Deflation and Consumer Expenditures

by

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> "[T]he Japanese are not spending. That is not because they reckon that entrenched deflation means things will get cheaper in the future." *The Economist*, September 17, 2016, p. 69

Summary: One often hears that one reason deflation should be avoided is because it leads to the expectation of lower prices in the future on the part of consumers. This in turn causes consumers to defer their spending. The consequence of this is reduced demand for products and lower investment by firms now. The net result is weaker economic activity. This paper provides a new approach to verify this view.

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I. Introduction

The public and the media hold the view that deflation is an economic pathology that stands in the way of economic growth and progress. Often enough even some central bankers and academics seem to worry about deflation as a cause for economic weakness, at least in the short run. Frequently one hears about the lost decade of Japan *caused* by deflation. To the public and some policy makers, deflation is viewed as inhibiting growth or, even causing recession, I surmise, partly because of the experience of the Great Depression in the United States but more importantly the more recent experience of Japan. But it was not that long ago that economists were preoccupied with inflation, as demonstrated by seminars and commissions formed to address the issue (e.g., Romer and Romer (1997)). Consumer spending is usually identified as the main culprit among the possible routes for deflation leading to weakness in the economy. The question of the impact of deflation on economic activity is especially relevant these days as it appears that long-term inflation is expected to be quite low, in the range of 2% (Christensen and Rudebusch, 2017); short-term fluctuations can easily push the rate into negative territory.

The argument goes something like the following: Current falling prices lead to the expectation of further price declines in the future, causing consumers to postpone their expenditures in order to make purchases at those lower future prices. The weakness in aggregate demand then results in reduced investment and employment, bringing about weak or falling economic activity. Therefore, deflation must be fought through policy, usually monetary policy. But of course falling prices can have many causes, such as declining import prices (e.g., the prices of oil and other imported commodities) and rising productivity, innovation, and other supply shocks. But if prices fall because of improved productivity or

lower import prices, economic activity is supposed to increase and welfare enhanced.

The argument that consumer spending decreases as a result of deflation neglects the impact on interest rates: lower consumption expenditures leads to a rise in the saving rate which, in turn, stimulates business investment (and perhaps even higher consumer expenditures on items that are interest-rate sensitive, such as on residences and automobiles); in turn, higher business investment increases aggregate demand.

Perhaps a more orthodox, theoretical economic argument considers the effect inflation has on the real rate of interest; changes in interest rates then cause changes in consumer expenditures. Depending on the relative strengths of the income and substitution effects of changes in the real rate of interest, and whether or not the nominal interest rate has a zero lower bound, deflation *may* possibly lead consumers to postpone their consumption. Cargill and Parker (2004) provide a concise demonstration of this approach along with some numerical results from simulations in support of the assumptions behind their model.

In contrast to these views, there is some literature that argues the optimal policy is one that generates deflation, an argument that was made by Friedman (1969); he proposed that deflation should proceed at the real rate of interest so as to make the cost of holding money balances zero. More recently models have been constructed that suggest (positive) inflation may well be optimal in certain situations (Kehoe, Levine and Woodford (1992), Scheinkman and Weiss (1986), and Woodford (1990)). Marshall (1926) argued that volatility in inflation is worse than a gradual decline in prices because inflation volatility hurts trade. Levine (1988) concludes that a steady expansion in the money supply can improve trade (through its distributional effect).

Aside from the optimal rate of change in the price level, the question of whether or not deflation causes recession is an empirical matter. One problem that hinders finding the answer to this question is the absence of data stretching over a long enough period, sufficient acceptable cross-section data points, and the right type of information.

In the postwar years in the United States overall prices (as measured by the consumer price index in urban areas (CPI-U) declined in only two years,[1] by 0.63% in 1955 and by 0.11% in 2009, clearly much too few data points to be of any real value. Pushing the period of observation to the war and prewar years is not helpful for the following reasons. First, prices during the war years were distorted for various reasons (such as controls and shortages); second, the Great Depression is an anomalous period that involved a huge decline in economic activity and the closing of banks; neither of these can be seriously considered as representative for the issue of whether consumer spending falls because of deflation; and third, the farther back we go – especially to the pre-Great Depression times – the quality of data on prices becomes more questionable. In regards to this last, it should be noted that the CPI-U has been known for some time to overestimate the rate of increase in prices; only in the last two decades or so this bias has presumably been (perhaps only partially) removed as a result of the work of the Gordon Commission (R.J. Gordon, 2016, discusses the quality of price data in some detail).

Attempts have been made to overcome the paucity of data by resorting to multi-country observations. In their study Borio and collaborators (2015) gather data for

[1] This is true for annual data; when measured quarterly, as it is done in this paper, the CPI-U declines more frequently: nine times during the period 2000.Q1-2015.Q2, the period considered in this study.

38 countries over 140 years. The true magnitude of inflation going back that far back is simply very dubious, particularly for many of the countries included in their work, such as Greece, China, Peru, Turkey, and Uruguay. Feldstein (2016) maintains that even for the U.S. the true magnitude of inflation is not known – it is probably lower than the measured level. One might be tempted think that the errors of the reported prices – either historical data or by various countries included in the work of Borio and collaborators – are likely to be unbiased. But prices (as well as the level of economic activity) are among the variables that many nations distort for political reasons to create an illusion of prosperity or at least a better economy than is really the case; this means the bias on *reported* inflation is likely to be on the downside. Finally, price data for many years and for many of the countries in the sample are missing.

Deflationary periods have been relatively rare events in the United States in the past 7-8 decades. Out of 900 months since 1941, deflations have been observed in only 35 months (less than 4% of the time). Since the start of the Great Recession, when the public and policymakers became concerned about deflation, there have been only ten months (on a quarterly basis, only five times) during which the measured CPI-U has turned down. As these numbers demonstrate, deflations in the US have been rather infrequent events, making it difficult to conclude with any degree of confidence the effects of deflation on the economy in general and on consumer behavior in particular.

Furthermore, I argue below that an overall price index, such as the CPI-U, is not the appropriate measure to discover whether consumers do indeed postpone their spending when there is actual or anticipated deflation; we should instead focus on those components of the CPI-U that may respond to expected deflation. Yet the vast majority of empirical studies attempting to discover the economic impact of price changes (positive or negative) have used *total* consumer expenditures.

Those that have considered the components of consumer spending have generally been theoretical: e.g., Romer (2011) hypothesizes that rising expected inflation lowers the real borrowing cost and results in increased spending on cars and houses (and business equipment). This line of reasoning leads to the argument that policymakers should raise the rate of inflation in order to encourage consumer spending. However, the evidence in support of such theories is not strong; and at least some evidence refutes these theories. An excellent study by Burke and Ozdagli (2013) uses panel data collected during April 2009-November 2012 to determine the relationship between inflation expectations and current spending, taking into account wage growth expectations, uncertainty in inflation expectations, macroeconomic conditions, and the unobserved heterogeneity at the household level. The general conclusion the study reaches is that the effects of inflation on spending on large consumer durables as well as on nondurables are small, *negative* (my emphasis), and statistically insignificant, with the exception of spending on cars.

Unless the economy is collapsing, as it did in the 1929-1933 years, there are components of consumer spending that one expects to be quite immune to mild deflations, the kind of deflations experienced in the United States. One important item among these is food, one of the most important of necessities – in other words, food purchasing is highly price inelastic, at least in the range of price changes that we have experienced in the United States over the past 7-8 decades. It seems logical then that we ought to exclude spending on food from a study that attempts to determine the impact deflation has on total consumer expenditures. Among the items the acquisition of which consumers can postpone are durables goods (autos, some appliances, furniture, and so on). One "nondurable" set of goods that consumers need not purchase immediately and whose acquisition might well be deferrable is clothing (Gordon, 2016, refers to these as "semi-

durable" goods). Sure, fashions change and seasons change leading to a desire to add to or replace some clothing, but if deflationary expectations play a significant role in buying behavior then the consumer should be willing to cut back a bit on such purchases in the current period .

When we analyze individual components of consumption, economic theory suggests that the relevant price is real price. Consider the situation when the nominal price of a deferrable good is expected to fall; under the theory that their purchases would decline, consumers would spend less on such goods in the current period. But what if the prices of other components of consumption increase sufficiently so that the relative price of the deferrable product declines? Consumers can then be expected to increase their spending on the deferrable item in question since its relative price has fallen. In situations such as this, the conclusion that deflationary expectations cause expenditures on these goods to decline would be mistaken.

While series on expected inflation, either from surveys or implied by US Treasury bonds and inflation-adjusted securities (such as TIPS), exist, these are not appropriate for the current study. The expected inflation data pertain to the *overall* prices, such as the CPI-U, whereas for this study we need expected prices on specific product groups; unfortunately such series are not available. Therefore, the actual future price is used as a proxy for anticipated price.

Often Japan is taken as representing what can happen with deflation; but Japan's deflation rate never fell below -1.3% (OECD statistic data) since 1970. It is mistaken to compare deflations of a few percentage points per year with inflations of several hundred percentage points.

Although the focus of this study is on deflation because of the recent focus of policy, its results apply just as strongly to (mild) inflationary periods as well.

II. Data

It may be preferable to work with seasonally adjusted data to remove the influence of factors that are not related to normal economic functioning or are known to be temporary. However, for at least some purchases, consumers *may* not make seasonal adjustments in the timing of their spending decisions – for example, the decision when to buy food or seek medical treatment. Therefore, it may be better to use seasonally unadjusted figures for the problem that is being studied here. Unfortunately, consumer expenditures data are provided only on a seasonally adjusted, quarterly basis; thus data restrictions preclude the use of raw data. As a result, seasonally adjusted data are used in this study. It is felt that the seasonal adjustment is not too distortive here because, for the items that are considered here, much seasonality pertains to monthly figures and the use of quarterly data reduces the bias that may be introduced as a result of seasonal adjustments.

As this study is an exploratory one, only two consumer spending time series are selected; other expenditure series can then be looked at in later works. Nominal values of food and beverages purchased off premises are used to represent those expenditures that are not deferrable, and clothing and footwear represent those expenditures that can be postponed. Both these series are seasonally adjusted and available quarterly only. For consistency, the corresponding seasonally adjusted components of consumer price series are used.

The data used here are quarterly for the period 2000.Q1 through 2015.Q2. For the price of food the *Food and Beverages* component and for the price of clothing and footwear the *Apparel* component of the CPI-U are used. The corresponding spending measures are *Food and Beverages Purchased off-Sites* and *Clothing and Footwear and Related Services*, respectively. The expenditures series are

converted to per capita terms using the US Census population data. For ease of exposition, the two items of interest in this study are referred to simply as *Food* and *Apparel (*or *Clothing)*, respectively.

Prices of food and apparel are considered to be endogenous in the regressions. Accordingly, instrumental variables are used for prices.

III. Prices and Expenditures on Food and Clothing

Changes in the nominal price of food and beverages average to 0.64% during the period under study, with a standard deviation of 0.43%. Of the 61 quarterly observations, the change in the price of food is negative in only two quarters, 2009.Q1 and 2009.Q2, in the midst of the Great Recession in the United States. In contrast, the average nominal price change for apparels is -0.05% with a standard deviation of 0.63%; the price change for these items is negative in 35 cases out of the 61 observations. Nominal per capita spending on food and beverages increases by an average of 0.65% with a standard deviation of 0.70%, while nominal per capita spending on apparels increases by an average of 0.28% with a standard deviation of 1.27%. As expected and these figures attest, spending on food is more stable than spending on apparel due to both a less volatile food price and a more stable allocation of income on food (see figures 1 and 2); this is true of real spending as well, even more so (see figure 3).

What determines expenditures decision is real price, not nominal. To convert nominal to real prices, the ratio of the price component to the overall CPI-U is used.[2] For food and beverages, the real price declines in 27 quarters out of the 61; for clothing, real price *rises* in only 12 quarters (versus 49 price declines!). The

[2] Ideally one would want to use the CPI expunged of the component being deflated to arrive at the real price. This is normally not done because the impact is considered too small to affect results.

average change in the real price of food is +0.11% with a standard deviation of 0.63%; for clothing the respective figures are -0.59% and 0.77%. Note that that *real* price of apparel has followed a downward trend since the beginning of the new century (see figure 5).

The nominal price of food and beverages rises up to the start of the Big Recession, barely dips in 2009.Q2 and 2009.Q3, then resumes is upward trend (see figure 1). The trend in the *real* price of food and beverages, on the other hand, is pretty flat during the entire period. While the real price of food does fall during some periods, these decreases are rather small, except that the decreases are quite sizeable during the three quarters 2009.Q2-2009.Q4 (figures 1and 2). Per capita spending on food and beverages falls quite sharply, by a total of nearly 3% during the four quarters 2008.Q1-2009.Q3 (figure 3). The fall in real income is the likely culprit for causing food expenditures to decline.

As shown in figure 1 the *nominal* price of clothing and footwear follows a flat to gently downward trend throughout much of this period, while its real price experiences a very steep decline (figure 5). In contrast with spending on food and beverages, spending on clothing and footwear is quite volatile, while following an upward trend.

It is worth noting that during the 15-year period we consider here the price of food, with a standard deviation of 0.43, is less volatile than the overall price level as measured by the CPI-U, which has a standard deviation of 0.59; this raises the question of whether the "core" price level, which excludes the prices of food and energy, provides very useful information about the underlying inflation; perhaps "core" should exclude food.

IV. Some Observations on the Data Series

The first difference of the real price of food appears trendless but note the sharp rise in 2008.Q4 followed by the sharp decline in the following quarter in this series (figure 2). This is the result of two simultaneous events: the nominal price of food rises by 3.5% in 2008.Q4 as the CPI-U falls by 2.3%. By 2009.Q2 the CPI-U is up by more than 0.5% while the price of food is down by 0.4%, hence the observed reversal in the change in price. The one-quarter sharp rise in the real price of food is treated as an outlier in this research and left out of the regressions presented here.

The real price of apparel follows a steep decline through mid-2008 and then follows a nearly flat trend afterwards — and the first difference of the series has a mild upward trend through the mid-2008.

A visual inspection of per capita real spending series on food and apparel suggests nonstationarity; both series are tested for stationarity using the Augmented Dickey-Fuller (ADF) method. The ADF unit root test is conducted with and without a constant and a constant and trend. In all instances the hypothesis of unit root – that is, stationarity – cannot be accepted. A visual examination of the correlograms of both expenditures series also suggests a high probability of both series being nonstationary (figures 6 and 7). The first difference of expenditures on food has a plot that is trendless with rather constant fluctuations, except there is a sharp rise in its value in 2008.Q4; its correlogram suggests stationarity as does the ADF unit test after first-differencing.

The plot of the differenced expenditures on clothing has a slight upward trend, suggesting that the second differencing of this series may be necessary; however,

an examination of the correlogram of the first difference of clothing expenditures appears quite random.[3]

V. Regressions

Although the expenditures series are nonstationary, spurious regression is not likely to be an issue using the levels of the variables in regressions on income and prices because the economic theory of their relationship is well established and the differenced variables might not represent the true process (Hamilton, 1994).

The relative prices are considered to be endogenous throughout. So much of apparel purchased in the United States is imported from a rather large number of different countries (China, India, Europe, Vietnam, and several countries in Latin America) in competition with one another that the assumption of exogenous apparel price may be entertained. Nevertheless, since the United States is such a significant importer of apparels, their prices are very likely affected by US demand. The exogeneity assumption is much less tenable with the price of food[4]. Therefore, two-stage least squares is used here. The candidates for instruments for the price of food are: average real agricultural wages for U.S. farmers, and the real prices of potassium, dammonium, and nitrogen, all of which are used for fertilizer; instrument candidates for the price of apparel are the international price indexes of cotton, of wool, of hide, and the price of synthetic fiber, the price of cotton received by U.S. (upland) farmers, all in real term. Each is analyzed for its validity.

[3] The results of the unit root tests are available from the author upon request.
[4] Mary Burke raised the issue of endogenous prices in an earlier version of this work.

The correlations of the potential instruments with the real price of food (RFP) are: 0.29 with dammonium (DPAR), 0.63 with both nitrogen (NITR) and potassium (POTR), and 0.64 with agricultural workers' wages (AGWR).

The regression of the RPF on each of the possible instruments results in the following F-statistics: 7 for DAPR, 44 for NITR, 38 for POTR, and 42 for AGWR. The regression of RPF on all four has F-statistic = 23.7 and with DAPR excluded the F-statistic = 23.5. Consequently the instruments used are NITR, POTR, and AGWR. The addition of next period values of NITR, POTR, and AGWR among the instruments for next period own price RPF1does not materially change the results.

The same approach is used to identify instruments for the real price of apparel (RPA). The correlation with the instrument candidates are: 0.95 with synthetic fiber price (SYNPR), -0.44 with cotton price received by farmers (COTFRMPR), -0.37 with cotton price (COTR), -0.64 with wool price (WOOL), and -0.06 with the price of hide (HIDE). Regressions of RPA on individual potential instruments results in the following F-statistics: 513 for SYNPR, 14 for COTFRMPR, 9 for COTR, 43 for WOOL, and 0.4 for HIDE. With all candidate instruments included in the regression of RPA, the F-statistic is 123; with COTFRMPR excluded the F-statistic rises to 156; when only SYNPR and COTPR are included F-statistic reaches 284. Therefore, in the apparel 2SLSs only COTPR and SYNPR are used; the inclusion of the other instrument candidates does not materially affect the results, nor does the addition of next period's values of COTPR and SYNPR as instruments for next period's apparel price, RPA1 .

Real per capita disposable income is used to measure income. The polynomial distributed lag of real income (RCYPDL)[5] is used to capture the permanent

[5] The PDL is second-degree, 2 periods long without any constraints at either end.

component of income as well; it turns out that this measure performs marginally better than current real income in terms of stability of estimates.

Statistical Results

Apparel

Equation (1) is analogous to a simple consumption function with (income) expectations except that future price is allowed to play a role. The income variable has a reasonably high t-ratio. While the current real price has a negative influence on expenditures, it is statistically insignificantly different from zero. The fit is weak, $\overline{R}^2 = 0.12$, with the Durbin-Watson (DW) statistic at only 0.76.[6] The important thing to note is that RPA1, next quarter's price, has a positive influence although not statistically significant, on expenditures on apparel – so if price is expected to be lower (higher) then current spending falls (rises). Equation (2) adds the dummy D1 (which has the value 1 when there is deflation in the next quarter, 0 otherwise) to determine whether overall deflation plays an independent role; while not statistically significant, its negative sign suggests that future deflation reduces current spending, which is counter to the idea that lower future price reduces current spending. The J-statistics in both equations support the selected the instruments.

Equations (3) and (4) replicate the first two equations except that they represent a correction for serial correlation. The impact of serial correlation correction is quite significant in magnitude on the estimated coefficients of income and prices– they are all smaller in absolute value by 73%-85%. As before, the future own-

[6] The Durbin-Watson statistics are not shown in the tables. They are available from the author upon request.

price has a positive effect on current spending – i.e., if apparel price is expected to be lower, current spending rises. In equation (4) the dummy for future deflation is a statistically significant and again implies that future overall deflation has a *positive* impact on current spending. Overall, these results support the view that expected overall deflation *raises* current spending on apparel.

Food

Because 2008.Q4 is considered an outlier data point for food, the food regressions exclude the observation for that quarter. Equation (1) is an expenditures model with real income RCYPDL and real food price RPF as explanatory variables along with next quarter's real price of food RPF1 to capture the effect of expected future price. The effects of income and current price are as expected; future price has a negative impact on current spending – i.e. when the price of food is expected to fall current spending rises, counter to the general view that anticipated deflation is deleterious to current spending. This result is surprising as we argued that spending on food should be immune to future expected price. Equation (2), as before, considers the possibility of that overall expected inflation (as measured by the dummy variable D1) may have an independent influence on spending. In this case, overall future inflation reinforces the future own-price effect. It should be noted that the J-statistic in both equations are quite low at around 3.1-3.4.

Equations (3) and (4) are the result of correction for serial correlation. In equation (3) the sign of the coefficient of RPF1 turns positive but highly insignificant; in equation (4) the sign of that coefficient is still negative as before but the sign of D1 turns positive and highly insignificant.

VI. Concluding Remarks

The results obtained above cast doubt on the argument that expected future deflation causes current spending to fall. While very weak support is provided for apparel when apparel prices are expected to fall, expected overall inflation seems to counter balance the own-price effect. With respect to food neither the expected own-price nor the overall inflation supports the orthodox view that future expected price affects current spending.

Perhaps more than 80% of consumer spending falls into the category of goods and services that is *not* deferrable, at least in times of mild deflation not accompanied with economic downturns. Food constitutes about 15% of expenditures, of which a relatively small amount, 5.8%, is food away from home (fast food and food at full-service restaurants). In all likelihood, as price of food away from home declines consumer spend more on eating out instead of waiting until the price of such services fall further! Housing expenses use up 42% of expenditures, much of which cannot be postponed; these include mortgage payments, rent, and utilities. Transportation amounts close to 15%, again much of which is incurred even with the expectation of mild future deflation in their costs – e.g., fuel amounts to 3.2% of these costs, car repairs add 1.2%, and public transportation amounts to 1.1% of spending; only if the consumer loses her/his job some components of these costs are cut back. Medical care represents about 8% of expenditures, again much of which will be incurred when needed, not postponed. The same argument applies to communication (e.g., telephone fees) and much of educational expenses, such as college expenses. These costs can be cut and the use of these services curtailed only in recessionary times, but not if there is a decline in their prices while the economy is growing and jobs are not being lost.

So the theory that price declines cause a postponement of consumer spending, which in turn results in weaker economic activity, is simply not a reasonable one considering the allocation of personal expenditures. Although the ideal thing would be to have a measure of expected prices, such data do not exist. Nevertheless, the explanation, the data and the statistical analysis provided here, however limited there may be, tend to refute the theory. In any case, there is no justification for policy to attempt to push prices up to avoid deflation, at least not using weaker consumer expenditures as a reason for such a policy.

A great deal more research is needed to better understand the impact of deflation on economic agents' behavior – be they consumers or firms. Also, to the extent that economic agents adjust their activities slowly and partially to changes in real prices, studies can look at the impact of nominal prices instead of real prices adopted in the current research.

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Table 1. Regression results for Apparel

Equation	Const	RCYPDL	RPA	RPA1	D1	AR1 Coeff	J-stat	Adj R^2	DW
1	-1.73 *(1.72)*	1.91 *(1.05)*	-6.41 *(6.90)*	7.37 *(7.21)*			0.00	0.12	0.76
2	-2.01 *(1.73)*	2.14 *(1.05)*	-4.14 *(5.19)*	5.13 *(5.52)*	-0.042 *(0.033)*		0.00	0.39	0.55
3	1.08 *(0.44)*	0.28 *(0.21)*	-1.71 *(0.72)*	1.39 *(1.08)*		0.89 *(0.06)*	0.22	0.92	1.95
4	1.23 *(0.55)*	0.32 *(0.26)*	-1.66 *(0.38)*	1.06 *(0.55)*	-0.010 *(0.004)*	0.90 *(0.06)*	2.16	0.93	1.95

Standard errors in parentheses

Instruments: SYNPR, COTPR

RPA = real price of apparel;

RPA1 = value of RPA, next period;

RCYPDL = polynomial distributed lag of RCY, 2 periods long, second order, no constraints at either end

SYNPR = real price of synthetic fiber; COTPR = real price of cotton;

D1 = deflation dummy, next quarter, 1 when CPI-U falls, 0 otherwise

Sample period: quarterly 2001.Q1 -2015.Q1

Table 2. Regression results for Food

Equations	Const	RCYPDL	RPF	RPF1	D1	AR1 Coeff	J-stat	Adj R^2	DW
1	1.62 *(0.12)*	0.42 *(0.07)*	-1.00 *(0.37)*	-0.051 *(0.34)*			3.12	0.83	0.59
2	1.64 *(0.12)*	0.44 *(0.06)*	-0.99 *(0.39)*	-0.093 *(0.36)*	-0.0053 *(0.0045)*		3.36	0.84	0.68
3	1.46 *(0.21)*	0.049 *(0.11)*	-0.52 *(0.14)*	0.054 *(0.20)*		0.95 *(0.04)*	13.9	0.93	2.0
4	1.50 *(0.18)*	0.13 *(0.10)*	-0.39 *(0.16)*	-0.20 *(0.17)*	0.001 *(0.003)*	0.94 *(0.05)*	16.5	0.93	2.0

Standard errors in parentheses

Instruments: AGWR, NITR, POTR

RCYPDL = polynomial distributed lag of RCY, 2 periods long, second order, no constraints at either end

RPF = real price of food;

RPF1 = value of RPF, next period; AGWR = agriculture workers real wage rate

NTR = real price of nitrogen used as fertilizer; POTR = real price of potash

D1 = deflation dummy, next quarter, 1 when CPI-U falls, 0 otherwise

Sample period: quarterly 2001.Q1 -2015.Q1, with 2008.Q4 omitted

Figure 1. Nominal Price Levels: CPI-U, Apparel, and Food

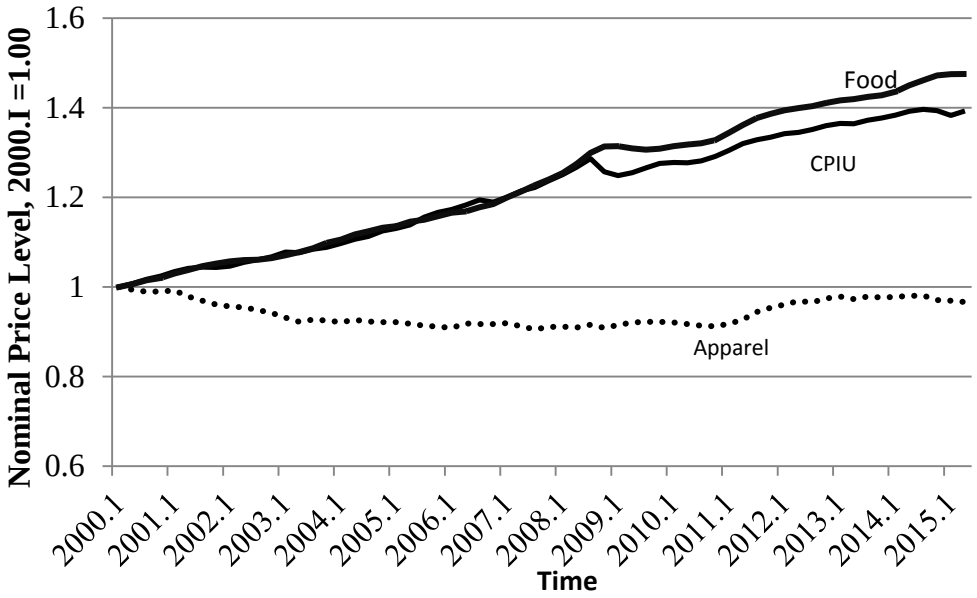

Figure 2: First Difference of Real Prices

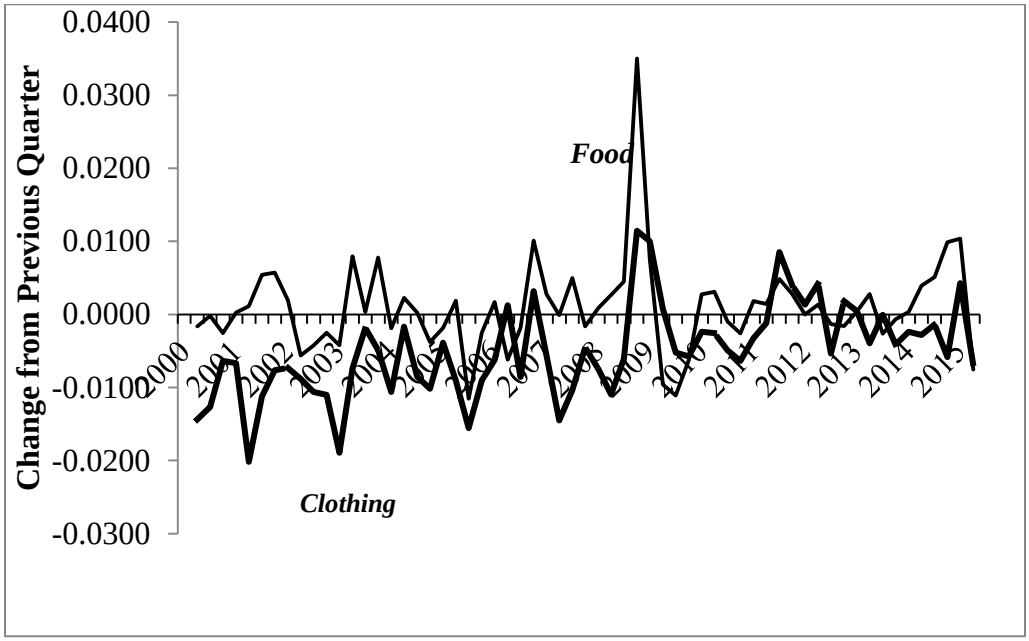

Figure 3. <u>Per Capita Real Expenditures</u>

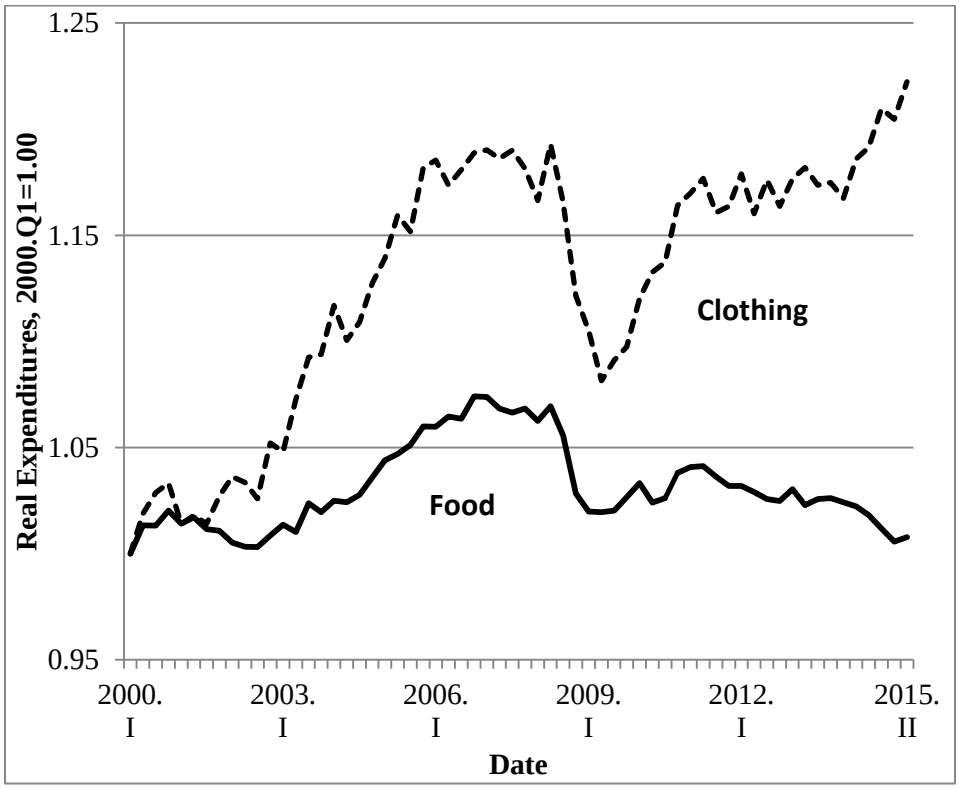

Figure 4. Real Per Capita Food Expenditures and Price of Food

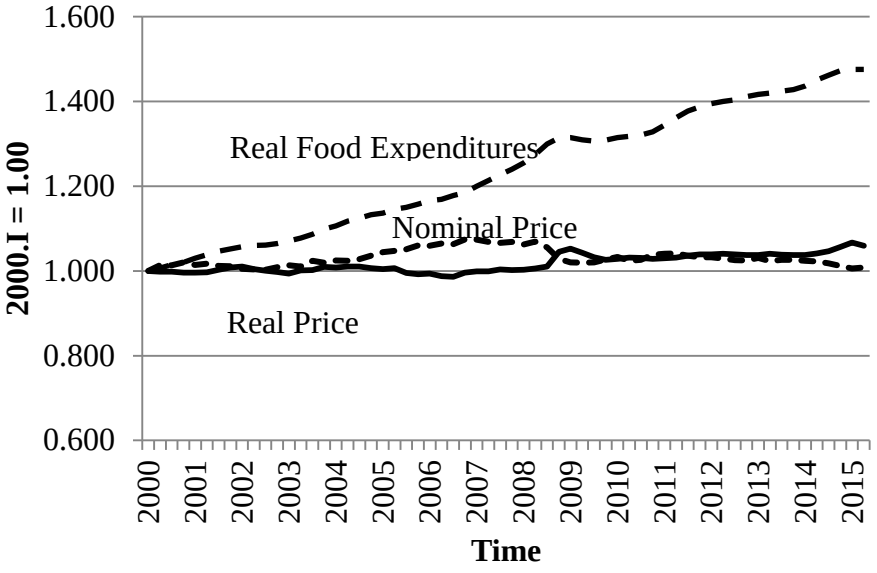

Figure 5. Real Per Capita Apparel Expenditures and Price of Apparel

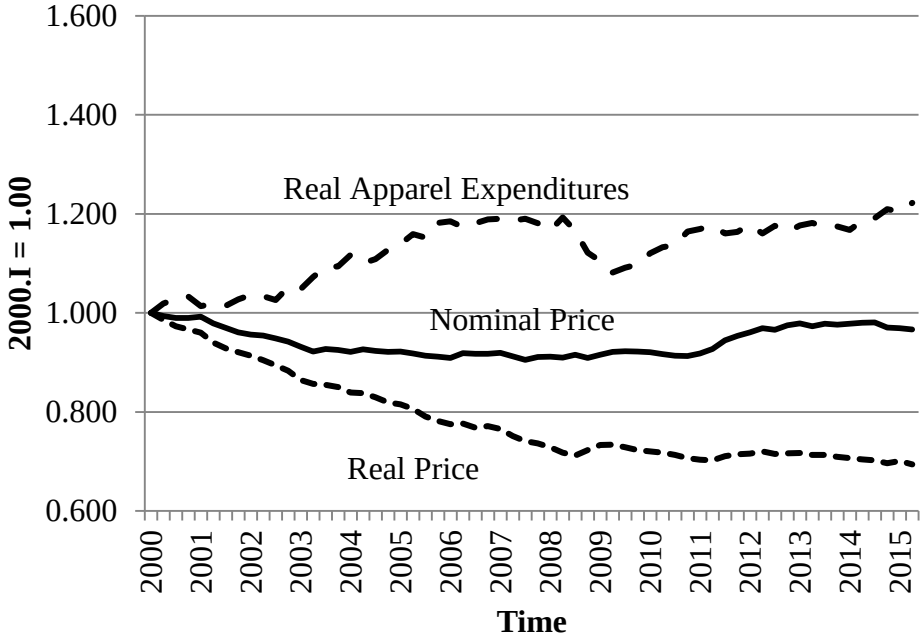

Figure 6. Correlogram for per Capita Expenditures on Clothing

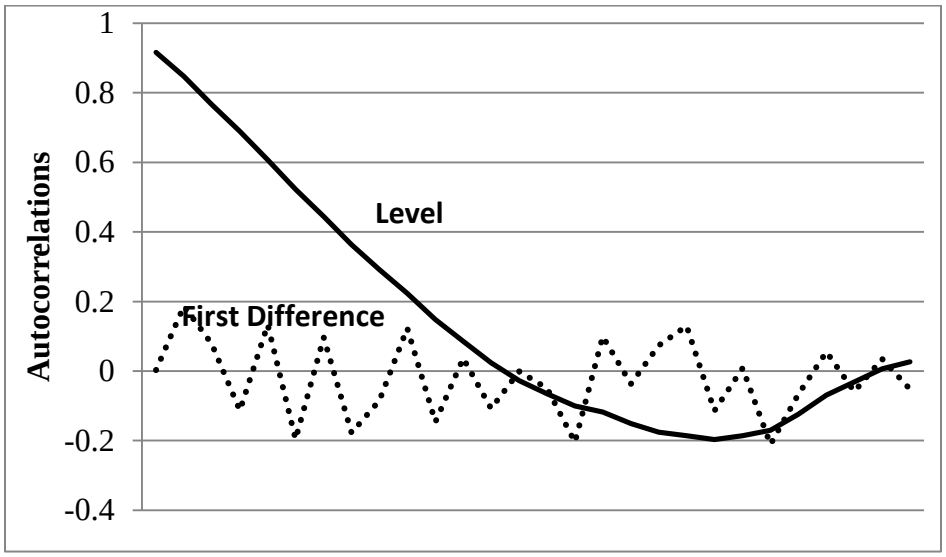

Figure 7. Correlogram for per Capita Expenditures on Food