezuela	$\lambda_2=0.3383$	8.26	10.54
	$\lambda_3=0.1076$	2.28	2.28

V. EMPIRICAL EVIDENCE OF EXCESS SENSITIVITY OF CONSUMPTION
ACROSS COUNTRIES

The lag number = 4 was determined for Belgium, Chile, France, El Salvador, Italy, Japan, Malaysia, South Africa, Singapore, Sweden, UK, USA, Turkey and Venezuela. The lag number = 3 was determined for Canada, Egypt, Finland, Germany, India and the Pakistan, by results obtained from Akaike information criterion (AIC), and Schwartz Bayesian Criterion (SBC). In the VAR of order 4, the variables were estimated as follows

$$Y_t = k_1 + p_{1,1}Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4} + \varepsilon_{1,t} \quad (47)$$

$$T_t = k_2 + p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + p_{2,5}T_{t-1} + p_{2,6}T_{t-2} + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}B_{t-1} + p_{2,10}B_{t-2} + p_{2,11}B_{t-3} + p_{2,12}B_{t-4} + \varepsilon_{2,t} \quad (48)$$

$$B_t = k_3 + p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + p_{3,9}B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4} + \varepsilon_{3,t} \quad (49)$$

and the excess sensitivity tests were conducted by the equation below

$$\begin{aligned} \Delta C_t = & c - b_{11} [(p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\ & + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4}] \\ & + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} \\ & + b_{21} [p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} - p_{2,6}T_{t-2} \\ & - p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}B_{t-1} - p_{2,10}B_{t-2} + p_{2,11}B_{t-3} + p_{2,12}B_{t-4}] \\ & + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} \end{aligned}$$

$$\begin{aligned}
& - b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\
& + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4}] \\
& + b_{32}\Delta B_{t-1} + b_{33}\Delta B_{t-2} + b_{34}\Delta B_{t-3} + \eta_t
\end{aligned} \tag{50}$$

where $c = m + b_0k_1 + b_1k_2 + b_2k_3$, and

$$\eta_t = rR^{-1}[(\Omega_1 + \Omega_2 + \Omega_3)]e_t + b_0\varepsilon_{1,t+1} + b_1\varepsilon_{2,t+1} + b_2\varepsilon_{3,t+1} + e_{t+1}$$

And Ω_i now stands for the cumulative effects of current forecast errors of a fourth order VAR system on the variables in the system. Considering eq. (50) as an unrestricted system, I then run excess sensitivity tests as follows:

$$\Delta C_t = c + \eta_t \tag{51}$$

$$\begin{aligned}
\Delta C_t = c + b_{11} [& (p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
& + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4}] \\
& + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} + \eta_t
\end{aligned} \tag{52}$$

$$\begin{aligned}
\Delta C_t = c + b_{21} [& p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} + p_{2,6}T_{t-2} \\
& + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}B_{t-1} + p_{2,10}B_{t-2} + p_{2,11}B_{t-3} + p_{2,12}B_{t-4}] \\
& + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} \\
& + b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\
& + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4}] \\
& + b_{32}\Delta B_{t-1} + b_{33}\Delta B_{t-2} + b_{34}\Delta B_{t-3} + \eta_t
\end{aligned} \tag{53}$$

$$\begin{aligned}
\Delta C_t = c + b_{11} [& (p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
& + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4}] \\
& + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3}
\end{aligned}$$

$$\begin{aligned}
& + b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\
& + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4}] \\
& + b_{32}\Delta B_{t-1} + b_{33}\Delta B_{t-2} + b_{34}\Delta B_{t-3} + \eta_t \tag{54}
\end{aligned}$$

$$\begin{aligned}
\Delta C_t = c + b_{11} [& (p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
& + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4}] \\
& + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} \\
& + b_{21} [p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} + p_{2,6}T_{t-2} \\
& + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}B_{t-1} + p_{2,10}B_{t-2} + p_{2,11}B_{t-3} + p_{2,12}B_{t-4}] \\
& + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} + \eta_t \tag{55}
\end{aligned}$$

The parameter estimates of eqs. (47), (48), (49) and (50) are given in Table 5. The results of the F statistics tests for eqs. (51), (52), (53), (54) and (55) are shown in columns 1, 2, 3, 4 and 5 of Table 6, respectively. In the first column the null hypothesis is that all coefficients are jointly zero, whereas alternative hypothesis is that at least one of these coefficients is not equal to zero. The null hypothesis is rejected in six countries: Chile, El Salvador, India, Pakistan, Singapore and Turkey. The second, third (except Turkey), fourth and the fifth columns show that the null hypothesis indicated by the eqs. (52), (53), (54) and (55) is accepted in all countries at the 0.05 level. In summary, the PIH holds in fourteen countries, whereas the RET holds in twenty cases. The failure of the PIH occurs in developing countries. All estimations and tests from eq. (47) to (55) were rerun by replacing RDEBT with RDEF.

$$\begin{aligned}
Y_t = k_1 + p_{11}Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
+ p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4} + \varepsilon_{1,t} \tag{47}
\end{aligned}$$

$$T_t = k_2 - p_{2,1}Y_{t-1} - p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + p_{2,5}T_{t-1} - p_{2,6}T_{t-2} \\ + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}D_{t-1} + p_{2,10}D_{t-2} + p_{2,11}D_{t-3} + p_{2,12}D_{t-4} + \varepsilon_{2,t} \quad (48')$$

$$D_t = k_3 + p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\ + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + p_{3,9}D_{t-1} + p_{3,10}D_{t-2} + p_{3,11}D_{t-3} + p_{3,12}D_{t-4} + \varepsilon_{3,t} \quad (49')$$

where D_t stands for RDEF, per capita real budget deficit. The excess sensitivity test was carried out using:

$$\Delta C_t = c + b_{11} [(p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\ + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4}] \\ + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} \\ + b_{21} [p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} + p_{2,6}T_{t-2} \\ + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}D_{t-1} + p_{2,10}D_{t-2} + p_{2,11}D_{t-3} + p_{2,12}D_{t-4}] \\ + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} \\ + b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\ + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)D_{t-1} + p_{3,10}D_{t-2} + p_{3,11}D_{t-3} + p_{3,12}D_{t-4}] \\ + b_{32}\Delta D_{t-1} + b_{33}\Delta D_{t-2} + b_{34}\Delta D_{t-3} + \eta_t \quad (50')$$

where $c = m + b_0k_1 + b_1k_2 + b_2k_3$, and

$$\eta_t = rR^{-1}[(\Omega_1 + \Omega_2 + \Omega_3)]e_t + b_0\varepsilon_{1,t+1} + b_1\varepsilon_{2,t+1} + b_2\varepsilon_{3,t+1} + e_{t+1}$$

Considering eq. (50') as unrestricted system, I again run excess sensitivity tests:

$$\Delta Ct = c + \eta_t \quad (51')$$

$$\Delta C_t = c + b_{11} [(p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\ - p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4}]$$

$$+ b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} + \eta_t \quad (52')$$

$$\begin{aligned} \Delta C_t = c + b_{21} [& p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} + p_{2,6}T_{t-2} \\ & + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}D_{t-1} + p_{2,10}D_{t-2} + p_{2,11}D_{t-3} + p_{2,12}D_{t-4}] \\ & + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} \\ & + b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\ & + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)D_{t-1} + p_{3,10}D_{t-2} + p_{3,11}D_{t-3} + p_{3,12}D_{t-4}] \\ & + b_{32}\Delta D_{t-1} + b_{33}\Delta D_{t-2} + b_{34}\Delta D_{t-3} + \eta_t \end{aligned} \quad (53')$$

$$\begin{aligned} \Delta C_t = c + b_{11} [& (p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\ & + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4}] \\ & + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} \\ & + b_{31} [p_{3,1}Y_{t-1} + p_{3,2}Y_{t-2} + p_{3,3}Y_{t-3} + p_{3,4}Y_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\ & + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)D_{t-1} + p_{3,10}D_{t-2} + p_{3,11}D_{t-3} + p_{3,12}D_{t-4}] \\ & + b_{32}\Delta D_{t-1} + b_{33}\Delta D_{t-2} + b_{34}\Delta D_{t-3} + \eta_t \end{aligned} \quad (54')$$

$$\begin{aligned} \Delta C_t = c + b_{11} [& (p_{1,1}-1)Y_{t-1} + p_{1,2}Y_{t-2} + p_{1,3}Y_{t-3} + p_{1,4}Y_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\ & + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}D_{t-1} + p_{1,10}D_{t-2} + p_{1,11}D_{t-3} + p_{1,12}D_{t-4}] \\ & + b_{12}\Delta Y_{t-1} + b_{13}\Delta Y_{t-2} + b_{14}\Delta Y_{t-3} \\ & + b_{21} [p_{2,1}Y_{t-1} + p_{2,2}Y_{t-2} + p_{2,3}Y_{t-3} + p_{2,4}Y_{t-4} + (p_{2,5}-1)T_{t-1} + p_{2,6}T_{t-2} \\ & + p_{2,7}T_{t-3} + p_{2,8}T_{t-4} + p_{2,9}D_{t-1} + p_{2,10}D_{t-2} + p_{2,11}D_{t-3} + p_{2,12}D_{t-4}] \\ & + b_{22}\Delta T_{t-1} + b_{23}\Delta T_{t-2} + b_{24}\Delta T_{t-3} + \eta_t \end{aligned} \quad (55')$$

The results of eqs. (47'), (48'), (49') and the (50') are given in Table 7. The excess sensitivity tests results of eqs.(51'), (52'), (53'), (54') and (55') are given in Table 8.

I found that the restrictions in eq. (51') are accepted in fourteen countries, rejected in Chile, El Salvador, Finland, Pakistan, Singapore and Turkey. The restrictions of eqs. (52'), (53') (except South Africa and Turkey), (54') and the (55') (except El Salvador), are accepted at the 0.05 level. Again the PIH holds in fourteen countries, whereas the RET holds in twenty cases. The failure of the PIH occurs in Chile, El Salvador, Finland, Pakistan, Singapore and Turkey.

It might be expected that this result would change if income and tax variables were replaced by disposable income.

$$\begin{aligned}
\Delta C_t = & c + b_{11} [(p_{1,1}-1)DY_{t-1} + p_{1,2}DY_{t-2} + p_{1,3}DY_{t-3} + p_{1,4}DY_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
& + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4}] \\
& + b_{12}\Delta DY_{t-1} + b_{13}\Delta DY_{t-2} + b_{14}\Delta DY_{t-3} \\
& + b_{31} [p_{3,1}DY_{t-1} + p_{3,2}DY_{t-2} + p_{3,3}DY_{t-3} + p_{3,4}DY_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\
& + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4}] \\
& + b_{32}\Delta B_{t-1} + b_{33}\Delta B_{t-2} + b_{34}\Delta B_{t-3} + \eta_t
\end{aligned} \tag{56}$$

where DY_t stands for disposable income. The excess sensitivity tests are:

$$\Delta Ct = c + \eta_t \tag{57}$$

$$\begin{aligned}
\Delta C_t = & c + b_{31} [p_{3,1}DY_{t-1} + p_{3,2}DY_{t-2} + p_{3,3}DY_{t-3} + p_{3,4}DY_{t-4} + p_{3,5}T_{t-1} + p_{3,6}T_{t-2} \\
& + p_{3,7}T_{t-3} + p_{3,8}T_{t-4} + (p_{3,9}-1)B_{t-1} + p_{3,10}B_{t-2} + p_{3,11}B_{t-3} + p_{3,12}B_{t-4}] \\
& + b_{32}\Delta B_{t-1} + b_{33}\Delta B_{t-2} + b_{34}\Delta B_{t-3} + \eta_t
\end{aligned} \tag{58}$$

$$\begin{aligned}
\Delta C_t = & c + b_{11} [(p_{1,1}-1)DY_{t-1} + p_{1,2}DY_{t-2} + p_{1,3}DY_{t-3} + p_{1,4}DY_{t-4} + p_{1,5}T_{t-1} + p_{1,6}T_{t-2} \\
& + p_{1,7}T_{t-3} + p_{1,8}T_{t-4} + p_{1,9}B_{t-1} + p_{1,10}B_{t-2} + p_{1,11}B_{t-3} + p_{1,12}B_{t-4}]
\end{aligned}$$

$$+ b_{12}\Delta DY_{t-1} + b_{13}\Delta DY_{t-2} + b_{14}\Delta DY_{t-3} + \eta_t \quad (59)$$

The results of the F statistics tests for eqs. (57), (58) and (59) are shown in Table 9. In the first column the null hypothesis that all coefficients are jointly zero is rejected at the 0.05 level in six countries: Chile, Finland, India, Singapore, Turkey and the United Kingdom. Except Chile, the null hypothesis that the coefficients on the debt variable are jointly zero, as restricted in eq. (59), is accepted in all countries at the 0.05 level. By replacing debt with the deficit variable, eqs. (57), (58) and (59) were rerun and the results are given by the first, second and the third columns of Table 10. In this case, the PIH holds in sixteen countries, whereas it fails in Chile, Singapore, South Africa and the Turkey. The coefficients of deficit variable are jointly insignificant in all countries.

The F statistic results given by Table 6 were obtained from the restrictions on the coefficients that were estimated in two steps. First, eqs. (47), (48) and (49) were estimated by a VAR system and at the second step, the coefficients b_{11} , b_{21} and the b_{31} in eq. (50) were estimated by the coefficients obtained from the first step. The coefficients b_{11} and b_{31} in eq.(56) were estimated also by the predetermined coefficients in the VAR system in the first step. The same tests were conducted by estimating all coefficients jointly in the system in one step. The results of the Wald test statistics from the iterative least squares method for eqs. (47), (48), (49) and (50) are given in Table 11.

In the first column the null hypothesis is that all coefficients are jointly zero, whereas the alternative hypothesis is that at least one of these coefficients is not equal to zero. The null hypothesis in eq.(51) is rejected in four countries: Chile, Finland, India, and Turkey. The second (except Chile), third, fourth and the fifth columns show that the null hypothesis indicated by eqs. (52), (53), (54) and (55) is accepted in all countries at

the 0.05 level. In summary, the PIH holds in sixteen countries whereas the RET holds in nineteen cases. The RET fails in Chile.

The Wald test statistics, eqs.(51') to (55'), are given in Table 12. Table 12 shows that the PIH holds in fifteen countries and fails in five countries; Chile, Finland, India, Pakistan and Turkey. The RET holds in all countries except Chile. The results from system estimations in one step (Table 11 and Table 12) do not differ much from the system estimations in two steps (Table 6 and Table 8).

Since the available data for countries studied are limited to 24 annual observations in my estimation procedures, I performed a regression analysis on the pooled data set as well. Wald test statistics for the pooled data set are given in Tables 13 and 14. The estimation on the data sets from all countries, developed countries and developing countries show that the PIH fails. The RET holds in the data set for all countries and developed countries in one-step joint estimation. The same test was conducted using a two-step estimation procedure as well. The result is the same. In this analysis the result is that the PIH fails in estimation on the data sets from all countries, developed countries and developing countries. The RET holds in the data set for all countries and developed countries. These results are given in Table 15 and 16.

The origin of the failure of the PIH in Tables 13, 14, 15 and 16 might be the high χ^2 value of Chile, Finland, India, Pakistan and Turkey. The origin of the failure of the RET in the developing countries pooled data might be the high χ^2 value of Chile, as shown in Tables 11 and 12. Indeed when I excluded Chile from the developing countries pooled data set, I found that the RET holds but the PIH still fails. This result is again supportive of the RET.

Finally I wanted to compare the results of estimations from the USA annual data set from 1970 to 1993 with the quarterly data set from 1961:1 to 1994:4. The quarterly data for real consumption, deficit and debt were drawn from IFS 1995 CD. The quarterly data for real tax were obtained from OECD Department of Economics in Paris. The result is the same. Both the PIH and the RET holds in USA data. This result, obtained from quarterly data, may also be a verification of the accuracy of the results obtained from annual data for other countries as well as the USA. This result is given by Tables 17 and 18.

Table 5: Estimates of parameters of eqs.(47), (48), (49) and (50).**Belgium : Estimates of parameters in eq.(50)**

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
51.19	-5.06	-2.06	-2.33	-.054	11.25	6.23	5.30	-2.66	0.979	-.444	.462	2.17
(20.9)	(10.5)	(4.63)	(4.18)	(1.01)	(22.8)	(12.2)	(8.70)	(5.29)	(.993)	(.664)	(1.53)	(4.08)

Belgium : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
66.45	-.629	-1.31	-.659	1.40	5.92	.798	1.93	-5.67	-1.55	1.20	-.178	1.38
(41.3)	(2.47)	(2.96)	(2.88)	(2.75)	(6.23)	(7.22)	(7.01)	(6.15)	(1.37)	(1.79)	(1.89)	(1.55)

Belgium : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
30.56	-.516	-.581	-.448	.635	3.03	.486	1.34	-2.69	-.655	.458	-.170	.739
(18.4)	(1.10)	(1.32)	(1.28)	(1.23)	(2.78)	(3.22)	(3.13)	(2.75)	(.615)	(.803)	(.844)	(.693)

Belgium : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
66.14	-.915	-1.23	-.676	-.173	3.94	1.29	3.11	-2.91	-.368	.805	-.933	2.11
(28.7)	(1.72)	(2.06)	(2.00)	(1.91)	(4.33)	(5.02)	(4.87)	(4.28)	(.959)	(1.25)	(1.31)	(1.07)

Canada : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{21}	b_{22}	b_{23}	b_{31}	b_{32}	b_{33}
10.91	.602	-.095	-.008	-.319	.345	.315	-.244	.199	.121
(22.5)	(1.23)	(1.06)	(1.57)	(3.45)	(.946)	(7.45)	(8.58)	(3.33)	(1.80)

Canada : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$
31.09	1.06	-.778	.250	-1.82	3.35	-1.21	-.485	-.222	1.54
(87.6)	(.580)	(.855)	(.686)	(2.32)	(2.63)	(2.17)	(1.21)	(1.96)	(1.34)

Canada : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$
32.42	.181	-.169	-.077	-.158	.464	-.433	-.056	-.281	.515
(20.7)	(.136)	(.201)	(.162)	(.550)	(.621)	(.514)	(.286)	(.463)	(.318)

Canada : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$
-9.57	-.176	-.106	.264	.266	1.09	-.920	1.34	-.098	-.193
(23.8)	(.157)	(.232)	(.186)	(.633)	(.715)	(.592)	(.330)	(.534)	(.366)

Chile : Estimates of parameters in eq.(50)

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₁₄</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₂₄</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>	<i>b₃₄</i>
-7.85	.220	-.275	-.040	.004	1.58	.779	.679	-.093	.436	-.219	-.322	.081
(2.42)	(.878)	(.240)	(.099)	(.018)	(2.64)	(.962)	(.444)	(.143)	(.241)	(.409)	(.279)	(.072)

Chile : Estimates of parameters in eq.(47)

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>	<i>p_{1,10}</i>	<i>p_{1,11}</i>	<i>p_{1,12}</i>
-11.02	-.115	2.25	.979	.070	3.19	-5.55	-5.38	-.120	-2.85	.764	1.73	-.462
(4.40)	(.773)	(.502)	(.248)	(.028)	(2.54)	(1.87)	(.979)	(.151)	(.293)	(.428)	(.481)	(.105)

Chile : Estimates of parameters in eq.(48)

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>	<i>p_{2,10}</i>	<i>p_{2,11}</i>	<i>p_{2,12}</i>
-4.43	-.116	.742	.299	.025	1.11	-1.98	-1.60	-.056	-.773	.220	.467	-.132
(1.68)	(.295)	(.192)	(.094)	(.011)	(.972)	(.717)	(.374)	(.057)	(.112)	(.163)	(.183)	(.040)

Chile : Estimates of parameters in eq.(49)

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>	<i>p_{3,10}</i>	<i>p_{3,11}</i>	<i>p_{3,12}</i>
4.46	-1.10	-.301	.311	.033	4.13	1.63	-.708	-.220	.184	.086	.227	-.063
(6.24)	(1.09)	(.713)	(.352)	(.040)	(3.61)	(2.66)	(1.39)	(.214)	(.416)	(.608)	(.683)	(.149)

Egypt : Estimates of parameters in eq.(50)

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>
.840	1.39	.031	-.143	-1.46	-.679	1.14	62.65	-15.46	8.23
(1.06)	(2.39)	(.573)	(.799)	(2.82)	(2.12)	(4.06)	(226)	(67.0)	(19.2)

Egypt : Estimates of parameters in eq.(47)

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>
1.05	.425	-.430	-.118	.999	1.15	1.02	11.01	-.207	13.11
(1.32)	(.566)	(.638)	(.492)	(1.21)	(1.02)	(1.19)	(20.4)	(27.5)	(18.7)

Egypt : Estimates of parameters in eq.(48)

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>
.352	.056	-.071	-.039	.503	.185	.053	4.58	-1.19	10.28
(.470)	(.201)	(.226)	(.174)	(.430)	(.364)	(.424)	(7.25)	(9.76)	(6.64)

Egypt : Estimates of parameters in eq.(49)

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>
-.008	.008	.005	-.003	-.007	-.034	.009	1.23	-.346	.002
(.028)	(.012)	(.013)	(.010)	(.026)	(.022)	(.025)	(.443)	(.596)	(.405)

El Salvador : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
.950	1.29	-.033	.222	.304	-3.15	-.739	-.603	-1.40	-.482	-.128	-.073	.236
(.777)	(.864)	(.552)	(.574)	(.542)	(2.05)	(2.43)	(1.47)	(.800)	(1.63)	(.559)	(.359)	(.320)

El Salvador : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
.226	.820	-.259	-.051	.717	1.52	-.524	-1.67	-.463	-.800	-.453	.560	-1.03
(.685)	(.345)	(.548)	(.524)	(.344)	(.624)	(.647)	(.594)	(.793)	(.426)	(.629)	(.408)	(.280)

El Salvador : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-.122	-.013	.144	-.086	.126	.463	.383	-.680	-.463	.096	-.214	.086	-.111
(.514)	(.259)	(.411)	(.393)	(.258)	(.468)	(.485)	(.446)	(.595)	(.319)	(.472)	(.306)	(.210)

El Salvador : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.104	-.231	.139	.031	.025	-.135	-.201	.643	.467	.403	-.030	.311	-.458
(.733)	(.369)	(.586)	(.561)	(.368)	(.667)	(.692)	(.635)	(.848)	(.455)	(.673)	(.436)	(.299)

Finland : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{21}	b_{22}	b_{23}	b_{31}	b_{32}	b_{33}
71.49	.613	-.070	-.307	.586	.357	.946	-4.38	-.147	-1.63
(21.6)	(.506)	(.297)	(.278)	(1.37)	(.841)	(.806)	(3.33)	(2.58)	(2.08)

Finland : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$
6.05	-.162	-.314	-3.12	6.47	-.142	10.60	-12.14	7.21	10.34
(79.7)	(.627)	(.760)	(1.10)	(3.17)	(1.96)	(4.45)	(7.78)	(8.24)	(5.92)

Finland : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$
27.99	-.095	.039	-.557	1.36	-.139	1.34	-.814	-.010	1.48
(32.92)	(.259)	(.314)	(.457)	(1.31)	(.813)	(1.84)	(3.21)	(3.40)	(2.44)

Finland : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$
-11.03	-.122	-.047	-.238	.843	-.076	1.02	-.550	.884	1.437
(4.87)	(.038)	(.046)	(.067)	(.193)	(.120)	(.272)	(.475)	(.503)	(.362)

France : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
44.03	0.462	0.105	0.097	-0.56	252	-262	-287	.120	-0.83	.050	.143	-0.17
(30.1)	(2.51)	(2.05)	(3.49)	(1.80)	(6.47)	(5.34)	(8.47)	(4.77)	(1.66)	(2.08)	(1.41)	(1.33)

France: Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
80.33	5.51	2.67	-3.95	-1.88	-12.96	-6.80	10.10	4.95	-323	829	-707	.092
(62.6)	(4.28)	(4.09)	(2.67)	(4.46)	(12.6)	(10.3)	(7.10)	(12.8)	(2.33)	(2.15)	(2.07)	(2.69)

France : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
28.53	2.05	.927	-1.59	-789	-4.83	-2.33	4.09	2.15	-0.79	.289	-317	-0.20
(21.1)	(1.44)	(1.38)	(.903)	(1.50)	(4.25)	(3.49)	(2.39)	(4.32)	(.787)	(.726)	(.698)	(.907)

France : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
6.00	1.80	.749	-1.52	-1.26	-4.60	-1.45	3.72	3.43	-247	.443	-.091	.172
(12.4)	(.855)	(.817)	(.534)	(.890)	(2.51)	(2.06)	(1.41)	(2.56)	(.466)	(.430)	(.413)	(.537)

Germany : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{21}	b_{22}	b_{23}	b_{31}	b_{32}	b_{33}
-12.11	1.60	-782	-308	-1.81	1.10	.198	-1.84	2.411	3.13
(13.6)	(20.6)	(8.00)	(7.55)	(43.1)	(11.3)	(10.7)	(34.6)	(18.8)	(56.4)

Germany : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$
-16.94	7.13	-3.32	.558	-13.21	5.37	-3.56	-14.12	4.80	9.82
(25.9)	(2.36)	(3.38)	(3.27)	(7.04)	(10.0)	(11.4)	(6.65)	(5.80)	(6.65)

Germany : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$
-4.16	1.68	-.965	.527	-2.94	1.21	-2.15	-3.25	2.35	2.08
(6.65)	(.607)	(.869)	(.840)	(1.80)	(2.57)	(2.94)	(1.70)	(1.48)	(1.70)

Germany : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$
-6.03	1.34	-744	-106	-2.69	1.57	240	-2.83	1.02	1.67
(4.22)	(.385)	(.551)	(.533)	(1.14)	(1.63)	(1.86)	(1.08)	(.945)	(1.08)

India : Estimates of parameters in eq.(50)

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>
1.13	900	.008	.013	-.041	.798	.732	-.339	-.246	-.160
(.533)	(.821)	(.369)	(.381)	(4.43)	(3.37)	(5.12)	(1.12)	(.651)	(.810)

India : Estimates of parameters in eq.(47)

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>
1.32	-.922	.956	-.151	6.07	4.40	4.67	1.79	-2.94	-1.34
(.833)	(.927)	(.650)	(.481)	(6.42)	(4.67)	(7.85)	(1.30)	(1.02)	(1.51)

India : Estimates of parameters in eq.(48)

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>
.203	-.117	.166	-.042	.547	-.321	.515	.344	-.305	-.165
(.122)	(.136)	(.095)	(.070)	(.946)	(.689)	(1.15)	(.192)	(.151)	(.223)

India : Estimates of parameters in eq.(49)

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>
.237	-.958	.542	-.098	6.31	-1.24	3.18	1.19	-.802	-.562
(.525)	(.584)	(.410)	(.303)	(4.04)	(2.94)	(4.95)	(.825)	(.646)	(.954)

Italy : Estimates of parameters in eq.(50)

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₁₄</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₂₄</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>	<i>b₃₄</i>
5.20	.763	-.953	-1.74	-.847	1.95	-1.23	-1.57	-1.48	.773	1.14	.483	.947
(20.7)	(1.55)	(.452)	(1.38)	(.810)	(1.60)	(1.12)	(1.43)	(1.29)	(.723)	(.718)	(.541)	(.765)

Italy : Estimates of parameters in eq.(47)

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>	<i>p_{1,10}</i>	<i>p_{1,11}</i>	<i>p_{1,12}</i>
13.13	.059	.314	-.252	-.132	.216	.293	.017	.036	.032	-.040	-.038	-.059
(4.95)	(.114)	(.084)	(.085)	(.043)	(.087)	(.080)	(.079)	(.080)	(.051)	(.059)	(.059)	(.061)

Italy : Estimates of parameters in eq.(48)

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>	<i>p_{2,10}</i>	<i>p_{2,11}</i>	<i>p_{2,12}</i>
1.01	.249	.096	.334	-.020	.539	-.232	.266	-.318	-.014	-.016	-.015	.039
(7.14)	(.130)	(.106)	(.108)	(.054)	(.168)	(.154)	(.150)	(.153)	(.078)	(.084)	(.086)	(.085)

Italy : Estimates of parameters in eq.(49)

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>	<i>p_{3,10}</i>	<i>p_{3,11}</i>	<i>p_{3,12}</i>
33.55	-.067	.196	.143	.013	.027	-.094	-.254	-.125	1.04	-.018	-.236	-.071
(15.6)	(.260)	(.216)	(.218)	(.111)	(.255)	(.236)	(.228)	(.238)	(.222)	(.285)	(.282)	(.257)

Japan : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
9.42	.379	-.089	.007	.317	-.388	-3.79	1.56	2.11	-.262	-.231	.005	-.087
(71.0)	(.871)	(.521)	(.530)	(.712)	(5.27)	(4.43)	(3.74)	(4.30)	(.806)	(.607)	(.693)	(.645)

Japan : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
79.37	-.257	-.321	-.594	-.246	.935	2.27	-.227	-4.32	-.512	-.430	.10	-.304
(52.5)	(.499)	(.287)	(.457)	(.433)	(1.92)	(4.88)	(6.31)	(4.66)	(.307)	(.473)	(.500)	(.486)

Japan : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
.034	.009	-.074	-.049	.046	1.29	.275	-1.55	1.29	.027	-.018	-.055	.027
(9.92)	(.094)	(.054)	(.086)	(.081)	(.364)	(.923)	(1.19)	(.881)	(.058)	(.089)	(.094)	(.091)

Japan : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
80.42	-.541	-.279	-.033	-.896	-2.05	3.75	1.12	-3.52	.338	-.437	-.539	-.259
(68.7)	(.654)	(.376)	(.598)	(.567)	(2.52)	(6.40)	(8.26)	(6.10)	(.402)	(.619)	(.655)	(.637)

Malaysia : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-.708	.717	-.025	-.261	.020	.044	.590	.447	.606	-.362	-.0002	.697	.605
(2.39)	(.535)	(.194)	(.556)	(.264)	(.839)	(1.22)	(1.41)	(.980)	(.250)	(.210)	(.909)	(.892)

Malaysia : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
2.04	1.74	1.58	-1.30	-.326	-5.76	-.496	1.71	3.19	-1.14	-2.51	.453	2.65
(8.49)	(.641)	(1.54)	(1.22)	(.775)	(4.17)	(2.24)	(2.33)	(2.41)	(1.17)	(1.46)	(.939)	(1.48)

Malaysia : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-3.08	.566	.650	-.400	.183	-1.88	-.384	.097	.781	-.680	-.633	.207	.577
(1.07)	(.080)	(.194)	(.153)	(.097)	(.525)	(.282)	(.293)	(.304)	(.148)	(.184)	(.118)	(.187)

Malaysia : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
3.48	.060	.701	-.885	-.350	-2.43	.280	2.90	2.24	-.604	-.582	.315	1.59
(2.60)	(.190)	(.473)	(.374)	(.238)	(1.28)	(.688)	(.715)	(.742)	(.361)	(.450)	(.288)	(.457)

Pakistan : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{21}	b_{22}	b_{23}	b_{31}	b_{32}	b_{33}
653	-289	170	-252	5.56	1.77	524	558	-1.14	-.001
(1.00)	(.445)	(.371)	(.311)	(2.18)	(1.97)	(1.35)	(.606)	(.523)	(.368)

Pakistan : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$
1.14	-.030	1.01	.172	4.62	-3.90	-4.18	-.245	.449	-.414
(1.33)	(.588)	(.686)	(.486)	(3.12)	(2.89)	(2.19)	(.571)	(.801)	(.721)

Pakistan : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$
-.183	-.093	.214	.084	.887	-.555	-.909	.203	.007	-.079
(.353)	(.155)	(.180)	(.128)	(.823)	(.764)	(.578)	(.150)	(.211)	(.190)

Pakistan : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$
1.35	-.256	-.367	.258	.828	2.24	-1.32	.681	.039	-.511
(1.01)	(.443)	(.517)	(.366)	(2.35)	(2.18)	(1.65)	(.431)	(.604)	(.544)

South Africa : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-5.49	.848	.138	-.139	.195	-2.75	.224	1.05	-.574	.418	-.383	-.229	-.412
(6.88)	(.604)	(.368)	(.385)	(.366)	(2.68)	(2.96)	(2.45)	(2.16)	(1.02)	(1.00)	(.691)	(.588)

South Africa : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-11.27	-.206	-.228	-1.43	-2.23	-.414	-4.86	9.89	9.26	2.69	2.46	.318	1.34
(11.6)	(1.37)	(.715)	(.710)	(.800)	(6.81)	(5.35)	(4.37)	(4.92)	(1.46)	(1.97)	(1.23)	(1.58)

South Africa : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-1.23	.021	-.021	-.286	-.443	-.644	-.835	2.14	2.07	.679	.465	-.082	.069
(2.76)	(.326)	(.169)	(.168)	(.189)	(1.61)	(1.26)	(1.03)	(1.16)	(.347)	(.469)	(.292)	(.376)

South Africa : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
2.99	.089	.118	-.285	-.684	-2.43	-2.50	2.23	2.88	1.53	.830	.135	.326
(2.54)	(.300)	(.155)	(.154)	(.174)	(1.48)	(1.16)	(.954)	(1.07)	(.319)	(.431)	(.268)	(.345)

Singapore : Estimates of parameters in eq.(50)

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
2.31	.626	.037	.069	.100	-.375	-.571	-.384	.461	-.078	-.055	.099	-.129
(5.93)	(.290)	(.182)	(.183)	(.277)	(.727)	(.491)	(.623)	(.940)	(.212)	(.161)	(.160)	(.239)

Singapore : Estimates of parameters in eq.(47)

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
-1.64	1.06	-.172	.550	.302	.349	-2.17	-.146	-1.76	.211	-.261	.365	-.314
(19.2)	(.797)	(.676)	(.973)	(.965)	(2.32)	(1.64)	(3.15)	(2.62)	(.746)	(.692)	(.620)	(.835)

Singapore : Estimates of parameters in eq.(48)

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
-8.34	.439	.050	.178	.112	.245	-.837	-.567	.245	-.260	-.068	-.090	.013
(5.25)	(.217)	(.184)	(.265)	(.262)	(.633)	(.448)	(.860)	(.715)	(.203)	(.188)	(.168)	(.227)

Singapore : Estimates of parameters in eq.(49)

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
-.989	.157	-.505	.122	.814	-.197	-.648	2.79	-4.38	.338	.556	.025	.163
(10.5)	(.437)	(.370)	(.533)	(.528)	(1.27)	(.902)	(1.73)	(1.43)	(.408)	(.379)	(.339)	(.458)

Sweden : Estimates of parameters in eq.(50)

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
-121.6	.298	.079	.048	-.049	.443	.239	-.139	.284	-.241	.352	-.248	-.271
(83.8)	(.579)	(.446)	(.276)	(.498)	(1.34)	(1.02)	(.790)	(1.71)	(1.14)	(1.25)	(.751)	(.768)

Sweden : Estimates of parameters in eq.(47)

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
-201.2	2.12	.777	-.808	1.14	-2.54	-1.36	3.38	-6.54	2.15	-1.95	-1.57	4.81
(168)	(.830)	(.933)	(.770)	(.552)	(1.72)	(2.62)	(2.44)	(2.41)	(1.50)	(2.15)	(2.18)	(2.56)

Sweden : Estimates of parameters in eq.(48)

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
-149.0	.890	.199	-.098	.434	-.506	-.660	.683	-2.59	.678	-.141	-.968	2.54
(68.6)	(.338)	(.380)	(.313)	(.225)	(.703)	(1.06)	(.997)	(.983)	(.614)	(.877)	(.892)	(1.04)

Sweden : Estimates of parameters in eq.(49)

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
-20.18	-.051	.115	-.172	.335	.364	-.471	.548	-.989	1.56	-.646	-.231	.465
(64.4)	(.317)	(.357)	(.294)	(.211)	(.660)	(1.00)	(.937)	(.924)	(.577)	(.824)	(.838)	(.980)

Turkey : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-12.71	959	.039	-.162	-.002	-1.02	-.318	875	.131	3.27	-14.71	-5.31	-20.80
(6.99)	(.265)	(.203)	(.439)	(.259)	(1.41)	(.984)	(1.79)	(1.13)	(88.1)	(56.4)	(37.6)	(48.0)

Turkey : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-15.25	1.06	1.03	1.25	.475	-3.77	-4.06	-6.13	-2.68	21.81	-.299	130.0	-.102
(12.2)	(.351)	(.422)	(.702)	(.247)	(1.51)	(1.72)	(3.00)	(1.60)	(106.)	(114)	(81.7)	(76.9)

Turkey : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-1.25	.113	.283	.252	-.062	-.169	-1.02	-1.31	.222	-5.40	22.43	-1.42	-16.55
(3.25)	(.093)	(.112)	(.187)	(.066)	(.404)	(.459)	(.800)	(.426)	(28.2)	(30.6)	(21.7)	(20.5)

Turkey : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.066	-.001	.003	-.001	-.000	.007	-.018	.008	.000	.676	.013	-.324	.135
(.042)	(.001)	(.001)	(.002)	(.000)	(.005)	(.005)	(.010)	(.000)	(.368)	(.398)	(.283)	(.267)

UK : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
32.91	3.01	-.281	2.68	4.33	-10.58	-12.58	-4.26	-.956	7.55	9.48	-1.04	-2.50
(63.0)	(2.38)	(.990)	(2.37)	(3.97)	(9.03)	(10.2)	(3.57)	(1.74)	(6.14)	(8.72)	(1.47)	(3.04)

UK : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
10.37	1.69	-1.15	-2.23	1.71	3.44	-1.14	-1.05	.462	-4.51	4.07	3.21	-2.00
(107)	(.999)	(1.32)	(2.17)	(1.84)	(5.17)	(2.47)	(3.15)	(2.75)	(2.28)	(3.40)	(4.52)	(3.80)

UK : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
34.49	.481	-.162	-.498	.061	.588	-.070	-.253	-.130	-1.33	.530	.743	.243
(25.9)	(.240)	(.318)	(.524)	(.443)	(1.24)	(.595)	(.759)	(.664)	(.550)	(.820)	(1.09)	(.916)

UK : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
45.47	.524	-.230	-.120	.040	-.285	-.802	-.370	-.471	-.579	.714	.048	.731
(50.6)	(.469)	(.621)	(1.02)	(.864)	(2.43)	(1.16)	(1.48)	(1.29)	(1.07)	(1.59)	(2.12)	(1.78)

USA : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
3.20	.327	-.103	.100	.113	.421	.371	-.610	-.230	1.74	.748	-2.08	-.056
(23.40)	(.286)	(.283)	(.184)	(.214)	(.912)	(.772)	(.509)	(.547)	(1.53)	(2.49)	(1.55)	(2.36)

USA : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-15.32	.955	.450	.495	.119	-1.14	-1.70	-2.30	.304	5.61	-7.77	-5.87	7.12
(48.6)	(.447)	(.628)	(.563)	(.591)	(2.23)	(1.75)	(1.14)	(1.17)	(3.98)	(6.36)	(4.79)	(5.12)

USA : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-37.82	.546	.145	.033	.067	-1.12	-.576	-.391	-.144	-1.58	-1.03	.161	2.66
(16.8)	(.154)	(.217)	(.194)	(.204)	(.770)	(.605)	(.396)	(.406)	(1.37)	(2.19)	(1.65)	(1.77)

USA : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
13.26	-.137	-.123	.010	.112	.374	.426	-.166	-.144	1.40	.835	-.426	-1.34
(5.04)	(.046)	(.065)	(.058)	(.061)	(.231)	(.181)	(.119)	(.122)	(.413)	(.659)	(.496)	(.531)

Venezuela : Estimates of parameters in eq.(50)

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-5.97	2.22	445	738	-.351	-.859	-.690	-2.10	-.926	-15.39	-6.83	-10.96	-6.91
(11.3)	(3.03)	(1.03)	(1.46)	(.929)	(.770)	(1.89)	(4.58)	(1.58)	(30.6)	(14.1)	(21.5)	(15.3)

Venezuela : Estimates of parameters in eq.(47)

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-4.56	.455	.187	.313	.004	.662	.868	-.692	-.449	2.61	.061	-.957	-9.50
(13.8)	(.500)	(.451)	(.457)	(.529)	(1.15)	(.929)	(1.03)	(1.01)	(4.75)	(4.65)	(4.70)	(8.52)

Venezuela : Estimates of parameters in eq.(48)

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-2.26	.054	.185	.109	.072	-.081	-.200	-.347	-.504	.277	-.457	.644	-.956
(3.35)	(.121)	(.109)	(.111)	(.128)	(.281)	(.226)	(.252)	(.246)	(1.15)	(1.13)	(1.14)	(2.07)

Venezuela : Estimates of parameters in eq.(49)

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.757	-.015	.030	-.044	.017	.012	-.002	.030	.016	.740	-.236	.060	-.275
(1.28)	(.046)	(.041)	(.042)	(.049)	(.107)	(.086)	(.096)	(.094)	(.442)	(.433)	(.437)	(.793)

*standard errors are in parenthesis.

Table 6: Excess Sensitivity Test Results from eqs. (51), (52), (53), (54) and (55).

Countries	1	2	3	4	5
Belgium	F(12,7) 1.09 (0.471)	F(8,7) 0.235 (0.970)	F(4,7) 0.092 (0.981)	F(4,7) 0.109 (0.975)	F(4,7) 0.343 (0.840)
Canada	F(9,7) 2.527 (0.117)	F(6,7) 0.123 (0.989)	F(3,7) 1.78 (0.238)	F(3,7) 0.113 (0.949)	F(3,7) 0.074 (0.971)
Chile	F(12,5) 5479 (0.000)	F(8,5) 1.42 (0.361)	F(4,5) 1.22 (0.389)	F(4,5) 0.820 (0.563)	F(4,5) 1.51 (0.429)
Egypt	F(9,6) 0.779 (0.646)	F(6,6) 0.210 (0.960)	F(3,6) 0.354 (0.788)	F(3,6) 0.144 (0.929)	F(3,6) 0.086 (0.964)
El Salvador	F(12,7) 4.32 (0.030)	F(8,7) 1.52 (0.296)	F(4,7) 2.61 (0.126)	F(4,7) 2.51 (0.135)	F(4,7) 0.219 (0.919)
Finland	F(9,5) 3.23 (0.104)	F(6,5) 2.53 (0.163)	F(3,5) 1.16 (0.409)	F(3,5) 0.587 (0.648)	F(3,5) 0.655 (0.613)
France	F(12,5) 0.824 (0.639)	F(8,5) 0.005 (0.999)	F(4,5) 0.032 (0.997)	F(4,5) 0.002 (0.999)	F(4,5) 0.007 (0.999)
Germany	F(9,6) 1.43 (0.338)	F(6,6) 0.040 (0.999)	F(3,6) 0.018 (0.996)	F(3,6) 0.020 (0.995)	F(3,6) 0.063 (0.973)
India	F(9,7) 4.95 (0.023)	F(6,7) 0.066 (0.997)	F(3,7) 0.754 (0.553)	F(3,7) 0.041 (0.987)	F(3,7) 0.106 (0.953)
Italy	F(12,4) 1.53 (0.363)	F(8,4) 0.669 (0.708)	F(4,4) 2.10 (0.244)	F(4,4) 0.387 (0.809)	F(4,4) 0.736 (0.612)
Japan	F(12,5) 0.329 (0.946)	F(8,5) 0.381 (0.891)	F(4,5) 0.128 (0.965)	F(4,5) 0.441 (0.775)	F(4,5) 0.105 (0.975)
Malaysia	F(12,4) 3.12 (0.140)	F(8,4) 1.07 (0.506)	F(4,4) 1.03 (0.485)	F(4,4) 0.371 (0.819)	F(4,4) 0.551 (0.710)
Pakistan	F(9,5) 6.50 (0.026)	F(6,5) 1.27 (0.404)	F(3,5) 0.412 (0.751)	F(3,5) 2.23 (0.202)	F(3,5) 1.91 (0.245)

South Africa	F(12,4) 3.33 (0.127)	F(8,4) 0.430 (0.855)	F(4,4) 1.05 (0.478)	F(4,4) 0.528 (0.724)	F(4,4) 0.195 (0.928)
Singapore	F(12,7) 4.82 (0.022)	F(8,7) 0.829 (0.604)	F(4,7) 1.50 (0.297)	F(4,7) 0.668 (0.634)	F(4,7) 0.149 (0.957)
Sweden	F(12,7) 2.57 (0.107)	F(8,7) 0.050 (0.999)	F(4,7) 0.238 (0.907)	F(4,7) 0.051 (0.993)	F(4,7) 0.062 (0.991)
Turkey	F(12,7) 13.62 (0.001)	F(8,7) 0.575 (0.772)	F(4,7) 8.74 (0.007)	F(4,7) 0.458 (0.764)	F(4,7) 0.086 (0.983)
UK	F(12,7) 2.43 (0.121)	F(8,7) 0.428 (0.870)	F(4,7) 0.601 (0.673)	F(4,7) 0.453 (0.767)	F(4,7) 0.516 (0.727)
USA	F(12,5) 2.38 (0.173)	F(8,5) 0.488 (0.824)	F(4,5) 1.50 (0.326)	F(4,5) 0.491 (0.744)	F(4,5) 0.797 (0.574)
Venezuela	F(12,7) 0.677 (0.736)	F(4,7) 0.228 (0.972)	F(4,7) 0.819 (0.551)	F(4,7) 0.396 (0.805)	F(4,7) 0.078 (0.986)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51).

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52).

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53).

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54).

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55).

Table 7: Parameter Estimates of eqs.(47)', (48)', (49)' and (50)'**Belgium : Estimates of parameters in eq.(50')**

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
104.8	-1.29	0.342	-.908	-.411	3.98	-.807	1.50	.707	4.76	-.662	-.785	-.960
(34.39)	(1.19)	(1.31)	(.972)	(1.22)	(2.79)	(2.87)	(2.19)	(2.74)	(1.80)	(2.13)	(2.05)	(1.80)

Belgium :Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
197.3	-1.39	-1.83	-1.85	-1.80	4.00	4.79	3.97	5.72	1.62	4.66	5.52	5.25
(66.9)	(2.25)	(2.67)	(2.64)	(2.10)	(4.98)	(5.73)	(5.73)	(4.94)	(3.57)	(3.25)	(3.39)	(3.58)

Belgium :Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
85.02	-.889	-.774	-.908	-.681	2.34	2.04	1.95	2.27	.579	2.10	2.32	2.28
(.853)	(1.04)	(1.23)	(1.21)	(.971)	(2.30)	(2.64)	(2.64)	(2.28)	(1.65)	(1.49)	(1.56)	(1.65)

Belgium :Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
4.12	.072	.131	-.055	-.182	-.337	-.231	.105	.366	.247	.139	.277	-.164
(.180)	(.276)	(.327)	(.323)	(.258)	(.610)	(.702)	(.701)	(.605)	(.437)	(.397)	(.414)	(.438)

Canada :Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
47.85	.169	.705	-.367	.092	-1.51	-1.39	.863	1.05	.841	.498	1.39	-1.14
(97.97)	(.580)	(.701)	(.468)	(.284)	(2.51)	(1.94)	(1.82)	(2.91)	(2.39)	(1.31)	(2.41)	(3.51)

Canada :Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-300	.737	.166	-.955	1.29	3.06	-2.93	6.15	1.48	-5.29	5.14	-3.39	-7.02
(149)	(.992)	(1.39)	(.936)	(.684)	(3.20)	(3.27)	(2.50)	(3.98)	(3.38)	(1.55)	(3.88)	(5.98)

Canada :Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-109	.440	-.246	-.047	.471	.393	.160	1.95	-1.63	-.944	.578	-2.27	-.402
(56.4)	(.375)	(.528)	(.354)	(.259)	(1.21)	(1.23)	(.947)	(1.50)	(1.28)	(.589)	(1.46)	(2.26)

Canada :Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-82.07	.328	-.028	-.053	.251	-.542	-.389	1.47	-1.06	-.218	.440	-1.94	-.312
(.976)	(.006)	(.009)	(.006)	(.004)	(.021)	(.021)	(.016)	(.026)	(.022)	(.010)	(.025)	(.039)

Chile : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
17.64	.803	-.176	.326	.039	-.080	.572	-.944	-.301	-1.62	.474	-.286	-.124
(4.89)	(.765)	(.480)	(.566)	(.054)	(2.83)	(1.87)	(2.00)	(.407)	(1.69)	(1.28)	(.928)	(.236)

Chile : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
20.80	-2.74	1.56	-1.86	-.225	10.34	-4.03	6.43	1.62	11.25	-2.08	0.529	1.039
(4.70)	(.707)	(.447)	(.490)	(.051)	(2.38)	(1.56)	(1.73)	(.364)	(1.51)	(1.24)	(.939)	(.216)

Chile : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
4.10	-.811	.491	-.416	-.050	2.93	-1.31	1.46	.360	2.94	-.429	.005	.260
(1.02)	(.154)	(.097)	(.106)	(.011)	(.518)	(.340)	(.378)	(.079)	(.328)	(.271)	(.204)	(.047)

Chile : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-.625	.055	.204	-.105	-.012	-.169	-.569	.142	.104	1.06	-.839	.103	.028
(1.21)	(.182)	(.115)	(.126)	(.013)	(.616)	(.403)	(.449)	(.094)	(.390)	(.322)	(.242)	(.056)

Egypt : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
1.75	1.62	.165	.877	-.143	-2.47	-2.39	-.730	-1.30	-.483	-.009	-.023	.937
(1.47)	(.755)	(.461)	(.902)	(.400)	(1.92)	(3.68)	(1.09)	(1.36)	(1.64)	(1.27)	(.935)	(.901)

Egypt : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
3.21	-.356	-.699	.764	-.582	5.39	-4.40	1.88	.571	-2.86	-1.38	-1.97	.950
(2.18)	(1.14)	(.750)	(2.21)	(.814)	(2.48)	(7.99)	(1.55)	(2.43)	(3.65)	(2.42)	(1.80)	(2.21)

Egypt : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
1.32	-.170	-.254	.147	-.244	2.07	-1.24	.531	.407	-.708	-.330	-.570	.144
(2.00)	(1.05)	(.689)	(2.03)	(.748)	(2.28)	(7.34)	(1.43)	(2.23)	(3.35)	(2.22)	(1.65)	(2.03)

Egypt : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.104	.221	.273	.288	-.070	-1.07	-1.95	-.425	-.315	-1.47	-.801	-.029	.561
(.938)	(.492)	(.322)	(.952)	(.350)	(1.06)	(3.43)	(.670)	(1.04)	(1.56)	(1.04)	(.775)	(.953)

El Salvador : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
.046	.142	.093	-.416	-.092	-.063	2.80	.698	1.13	-1.71	-1.38	.743	-2.19
(.715)	(.259)	(.252)	(.230)	(.214)	(.037)	(1.17)	(1.21)	(1.09)	(.518)	(.800)	(.666)	(.870)

El Salvador : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-1.18	1.32	-.770	.531	.298	.778	-1.62	1.56	-3.33	.023	1.94	-3.02	3.29
(.792)	(.218)	(.285)	(.256)	(.189)	(.911)	(.938)	(1.03)	(.914)	(.775)	(.791)	(.870)	(.604)

El Salvador : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-.043	.029	.017	.060	.037	.575	.694	-.909	-.569	-.241	-.247	.350	.047
(.576)	(.159)	(.207)	(.186)	(.137)	(.662)	(.682)	(.750)	(.665)	(.564)	(.575)	(.633)	(.439)

El Salvador : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.239	-.126	.127	-.089	.115	.491	.678	-1.49	-.172	.036	-.198	.772	-.543
(.527)	(.145)	(.190)	(.170)	(.126)	(.606)	(.624)	(.686)	(.609)	(.516)	(.526)	(.579)	(.402)

Finland : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
102	.774	-.074	.006	1.178	-1.15	.541	-.188	-.398	.007	-.432	.196	.195
(21.8)	(.327)	(.300)	(.314)	(.292)	(1.17)	(1.11)	(1.02)	(.965)	(.559)	(.569)	(.964)	(.974)

Finland : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
229	.182	-1.01	-.275	-2.38	-.675	5.23	.235	6.82	3.02	2.31	2.34	-1.33
(45.91)	(.633)	(1.08)	(1.09)	(.931)	(2.40)	(3.60)	(3.31)	(2.73)	(1.52)	(2.48)	(2.78)	(1.88)

Finland : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
65.79	-.177	-.001	-.208	-.632	.537	.766	.167	1.89	.821	1.39	.650	-.327
(13.06)	(.180)	(.308)	(.310)	(.265)	(.686)	(1.02)	(.942)	(.777)	(.435)	(.708)	(.792)	(.537)

Finland : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
23.90	.192	.150	-.233	.073	-1.01	-.120	.508	-.656	1.16	-.129	-.330	.516
(17.39)	(.240)	(.410)	(.413)	(.353)	(.913)	(1.36)	(1.25)	(1.03)	(.579)	(.942)	(1.05)	(.715)

France : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
31.87	-367	319	317	433	2.42	-1.21	-690	-1.09	1.82	2.69	1.16	713
(31.38)	(2.62)	(1.36)	(1.78)	(1.35)	(7.13)	(3.96)	(4.97)	(3.54)	(2.78)	(4.76)	(2.49)	(2.68)

France : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
98.63	6.25	6.13	-4.80	-3.89	-15.76	-15.86	13.10	10.06	7.08	0.272	-4.59	-1.25
(116)	(3.18)	(3.67)	(3.94)	(2.45)	(8.94)	(9.96)	(10.99)	(6.88)	(13.05)	(11.04)	(6.04)	(7.53)

France : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
33.82	2.03	2.14	-1.73	-1.37	-5.00	-5.56	4.68	3.61	2.25	0.349	-1.50	-709
(40.45)	(1.10)	(1.27)	(1.36)	(.849)	(3.09)	(3.44)	(3.80)	(2.38)	(4.51)	(3.82)	(2.09)	(2.61)

France : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-8.87	-382	237	125	167	1.17	-843	-221	-555	-1.15	-421	-650	-117
(8.20)	(.223)	(.257)	(.276)	(.172)	(.627)	(.699)	(.771)	(.483)	(.916)	(.775)	(.424)	(.529)

Germany : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-3.16	394	-057	-031	-019	696	181	036	154	-455	-742	538	-649
(12.33)	(1.60)	(3.40)	(1.43)	(3.34)	(3.75)	(10.0)	(5.36)	(11.4)	(3.06)	(7.77)	(6.49)	(3.55)

Germany : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
466	3.86	-2.98	2.44	-2.20	-8.26	7.34	-6.96	7.87	7.79	-10.31	5.87	-154
(22.97)	(1.40)	(2.90)	(3.62)	(2.53)	(5.03)	(9.93)	(12.65)	(8.93)	(4.96)	(6.90)	(7.78)	(6.28)

Germany : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-2.34	885	-745	752	-656	-1.62	1.81	-2.33	2.48	1.86	-3.10	2.30	-484
(6.20)	(.379)	(.784)	(.978)	(.684)	(1.36)	(2.68)	(3.41)	(2.41)	(1.33)	(1.86)	(2.10)	(1.69)

Germany : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
2.77	.001	-220	.072	-160	-.043	.743	-.159	.401	.143	-.420	.196	-.172
(1.19)	(.073)	(.151)	(.188)	(.131)	(.261)	(.515)	(.656)	(.463)	(.257)	(.358)	(.404)	(.326)

India : Estimates of parameters in eq.(50')

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
.561	.731	.270	-.001	.341	0.523	-.930	.606	-3.27	0.560	1.11	.047	.686
(2.04)	(1.51)	(1.06)	(.964)	(.964)	(11.8)	(9.26)	(11.1)	(8.75)	(4.46)	(4.44)	(3.18)	(4.21)

India : Estimates of parameters in eq.(47')

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
.605	-.336	.599	.655	1.02	9.57	-.296	-7.28	-13.01	3.21	.190	-4.40	1.75
(2.68)	(2.37)	(1.53)	(1.31)	(1.51)	(20.87)	(13.52)	(15.20)	(12.66)	(4.63)	(7.93)	(4.86)	(5.40)

India : Estimates of parameters in eq.(48')

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
.247	.000	.172	.040	.111	.463	-1.09	-.873	-1.82	-.042	-.102	-.719	.084
(.298)	(.263)	(.170)	(.146)	(.169)	(2.32)	(1.50)	(1.69)	(1.40)	(.515)	(.882)	(.541)	(.601)

India : Estimates of parameters in eq.(49')

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
-.093	.172	-.299	-.100	-.151	-1.15	1.98	.771	2.76	.552	-.008	.495	.667
(.365)	(.323)	(.209)	(.179)	(.207)	(2.84)	(1.84)	(2.07)	(1.72)	(.632)	(1.08)	(.663)	(.737)

Italy : Estimates of parameters in eq.(50')

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
-4.13	-1.10	-.462	-.075	.224	.077	.595	.613	.369	-2.03	-.067	-.169	.130
(7.65)	(.836)	(.438)	(.452)	(.237)	(.922)	(.525)	(.620)	(.538)	(3.42)	(1.54)	(1.40)	(.845)

Italy : Estimates of parameters in eq.(47')

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
.728	.204	.316	-.359	-.126	.239	.285	-.033	.005	-.051	-.141	.336	.205
(2.27)	(.122)	(.100)	(.093)	(.052)	(.093)	(.087)	(.094)	(.091)	(.269)	(.263)	(.240)	(.177)

Italy : Estimates of parameters in eq.(48')

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
-.606	.245	.080	.335	-.007	.508	-.238	.296	-.306	-.243	.021	.173	.030
(2.98)	(.126)	(.113)	(.105)	(.067)	(.165)	(.153)	(.164)	(.162)	(.368)	(.360)	(.308)	(.226)

Italy : Estimates of parameters in eq.(49')

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
1.08	-.001	-.030	-.001	.036	.027	.066	-.008	.063	.450	-.199	.140	.041
(1.18)	(.048)	(.044)	(.040)	(.026)	(.047)	(.045)	(.048)	(.048)	(.185)	(.178)	(.149)	(.099)

Japan : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-26.36	-185	.030	.108	.241	-1.10	-2.69	.235	1.58	-2.03	-1.49	1.34	1.06
(50.61)	(.652)	(.354)	(.359)	(.559)	(4.28)	(4.43)	(7.85)	(6.30)	(2.25)	(2.31)	(1.61)	(2.18)

Japan : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
77.87	-404	-215	-534	-371	-210	4.98	-4.20	-2.97	-2.23	-788	.405	1.25
(24.36)	(.376)	(.158)	(.182)	(.274)	(1.31)	(2.67)	(3.74)	(3.42)	(.552)	(1.31)	(1.45)	(1.16)

Japan : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-442	-022	-084	-021	.038	1.47	-264	-748	.899	.156	-197	-098	.086
(6.72)	(.104)	(.044)	(.050)	(.076)	(.362)	.738	1.03	.945	.152	.362	.401	.322

Japan : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
7.35	-079	-003	.078	-207	.732	-3.19	3.81	-1.18	.196	.049	.581	-721
(17.70)	(.273)	(.115)	(.132)	(.199)	(.953)	(1.94)	(2.72)	(2.48)	(.401)	(.953)	(1.05)	(.848)

Malaysia : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
.274	.250	.127	.468	-.212	.573	-.211	-.890	.239	.281	-.534	.343	.134
(1.35)	(.325)	(.241)	(.888)	(.346)	(.898)	(.701)	(1.44)	(.924)	(1.07)	(.405)	(.633)	(.389)

Malaysia : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
4.48	.624	-.647	.874	-.274	1.87	.180	-2.27	1.94	.975	-1.00	1.16	.767
(2.32)	(.326)	(.577)	(.758)	(.645)	(1.18)	(1.18)	(1.16)	(1.53)	(.772)	(.952)	(.954)	(.508)

Malaysia : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-.554	.247	-.003	-.032	.079	.423	-.169	-.154	-.447	-.072	-.179	.005	-.033
(1.04)	(.146)	(.258)	(.340)	(.289)	(.530)	(.533)	(.523)	(.685)	(.346)	(.427)	(.427)	(.228)

Malaysia : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-1.76	.252	-.561	.393	.302	-.634	.805	-1.37	-.318	.824	-.443	-.197	.149
(1.35)	(.191)	(.337)	(.443)	(.377)	(.691)	(.695)	(.683)	(.894)	(.451)	(.556)	(.557)	(.297)

Pakistan : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
1.16	946	303	327	329	-1.10	-525	-1.58	-2.28	-759	-740	374	120
(.430)	(.612)	(.349)	(.321)	(.270)	(3.22)	(1.77)	(1.53)	(1.43)	(1.78)	(1.64)	(.790)	(.634)

Pakistan : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
1.40	-619	592	1.42	489	5.19	-470	-7.69	-6.22	124	736	-419	1.94
(.309)	(.276)	(.272)	(.278)	(.224)	(.967)	(1.28)	(1.25)	(1.47)	(.647)	(.563)	(.442)	(.472)

Pakistan : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
151	-285	172	098	235	1.50	-316	-654	-1.63	104	061	-188	117
(.171)	(.153)	(.151)	(.154)	(.124)	(.536)	(.715)	(.697)	(.819)	(.358)	(.312)	(.245)	(.262)

Pakistan : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
.050	-.081	.012	.053	-.216	.921	.334	-.489	.812	-.234	.406	.125	.297
(.186)	(.166)	(.164)	(.168)	(.135)	(.582)	(.776)	(.757)	(.890)	(.389)	(.339)	(.266)	(.284)

South Africa : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
3.68	491	683	570	188	.008	-3.31	-2.97	-1.01	-1.01	443	-573	-751
(7.69)	(.095)	(.551)	(.634)	(.331)	(.112)	(2.83)	(3.19)	(1.74)	(1.04)	(.971)	(1.07)	(1.29)

South Africa : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-9.28	1.11	-1.69	1.72	-2.12	-1.77	4.68	-3.59	6.66	-4.12	-5.88	-300	-7.95
(19.56)	(1.98)	(2.39)	(1.88)	(1.00)	(10.10)	(11.65)	(10.17)	(5.08)	(4.17)	(5.26)	(4.50)	(3.79)

South Africa : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-3.02	.096	-.370	.168	-.451	.197	1.21	.141	1.50	-1.32	-1.22	-167	-1.26
(3.53)	(.358)	(.432)	(.340)	(.181)	(1.82)	(2.10)	(1.83)	(.917)	(.753)	(.951)	(.813)	(.684)

South Africa : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-7.3	-.247	-.412	-.390	.045	1.20	2.41	1.95	-.286	-.711	-.525	.216	.568
(1.99)	(.202)	(.243)	(.192)	(.102)	(1.02)	(1.18)	(1.03)	(.517)	(.424)	(.536)	(.458)	(.386)

Singapore : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
-2.12	-13.67	-207	-4.97	991	22.30	-7.01	-24.96	13.76	16.07	17.89	20.37	5.41
(2.12)	(13.0)	(308)	(4.61)	(936)	(20.8)	(6.03)	(22.7)	(12.5)	(14.6)	(16.4)	(18.7)	(4.93)

Singapore : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
-6.76	1.85	-782	587	587	-2.79	1.10	562	-5.01	-745	-354	-900	1.59
(9.90)	(1.01)	(883)	(760)	(792)	(4.17)	(4.22)	(3.81)	(5.93)	(1.27)	(1.35)	(858)	(1.78)

Singapore : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
-3.13	.311	-189	.249	.053	.163	.358	-.176	-1.49	-.502	-.408	.200	.271
(2.85)	(.292)	(.254)	(.218)	(.228)	(1.19)	(1.21)	(1.09)	(1.70)	(.367)	(.389)	(.246)	(.513)

Singapore : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-4.91	0.338	-129	-.214	.513	-.902	1.62	-1.65	-1.49	-.064	.106	-.140	1.37
(3.11)	(.319)	(.278)	(.239)	(.249)	(1.31)	(1.32)	(1.20)	(1.86)	(.401)	(.426)	(.270)	(.561)

Sweden : Estimates of parameters in eq.(50')

c	b_{11}	b_{12}	b_{13}	b_{14}	b_{21}	b_{22}	b_{23}	b_{24}	b_{31}	b_{32}	b_{33}	b_{34}
59.90	512	-.018	-.037	152	-.201	223	241	-699	.009	-.164	-.276	539
(48.67)	(504)	(.278)	(.291)	(.395)	(1.39)	(898)	(1.10)	(1.34)	(1.15)	(.933)	(.915)	(1.31)

Sweden : Estimates of parameters in eq.(47')

k_1	$p_{1,1}$	$p_{1,2}$	$p_{1,3}$	$p_{1,4}$	$p_{1,5}$	$p_{1,6}$	$p_{1,7}$	$p_{1,8}$	$p_{1,9}$	$p_{1,10}$	$p_{1,11}$	$p_{1,12}$
118.4	475	-.063	-.050	537	556	1.67	-2.60	-1.22	-1.90	.107	3.76	-1.43
(98.17)	(738)	(.815)	(.812)	(.639)	(1.82)	(2.53)	(2.68)	(2.46)	(1.98)	(2.77)	(2.67)	(2.83)

Sweden : Estimates of parameters in eq.(48')

k_2	$p_{2,1}$	$p_{2,2}$	$p_{2,3}$	$p_{2,4}$	$p_{2,5}$	$p_{2,6}$	$p_{2,7}$	$p_{2,8}$	$p_{2,9}$	$p_{2,10}$	$p_{2,11}$	$p_{2,12}$
4.49	.036	.029	.182	-.129	1.07	.457	-1.92	.887	-.623	.120	2.03	-2.00
(43.28)	(.326)	(.359)	(.358)	(.282)	(.803)	(1.11)	(1.18)	(1.08)	(.874)	(1.22)	(1.18)	(1.24)

Sweden : Estimates of parameters in eq.(49')

k_3	$p_{3,1}$	$p_{3,2}$	$p_{3,3}$	$p_{3,4}$	$p_{3,5}$	$p_{3,6}$	$p_{3,7}$	$p_{3,8}$	$p_{3,9}$	$p_{3,10}$	$p_{3,11}$	$p_{3,12}$
-20.79	.133	.109	.119	-.312	-.020	-.282	-.714	1.08	.642	.263	.535	-1.38
(24.80)	(.187)	(.206)	(.205)	(.161)	(.460)	(.640)	(.678)	(.623)	(.501)	(.702)	(.676)	(.716)

Turkey : Estimates of parameters in eq.(50')

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
-5.66	.930	-.039	-.165	-.003	-.870	-.029	1.05	.107	.504	.2828	.554	.092
(3.27)	(.166)	(.366)	(.318)	(.226)	(2.06)	(1.56)	(1.77)	(.868)	(1.91)	(2.00)	(1.18)	(2.00)

Turkey : Estimates of parameters in eq.(47')

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
-6.43	1.25	-.110	.859	.723	-2.57	.161	-2.61	-4.42	5.72	-.979	1.95	-.654
(4.51)	(.139)	(.347)	(.326)	(.196)	(1.74)	(1.64)	(1.77)	(.928)	(2.03)	(2.60)	(1.19)	(1.96)

Turkey : Estimates of parameters in eq.(48')

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
-.476	.161	.023	.144	-.045	.340	-.543	-.257	-.107	.546	-.275	.727	-.661
(.725)	(.022)	(.056)	(.052)	(.032)	(.280)	(.263)	(.286)	(.149)	(.326)	(.418)	(.192)	(.315)

Turkey : Estimates of parameters in eq.(49')

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
-.015	.099	-.000	-.157	-.013	-.201	-.424	.855	-.164	-.453	-.145	-.341	-.682
(.363)	(.011)	(.028)	(.026)	(.016)	(.140)	(.132)	(.143)	(.075)	(.163)	(.209)	(.096)	(.158)

UK : Estimates of parameters in eq.(50')

<i>c</i>	<i>b</i> ₁₁	<i>b</i> ₁₂	<i>b</i> ₁₃	<i>b</i> ₁₄	<i>b</i> ₂₁	<i>b</i> ₂₂	<i>b</i> ₂₃	<i>b</i> ₂₄	<i>b</i> ₃₁	<i>b</i> ₃₂	<i>b</i> ₃₃	<i>b</i> ₃₄
100	.629	.052	-.107	.163	-.001	-.115	.305	-.586	-.246	.636	-.235	.277
(50.9)	(.398)	(.421)	(.660)	(.565)	(.953)	(1.31)	(1.88)	(1.98)	(1.32)	(2.26)	(1.49)	(1.42)

UK : Estimates of parameters in eq.(47')

<i>k</i> ₁	<i>p</i> _{1,1}	<i>p</i> _{1,2}	<i>p</i> _{1,3}	<i>p</i> _{1,4}	<i>p</i> _{1,5}	<i>p</i> _{1,6}	<i>p</i> _{1,7}	<i>p</i> _{1,8}	<i>p</i> _{1,9}	<i>p</i> _{1,10}	<i>p</i> _{1,11}	<i>p</i> _{1,12}
169.0	1.73	.466	-1.26	2.49	-3.53	-2.31	2.37	-8.09	-1.31	7.95	-2.98	3.49
(96.26)	(.987)	(1.04)	(5.12)	(1.91)	(3.25)	(4.00)	(20.16)	(6.67)	(17.33)	(11.32)	(10.65)	(5.44)

UK : Estimates of parameters in eq.(48')

<i>k</i> ₂	<i>p</i> _{2,1}	<i>p</i> _{2,2}	<i>p</i> _{2,3}	<i>p</i> _{2,4}	<i>p</i> _{2,5}	<i>p</i> _{2,6}	<i>p</i> _{2,7}	<i>p</i> _{2,8}	<i>p</i> _{2,9}	<i>p</i> _{2,10}	<i>p</i> _{2,11}	<i>p</i> _{2,12}
48.80	.224	.103	-.988	.376	-.347	-.061	3.37	-2.30	-2.80	3.4	-1.74	1.36
(27.54)	(.282)	(.298)	(1.46)	(.548)	(.932)	(1.14)	(5.76)	(1.91)	(4.96)	(3.24)	(3.04)	(1.55)

UK : Estimates of parameters in eq.(49')

<i>k</i> ₃	<i>p</i> _{3,1}	<i>p</i> _{3,2}	<i>p</i> _{3,3}	<i>p</i> _{3,4}	<i>p</i> _{3,5}	<i>p</i> _{3,6}	<i>p</i> _{3,7}	<i>p</i> _{3,8}	<i>p</i> _{3,9}	<i>p</i> _{3,10}	<i>p</i> _{3,11}	<i>p</i> _{3,12}
25.31	.092	-.250	.094	.145	-.503	.715	-.155	-.995	.496	0.163	0.118	0.268
(14.22)	(.146)	(.154)	(.757)	(.283)	(.482)	(.591)	(2.98)	(.987)	(2.56)	(1.67)	(1.57)	(.805)

USA : Estimates of parameters in eq.(50')

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₁₄</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₂₄</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>	<i>b₃₄</i>
10.54	.862	.046	-.280	.485	-.272	-.907	1.04	-2.51	-1.06	1.21	-.792	.926
(6.79)	(.296)	(.283)	(.251)	(.379)	(.824)	(.645)	(1.09)	(1.10)	(1.03)	(.550)	(.660)	(.429)

USA : Estimates of parameters in eq.(47')

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>	<i>p_{1,10}</i>	<i>p_{1,11}</i>	<i>p_{1,12}</i>
.885	1.11	.038	-.875	1.27	-.195	-2.16	3.56	-4.65	-2.63	2.40	-2.89	.858
(11.32)	(.241)	(.282)	(.374)	(.360)	(1.37)	(1.30)	(1.37)	(1.63)	(1.25)	(1.02)	(.651)	(.729)

USA : Estimates of parameters in eq.(48')

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>	<i>p_{2,10}</i>	<i>p_{2,11}</i>	<i>p_{2,12}</i>
-.501	.207	-.175	.124	.023	.259	.017	-.200	-.073	.057	-.063	-.078	-.115
(8.14)	(.173)	(.203)	(.269)	(.259)	(.987)	(.942)	(.986)	(1.17)	(.903)	(.740)	(.468)	(.524)

USA : Estimates of parameters in eq.(49')

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>	<i>p_{3,10}</i>	<i>p_{3,11}</i>	<i>p_{3,12}</i>
-8.06	.337	-.449	.297	.046	-.313	.681	-.790	-.757	.437	-.125	-.117	.324
(9.44)	(.201)	(.235)	(.312)	(.300)	(1.14)	(1.09)	(1.14)	(1.36)	(1.04)	(.858)	(.543)	(.608)

Venezuela : Estimates of parameters in eq.(50')

<i>c</i>	<i>b₁₁</i>	<i>b₁₂</i>	<i>b₁₃</i>	<i>b₁₄</i>	<i>b₂₁</i>	<i>b₂₂</i>	<i>b₂₃</i>	<i>b₂₄</i>	<i>b₃₁</i>	<i>b₃₂</i>	<i>b₃₃</i>	<i>b₃₄</i>
3.32	.496	-.095	.061	.228	-.398	.300	.151	-.400	-.262	-.647	.038	.090
(7.09)	(1.07)	(.363)	(.367)	(.555)	(1.59)	(.871)	(.965)	(1.08)	(3.82)	(1.87)	(2.33)	(2.55)

Venezuela : Estimates of parameters in eq.(47')

<i>k₁</i>	<i>p_{1,1}</i>	<i>p_{1,2}</i>	<i>p_{1,3}</i>	<i>p_{1,4}</i>	<i>p_{1,5}</i>	<i>p_{1,6}</i>	<i>p_{1,7}</i>	<i>p_{1,8}</i>	<i>p_{1,9}</i>	<i>p_{1,10}</i>	<i>p_{1,11}</i>	<i>p_{1,12}</i>
3.77	.971	.382	.572	-.771	-.801	.277	-1.50	.928	-.204	1.33	2.50	-1.22
(8.05)	(.361)	(.457)	(.465)	(.403)	(1.10)	(1.13)	(1.10)	(1.05)	(1.95)	(2.04)	(2.11)	(1.80)

Venezuela : Estimates of parameters in eq.(48')

<i>k₂</i>	<i>p_{2,1}</i>	<i>p_{2,2}</i>	<i>p_{2,3}</i>	<i>p_{2,4}</i>	<i>p_{2,5}</i>	<i>p_{2,6}</i>	<i>p_{2,7}</i>	<i>p_{2,8}</i>	<i>p_{2,9}</i>	<i>p_{2,10}</i>	<i>p_{2,11}</i>	<i>p_{2,12}</i>
-1.01	.089	.267	.123	-.034	-.246	-.431	-.260	-.358	-.223	.867	-.052	-.038
(1.55)	(.070)	(.088)	(.090)	(.078)	(.213)	(.219)	(.214)	(.204)	(.378)	(.394)	(.409)	(.348)

Venezuela : Estimates of parameters in eq.(49')

<i>k₃</i>	<i>p_{3,1}</i>	<i>p_{3,2}</i>	<i>p_{3,3}</i>	<i>p_{3,4}</i>	<i>p_{3,5}</i>	<i>p_{3,6}</i>	<i>p_{3,7}</i>	<i>p_{3,8}</i>	<i>p_{3,9}</i>	<i>p_{3,10}</i>	<i>p_{3,11}</i>	<i>p_{3,12}</i>
-1.12	-.007	.041	-.028	.107	-.166	-.158	.043	-.308	.423	-.202	-.587	.522
(1.39)	(.062)	(.079)	(.080)	(.070)	(.191)	(.196)	(.191)	(.183)	(.338)	(.352)	(.366)	(.311)

*standard errors are in parenthesis.

Table 8: Excess Sensitivity Test Results from eqs. (51'), (52'), (53'), (54') and (55').

Countries	1	2	3	4	5
Belgium	F(12,7) 1.58 (0.277)	F(8,7) 1.63 (0.265)	F(4,7) 1.17 (0.398)	F(4,7) 1.21 (0.385)	F(4,7) 3.10 (0.091)
Canada	F(12,2) 0.717 (0.714)	F(8,2) 0.665 (0.720)	F(4,2) 0.864 (0.598)	F(4,2) 0.686 (0.665)	F(4,2) 0.513 (0.743)
Chile	F(12,5) 1574 (0.000)	F(8,5) 0.439 (0.855)	F(4,5) 0.973 (0.496)	F(4,5) 0.460 (0.763)	F(4,5) 0.364 (0.825)
Egypt	F(12,2) 1.32 (0.508)	F(8,2) 0.443 (0.832)	F(4,2) 1.23 (0.493)	F(4,2) 0.562 (0.719)	F(4,2) 0.427 (0.787)
El Salvador	F(12,7) 7.32 (0.006)	F(8,7) 2.65 (0.107)	F(4,7) 2.17 (0.174)	F(4,7) 2.04 (0.292)	F(4,7) 4.655 (0.037)
Finland	F(12,5) 6.00 (0.029)	F(8,5) 0.578 (0.765)	F(4,5) 2.25 (0.168)	F(4,5) 0.255 (0.894)	F(4,5) 0.289 (0.873)
France	F(12,5) 1.68 (0.295)	F(8,5) 0.102 (0.996)	F(4,5) 0.047 (0.994)	F(4,5) 0.043 (0.995)	F(4,5) 0.129 (0.965)
Germany	F(12,7) 0.842 (0.621)	F(8,7) 0.026 (0.999)	F(4,7) 0.032 (0.997)	F(4,7) 0.008 (0.999)	F(4,7) 0.023 (0.998)
India	F(12,3) 0.768 (0.687)	F(8,3) 0.059 (0.999)	F(4,3) 0.475 (0.757)	F(4,3) 0.044 (0.994)	F(4,3) 0.019 (0.998)
Italy	F(12,4) 1.09 (0.514)	F(8,4) 0.270 (0.945)	F(4,4) 1.36 (0.385)	F(4,4) 0.434 (0.380)	F(4,4) 0.152 (0.952)
Japan	F(12,5) 0.535 (0.825)	F(8,5) 0.643 (0.724)	F(4,5) 0.182 (0.938)	F(4,5) 0.442 (0.774)	F(4,5) 0.623 (0.666)
Malaysia	F(12,5) 1.29 (0.414)	F(8,5) 0.591 (0.757)	F(4,5) 0.380 (0.582)	F(4,5) 0.691 (0.628)	F(4,5) 0.887 (0.533)
Pakistan	F(12,4) 5.90 (0.050)	F(8,4) 0.801 (0.635)	F(4,4) 2.43 (0.204)	F(4,4) 1.14 (0.449)	F(4,4) 0.546 (0.713)

Singapore	F(12,7) 7.89 (0.005)	F(8,7) 1.19 (0.415)	F(4,7) 0.602 (0.673)	F(4,7) 1.44 (0.315)	F(4,7) 0.620 (0.662)
South Africa	F(12,4) 4.33 (0.084)	F(8,4) 0.542 (0.786)	F(4,4) 7.17 (0.041)	F(4,4) 0.703 (0.629)	F(4,4) 0.447 (0.772)
Sweden	F(12,7) 2.22 (0.147)	F(8,7) 0.047 (0.999)	F(4,7) 0.267 (0.889)	F(4,7) 0.084 (0.984)	F(4,7) 0.060 (0.991)
Turkey	F(12,7) 44.42 (0.000)	F(8,7) 1.93 (0.198)	F(4,7) 27.49 (0.000)	F(4,7) 1.25 (0.372)	F(4,7) 0.559 (0.699)
UK	F(12,7) 2.13 (0.160)	F(8,7) 0.080 (0.998)	F(4,7) 0.719 (0.604)	F(4,7) 0.073 (0.988)	F(4,7) 0.019 (0.999)
USA	F(12,5) 3.81 (0.074)	F(8,5) 1.11 (0.475)	F(4,5) 4.57 (0.063)	F(4,5) 1.45 (0.341)	F(4,5) 1.95 (0.240)
Venezuela	F(12,7) 0.637 (0.764)	F(8,7) 0.210 (0.978)	F(4,7) 0.414 (0.793)	F(4,7) 0.198 (0.931)	F(4,7) 0.049 (0.994)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51').

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52').

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53').

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54').

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55').

Table 9: Excess Sensitivity Test Results from eqs. (57), (58) and (59).

Countries	1	2	3
Belgium	F(8,11) 1.33 (0.319)	F(4,11) 0.665 (0.629)	F(4,11) 0.175 (0.946)
Canada	F(6,10) 3.13 (0.053)	F(3,10) 4.01 (0.041)	F(3,10) 0.194 (0.897)
Chile	F(8,9) 494.59 (0.000)	F(4,9) 9.26 (0.002)	F(4,9) 5.25 (0.018)
Egypt	F(6,9) 0.955 (0.503)	F(3,9) 0.764 (0.541)	F(3,9) 0.437 (0.331)
El Salvador	F(8,11) 1.88 (0.162)	F(4,11) 2.04 (0.756)	F(4,11) 0.094 (0.982)
Finland	F(6,8) 3.70 (0.045)	F(3,8) 1.72 (0.238)	F(3,8) 0.923 (0.472)
France	F(8,9) 0.848 (0.586)	F(4,9) 0.337 (0.845)	F(4,9) 0.040 (0.996)
Germany	F(6,9) 1.53 (0.269)	F(3,9) 0.256 (0.855)	F(3,9) 0.077 (0.970)
India	F(6,10) 6.26 (0.005)	F(3,10) 0.856 (0.494)	F(3,10) 0.071 (0.973)
Italy	F(8,8) 1.36 (0.336)	F(4,8) 2.21 (0.157)	F(4,8) 0.447 (0.772)
Japan	F(8,9) 0.399 (0.894)	F(4,9) 0.448 (0.721)	F(4,9) 0.515 (0.726)
Malaysia	F(8,8) 3.11 (0.064)	F(4,8) 1.91 (0.201)	F(4,8) 2.01 (0.285)
Pakistan	F(6,8) 3.31 (0.060)	F(3,8) 3.34 (0.076)	F(3,8) 0.345 (0.793)

Singapore	F(8,11) 3.89 (0.020)	F(4,11) 2.31 (0.122)	F(4,11) 0.500 (0.736)
South Africa	F(8,8) 3.12 (0.063)	F(4,8) 1.29 (0.347)	F(4,8) 0.308 (0.864)
Sweden	F(8,11) 1.79 (0.180)	F(4,11) 1.18 (0.371)	F(4,11) 0.043 (0.995)
Turkey	F(8,11) 4.55 (0.011)	F(4,11) 5.96 (0.008)	F(4,11) 2.30 (0.123)
UK	F(8,11) 4.84 (0.009)	F(4,11) 0.311 (0.864)	F(4,11) 0.185 (0.940)
USA	F(8,9) 2.97 (0.062)	F(4,9) 2.19 (0.150)	F(4,9) 0.808 (0.550)
Venezuela	F(8,11) 0.419 (0.885)	F(4,11) 0.635 (0.648)	F(4,11) 0.283 (0.882)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All RYD and RDEBT variables are jointly equal to zero, eq. (57).

Column 2: H_0 : All RYD variables are equal to zero, eq. (58).

Column 3: H_0 : All RDEBT variables are equal to zero, eq. (59).

Table 10: Excess Sensitivity Test Results from eqs. (57'), (58') and (59').

Countries	1	2	3
Belgium	F(8,11) 0.878 (0.562)	F(4,11) 0.895 (0.499)	F(4,11) 0.055 (0.993)
Canada	F(8,6) 2.87 (0.107)	F(4,6) 2.75 (0.129)	F(4,6) 0.197 (0.930)
Chile	F(8,9) 520.51 (0.000)	F(4,9) 4.41 (0.029)	F(4,9) 0.250 (0.901)
Egypt	F(8,6) 0.718 (0.676)	F(4,6) 0.839 (0.547)	F(4,6) 0.175 (0.943)
El Salvador	F(8,11) 2.29 (0.100)	F(4,11) 1.59 (0.243)	F(4,11) 0.167 (0.950)
Finland	F(8,9) 2.41 (0.105)	F(4,9) 0.810 (0.548)	F(4,9) 0.207 (0.928)
France	F(8,9) 0.767 (0.640)	F(4,9) 0.358 (0.832)	F(4,9) 0.028 (0.998)
Germany	F(8,11) 0.976 (0.500)	F(4,11) 1.05 (0.424)	F(4,11) 0.044 (0.995)
India	F(8,7) 0.478 (0.838)	F(4,7) 0.410 (0.796)	F(4,7) 0.033 (0.997)
Italy	F(8,8) 1.67 (0.239)	F(4,8) 2.90 (0.092)	F(4,8) 0.442 (0.775)
Japan	F(8,9) 0.240 (0.971)	F(4,9) 0.393 (0.808)	F(4,9) 0.247 (0.903)
Malaysia	F(8,9) 1.88 (0.181)	F(4,9) 3.61 (0.050)	F(4,9) 0.594 (0.675)
Pakistan	F(8,8) 1.67 (0.241)	F(4,8) 1.23 (0.367)	F(4,8) 0.164 (0.950)

Singapore	F(8,11) 3.42 (0.031)	F(4,11) 1.34 (0.315)	F(4,11) 1.14 (0.387)
South Africa	F(8,8) 4.33 (0.026)	F(4,8) 6.40 (0.012)	F(4,8) 0.283 (0.880)
Sweden	F(8,11) 1.92 (0.155)	F(4,11) 1.41 (0.291)	F(4,11) 0.155 (0.956)
Turkey	F(8,11) 5.90 (0.004)	F(4,11) 6.81 (0.005)	F(4,11) 0.056 (0.993)
UK	F(8,11) 2.76 (0.060)	F(4,11) 3.15 (0.058)	F(4,11) 0.009 (0.999)
USA	F(8,9) 2.54 (0.093)	F(4,9) 2.51 (0.115)	F(4,9) 0.918 (0.493)
Venezuela	F(8,8) 1.97 (0.177)	F(4,8) 2.51 (0.123)	F(4,8) 0.685 (0.621)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All RYD and RDEBT variables are jointly equal to zero, eq. (57').

Column 2: H_0 : All RYD variables are equal to zero, eq. (58').

Column 3: H_0 : All RDEBT variables are equal to zero, eq. (59').

**Table 11: Excess Sensitivity Test Results from eqs. (51), (52), (53), (54) and (55),
using Wald statistic to test the restrictions on coefficients that were
determined jointly within the system in one step.**

Countries	1	2	3	4	5
Belgium	$\chi^2 = 6.363$ (0.896)	$\chi^2 = 0.066$ (1.000)	$\chi^2 = 0.175$ (0.996)	$\chi^2 = 0.024$ (0.999)	$\chi^2 = 0.057$ (0.999)
Canada	$\chi^2 = 10.08$ (0.343)	$\chi^2 = 0.356$ (0.999)	$\chi^2 = 4.432$ (0.218)	$\chi^2 = 0.231$ (0.972)	$\chi^2 = 0.167$ (0.982)
Chile	$\chi^2 = 367952$ (0.000)	$\chi^2 = 91.05$ (0.000)	$\chi^2 = 21.67$ (0.000)	$\chi^2 = 1.171$ (0.759)	$\chi^2 = 1.774$ (0.620)
Egypt	$\chi^2 = 12.67$ (0.177)	$\chi^2 = 0.004$ (1.000)	$\chi^2 = 12.65$ (0.005)	$\chi^2 = 0.001$ (0.999)	$\chi^2 = 0.000$ (0.999)
El Salvador	$\chi^2 = 7.59$ (0.815)	$\chi^2 = 1.78$ (0.986)	$\chi^2 = 1.40$ (0.843)	$\chi^2 = 1.49$ (0.827)	$\chi^2 = 0.125$ (0.998)
Finland	$\chi^2 = 31.79$ (0.000)	$\chi^2 = 0.950$ (0.987)	$\chi^2 = 7.320$ (0.062)	$\chi^2 = 0.153$ (0.984)	$\chi^2 = 0.623$ (0.890)
France	$\chi^2 = 6.40$ (0.894)	$\chi^2 = 0.027$ (1.000)	$\chi^2 = 0.081$ (0.999)	$\chi^2 = 0.006$ 0.999	$\chi^2 = 0.020$ (0.999)
Germany	$\chi^2 = 15.66$ (0.074)	$\chi^2 = 0.220$ (0.999)	$\chi^2 = 6.096$ (0.107)	$\chi^2 = 0.047$ (0.997)	$\chi^2 = 0.179$ (0.980)
India	$\chi^2 = 48.46$ (0.000)	$\chi^2 = 0.402$ (0.998)	$\chi^2 = 8.866$ (0.031)	$\chi^2 = 0.134$ (0.987)	$\chi^2 = 0.296$ (0.960)
Italy	$\chi^2 = 0.093$ (1.000)	$\chi^2 = 0.029$ (1.000)	$\chi^2 = 0.038$ (0.994)	$\chi^2 = 0.011$ (0.999)	$\chi^2 = 0.019$ (0.999)
Japan	$\chi^2 = 1.578$ (0.999)	$\chi^2 = 1.252$ (0.996)	$\chi^2 = 0.202$ (0.995)	$\chi^2 = 0.725$ (0.948)	$\chi^2 = 0.149$ (0.997)
Malaysia	$\chi^2 = 6.028$ (0.914)	$\chi^2 = 1.385$ (0.994)	$\chi^2 = 0.667$ (0.955)	$\chi^2 = 0.241$ (0.993)	$\chi^2 = 0.354$ (0.986)
Pakistan	$\chi^2 = 5.081$ (0.827)	$\chi^2 = 0.128$ (0.999)	$\chi^2 = 3.38$ (0.336)	$\chi^2 = 0.085$ (0.993)	$\chi^2 = 0.120$ (0.989)

South Africa	$\chi^2 = 11.08$ (0.270)	$\chi^2 = 0.139$ (0.999)	$\chi^2 = 8.401$ (0.038)	$\chi^2 = 0.056$ (0.096)	$\chi^2 = 0.089$ (0.993)
Singapore	$\chi^2 = 13.39$ (0.341)	$\chi^2 = 1.36$ (0.994)	$\chi^2 = 1.40$ (0.843)	$\chi^2 = 0.568$ (0.966)	$\chi^2 = 0.162$ (0.996)
Sweden	$\chi^2 = 14.60$ (0.263)	$\chi^2 = 0.189$ (0.999)	$\chi^2 = 0.449$ (0.978)	$\chi^2 = 0.097$ (0.998)	$\chi^2 = 0.116$ (0.998)
Turkey	$\chi^2 = 23.17$ (0.005)	$\chi^2 = 0.000$ (1.000)	$\chi^2 = 23.16$ (0.000)	$\chi^2 = 0.000$ (1.000)	$\chi^2 = 0.000$ (1.000)
UK	$\chi^2 = 13.17$ (0.356)	$\chi^2 = 0.122$ (0.999)	$\chi^2 = 1.016$ (0.907)	$\chi^2 = 0.097$ (0.998)	$\chi^2 = 0.103$ (0.998)
USA	$\chi^2 = 5.14$ (0.821)	$\chi^2 = 0.229$ (0.999)	$\chi^2 = 3.51$ (0.318)	$\chi^2 = 0.155$ (0.984)	$\chi^2 = 0.161$ (0.983)
Venezuela	$\chi^2 = 0.055$ (1.00)	$\chi^2 = 0.012$ (1.00)	$\chi^2 = 0.022$ (0.999)	$\chi^2 = 0.010$ (0.999)	$\chi^2 = 0.002$ (0.999)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51).

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52).

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53).

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54).

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55).

**Table 12: Excess Sensitivity Test Results from eqs. (51'), (52'), (53'), (54') and (55'),
using Wald statistic to test the restrictions on coefficients that were
determined jointly within the system in one step.**

Countries	1	2	3	4	5
Belgium	$\chi^2 = 12.36$ (0.417)	$\chi^2 = 0.042$ (1.000)	$\chi^2 = 0.139$ (0.997)	$\chi^2 = 0.026$ (0.999)	$\chi^2 = 0.023$ (0.999)
Canada	$\chi^2 = 11.20$ (0.261)	$\chi^2 = 0.545$ (0.997)	$\chi^2 = 7.135$ (0.067)	$\chi^2 = 0.364$ (0.947)	$\chi^2 = 0.125$ (0.988)
Chile	$\chi^2 = 367905$ (0.000)	$\chi^2 = 91.04$ (0.000)	$\chi^2 = 21.67$ (0.000)	$\chi^2 = 1.171$ (0.759)	$\chi^2 = 1.773$ (0.620)
Egypt	$\chi^2 = 3.526$ (0.990)	$\chi^2 = 0.430$ (0.999)	$\chi^2 = 1.155$ (0.885)	$\chi^2 = 0.266$ (0.991)	$\chi^2 = 0.360$ (0.985)
El Salvador	$\chi^2 = 25.79$ (0.002)	$\chi^2 = 1.875$ (0.930)	$\chi^2 = 15.89$ (0.001)	$\chi^2 = 1.174$ (0.759)	$\chi^2 = 0.355$ (0.949)
Finland	$\chi^2 = 27.54$ (0.001)	$\chi^2 = 0.672$ (0.995)	$\chi^2 = 8.945$ (0.030)	$\chi^2 = 0.120$ (0.989)	$\chi^2 = 0.473$ (0.924)
France	$\chi^2 = 0.036$ (0.100)	$\chi^2 = 0.000$ (1.00)	$\chi^2 = 0.000$ (1.000)	$\chi^2 = 0.000$ (1.00)	$\chi^2 = 0.000$ (1.00)
Germany	$\chi^2 = 14.66$ (0.100)	$\chi^2 = 0.022$ (0.999)	$\chi^2 = 11.83$ (0.007)	$\chi^2 = 0.030$ (0.998)	$\chi^2 = 0.055$ (0.996)
India	$\chi^2 = 22.03$ (0.008)	$\chi^2 = 0.254$ (0.999)	$\chi^2 = 13.81$ (0.003)	$\chi^2 = 0.107$ (0.990)	$\chi^2 = 0.066$ (0.995)
Italy	$\chi^2 = 8.130$ (0.774)	$\chi^2 = 1.741$ (0.987)	$\chi^2 = 2.149$ (0.708)	$\chi^2 = 1.336$ (0.855)	$\chi^2 = 0.609$ (0.962)
Japan	$\chi^2 = 3.44$ (0.991)	$\chi^2 = 2.890$ (0.941)	$\chi^2 = 0.383$ (0.983)	$\chi^2 = 1.072$ (0.898)	$\chi^2 = 1.212$ (0.876)
Malaysia	$\chi^2 = 7.62$ (0.813)	$\chi^2 = 2.33$ (0.969)	$\chi^2 = 1.54$ (0.813)	$\chi^2 = 1.362$ (0.850)	$\chi^2 = 1.748$ (0.781)
Pakistan	$\chi^2 = 41.15$ (0.000)	$\chi^2 = 3.728$ (0.881)	$\chi^2 = 5.64$ (0.226)	$\chi^2 = 2.659$ (0.616)	$\chi^2 = 1.273$ (0.865)

South Africa	$\chi^2 = 10.20$ (0.334)	$\chi^2 = 0.361$ (0.999)	$\chi^2 = 6.467$ (0.090)	$\chi^2 = 0.055$ (0.996)	$\chi^2 = 0.213$ (0.975)
Singapore	$\chi^2 = 4.46$ (0.973)	$\chi^2 = 0.439$ (0.999)	$\chi^2 = 0.079$ (0.999)	$\chi^2 = 0.136$ (0.997)	$\chi^2 = 0.015$ (0.999)
Sweden	$\chi^2 = 13.39$ (0.340)	$\chi^2 = 0.191$ (0.999)	$\chi^2 = 0.539$ (0.969)	$\chi^2 = 0.170$ (0.996)	$\chi^2 = 0.121$ (0.998)
Turkey	$\chi^2 = 276.5$ (0.000)	$\chi^2 = 8.05$ (0.428)	$\chi^2 = 57.50$ (0.000)	$\chi^2 = 2.55$ (0.635)	$\chi^2 = 1.180$ (0.881)
UK	$\chi^2 = 15.51$ (0.214)	$\chi^2 = 0.066$ (1.00)	$\chi^2 = 1.09$ (0.894)	$\chi^2 = 0.053$ (0.999)	$\chi^2 = 0.052$ (0.999)
USA	$\chi^2 = 9.27$ (0.412)	$\chi^2 = 0.836$ (0.991)	$\chi^2 = 4.86$ (0.182)	$\chi^2 = 0.371$ (0.945)	$\chi^2 = 0.591$ (0.898)
Venezuela	$\chi^2 = 8.73$ (0.725)	$\chi^2 = 1.919$ (0.983)	$\chi^2 = 1.886$ (0.756)	$\chi^2 = 1.886$ (0.756)	$\chi^2 = 0.222$ (0.994)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51').

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52').

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53').

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54').

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55').

Table 13: Excess Sensitivity Test Results from the pooled data, using Wald statistic to test the restrictions on coefficients that were determined jointly within the system in one step for eqs. (51), (52), (53), (54) and (55).

countries	1	2	3	4	5
All	$\chi^2 = 2910.1$	$\chi^2 = 2.814$	$\chi^2 = 572.0$	$\chi^2 = 1.208$	$\chi^2 = 0.238$
countries	(0.000)	(0.831)	(0.000)	(0.751)	(0.971)
Developed	$\chi^2 = 36.55$	$\chi^2 = 1.159$	$\chi^2 = 35.77$	$\chi^2 = 1.06$	$\chi^2 = 0.266$
countries	(0.000)	(0.978)	(0.000)	(0.786)	(0.966)
Developing	$\chi^2 = 38884$	$\chi^2 = 30.70$	$\chi^2 = 354.28$	$\chi^2 = 1.390$	$\chi^2 = 2.433$
countries	(0.000)	(0.000)	(0.000)	(0.707)	(0.480)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51).

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52).

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53).

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54).

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55).

Table 14: Excess Sensitivity Test Results from the pooled data, using Wald statistic to test the restrictions on coefficients that were determined jointly within the system in one step for eqs. (51'), (52'), (53'), (54') and (55').

countries	1	2	3	4	5
All	$\chi^2 = 682.2$	$\chi^2 = 0.110$	$\chi^2 = 615.5$	$\chi^2 = 0.025$	$\chi^2 = 0.033$
countries	(0.000)	(0.999)	(0.000)	(0.998)	(0.998)
Developed	$\chi^2 = 63.23$	$\chi^2 = 3.083$	$\chi^2 = 60.09$	$\chi^2 = 1.22$	$\chi^2 = 0.935$
countries	(0.000)	(0.798)	(0.000)	(0.740)	(0.816)
Developing	$\chi^2 = 41684$	$\chi^2 = 33.68$	$\chi^2 = 364.93$	$\chi^2 = 1.44$	$\chi^2 = 2.56$
countries	(0.000)	(0.000)	(0.000)	(0.694)	(0.465)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51').

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52').

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53').

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54').

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55').

Table 15: Excess Sensitivity Test Results from the pooled data, using F statistic to test the restrictions on coefficients that were determined within the system in two steps for eqs. (51), (52), (53), (54) and (55).

countries	1	2	3	4	5
All countries	F(9,376) 498.8 (0.000)	F(6,376) 0.716 (0.636)	F(3,376) 2.124 (0.096)	F(3,376) 0.907 (0.437)	F(3,376) 0.121 (0.947)
Developed countries	F(9,180) 5.16 (0.000)	F(6,180) 1.68 (0.127)	F(3,180) 6.94 (0.000)	F(3,180) 3.12 (0.027)	F(3,180) 0.051 (0.984)
Developing countries	F(9,183) 2719 (0.000)	F(6,183) 23.11 (0.000)	F(3,183) 18.04 (0.000)	F(3,183) 24.90 (0.000)	F(3,183) 16.24 (0.000)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51).

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52).

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53).

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54).

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55).

Table 16: Excess Sensitivity Test Results from pooled data, using F statistic to test the restrictions on coefficients that were determined within the system in two steps for eqs. (51'), (52'), (53'), (54') and (55').

countries	1	2	3	4	5
All countries	F(9,389) 514.6 (0.000)	F(6,389) 1.02 (0.410)	F(3,389) 2.52 (0.057)	F(3,389) 0.505 (0.678)	F(3,389) 0.539 (0.655)
Developed countries	F(9,188) 6.16 (0.000)	F(6,188) 1.48 (0.131)	F(3,188) 3.32 (0.020)	F(3,188) 2.18 (0.091)	F(3,188) 2.56 (0.055)
Developing countries	F(9,180) 1480 (0.000)	F(6,180) 3.59 (0.002)	F(3,180) 1.15 (0.330)	F(3,180) 3.60 (0.013)	F(3,180) 1.90 (0.130)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51').

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52').

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53').

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54').

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55').

Table 17: Excess Sensitivity Test Results from quarterly data for USA, using Wald statistic to test the restrictions on coefficients that were determined within the system in one step (51), (52), (53), (54) and (55).

country	1	2	3	4	5
USA	$\chi^2 = 4.58$ (0.970)	$\chi^2 = 0.469$ (0.999)	$\chi^2 = 0.073$ (0.999)	$\chi^2 = 0.181$ (0.996)	$\chi^2 = 0.193$ (0.995)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51).

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52).

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53).

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54).

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55).

Table 18: Excess Sensitivity Test Results from quarterly data for USA, using Wald statistic to test the restrictions on coefficients that were determined within the system in one step for eqs. (51'), (52'), (53'), (54') and (55').

country	1	2	3	4	5
USA	$\chi^2 = 5.29$ (0.947)	$\chi^2 = 0.788$ (0.999)	$\chi^2 = 0.712$ (0.949)	$\chi^2 = 0.636$ (0.958)	$\chi^2 = 0.220$ (0.994)

*the degrees of freedom and the levels of significance are in parenthesis.

Column 1: H_0 : All variables are jointly equal to zero, eq. (51').

Column 2: H_0 : All tax and debt variables are jointly equal to zero, eq. (52').

Column 3: H_0 : All income variables are jointly equal to zero, eq. (53').

Column 4: H_0 : All tax variables are jointly equal to zero, eq. (54').

Column 5: H_0 : All debt variables are jointly equal to zero, eq. (55').

VI. CONCLUSION

I tested the RET for twenty countries by using an "excess sensitivity test notion" and a VAR forecast method. Before testing RET, I conducted DF unit root tests, and the cointegration tests by Johansen procedure and concluded that the variables are nonstationary but cointegrated.

Although the basic purpose was to test the RET, I tested both the PIH and the RET separately. I conducted these tests by using, first, income, tax and debt and then, income, tax and deficit as explanatory variables. I reran these tests by replacing income and tax with disposable income. I estimated the coefficients of the regression equations within the system. The result is that the PIH holds in a majority of the countries whereas the RET holds in all twenty cases. The failure of the PIH mostly occurs in developing countries in all regressions. And also due to the limit in international data set, I used pooled data set for all countries, developed countries and developing countries. The PIH failed in all countries, developed countries and developing countries pooled data sets. The RET failed only in the pooled data set for developing countries. When Chile was excluded from the pooled data for developing countries, the RET again held.

The excess sensitivity test for RET used in this study is relatively more efficient than other test procedures that use only the contemporaneous values of variables as explanatory variables. In this study, in order for the consumption function equation to be exactly identified, consumption is regressed on both current (obtained from reduced form parameters) and lagged changes in variables.

The RET and the PIH held in the majority of the countries. The different test results for the PIH and the RET in some developing countries may arise simply from the fact that the PIH test and the RET test employ different variables. The failure of PIH might also be attributed to some factors such as the type of data or sample period used in the model. The data or sample period by itself may cause statistical rejection at a certain level of significance although the theory is correct. Or the failure may originate in structure of the economies under study, i.e., imperfect credit markets. If some individuals are unable to borrow, their consumption might be excessively sensitive to income, tax, and government borrowing (or deficit), with government expenditures are given. Even if individuals revise upward their permanent income due to new information and hence plan to increase their current consumption, they may not be able to fund this increase in consumption at time t . When they reach to an increased income or a credit at time $t + 1$, they will increase their consumption due to upward revision in their permanent income at time t . Then this result would be an excess sensitivity of consumption to previously predicted income (lagged income). The failure of the PIH, on the other hand, seems not to be explained by liquidity constraints given the supportive evidence for the RET. These constraints, if present, should have produced rejection of RET as well.

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