

How Long Can U.S. Consumers Carry the Economy on Their Shoulders?

Philip Arestis, The Levy Economics Institute, and Elias Karakitsos, Trafalgar Asset Managers

Abstract

The consumer has been on a tightrope since the bursting of the “new economy” bubble, as losses in equity markets have been partly offset by gains in real estate and fiscal support and mortgage refinancing have partly offset increased consumer cautiousness. The consumer will remain on a tightrope in the near future, but if the economy were to stumble, the fragile consumer might contribute to turning the downturn into a deep and protracted recession. There are two risks to the continuation of consumer resilience. The first arises from the fact that this has been a jobless recovery. The second arises from a growing personal sector imbalance that is fueled by the growing property bubble. Hence, the short-term outlook remains uncertain, but the long-term one is bleak.

JEL Classification: E21, E32, E37

Keywords: consumption, jobless recovery, personal sector imbalances, property bubble.

INTRODUCTION

Most industrialized economies claim that approximately 70 percent of their GDP comprises consumption. Indeed, Alan Greenspan suggested recently that “The red-hot housing market is likely to cool a bit this year, a move that could dampen consumer spending, a main force keeping the economy going” (New York Times, 4 March, 2003). Understanding consumer behavior is, thereby, paramount in the analysis of the determinants of aggregate demand. Consumers can, therefore, carry the economy on their shoulders. U.S. consumers have actually been doing just that recently. The purpose of this paper is to examine the extent to which U.S. consumers would remain as resilient in the future as they appear to have been in the past. The U.S. consumer has actually been on a tightrope in the aftermath of the burst of the “new economy” bubble, as losses in equity markets have been partly offset by gains in real estate and as the fiscal support and mortgage re-financing has partly offset increased consumer cautiousness. The U.S. consumer will remain on a tightrope in the near future, but if the economy were to stumble then the fragile consumer could very well help to turn the downturn to a deep and protracted recession. There are two risks to the continuous consumer resilience. The first arises from the fact that this has been a jobless recovery. The second risk arises from a growing personal sector imbalance that is fuelled by the growing property bubble. Hence, the short-term outlook remains uncertain, but the long-term one is bleak.

We proceed by discussing the two views that currently prevail on the immediate outlook of consumption. This is followed by an examination of the short- and long-run factors affecting U.S. consumer behavior. This enables us to put forward a theoretical argument and a model of consumer behavior, which we subsequently estimate on U.S. data. The short- and long-run behavior of U.S. consumption is then simulated under two scenarios, before a final section summarizes the argument and concludes.

TWO VIEWS ON CONSUMPTION

In November, 2002, and as Figure 1 shows, real consumption grew 2.7%, relative to the year earlier period (y-o-y), while real disposable income increased 6.1% and the savings ratio remained almost unchanged from the previous month at 4.3% (in this figure, personal savings as percent of personal disposable income is measured on the right vertical axis, while on the left

vertical axis we measure real personal consumption growth and personal disposal income growth). Real consumption expenditure continued to recover in November at 5.6% annualized relative to the previous month (m-o-m) after a -7.6% drop in September. In October consumption increased 2.1% (m-o-m). The recovery was uniform across durables, non-durables and services and hence consumption in the fourth quarter grew at 2.5% (y-o-y), more than had been expected by the consensus. This means that market fears of a very soft fourth quarter proved to be unfounded. For how long can the consumer remain resilient? This is precisely the question we wish to give an answer to in this paper.

There are two views regarding the outlook for consumption. In the first view (the rosy scenario) consumption will remain robust, as real disposable income will receive another sizeable boost from the administration's planned tax cuts. Extremely low interest rates are encouraging consumers to take more debt and have spurred yet another surge in refinancing resulting from lower mortgage interest rates. Hence, the easy stance of fiscal and monetary policy will make sure that consumption remains healthy. This view forms the consensus, shared by the policymakers, economists and the markets. For example, although Greenspan (2003; see also Federal Reserve Board, 2003) expresses some fears about the consumer, maintains the view that consumption will remain robust next year.¹ Bernanke (2003) concurs with this view, suggesting that in the U.S. "households and the banking system seem to be in good financial condition for this stage of the business cycle" (p. 2). This behavior of the U.S. consumer is explained by the growth of real disposable income and, also, movements in real wealth. While the former variable has been a positive factor, the latter "has been more of a mixed bag losses in stock portfolio have been mitigated by significant increases in the value of residential real estate" (Bernanke, *op. cit.*, p. 3). The rise in house prices could potentially produce a "bubble," which, however, is precluded simply because "the rise in house prices appears to have closely tracked economic fundamentals" (Bernanke, *op. cit.*, p. 3). It is thereby concluded that "the bottom line is that the consumer seems in pretty good shape for this stage of the cycle household spending will continue into 2003 and 2004 at a pace consistent with a strengthening recovery" (p. 4). The view of economists, as expressed in Consensus Economics (January,

¹ An interesting argument has been put forward by Kohn (2003), that "The demand for housing as an asset may also reflect some specific institutional changes. In particular, in recent decades, the rise of home equity lines of credit and the lower costs of mortgage refinancing has meant that housing wealth has become increasingly 'liquid,' and as a consequence, may have become more attractive" (p. 5).

2003),² is that although consumption will weaken slightly from 3.1% this year, it will maintain a respectable growth of 2.6% in 2003. The steepness of the yield curve as well as the futures market are discounting that the recovery will firm next year. Investment will pick up next year and this will firm the recovery. The consensus expects that investment will recover next year with growth at 3.4% from -5.7% this year.

In the pessimistic view, which is the minority view, the performance of consumption has been at best modest in the last twelve months, given the sizeable boost in real disposable income from fiscal policy and the accommodative stance of monetary policy. Consumers have saved a large proportion of the fiscal injection, as they are fearful of a double-dip recession that may trigger a collapse in property prices (such a collapse, of course, could come from a burst of the “bubble” in the property market; see Baker, 2002). Some of the losses in equity markets have been offset by gains in property. But there is already a gap between assets and liabilities (i.e. an imbalance) in the personal sector balance sheet. The asset side of the balance sheet has declined, while liabilities have continued to soar (Arestis and Karakitsos, 2003b; Godley, 1999b; Papadimitriou et al, 2002). The income growth prospects remain vulnerable, as the long-term outlook for corporate profits looks increasingly bleak. Costs (both labor and non-labor) are on the increase and the one-off factors that contributed to an improvement in profits following September 11 are fading away. A new round of layoffs and hence a double dip recession may be necessary if profits are to recover. Investment may not recover (Arestis and Karakitsos, 2003a). The current anaemic recovery and the threat of a double-dip recession stems from the weakness of investment, due to excess capacity created in the euphoria years of the “new economy” bubble. The current imbalances of the corporate sector (i.e. the all time high indebtedness in the face of falling asset prices) are preventing investment from picking up and laying the foundations for a new long-lasting business cycle. The poor prospects of the corporate sector are clouding the outlook for income growth and job security in the personal sector. Easy fiscal policy may create a cyclical upturn in the short run, but such a stimulus to demand is unsustainable in the long run, as at the root of the problem are the imbalances of the corporate sector that will take time to be corrected (Arestis and Karakitsos, 2003a). Hence, the consumer is vulnerable. Any accident may aggravate the imbalances of the personal sector and trigger a

² Consensus Economics undertakes forecasting exercises based on a number of forecasts, the average of which is what is eventually reported.

huge retrenchment by consumers. Which view is likely to drive consumption in 2003 and beyond?

SHORT-RUN FACTORS AFFECTING CONSUMPTION

The most important determinant of consumption is real disposable income.³ Table 1 shows the sources and disposition of real and nominal disposable income. Personal income consists of earned and unearned income plus transfers payments from the government less personal contributions for social insurance. Disposable income is equal to personal income less taxes, while real disposable income is adjusted for inflation in consumer prices.

Figure 2 shows that personal income as well as wages and salaries, which account for more than half of personal income, continue to recover from last year's recession, but they are still below the average of the previous business cycle. Figure 3 shows that although wages and salaries in the government sector, which account for only 17% of the total, have abated somewhat in the last twelve months, those in the private producing industries have recovered, but remain below the average of the last business cycle. Figure 4 shows that the recovery in wages and salaries is uniform across services, distributive industries and manufacturing, although in the latter they have simply stopped falling. This is not unreasonable, as the brunt of the recession was felt by the manufacturing industry.

Other earned personal income, which accounts for 15% of personal income, is growing satisfactorily. Among the components of other earned personal income, other labor income is at an all time high in the last fifteen years, while proprietor's income, with Inventory Valuation Adjustment (IVA) and Capital Consumption Adjustment (CCA), has recovered to the average of the last business cycle (see Figure 5). Unearned personal income, which accounts for 18% of personal income, is struggling to recover; in fact by January 2003 it is still falling slightly (see Figure 6; in this figure we measure personal dividend income and net personal interest income on the left-hand side vertical axis, and rental income on the right-hand vertical axis).

Figure 7 shows that although personal income has recovered, the recovery in disposable personal income has been even more pronounced. Thus, although personal income grew only 4.5% (y-o-y) in November, disposable personal income grew as much as 8%. This is due to the

³ This is probably one of the very few propositions in economics, accepted on both theoretical and empirical grounds.

fiscal support of the personal sector. The net transfers to persons (transfers less personal contributions to social security) rose from 2% (y-o-y) at the peak of the bubble in March 2000 to 14.6% in February 2002. However, they declined since then to 10.6% (y-o-y) in November 2002 (see Figure 8). Taxes as percent of disposable income have also been cut from the peak of 18.3% in March 2001 to 13.9% in November 2002 (see Figure 8, where NIC stands for National Insurance Contributions; net transfer payments and personal tax and nontax payments are measured on the right-hand side vertical axis, while nontax payments as percent of Disposable Income is measured on the right-hand side vertical axis).

As inflation in consumer prices, measured by the deflator in consumption expenditure, is rather low the growth in real disposable income in November was 6.1% compared with 8% in (nominal) disposable income. The recovery in real disposable income from 0.2% (y-o-y) in the trough in November 2001 to 6.1% in November 2002 has been spectacular and explains why the consumer has been so far resilient. However, there are doubts as to whether real disposable income would maintain its momentum in the near future. If companies were to indulge in a second round of cutting production, laying-off workers and slashing investment, then consumer confidence will be dented, triggering a new round of retrenchment by the personal sector. This would lower demand and firms will respond by a further round of retrenchment, thus creating a downward spiral of falling demand-production-income.

Overall, real disposable income has made a spectacular recovery in the last twelve months. Wages and salaries have recovered, although they remain below their long-term average. Other earned income is growing satisfactorily, whereas unearned income is struggling to recover. However, the most significant boost to real disposable income has come from fiscal policy and this is fading away. The current U.S. administration is planning a new round of tax cuts in the hope that the consumer would maintain its spending momentum, if income continues to grow rapidly. Our view is that when attempting to examine the future outlook for consumption, serious consideration and careful analysis of these long-term factors should be contemplated. We turn to this aspect in what follows.

FORCES RESTRAINING CONSUMPTION IN THE LONG RUN—PERSONAL SECTOR IMBALANCES

Spending decisions depend, in addition to real disposable income, on the long-term factors that shape savings as a percentage of disposable income (the savings ratio). The latter is essentially determined by wealth, job security and consumer confidence.

Figure 9 shows the relationship between net wealth (measured as multiples of disposable income; this is shown on the left-hand side vertical axis of Figure 9) and the savings ratio (this is shown on the right-hand side vertical axis in percentage terms). When net wealth is above its long-term average the savings ratio is low, and vice versa. For example, in the 1950s and 1960s, the golden years of demand-led business cycles, net wealth was above its long-term average and the average savings ratio was low. In the 1970s and the 1980s, the supply-led business cycles associated with the two oil shocks, net wealth fell below its long-term average and consequently the average savings ratio was increased. In the longest bull market from 1982 to 2000 net wealth steadily increased leading to steady decline in the savings ratio. The step function in Figure 9, depicting the average savings ratio, summarizes the negative relationship between wealth and savings ratio rather well.

During the bubble years in the second half of the 1990s net wealth rose to unprecedented levels and the savings ratio reached rock bottom at the peak of the bubble. As equity prices have declined steadily since March 2000 net wealth has fallen, almost to its long-term average of 480% in September 2002, while the savings ratio has increased to 4.3% in November 2002. This rise in the savings ratio reflects increased cautiousness on the part of consumers in the face of falling asset prices with undiminished debt. Figure 10 shows the degree of these personal sector imbalances. Since the peak of the bubble in March 2000 financial assets, measured on the left-hand side vertical axis while Total Debt as percentage of Disposable Income on the right-hand side vertical axis, have fallen \$6.8 trillion, but these have been partly offset by rising property prices of the order of \$3.2 trillion, thereby limiting the erosion of gross wealth to \$3.6 trillion. Real estate as percent of disposable income is at an all time high at 186% (see Figure 11; in this figure the values on the vertical axis are multiples of disposable income). The rise in property prices has led to a continuous increase in debt, which as percent of disposable income reached 103.8% in the third quarter of 2002 (see Figure 10). Since the peak of the bubble debt has increased \$1.5 trillion, thereby resulting in a deterioration of \$5.1 trillion in net wealth. This reduction in net wealth is huge representing half of GDP to which the consumer has yet to

respond. This is so since consumers remain overoptimistic about income growth prospects and foolishly believe that the boom in real estate will continue forever.

Job security and income growth prospects depend on the outlook for the corporate sector. We have argued elsewhere (Arestis and Karakitsos, 2003a, 2003b) that the outlook for both corporate profits and investment is not so rosy. Unemployment reached 6% of the labor force. Although this is low relative to previous business cycles, there has been no job creation in this recovery. Consumer confidence is low, although it has risen from its bottom in October (Conference Board, 2003). Household debt service has only slightly been dented at 14% of disposable income from 14.4%, a fifteen year high reached in the fourth quarter of last year (Figure 12).

Overall, rising property prices have induced U.S. consumers to carry on borrowing, in spite of huge losses in financial wealth. The process of repaying back debt through retrenchment has not yet started, although consumers have become more cautious and have saved a large part of the fiscal stimulus that was received in the last sixteen months. The threat from this new bubble is as bad as the bubble in equities. If the economy were to stumble, then property prices would fall and then consumers would be left with a huge overhang of debt. Repaying their debt would trigger a deep retrenchment that might raise the savings ratio and might indeed cause a deep recession.

THEORETICAL CONSIDERATIONS

The analysis so far enables us to construct a theoretical model of U.S. consumption. This particular framework we estimate and use for further investigation as shown below. We begin with our theoretical framework.

In the very long run—a period of many business cycles—consumption and real disposable income are growing at the same rate so that the ratio of consumption to income (the average propensity to consume) is constant. But in the short run—within a business cycle—consumption can deviate substantially from income. In the Permanent Income hypothesis (Friedman, 1957) and Life Cycle hypothesis (Modigliani and Brumberg, 1954; Ando and Modigliani, 1963) consumers smooth their consumption patterns in the business cycle by basing their expenditure on their estimate of their permanent or trend income. Hence, the saving rate should rise in a boom and fall in a recession as consumers interpret the fluctuations in

current income as temporary. In booms consumers regard the high current income as temporary and save the excess over permanent or trend income for the rainy days. In a recession consumers regard the drop in their current income as temporary and try to safeguard their standard of living by drawing down their savings (wealth). Thus, the saving ratio (the fraction of saving over disposable income S/YD) moves pro-cyclically, thereby rising in booms and falling in recessions. The validity of this relationship, however, has been questioned, based on two arguments.

The first is that consumer behavior is myopic in the sense that the marginal propensity to consume out of transitory income is not zero, as the Permanent Income hypothesis suggests. The second is that consumers in formulating their desired consumption are constrained in terms of achieving the desired level, simply because capital markets are imperfect. Consumers, thus, face liquidity constraints in that they cannot borrow to finance their consumption. Flavin (1985) finds that the response of consumption to current income is due to liquidity constraints rather than myopia. Direct estimates of the importance of liquidity constraints suggest that countries with high reliance of consumption on current income are those where consumers rely less on capital markets (Jappelli and Pagano, 1989; Zeldes, 1989a; see, also, Carroll, 2001).⁴ Campbell and Mankiw (1991) find that consumption for a number of countries can be accounted for by changes in permanent as well as current income suggesting that some households follow the Permanent Income hypothesis or Life Cycle hypothesis, while others the Keynesian consumption function. Indeed, the proportion of households who base their consumption on current income, varies between 20% for Canada to almost 100% for France with Sweden 35%, the U.S. (35%), and the UK (35%)⁵ falling in between (the result for the U.S. is consistent with the finding in Campbell and Mankiw, 1990). These findings are consistent with the notion that countries with less developed credit markets should have a higher proportion of households whose consumption depends on current income.⁶

⁴ The sample in Jappelli and Pagano, 1989) contains countries with capital markets that have reached different degrees of development: Sweden (12), U.S. (21), Japan (34), UK (40), Spain (52), Greece (54), Italy (58), where in brackets the percentage of households that are liquidity-constrained is shown, comprises the sample of countries. Three groupings are identified. Sweden and U.S. have a low percentage of households that are liquidity-constrained; UK and Japan then follow, while for Spain, Greece and Italy the opposite to Sweden and U.S. is true.

⁵ The result for the UK is sensitive to the seasonal adjustment procedure: the 35% quoted in the text is for seasonally adjusted quarterly data; it is 65% when annual differences of seasonal unadjusted data are used. For Japan no relevant percentage was identified (Campbell and Mankiw, 1991, pp. 737-738).

⁶ While it is true that liquidity constraints have received a great deal of attention in the literature, “much work needs to be done to incorporate them in a consistent fashion” (Attanasio and Blank, 2001, p. 6). In this context the

A further argument focuses on another important ingredient of the Life Cycle hypothesis. This relates to the motive for saving, which is to provide for retirement so that the consumers can smooth out their consumption plans for their entire life. Kotlikoff and Summers (1981), however, found that the amount of wealth in the economy is by far too large to finance consumption in retirement thereby rejecting this form of the hypothesis. They conclude that people are saving to leave bequests to their heirs. Hence, the theory should be revised to allow for bequests as an additional motive for saving. In their own words, “Intergenerational transfers appear to be the major element determining wealth accumulation in the United States” (p. 730). Modigliani (1988), however, argues that there are definitional and methodological problems with studies like Kotlikoff and Summers (1981). Once these have been accounted for, “the role of bequest motivated transfers ... seem to play an important role only in the very highest income and wealth brackets. Some portion of bequests, especially in lower income brackets, is not due to a pure bequest motive but rather to a precautionary motive reflecting uncertainty about the length of life, although it is not possible at present to pinpoint the size of this component” (p. 39).

It follows from this analysis that, although there may very well be arguments that contradict the Life Cycle hypothesis, the main tenet of the theory that wealth is an important determinant of consumption and that households smooth out their consumption expenditure through time, remains valid under conditions of uncertainty (Zeldes, 1989b); the consumption “smoothing” approach has received a great deal of attention recently and a growing number of contributions, an area reviewed recently by Browning and Crossley (2001). Under these conditions the motives for saving are also to provide for rainy days. In other words, saving is also *precautionary* and does not just provide for retirement or even for bequests.⁷ The larger share of saving of the old people is consistent with increased risk aversion as people age. Old people are more cautious than the young, they take less risk, and are wary of large medical bills and the possibility of low income during their retirement. Thus, under conditions of uncertainty saving acts as a *buffer stock* (Deaton, 1991; Carroll, 1994, 1997) to enable households to maintain their consumption pattern even when their current income drops below their permanent

difference of consumer behavior in developed and developing economies becomes paramount (for a recent study that concentrates on low-income countries, see Rosenzweig, 2001).

⁷ See Carroll and Kimball (2001) for a discussion of the tight relationship between liquidity constraints and precautionary behavior. In fact, “The precautionary saving motive can generate behavior that is virtually indistinguishable from that generated by a liquidity constraint, because the precautionary saving motive essentially induces self-imposed reluctance to borrow (or to borrow too much)” (Carroll, 2001, p. 32).

income, as for example would be the case if an individual becomes unemployed or the income of a self-employed person drops substantially in a recession.⁸ Consequently, and as Carroll and Samwick (1997) put it, “wealth is higher for households with greater income uncertainty” (p. 42), so that “consumers spend most of their lifetimes trying to maintain a modest “target” wealth-to-income ratio” (p. 68) and save for retirement later in their lives.⁹ Uncertainty and “buffer-stock” saving behavior contain the implication of a concave consumption function, with the interesting characteristic that there are differences between marginal propensities to consume out of different income brackets (higher income groups have a lower marginal propensity to consume than lower income groups), a characteristic noted some time ago by Keynes (1936).

These developments entail interesting implications, which can be highlighted as follows. We may begin by writing consumer behavior as:

$$(1) C = c.(YP)$$

where C is consumption, c is marginal propensity to consume out of permanent income (YP). We may also write disposal income of the personal sector (YD) as:

$$(2) YD = C + S$$

where S stands for savings. Substituting (2) into (1) we may arrive at (3):

$$(3) (S/YD) = 1 - c.(YP/YD)$$

In a boom current income exceeds permanent income and the ratio (YP/YD) falls which leads to a rise in the saving ratio (S/YD). In a recession current income falls short of permanent income the ratio (YP/YD) rises which leads to a fall in the saving ratio. However, if we re-write (1) as in (1a):

⁸ Two further dimensions of the analysis in the text are worth mentioning: the first is the possibility of discounting of the future changing over time, the hybolic discounting approach (Angeletos et al., 2001); and the second that refers to cross-national differences in savings rates (Deaton, 1992).

⁹ Carroll and Samwick (1997), using the Panel Study of Income Dynamics, provide evidence that supports the proposition that consumers who face greater uncertainty hold more wealth, and that they engage in “buffer-stock” saving behavior.

$$(1a) C = c_1.(YP) + c_2.(NW)$$

where NW is net wealth, and substitute (1a) into (2), we can arrive at equation (4):

$$(4) (S/YD) = 1 - c_1.(YP/YD) - c_2.(NW/YD)$$

It is clear from equation (4) that the saving ratio depends not only on the ratio of permanent to current income in the business cycle, but also on the wealth-income ratio. Thus, although in a boom the permanent to current income ratio falls, the wealth-income ratio may rise sufficiently to cause a fall instead of a rise in the saving ratio. This can be easily explained. Consumers have a target level for their wealth so that they can finance their own future consumption as well as that of their children in the form of bequests. Hence, households determine the optimal rate of their annual saving on the basis of their expectations about future income, asset prices, interest rates and inflation. In addition consumers take into account their precautionary saving—for the rainy days. If plans turn out as expected there is no need for adjusting their saving rate. However, if wealth is rising faster than expected their need to save is reduced, while if wealth is falling short of its target then consumers need to save more. Wealth can rise faster than expected if asset prices increase or income is growing faster or if inflation falls more than anticipated. Hence, the saving ratio varies in a way to achieve the target wealth in the face of unexpected developments in the main determinants of the future path of wealth. Hence, in order to analyze the behavior of the saving ratio in the business cycle we must examine the determinants of the wealth-income ratio.

Wealth is created by the accumulation of past savings. But wealth is kept or invested in various assets (tangible and financial) and consumers can additionally borrow using as a collateral their assets in order to increase the value of their wealth through investment. Thus, wealth is properly defined as *net* wealth, which is the value of assets less the liabilities of consumers. The value of assets and liabilities can increase or decrease as their prices change through time thereby altering the net wealth of consumers. At any point in time, consumers would have a target wealth which is computed on the required consumption for the remainder of their life expectancy taking into account that one of the spouses may live to become very old, the bequests consumers would like to leave to their heirs and the amount of precautionary saving in case they are faced with large medical bills during retirement. Since the target level of

wealth would finance future consumption for themselves or their children, consumers would attempt to estimate their permanent or lifetime resources and the desired level of consumption.

Furthermore, actual wealth would fluctuate around its target level as asset prices fluctuate in the course of the business cycle and consumers take advantage of low or high interest rates to borrow or repay their debts. Moreover, other variables, like consumer confidence influenced by the level and rate of change of unemployment, inflation, wage-settlements and interest rates, the length and depth of the recession or the extent of the boom may affect the level of precautionary saving and consumers' estimate of their permanent income. In good periods, like a boom in the property or the equity market, wealth may exceed its target prompting consumers to spend more thereby reducing their savings ratio, as they feel wealthier. This situation may be accentuated if economic activity is buoyant in which consumer confidence is rising, prompting consumers to borrow more as their estimate of their permanent income is also rising.

In bad periods, after a bust in the property or equity market or because their debt increased wealth may fall short of its target prompting consumers to spend less thereby raising their saving ratio as they feel poorer. This situation may be aggravated if falling wealth is accompanied by a recession in which consumer confidence is eroded, precautionary saving is increased and the estimate of their permanent income is reduced thereby prompting consumers to repay their debt. Hence, the adjustment of the saving ratio in the course of the business cycle requires an evaluation of all components of net wealth as well as the factors, which affect permanent income. In this framework the interest rate becomes a very important variable because it affects directly (through valuation) or indirectly (through other macro-variables) all components of the personal sector net wealth. Thus, in periods of high interest rates the value of bonds falls, house prices and the value of shares decline, servicing the debt increases or the value of debt increases through the restructuring of loans. Accordingly, consumer net wealth declines as the value of assets falls, whereas the liabilities increase. Consumer wealth falls short of its target prompting consumers to spend less and rebuild their wealth by saving more as they feel poorer. In contrast, in periods of low interest rates the value of bonds rises, house prices and the value of equities increase, servicing the debt becomes easier or the value of debt is reduced through the restructuring of loans. Accordingly, consumer net wealth exceeds its target prompting consumers to lower their savings ratio.

We may now use these propositions and the analysis, as in, for example, Frowen and Karakitsos (1996), to clarify the point that in a leveraged economy the savings ratio moves counter-cyclically, so that it falls in a boom and rises in a recession. In boom years asset prices rise faster than usual as consumers borrow against these assets to invest even more (leveraging). To the extent that consumers save to achieve a desired volume of wealth, then faster than usual rising asset prices make people feel wealthier inducing them to relax on their effort to save as they believe that they can meet their targets for savings (e.g. provide for pension, leave to their heirs, etc.) more comfortably in this way. Hence, the savings ratio falls in a boom. In a recession asset prices fall and people are left with an overhang of debt. In order to repay their debt people cut on consumption out of current income and intensify on their effort to save in order to rebuild their wealth. Hence, the savings ratio increases in a recession. We may also think of the rate of interest as an important determinant of consumption. Changes in the rate of interest can affect consumption in two ways. A higher rate of interest, for example, means higher returns on savings, so that consumers increase their consumption due to this income effect. At the same time, however, a higher rate of interest and the higher returns on savings this implies, causes consumers to substitute consumption for savings; there is, thus, a substitution effect in addition to the income effect referred to earlier. *Mutatis mutandis* in the case of a lower rate of interest being the object of analysis. The overall impact of a change in the rate of interest, then, depends crucially on the relative strength of the two effects to which we have just referred.

In the short run, therefore, consumption depends on real disposable, the savings ratio and the rate of interest. Our analysis clearly suggests that consumption may be written formally as in equation (5):

$$(5) C = C(DY, SR, R)$$

where C is as defined above, DY is real disposable income of the personal sector, SR is the savings ratio as defined above (i.e. S/YD), and R is the rate of interest.

The long-run forces that determine the savings ratio are net wealth and uncertainty about job security and income growth prospects. For the reasons discussed earlier, a rise in net wealth lowers the savings ratio and vice versa. An increase in uncertainty about job security and income growth prospects makes people more cautious inducing them to refrain from spending

out of current income, thereby raising the savings ratio. This analysis, then, leads us to hypothesize that the savings ratio is determined as in equation (6):

$$(6) \text{ SR} = \text{SR}(\text{NW}/\text{YD}, \text{UN}, \text{CNF})$$

where NW/YD is the ratio of net wealth (NW) to YD of the personal sector, UN is unemployment and CNF is consumer confidence.

The structure of the two relationships just portrayed captures the rationale of the short-run and long-run factors affecting consumption in the way explained above. Appropriate substitution of equation (2) into equation (1) yields our estimable equation (3):

$$(7) \text{ C} = \text{C}(\text{DY}, \text{NW}/\text{YD}, \text{UN}, \text{CNF}, \text{R})$$

An increase in real disposable income growth raises the rate of growth of real consumption by the same rate in the very long run (steady state). However, in the short run consumption rises less than income. An increase in net wealth lowers the savings ratio, thereby increasing real consumption growth.¹⁰ The wealth effect is very important in this theoretical framework and has long lasting effects. An increase in unemployment or a decline in consumer confidence increases uncertainty regarding job security and income growth prospects, hence raises the savings ratio, which, in turn, lowers consumption growth. An increase in the rate of interest lowers real consumption growth, if the substitution effect is higher than the income effect.

Equation (7) is precisely the equation that is estimated for the purposes of our analysis. We turn to the discussion of the empirical evidence in the section that follows.

EMPIRICAL INVESTIGATION AND EVIDENCE

In our model of consumer behavior, consumption is modelled both on monthly data for short-term projections, one to three months, and on quarterly data for medium to long-term projections, one to two years. It should be noted that both models have exactly the same

¹⁰ In Godley (1996, 1999a, 1999b) wealth effects in the Consumption Function are of crucial importance. This work follows Christ (1967) and Blinder and Solow (1973) in its emphasis on the limited nature of the models that do not account for stock/flow equilibrium/disequilibrium.

structure. The monthly model covers the period 1987(1)–2002(11), while the quarterly model covers the period 1969(1)–2002(3). A version of the quarterly model that excludes consumer confidence, for which data begin in 1968, covers an even longer period, 1952(1) – 2002(3). In terms of the variables utilized, we may note that C is Real Consumer Expenditure; CNFYOY is Conference Board Consumer Confidence Index, expressed as percentage change over the previous year earlier period; DY = Real Disposable Personal Income; ECM_{ij} is the residuals from the co-integrating equation; NW is personal sector net worth as percent of nominal disposable personal income; R10YH is the real 10-year Treasury Yield, adjusted with the headline measure of CPI inflation; UN is unemployment as percent of labor force; the letter L before a variable means that that variable is in natural logarithms; the letter Dj before a variable means that that variable is in the order of a j difference. Data were obtained from the Flow of Funds Accounts, Board of Governors of the Federal Reserve System and from NIPA accounts of the Bureau of Economic Analysis. The estimated relationships are reported in the Appendix.

Our approach to the estimation of the relationships in the Appendix is to begin by estimating a long-run relationship, along within the Engle-Granger framework and the Augmented Dickey-Fuller (ADF) test (Engle and Granger, 1987). In this way we can make sure for the presence of a unit root (under the null of no cointegration), so that non-stationary variables form a stationary cointegrating relationship. If this passes the test of cointegration, we can then proceed to estimate the dynamic relationship that corresponds to the cointegrating relationship. This means estimating the short-run error correction mechanism (ECM), using the estimates of disequilibrium to obtain information on the speed of adjustment to equilibrium. In other words, we begin by estimating equation (3) and then use the residuals (ε_t) of the estimated form of equation (7), to conduct the ADF test:

$$(8) D\varepsilon_t = a + b\varepsilon_{t-1} + \sum c_i D\varepsilon_{t-1}$$

and pay particular attention to the value of b under the assumption of no cointegration. If the test is passed, we proceed to estimate the dynamic short-run relationship:

$$(9) DLC_t = d + e \varepsilon_{t-1} + f DLC_{t-i} + g DX_{t-i}$$

with $e < 0$; DX incorporates all the other variables in “change” format.

The estimated relationships (shown in the Appendix) are well specified with satisfactory statistics/diagnostics. The model structure is stable in that it is capable of explaining with relatively great precision the behavior of consumption in the span of the period mentioned above. The forecast error of the model is only 0.5%. Hence, forecast errors that exceed 1% occur less frequently than 5% of the time. Figure 13 shows that in the last 35-years—around 140 observations—the error in consumption significantly exceeded 1% in only five occasions.

We illustrate the importance of the various determinants of consumption as these have been shown to influence it in the Appendix, by conducting a sensitivity analysis as follows. Growth rates have been perturbed by 100%, i.e. they have been doubled, while ratios have been increased by 10%. The sensitivity analysis shows the order of importance of the various determinants, starting from the most to the least important: real disposable income, net wealth, consumer confidence, real mortgage rate and, finally, unemployment. A sustained increase in real disposable income growth leads to an equal increase in consumption growth in the long run. A sustained ten percent increase in net wealth leads to around 4% increase in consumption growth. Net wealth is thereby shown to be the second most important determinant of consumption.

THE LIKELY IMPACT ON CONSUMPTION

This section is concerned with the picture that emerges when the short- and the long-run factors that shape consumption decisions are put together. Wages and salaries have recovered from their lows in the recession and the tax rebates and tax-cuts have boosted real disposable income. Consumers have also benefited from refinancing as a result of the lower mortgage rates. But consumers have become more cautious as the recovery has not been accompanied by job creation. Increased uncertainty about job security and income growth prospects have induced households to save a large part of the extra fiscal stimulus, although on two occasions they have been lured back to shopping as a result of the discounts offered by car and other manufacturers. But even that effect is petering out. The second round of zero-finance offered in July, 2002, lasted for a shorter period and the spending spree was smaller than the first round in the fourth quarter of 2002. Net wealth has been eroded despite the gains in real estate, and the personal sector imbalance has widened, as debt has continued to soar, while assets have fallen. The bubble in property is a certainty waiting to happen. Households are, therefore, vulnerable to

exogenous shocks that may induce them to save more. The real estate bubble may be pricked either on its own, as expectations of ever rising property prices peter out, or by rising long-term interest rates, if easy fiscal and monetary policy manage to create a cyclical upturn.

In order to evaluate the likely course of consumption over the next two years we have used the estimated relationships cited in the Appendix to simulate two scenarios.

Scenario I (Double-Dip Recession): What would happen to consumption if the economy were to stumble?

Scenario II (Recovery): What would happen to consumption if the economy were to receive a significant boost from fiscal policy?

Scenario I (Double-Dip Recession)

In this scenario the economy stumbles, for example the war in Iraq and the high price of oil causes a collapse in consumer and business confidence and the economy falls into recession. Table 2 summarizes the values that the main determinants of consumption assume and the likely impact on consumption. Real disposable income growth falls by just 1% to 2%. However, the recession is deep of the order of -2.5% in GDP, as the corporate sector responds by cutting production, laying-off people and slashing investment. The recession triggers a collapse in property that leads to a downward spiral on equity prices causing net wealth to fall to 425% of disposable income. Unemployment rises to 7% from its latest value of 6% and consumer confidence falls once more to -5% on a year earlier from its current value of -3%. The real mortgage interest rate remains almost unchanged, as the lower nominal rate is offset by faster falling prices.

Under these circumstances real consumption growth falls -1.7% after one year from the shock, but begins to recover in the second year with growth 0.5%. In the new steady state consumption is 0.9% higher. Hence, although the contraction in consumption is transitory, a very modest decline in real disposable income growth, but combined with a significant fall in net wealth and a reasonable rise in unemployment can cause a significant drop in consumption that lasts for a year. This implies that the recession will last for two years. This scenario illustrates how important the property bubble has been in keeping the consumer resilient both in last year's downturn and in the recovery.

Scenario II (Recovery)

In this scenario a huge fiscal package of the order of 3%, along with a continuous accommodative monetary policy, manage to create a cyclical upturn that creates the impression that the recovery becomes sustainable. In another paper (Arestis and Karakitsos, 2003b) we have shown that the imbalances of the corporate sector will prevent the recovery from becoming sustainable, unless these imbalances are corrected, which however will take time.

The fiscal package lifts real disposable income growth to 5% (y-o-y). The property market bubble grows and, in conjunction with higher economic growth leads to higher equity prices, lifts net wealth to 550% of disposable income. Unemployment falls to 5.5% of the labor force. Consumer confidence is bolstered to 5% (y-o-y) from its current value of -3%. The real mortgage rate rises to 4.5%, as nominal yields rise, but inflation rises, too. Under these circumstances consumption growth rises 2.1% in the first year and 3.8% in the second year compared with the recovery values. In the new steady state consumption growth rises 8.3%, but this conclusion ignores the point that later on the property bubble will burst. The main point of this scenario is to show that fiscal and monetary policy is capable of creating a cyclical upturn that may last for about two years.

SUMMARY AND CONCLUSIONS

The resilience of the consumer has kept the economy floating in the aftermath of the burst of the “new economy” bubble. As the model simulations have shown, this seemingly paradox is due to the replacement of the bubble in equities by a bubble in property. Moreover, the resilience of the consumer is due to the fiscal injection to consumer’s income, as well as to the low interest rates that have allowed mortgage re-financing. However, the bubble in real estate has not managed to prevent an erosion of net wealth, but it has achieved in keeping expectations high. The fiscal support to personal income has also helped in keeping both high expectations and income growth. The first risk to the continuous consumer resilience arises from the fact that this has been a jobless recovery.

The second risk to the consumer resilience arises from a growing personal sector imbalance. Although the precipitous fall in equity prices in the last three years has caused net wealth to return to its long-term average, the personal sector imbalance (i.e. the gap between financial assets and debt) has widened as a result of the property bubble. Rising property prices

have induced consumers to carry on borrowing, in spite of falling equity prices, thereby partly offsetting the losses in financial assets. In the short run the cushioning of net wealth by rising property prices may be beneficial as it postpones the curtailment of debt and the consumer retrenchment, but in the long run it poses a more serious problem as the imbalance of the personal sector is widening. A fall in property prices will be the final straw that would break the camel's back. The property market is a certainty, waiting to happen!

In the short run the planned new fiscal stimulus may succeed in keeping consumption growth healthy, but households are vulnerable to exogenous shocks that may induce them to save more. The real estate bubble, which is fuelled by low interest rates, may be pricked on its own, as expectations of ever rising property prices may finally fade away, or by rising long-term interest rates if the fiscal stimulus succeeds in creating a cyclical recovery. Hence, although the outlook for consumption over the next year remains uncertain, the long-term outlook remains bleak.

There are two further conclusions upon which it is worth commenting. The first is the role of economic policy. We have just commented on fiscal policy, but not much on monetary policy. And yet monetary policy may have a major role to play in a possible recovery. A brief comment on this issue is, therefore, in order. The second is the role and significance of wealth. We begin with the first.

Monetary policy can play a role in terms of the uncertainties to which we have alluded earlier in this contribution. To illustrate we begin by assuming that an “upward” adjustment begins. At the initial phase of this “upward” adjustment process, consumers are not expected to overreact as their incomes begin to grow, and they are able to service their debt. However, to the extent the monetary authorities begin to raise interest rates the economy decelerates, disposable income is reduced and consumers find it difficult to service their debt. The restructuring of the personal sector balance sheet aims at rebuilding wealth by increasing saving and repaying debts. This retrenchment takes many years to unwind. Hence, the ensued recovery is anemic—less buoyant than usual. Indeed, in the recent U.S. experience of a boom-bust cycle in asset prices, with considerable variation in net wealth and increased indebtedness, the recovery was anaemic. This was due precisely to the retrenchment not only of the personal sector, but also of the corporate and financial sectors (Arestis and Karakitsos, 2003b).

This leads conveniently to the second comment on the role and significance of wealth. This is that, contrary to the common belief, the wealth effect in consumption is slow but very

pronounced and is triggered by changes in interest rates. Thus, contrary to the other common belief interest rates have a significant effect on consumption, but which is unleashed gradually through the changes in wealth and the consequent restructuring of the personal sector balance sheet.

REFERENCES

- Ando, A. and Modigliani, F. 1963. "The 'Life Cycle' Hypothesis of Saving: Aggregate Implications and Tests." *American Economic Review* 53: 55-84.
- Angeletos, G. M., Laibson, D., Repetto, A., Tobacman, J. and Weinberg, S. 2001. "Hyperbolic Consumption Model: Calibration, Simulation, and Empirical Evaluation." *Journal of Economic Perspectives* 15(3): 47-68.
- Attanasio, O. P. and Blank, J. 2001. "The Assessment: Household Saving: Issues in Theory and Policy." *Oxford Review of Economic Policy* 17(1): 1-19.
- Arestis, P. and Karakitsos, E. 2003a. "How Far Can U.S. Equity Prices Fall Under Asset and Debt Deflation?" Working Paper No. 368. Annandale-on-Hudson, N.Y.: The Levy Economics Institute.
- . 2003b. "The Conditions for Sustainable U.S. Recovery: The Role of Investment." Working Paper No. 378. Annandale-on-Hudson, N.Y.: The Levy Economics Institute.
- Baker, D. 2002. "The Run-Up in Home Prices: Is It Real or Is It Another Bubble?" *Center for Economic and Policy Research*, Briefing Paper, August.
- Bernanke, B. S. 2003. "Balance Sheets and the Recovery." *41st Annual Conference*, Winter Institute, St. Cloud State University, St. Cloud: Minnesota, 21 February.
- Blinder, A. and Solow, R. 1973. "Does Fiscal Policy Matter?" *Journal of Public Economics*: November.
- Browning, M. and Crossley, T. F. 2001. "The Life-Cycle Model of Consumption and Saving." *Journal of Economic Perspectives* 15(3): 3-22.
- Campbell, J. and Mankiw, N. G. 1991. "The Response of Consumption to Income: A Cross-Country Investigation." *European Economic Review* 35: 723-767.
- . 1990. "Permanent Income, Current Income, and Consumption." *Journal of Business and Economics* 8: 269-279.
- Carroll, C. D. 1994. "How Does Future Income Affect Current Consumption?" *Quarterly Journal of Economics* 109(1): 111-147.
- . 1997. "Buffer-Stock Saving and the Life Cycle/Permanent Income Hypothesis." *Quarterly Journal of Economics* 112(1): 1-56.
- . 2001. "A Theory of the Consumption Function, With and Without Liquidity Constraints." *Journal of Economic Perspectives* 15(3): 23-45.

- Carroll, C. D. and Kimball, M. S. 2001. "Liquidity Constraints and Precautionary Saving." *NBER Working Paper No. 8496*. Cambridge, Mass.: National Bureau of Economic Research.
- Carroll, C. D. and Samwick, A. A. 1997. "The Nature of Precautionary Wealth." *Journal of Monetary Economics* 40(1): 41-71.
- Conference Board. 2003. "Consumer Confidence Index." *Consumer Confidence Survey*. February.
- Christ, C. 1967. "A Short-Run Aggregate Demand Model of the Interdependence and Effects of Monetary and Fiscal Policies with Keynesian and Classical Interest Elasticities." *American Economic Review*. Papers and Proceedings, May.
- Deaton, A. 1991. "Saving and Liquidity Constraints" *Econometrica* 59(5): 1221-1248.
- . 1992. *Understanding Consumption*. Oxford: Oxford University Press.
- Engle, R. F. and Granger, C. W. J. 1987. "Cointegration and Error Correction: Representation, Estimation and Testing," *Econometrica* 55: 251-276.
- Federal Reserve Board. 2003. *Monetary Policy Report*. Submitted to the Congress, 11, February.
- Flavin, M. 1985. "Excess Sensitivity of Consumption to Current Income: Liquidity Constraints or Myopia." *Canadian Journal of Economics* 18: 117-136.
- Friedman, M. 1957. *A Theory of the Consumption Function*. Princeton, N.J.: Princeton University Press.
- Frown S. F. and Karakitsos, E. 1996. "Monetary and Fiscal Policy Under Conditions of Globalized Money and Capital Markets: Lessons For The UK Personal Sector." *Public Finance* 51(3): 305-324.
- Godley, W. 1996. "Money, Finance and National Income Determination: An Integrated Approach." Working Paper No. 167. Annandale-on-Hudson, N.Y.: The Levy Economics Institute.
- . 1999a. "Seven Unsustainable Processes: Medium-Term Prospects and Policies for the United States and the World." *Strategic Analysis*. Annandale-on-Hudson, N.Y.: The Levy Economics Institute.
- . 1999b. "Money and Credit in a Keynesian Model of Income Determination." *Cambridge Journal of Economics* 23(4): 393-411.
- Greenspan, A. 2003. "Federal Reserve Board's Semiannual Monetary Policy Report to the Congress." *Testimony Before the Committee on Banking, Housing, and Urban Affairs*. U.S. Senate, February 11.

- Jappelli, T. and Pagano, M. 1989. "Consumption and Capital Market Imperfections: An International Comparison." *American Economic Review* 79(5): 1088-1105.
- Keynes, J. M. 1936. *The General Theory of Employment, Interest, and Money*, London: Macmillan.
- Kohn, D. L. 2003. "Strength in Consumer Durables and Housing," Speech given at the *Conference on Finance and Macroeconomics*, sponsored by the Federal Reserve of San Francisco and Stanford Institute for Economic Policy Research, California: San Francisco, 23 February.
- Kotlikoff, L. J. and Summers, L. H. 1981. "The Role of Intergenerational Transfers in Aggregate Capital Accumulation." *Journal of Political Economy* 89(4): 706-732.
- Modigliani, F. 1988. "The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth." *Journal of Economic Perspectives* 2(2): 15-40.
- Modigliani, F. and Brumberg, R. 1954. "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data." In K. K. Kurihara, ed. *Post-Keynesian Economics*. New Brunswick, N.J.: Rutgers University Press.
- Papadimitriou, D., Shaikh, A., Dos Santos, C. and Zezza, G. 2002. "Is Personal Debt Sustainable?" *Strategic Analysis*. Annandale-on-Hudson, N.Y.: The Levy Economics Institute.
- Rosenzweig, M. R. 2001. "Saving Behaviour in Low-Income Countries." *Oxford Review of Economic Policy* 17(1): 40-54.
- Zeldes, S. 1989a. "Consumption and Liquidity Constraints: an Empirical Investigation." *Journal of Political Economy* 97: 305-346.
- . 1989b. "Optimal Consumption with Stochastic Income: Deviations from Certainty Equivalence." *Quarterly Journal of Economics* 104: 275-298.

APPENDIX: ESTIMATED EQUATIONS

MONTHLY CONSUMPTION MODEL

Co-integrating Equation

Dependent Variable: LC

Method: Least Squares

Sample(adjusted): 1988:01 2002:10

Included observations: 178 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CNST	-1.143473	0.073099	-15.64289	0.0000
LDY	1.116723	0.009671	115.4759	0.0000
LNW	0.045284	0.016254	2.786108	0.0059
UN	-0.003508	0.001126	-3.114641	0.0022
CNFYOY	0.000168	4.10E-05	4.102471	0.0001
R10YH	-0.002689	0.001094	-2.456976	0.0150
R-squared	0.995939	Mean dependent var	8.549264	
Adjusted R-squared	0.995821	S.D. dependent var	0.139542	
S.E. of regression	0.009020	Akaike info criterion	-6.545555	
Sum squared resid	0.013995	Schwarz criterion	-6.438304	
Log likelihood	588.5544	F-statistic	8437.303	
Durbin-Watson stat	0.869146	Prob(F-statistic)	0.000000	
ADF Test Statistic	-3.518040	1% Critical Value*	-3.4693	
		5% Critical Value	-2.8782	
		10% Critical Value	-2.5756	

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM02)

Method: Least Squares

Date: 03/12/03 Time: 10:56

Sample(adjusted): 1988:06 2002:10

Included observations: 173 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM02(-1)	-0.306388	0.087091	-3.518040	0.0006
D(ECM02(-1))	-0.171927	0.098311	-1.748807	0.0822
D(ECM02(-2))	-0.140437	0.090836	-1.546053	0.1240
D(ECM02(-3))	-0.209576	0.084973	-2.466398	0.0147
D(ECM02(-4))	-0.056356	0.077939	-0.723075	0.4706
CNST	-9.43E-05	0.000561	-0.168096	0.8667
R-squared	0.245757	Mean dependent var	-9.09E-05	
Adjusted R-squared	0.223175	S.D. dependent var	0.008367	
S.E. of regression	0.007374	Akaike info criterion	-6.947542	
Sum squared resid	0.009082	Schwarz criterion	-6.838179	
Log likelihood	606.9623	F-statistic	10.88281	
Durbin-Watson stat	1.991663	Prob(F-statistic)	0.000000	

Dynamic Equation

Dependent Variable: D12LC

Method: Least Squares

Sample(adjusted): 1989:01 2002:10

Included observations: 166 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CNST	0.003171	0.001224	2.590552	0.0105
D12LC(-1)	0.626398	0.049562	12.63878	0.0000
ECM02(-12)	-0.380071	0.058010	-6.551765	0.0000
D12LDY	0.302749	0.045208	6.696842	0.0000
DLDY(-1)	-0.141710	0.056345	-2.515053	0.0129
D12LNW	0.035507	0.008793	4.038188	0.0001
D12UN(-1)	-0.002108	0.000785	-2.686643	0.0080
DCNF	0.000107	4.90E-05	2.177711	0.0309
R-squared	0.863641	Mean dependent var		0.030688
Adjusted R-squared	0.857599	S.D. dependent var		0.013494
S.E. of regression	0.005092	Akaike info criterion		-7.675275
Sum squared resid	0.004097	Schwarz criterion		-7.525299
Log likelihood	645.0478	F-statistic		142.9576
Durbin-Watson stat	2.037721	Prob(F-statistic)		0.000000

QUARTERLY CONSUMPTION MODEL

Co-integrating Equation

Dependent Variable: LC

Method: Least Squares

Sample(adjusted): 1968:1 2002:3

Included observations: 139 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CNST	-0.606037	0.029325	-20.66616	0.0000
LDY	1.035062	0.004397	235.3764	0.0000
LNW	0.143707	0.017698	8.119814	0.0000
UN	-0.003057	0.000879	-3.476268	0.0007
R10YH	-0.001360	0.000409	-3.325845	0.0011
CONFYOY	0.000186	3.88E-05	4.808316	0.0000
R-squared	0.998973	Mean dependent var	8.232774	
Adjusted R-squared	0.998935	S.D. dependent var	0.318953	
S.E. of regression	0.010411	Akaike info criterion	-6.249786	
Sum squared resid	0.014415	Schwarz criterion	-6.123118	
Log likelihood	440.3601	F-statistic	25880.16	
Durbin-Watson stat	0.806755	Prob(F-statistic)	0.000000	
ADF Test Statistic	-4.066320	1% Critical Value*	-3.4800	
		5% Critical Value	-2.8830	
		10% Critical Value	-2.5781	

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM01)

Method: Least Squares

Sample(adjusted): 1969:2 2002:3

Included observations: 134 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM01(-1)	-0.377854	0.092923	-4.066320	0.0001
D(ECM01(-1))	-0.211165	0.104476	-2.021194	0.0453
D(ECM01(-2))	0.107314	0.105607	1.016166	0.3115
D(ECM01(-3))	0.253873	0.105538	2.405520	0.0176
D(ECM01(-4))	0.111212	0.093773	1.185962	0.2378
CNST	-8.74E-05	0.000687	-0.127316	0.8989
R-squared	0.287744	Mean dependent var	6.08E-05	
Adjusted R-squared	0.259921	S.D. dependent var	0.009212	
S.E. of regression	0.007925	Akaike info criterion	-6.793804	
Sum squared resid	0.008039	Schwarz criterion	-6.664050	
Log likelihood	461.1849	F-statistic	10.34211	
Durbin-Watson stat	1.982249	Prob(F-statistic)	0.000000	

Dynamic Equation

Dependent Variable: D4LC

Method: Least Squares

Sample(adjusted): 1969:1 2002:3

Included observations: 135 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CNST	0.006094	0.001680	3.626932	0.0004
D4LC(-1)	0.779051	0.057837	13.46974	0.0000
D4LC(-4)	-0.149524	0.038699	-3.863746	0.0002
ECM01(-4)	-0.233992	0.073746	-3.172950	0.0019
D4LDY	0.312992	0.060263	5.193723	0.0000
D4LDY(-1)	-0.121418	0.054942	-2.209929	0.0289
DLNW	0.062094	0.026593	2.334947	0.0211
DUN	-0.007864	0.002004	-3.923299	0.0001
DCONF	0.000127	3.21E-05	3.951450	0.0001
R-squared	0.874020	Mean dependent var		0.032462
Adjusted R-squared	0.866021	S.D. dependent var		0.018187
S.E. of regression	0.006657	Akaike info criterion		-7.121927
Sum squared resid	0.005584	Schwarz criterion		-6.928242
Log likelihood	489.7301	F-statistic		109.2698
Durbin-Watson stat	2.102804	Prob(F-statistic)		0.000000

Table 1: Sources and Disposition of Personal Income

	November-02	Billions of Dollars	%
1. Wages & Salaries		5101.9	
% of Personal Income			56%
2. Other Earned Personal Income (Other Labor Income & Proprietor's Income)		1402.4	
% of Personal Income			15%
3. Unearned Personal Income (Rental, Dividend & Interest Income)		1656.4	
% of Personal Income			18%
4. Transfer payments to persons		1308.9	
% of Personal Income			14%
5. Less: Personal contributions for social insurance		391.3	
% of Personal Income			4%
6. Personal income (sum of (1-4) - 5)		9078.3	100%
7. Less: Personal tax and nontax payments		1105.3	
% of Personal Income			12%
8. Equals: Disposable personal income		7973	
% of Personal Income			88%
9. Less: Personal outlays		7633.2	100%
9.1 Personal consumption expenditures		7413	
% of Personal Outlays			97.1%
9.2 Interest paid by persons		187.3	
% of Personal Outlays			2.5%
9.3 Personal transfer payments to the rest of the world (net)		32.9	
% of Personal Outlays			0.4%
10. Equals: Personal saving (8 - 9)		339.8	
11. Personal saving as a percentage of disposable personal income			4%
12. Real Disposable Personal Income (billions of chained 1996 dollars)		7126.6	

TABLE 2: THE EFFECT OF DOUBLE-DIP RECESSION AND RECOVERY ON CONSUMPTION

Assumptions	Scenario I		Scenario II				Sensitivity of Scenario II			
	Current Values (Base)	Double-Dip Recession	Recovery	Real Disposable Income	Net Wealth	Unemployment	Consumer Confidence	Real Mortgage Rate		
Real Disposable Income, % YoY	3	2	5	10						
Net Wealth to Disposable Income ratio	5	425	550		605					
Unemployment as percent of Labor Force	6	7	5.5			11				
Consumer Confidence, % YoY	-3	-5	5				10			
Real Mortgage Interest rate, % p.a.	3	2.9	4.5					9		
Effect on Consumption										
1-Year Expected Consumption \$ billion	6609	6495	6750	6871	6738	6615	6694	6692		
% of Base or % of Recovery (1)		-1.7%	2.1%	1.8%	-0.2%	-2.0%	-0.8%	-0.9%		
2-Year Expected Consumption \$ billion		6645	6860	7325	7099	6823	7036	7036		
% of Base or % of Recovery (1)		0.5%	3.8%	6.8%	3.5%	-0.5%	2.6%	2.6%		
Steady State Consumption \$ billion		6669	7155	7425	7435	7253	7408	7312		
% of Base or % of Recovery (1)		0.9%	8.3%	10.0%	3.9%	1.4%	3.5%	2.2%		

(1) For the two scenarios the % change is computed relative to the base value (6609); for the sensitivity analysis the % change is computed relative to the recovery value (6750).

Figure 1: Consumption, Income & Savings

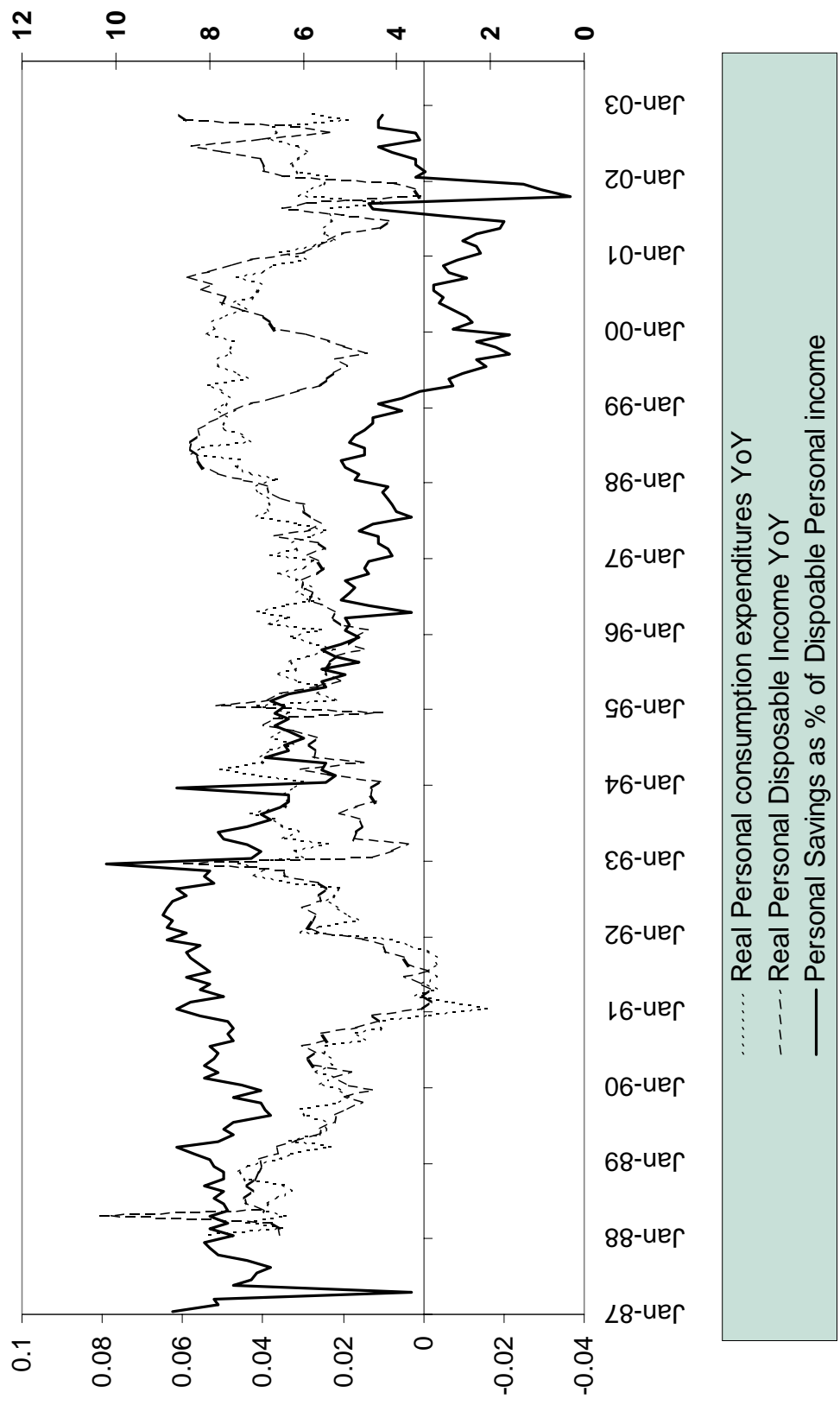


Figure 2: Personal Income and Wages & Salaries (Nominal)

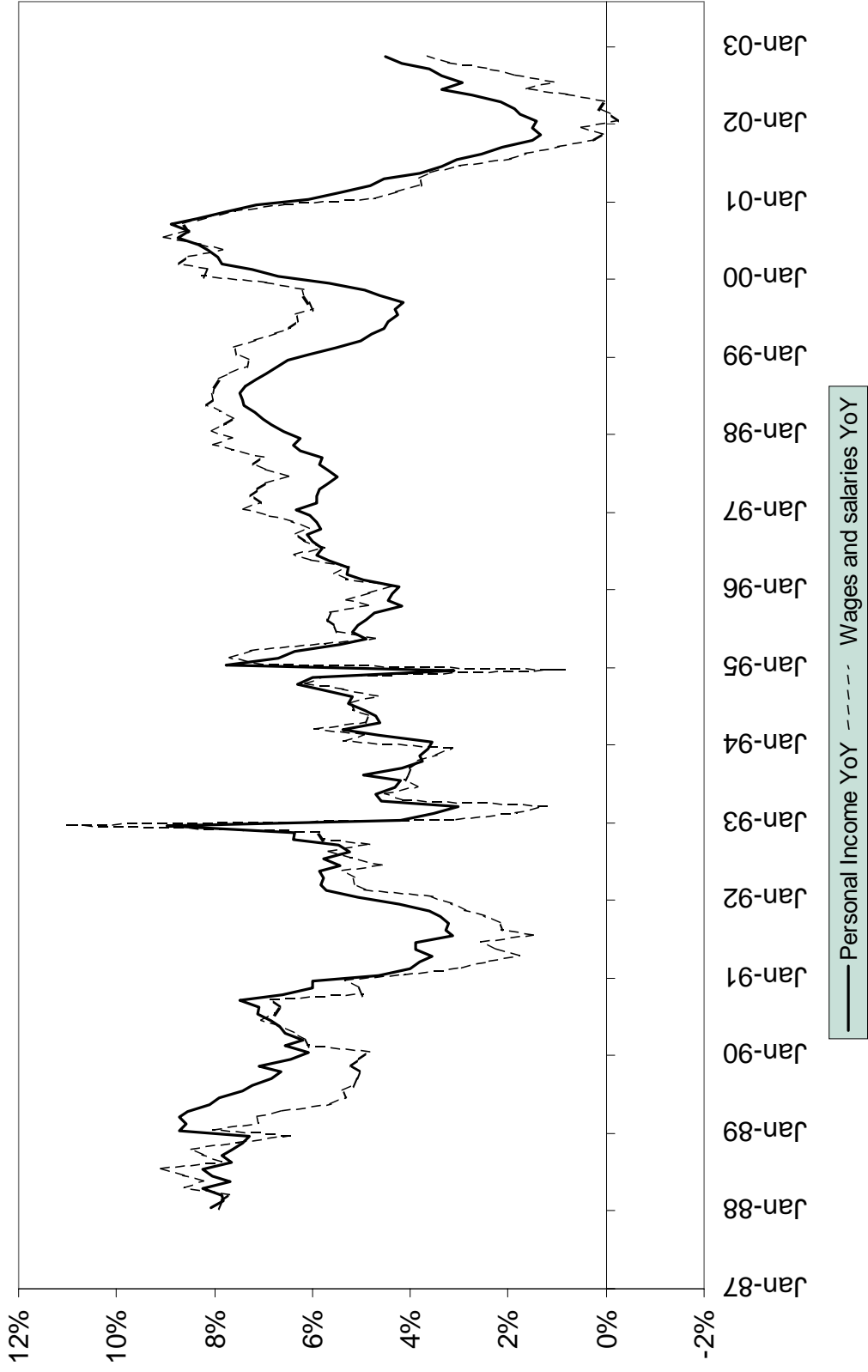


Figure 3: Wages & Salaries in Private Industries and Government (Nominal)

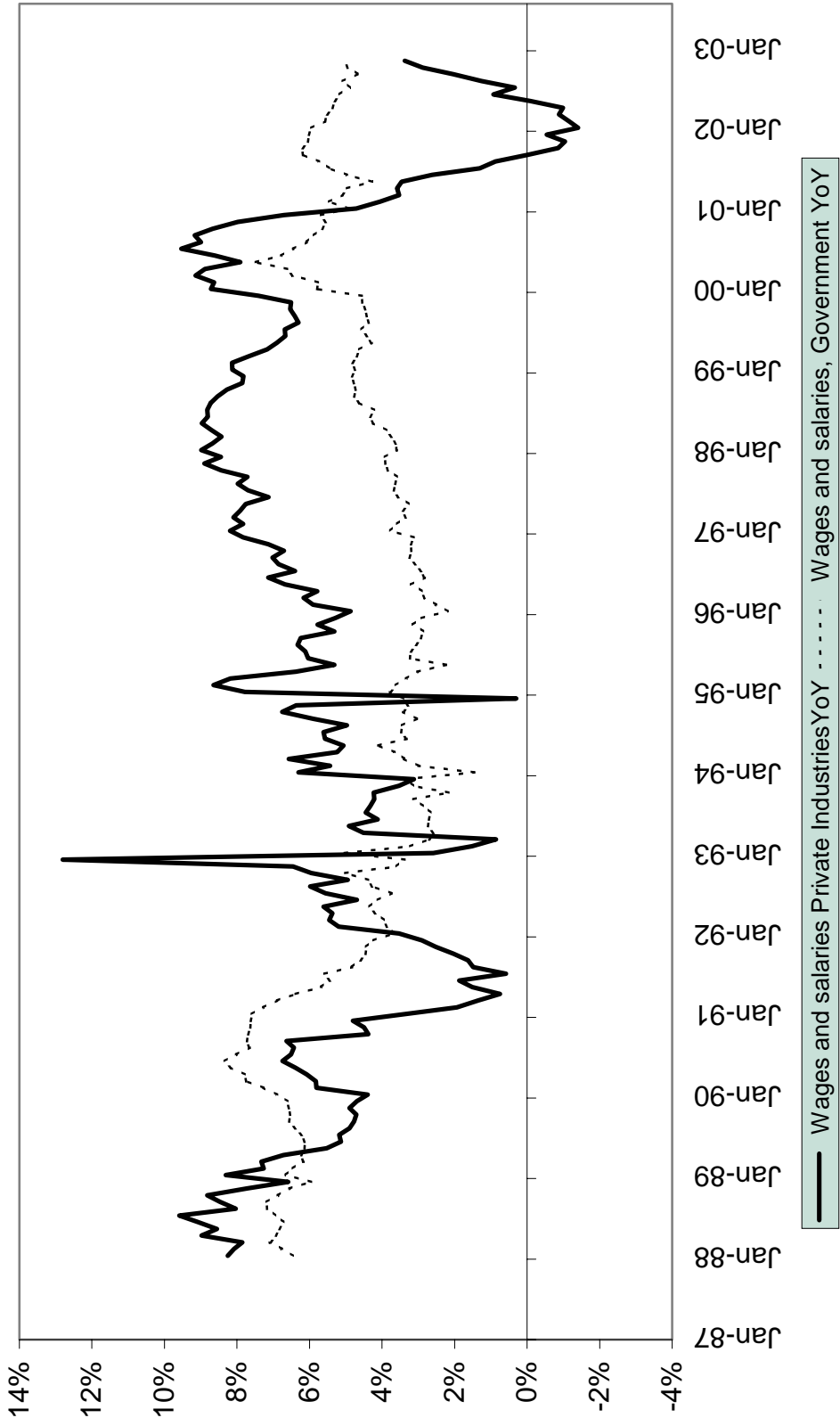


Figure 4: Wages & Salaries in Various Industries (Nominal)

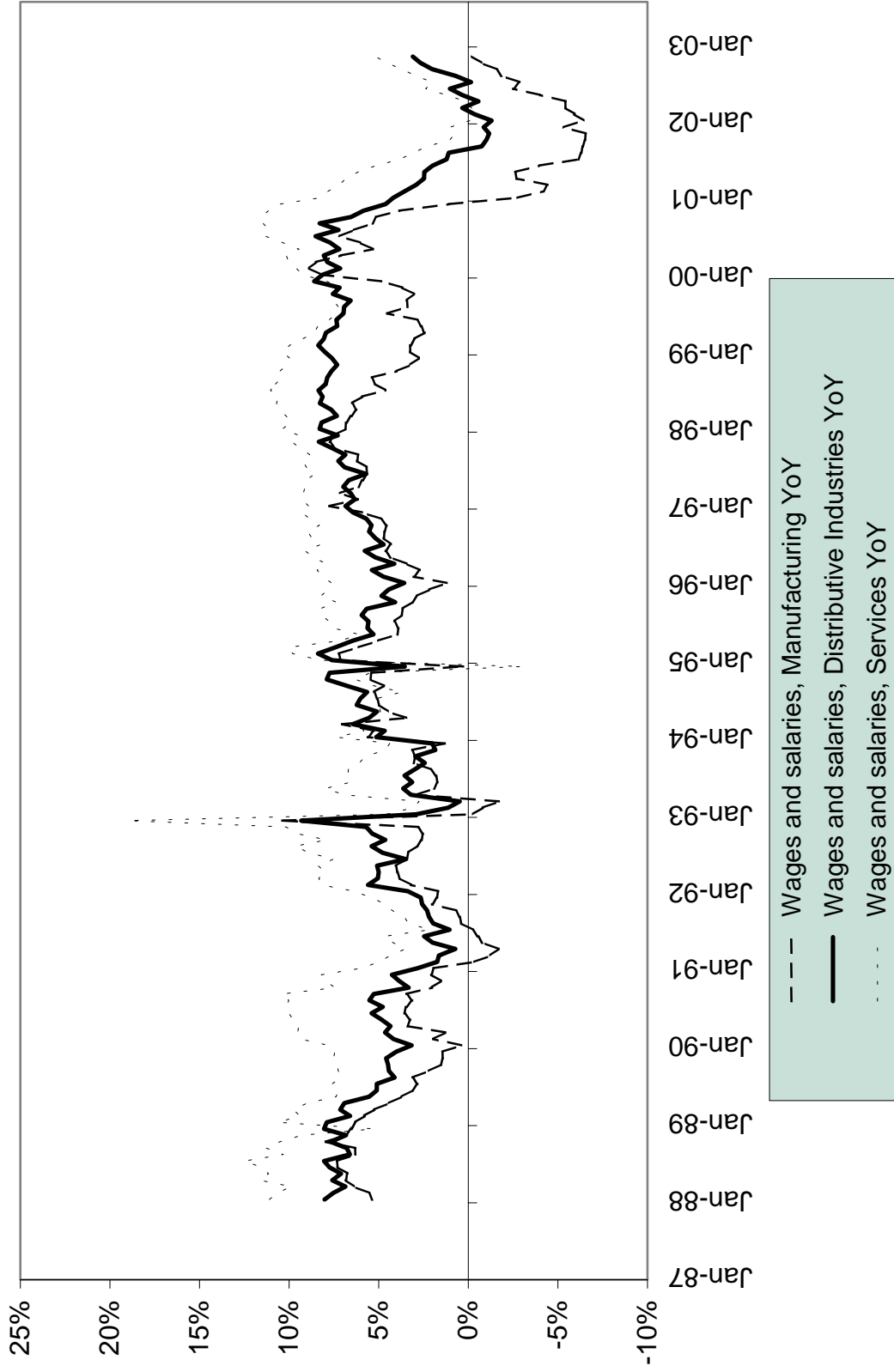


Figure 5: Other Earned Personal Income

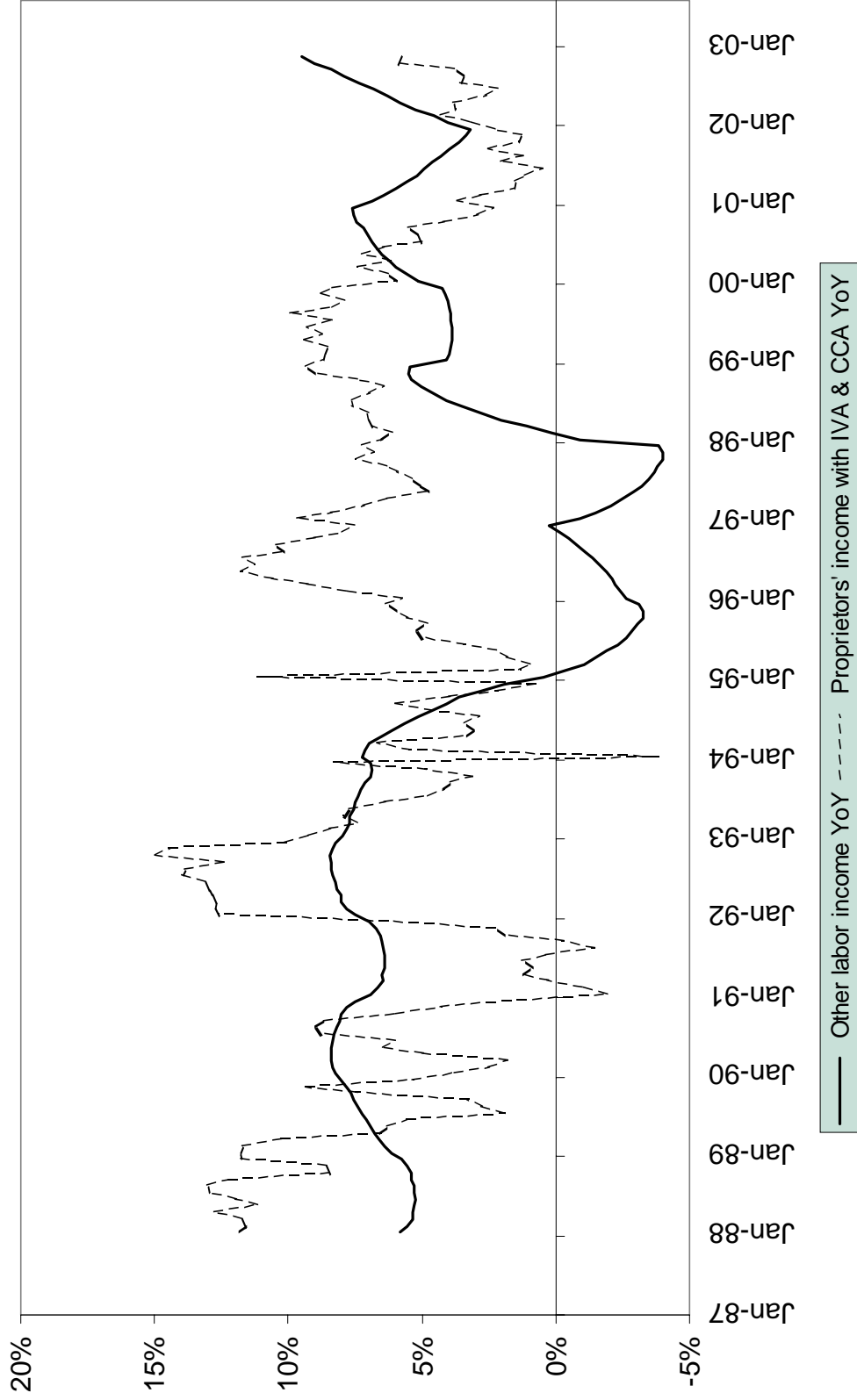


Figure 6: Unearned Personal Income

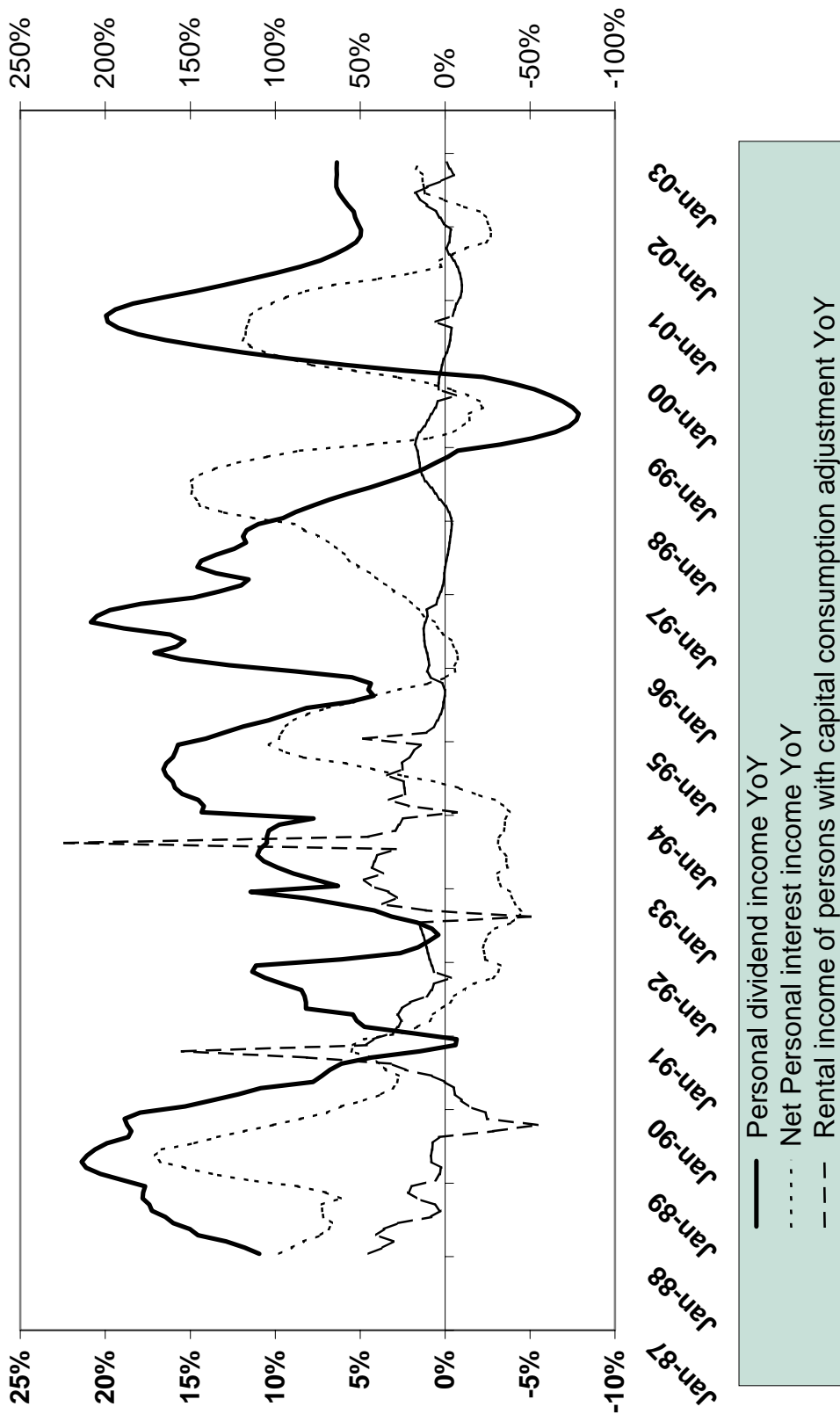


Figure 7: Personal Income and Disposable Personal Income (Nominal)

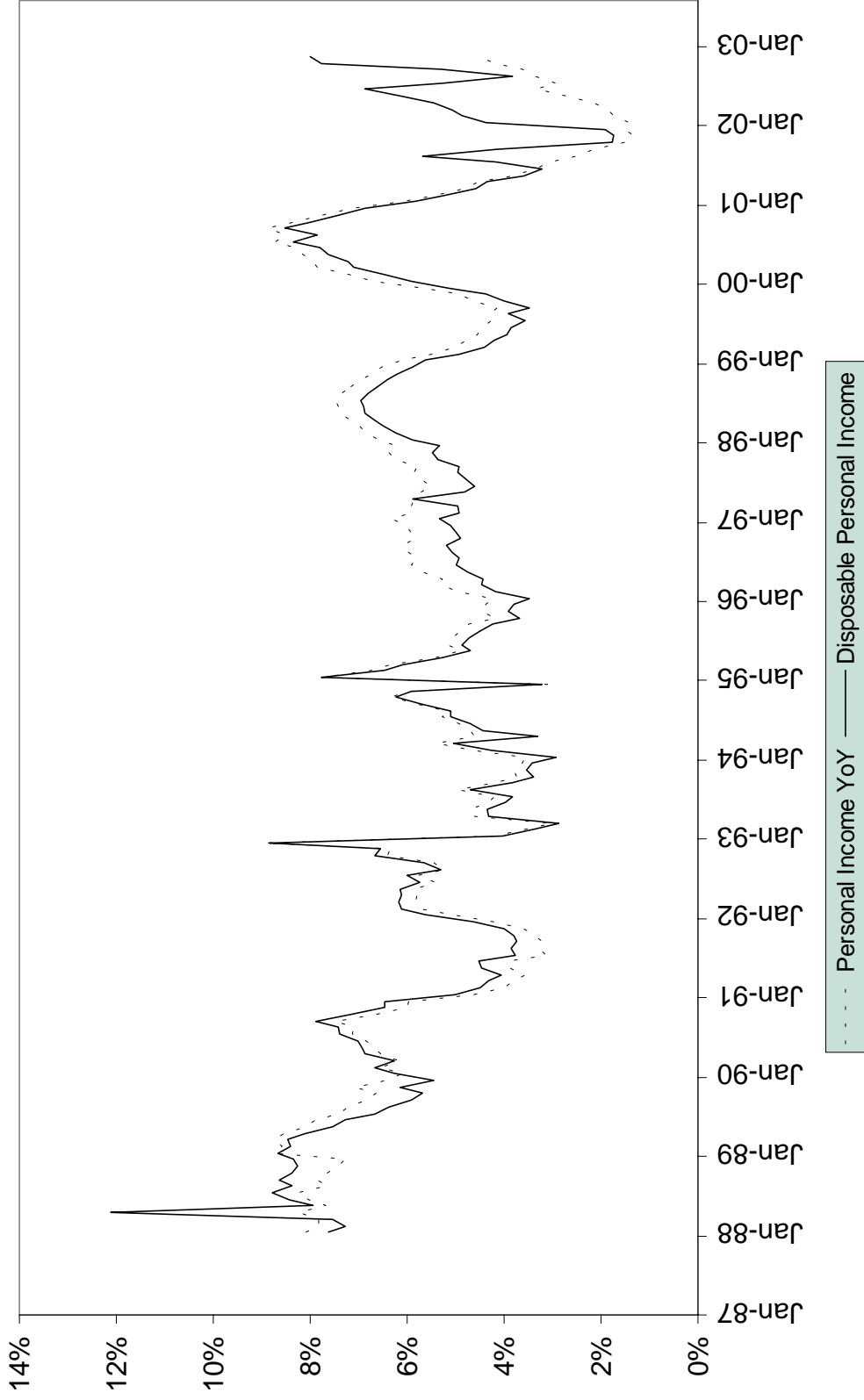
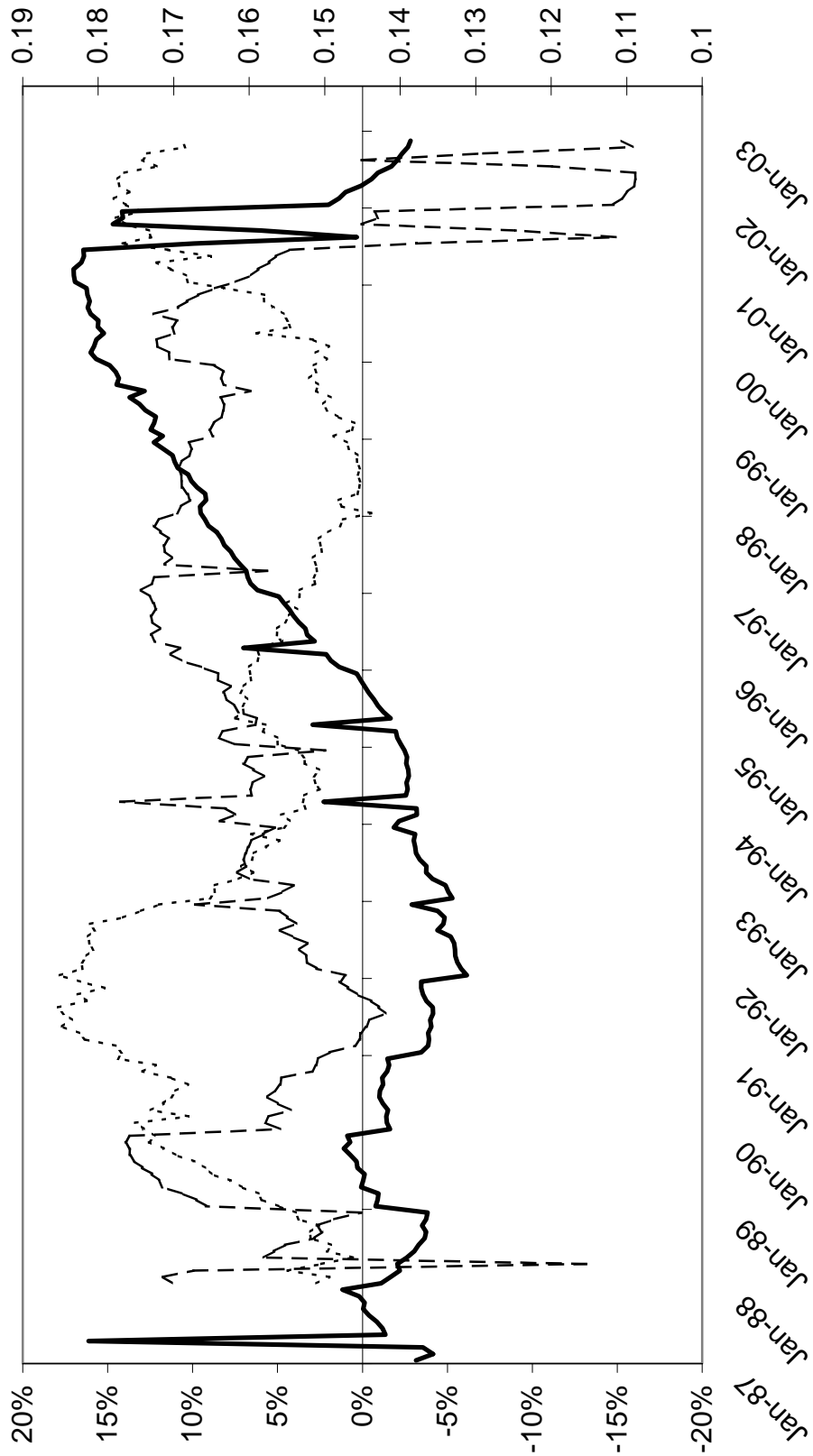


Figure 8: Fiscal Support to Personal Sector



..... Net Transfer payments to persons (Transfers - NIC) YoY
 --- Personal Tax and Nontax Payments YoY
 — Personal Tax and Nontax Payments as % of Disposable Income

Figure 9: Household Net Wealth

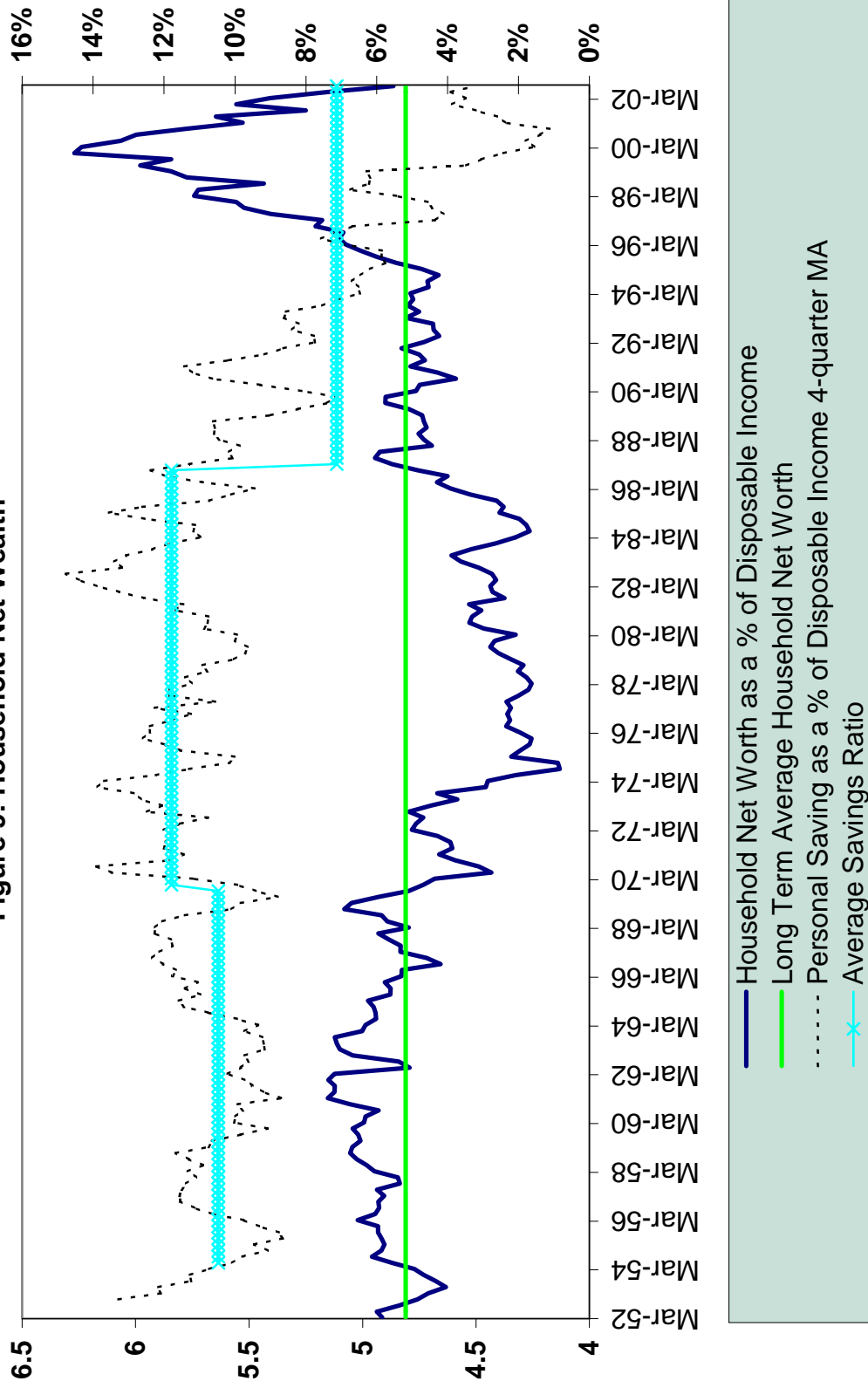


Figure 10: Financial Assets and Debt of the Personal Sector

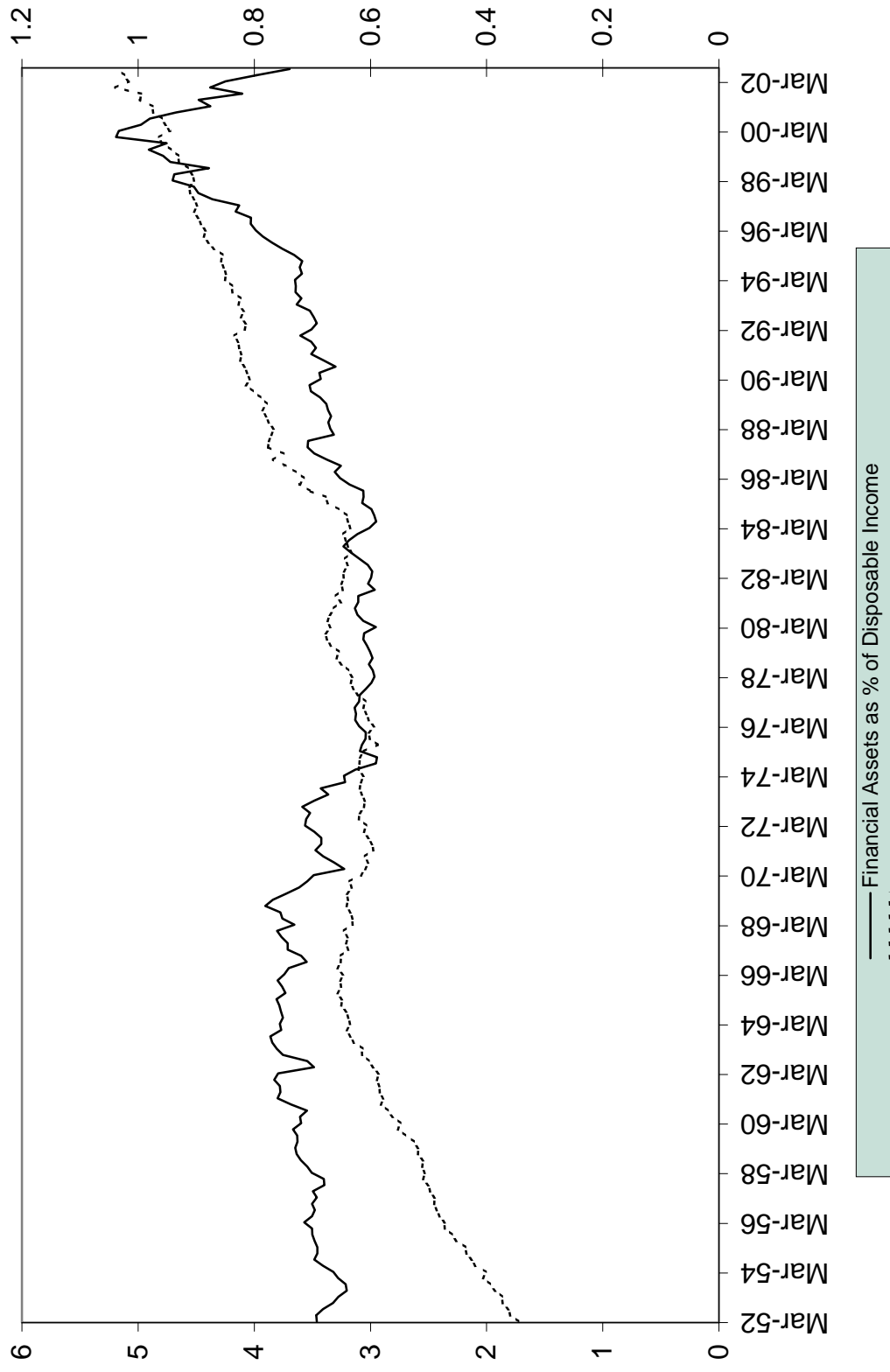


Figure 11: Tangible Assets & Real Estate

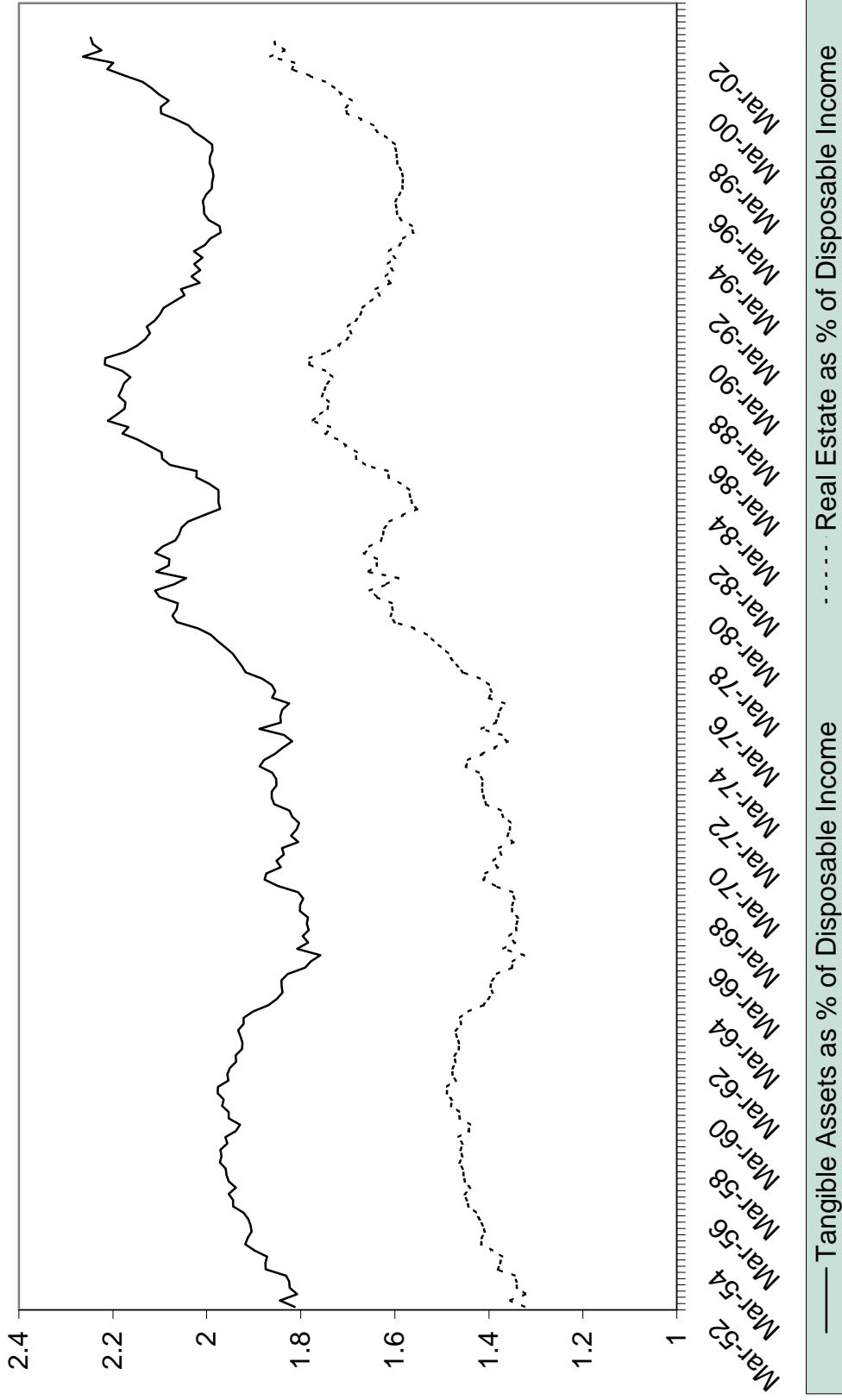


Figure 12: Household Debt-Service Burden

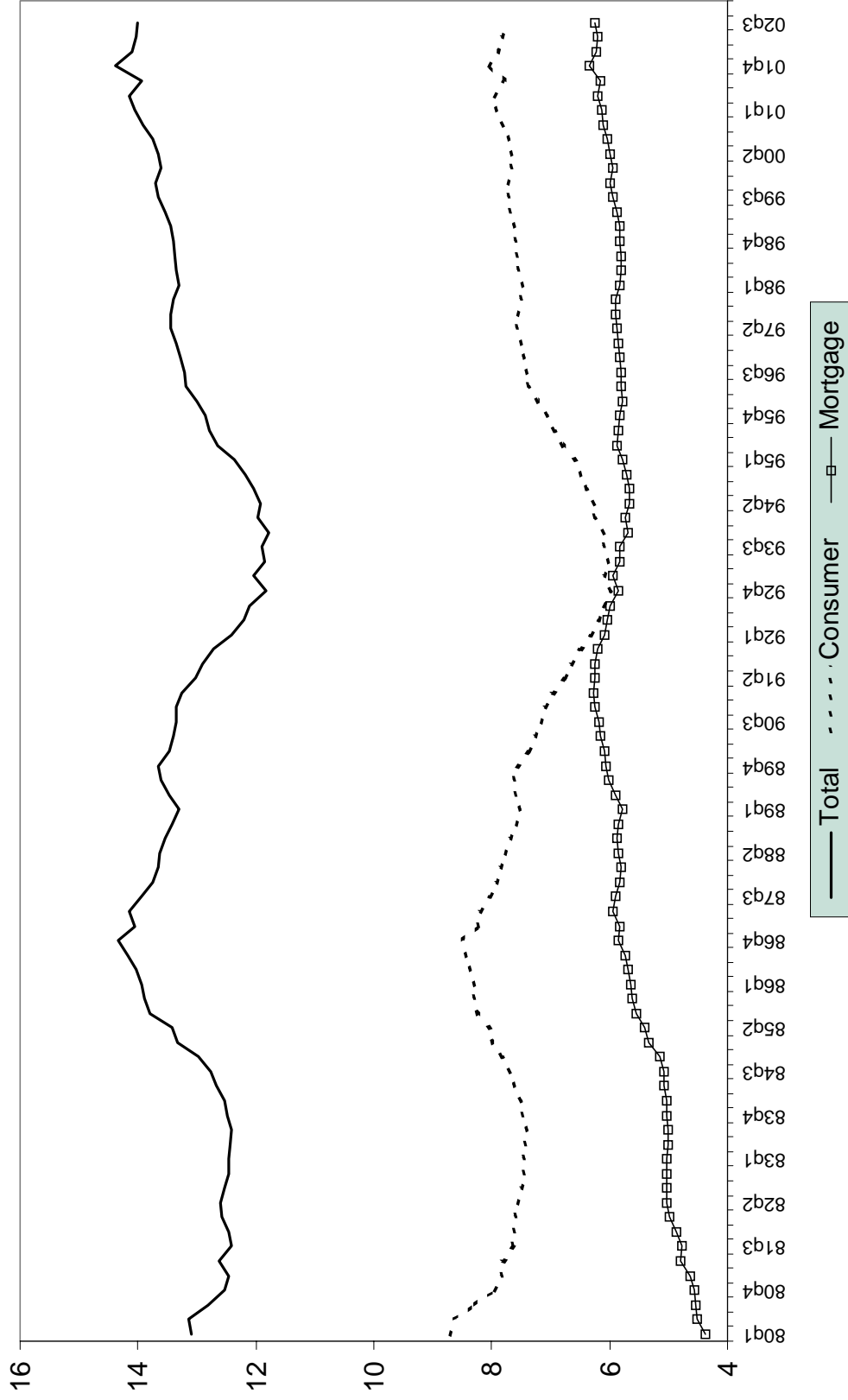


Figure 13: Real Expenditure on Nondurable Goods

