The Economics of Deleveraging: The Aftermath of Financialization

Abstract

This paper explores the economics of deleveraging and provides a simple model of the deleveraging process. Deleveraging involves a two step correction. The first step is when a borrowing boom comes to an end. The second step is when agents start to save and re-pay debt. Deleveraging can be understood through the metaphor of a car that symbolizes the economy. Borrowing is like stepping on the gas and accelerates economic activity. When borrowing stops, the foot comes off the pedal and the car slows down. However, the car’s trunk is now weighed down by accumulated debt so economic activity slows below its initial level. With deleveraging, households increase saving and re-pay debt. That is like stepping on the brake, causing the economy to slow further akin to a double dip. Rapid deleveraging is equivalent to hitting the brakes hard. The only positive is it reduces debt, which is like removing weight from the trunk. That helps stabilize activity at a new lower level, but it does not speed up the car.

Keywords: Deleveraging, debt, financialization, neoliberalism.

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I Introduction

After almost three decades of declining household saving rates and increasing consumer debt, the US economy has now entered a period of deleveraging marked by rising household saving rates and declining consumer credit. As shown in Table 1, the household saving rate fell from 10.6 percent in 1981 to 1.2 percent in the first quarter of 2008, and has since risen back to 4.9 percent in the second quarter of 2009. Table 2 shows that total outstanding consumer credit grew at an annual rate above 4 percent from 2004 to 2007, and then collapsed abruptly in the third quarter of 2008. In the fourth quarter of 2008 consumer credit growth turned negative and has remained negative since.

This paper explores the economics of deleveraging and provides a simple model of the deleveraging process. According to the model deleveraging is characterized by a simple logic that involves a two step correction. The first step is when borrowing comes to an end. The second step is when agents start to save and re-pay debt.

Deleveraging can be understood through the metaphor of a car that symbolizes the economy. Borrowing is like stepping on the gas and accelerates economic activity. When borrowing stops, the foot comes off the pedal and the car slows down. However, the car’s trunk is now weighed down by accumulated debt so economic activity slows below its initial level. With deleveraging, households start to increase saving and re-pay debt. That is like stepping on the brake, causing the economy to slow further akin to a double dip. Rapid deleveraging, as happening now, is equivalent to hitting the brakes hard. The only
positive is it reduces debt, which is like removing weight from the trunk. That helps stabilize activity at a new lower level, but it does not speed up the car.

II Some Economic Preliminaries

The model that is developed is intended to shed light on the US business cycle of the last thirty years and the predicament the US economy now finds itself in. Palley (2005, 2008a, 2009a) characterizes the period since 1980 as being marked by a new business cycle that differs dramatically from the business cycle that operated from 1945-80.

The old business cycle was characterized by full employment and a system in which wages grew with productivity. That set up a system in which wage growth fuelled demand growth, while demand growth and full employment provided an incentive to invest. That in turn raised productivity which raised wages.

The new business cycle is marked by abandonment of full employment and severing of the wage – productivity growth link. In place of wage growth, demand growth has rested on borrowing and asset price inflation. That explains why financial deregulation and financial innovation have been important as they ensured a steady stream of products that increased borrowing capacity and raise debt ceilings.

Rising debt has been a key part of the new business cycle, but debt is a two-edged sword. Initial borrowing stimulates demand but it leaves behind a debt burden that depresses future spending (Palley, 1994). This holds for both households and firms. Increased household debt entails freer spending debtor households making interest transfer payments to higher saving creditor households, which lowers demand. For firms,
interest payments reduce free cash flow which lowers investment (Fazarri and Hubbard, 1988).¹

III The model

The model is given by the following three equations:

(1) \( y_t = (1 + g)\alpha_0 + \alpha_1 y_{t-1} + \alpha_2 \Delta D_t - \alpha_3 i_{t-1} \)

(2) \( \Delta D_t = \beta [D^*_t - D_{t-1}] \)

(3) \( D^*_t = (1 + g)\gamma_0 + \gamma_1 y_{t-1} \)

\( y \) = nominal output, \( g \) = nominal output growth rate, \( D \) = nominal debt, \( \Delta D \) = nominal change in debt (borrowing or repayment), \( D^* \) = nominal debt ceiling, subscript \( t \) = current time period. This simple stylized structure is able to provide considerable insight into recent past dynamics of the US economy and the current process of deleveraging.

Equation (1) describes the evolution of output, which grows at a steady rate, \( g \). Borrowing (\( \Delta D > 0 \)) increases demand and positively impacts output but leaves behind a debt footprint in the form of debt service obligations that is a drag on activity (\( iD \)). The coefficient \( \alpha_3 \) can be thought of as the difference in the propensity to spend of debtor and creditor units. Conversely, debt repayment (\( \Delta D < 0 \)) negatively impacts output. This is the channel through which deleveraging operates.

Equation (2) determines borrowing and repayment. The basic logic is that of a conventional lagged adjustment mechanism in which the actual debt stock adjusts gradually to the debt ceiling. If actual debt is below the ceiling, agents borrow more

¹ Palley (2004) notes that business debt interest payments can be expansionary if households’ propensity to spend out of interest income exceeds the effect of reduced cash flows on business investment spending.
which increases activity. If actual debt is above the ceiling, agents repay debt which lowers activity. Equation (3) determines the debt ceiling which also grows at a steady rate g and is also affected by last period’s level of output. This latter argument provides an avenue for cyclical influences on the debt ceiling.

Increases in the debt ceiling are critical to understanding business cycle developments over the past thirty years and why the US now faces a double dip recession. Within the model, such increases proxy for the processes of financial innovation and financial deregulation. The paper maintains these processes offset the underlying stagnationist tendencies of the new neoliberal business cycle created at the end of the 1970s and beginning of the 1980s.

This interpretation constitutes a twist on the classic Minsky financial instability hypothesis. According to Minsky (1993) the economic system has an automatic proclivity to financial instability. Palley (2009b) puts a slightly different interpretation on this proclivity and argues the US neoliberal model has needed financial innovation and financial deregulation to maintain demand and counter stagnationist forces inherent in the model. This succeeded in putting off the model’s day of reckoning, but delay through increasing of debt ceilings and accumulation of debt meant the ultimate crisis was more abrupt and severe when it eventually occurred.

The model given by equations (1) – (3) contains two different dynamic mechanisms. The first is a trend growth mechanism; the second is a business cycle mechanism based on debt dynamics. For simplicity we shall work with case of $g = 0$ because that makes clear the role and borrowing and deleveraging which drive the
business cycle aspect of the model, and it is that aspect which dominates the immediate economic future.

That said, the inclusion of \( g \) in equations (1) and (3) provides helpful insights because it illustrates how underlying trend growth helps the economy deal with debt crises. Thus, if the economy is in an over-borrowed position \((D^*_{t} < D_{t-1})\) that triggers deflationary forces by obliging debt repayment, trend nominal output growth helps combat those forces by raising nominal income and the debt ceiling \((D^*_{t})\).

Since \( g \) refers to nominal income growth, there are two ways in which over-indebtedness can undermine this stabilizing effect of trend growth. The first is if the contraction induced by over-indebtedness lowers the rate of inflation, which connects to Fisher’s (1933) debt – deflation hypothesis. The second is if over-indebtedness lowers the real rate of growth. In this regard, the existing Post Keynesian growth literature shows higher steady state debt levels can lower growth but can also raise growth (Dutt, 2006; Palley, 2009c).

Assuming \( g = 0, \) steady state equilibrium involves a situation in which \( D_t = D_{t-1} = D^*_{t} \) and \( y_t = y_{t-1} = y^* \). In a sense, readers can think of the analysis as approximating near-term behavior of de-trended output. Substituting these conditions in equations (1) – (3) yields

\[
(4) \quad D^* = \gamma_0 + \gamma_1 y^*
\]

\[
(5) \quad y^* = \frac{\alpha_0 - \alpha_3 i \gamma_0}{1 - \alpha_1 + \alpha_3 i \gamma_1}
\]

Substituting equation (5) into equation (4) then yields

\[
(6) \quad D^* = \gamma_0 + \gamma_1 [\alpha_0 - \alpha_3 i \gamma_0 ]/[1 - \alpha_1 + \alpha_3 \gamma_1]
\]
Differentiating equations (5) and (6) with respect to the exogenous parameters yields
\[
\frac{d y*}{d\alpha_0} > 0, \quad \frac{d y*}{d\alpha_3} < 0, \quad \frac{d y*}{di} < 0, \quad \frac{d y*}{d\gamma_0} < 0, \quad \frac{d y*}{d\alpha_1} > 0, \quad \frac{d y*}{d\gamma_1} < 0,
\]
\[
\frac{d D*}{d\alpha_0} > 0, \quad \frac{d D*}{d\alpha_3} < 0, \quad \frac{d D*}{di} < 0, \quad \frac{d D*}{d\gamma_0} > 0, \quad \frac{d D*}{d\alpha_1} > 0, \quad \frac{d D*}{d\gamma_1} > 0,
\]
Increases in autonomous spending \((\alpha_0)\) raise equilibrium income, in turn raising equilibrium debt. Increases in the debt burden drag \((\alpha_3)\) and interest rate \((i)\) lower equilibrium income, which lowers equilibrium debt. Increases in the autonomous component of the debt ceiling \((\gamma_0)\) and the allowable debt-to-income multiple \((\gamma_1)\) both raise debt and lower income. The negative effect on income reflects the ultimate drag of the debt footprint. Increases in the propensity to spend \((\alpha_1)\) raise equilibrium income and debt. The logic is a higher expenditure multiplier that raises income, thereby allowing more borrowing.

The model given by equations (1) – (3) reduces to a two equation simultaneous system of first order difference equations given by
\[
(1) \quad y_t = \alpha_0 + \alpha_2\beta\gamma_0 + [\alpha_1 + \alpha_2\beta\gamma_1]y_{t-1} - [\alpha_2\beta + \alpha_3i]D_{t-1}
\]
\[
(2) \quad D_t = \beta\gamma_0 + \beta\gamma_1y_{t-1} + [1 - \beta]D_{t-1}
\]
The necessary and sufficient stability conditions (Gandolfo, 1979, p.138) are
\[
1 - \alpha_1 - \alpha_2\beta\gamma_1 > 0
\]
\[
\left| \begin{array}{cc}
1 - \alpha_1 - \alpha_2\beta\gamma_1 & \alpha_2\beta + \alpha_3i \\
- \beta\gamma_1 & \beta \\
\end{array} \right| = \beta[1 - \alpha_1 + \gamma_1\alpha_3i] > 0
\]
These conditions have a familiar Keynesian interpretation. The first condition is that the partial propensity to spend \((\alpha_1 + \alpha_2\beta\gamma_1)\) be less than unity. The second condition is that full equilibrium propensity to spend \((\alpha_1 - \alpha_3\gamma_1i)\) be less than unity. The second condition
holds if $\alpha_1 < 1$, which is the standard assumption in Keynesian models. The first condition includes the parameters $\gamma_1$ and $\beta$. These parameters affect borrowing and the debt ceiling and they provide the channel through which financialization can cause instability.

Inspection of the first stability condition shows that increases in $\beta$ or $\gamma_1$ increase the likelihood of instability. The logic is that they increase the size of the expenditure multiplier, adding the additional stimulus of spending financed by borrowing. If income increases not only is there the standard marginal propensity to consume effect, there is also additional spending that comes from increased borrowing owing to a higher debt ceiling.

Inspection of the second condition shows that increases in $\gamma_1$ or $i$ increase the likelihood of stability. The logic is a higher debt burden effect is stabilizing, though it contributes to a lower equilibrium level of output. Thus, in response to a positive shock, a large debt burden effect prevents aggregate demand and output from exploding and causing an unstable cumulative expansion. Conversely, in response to a negative demand shock that causes loan repayment, a large debt burden effect means debt repayment strongly adds to aggregate demand and helps stabilize the economy. This debt burden effect also points to the importance of robust counter-cyclical interest rate policy which can add to debt burdens to stop expansions and reduce debt burdens to diminish contractions.

It is well established (Blanchard, 1981) that aggregate output exhibits a hump-shaped response to shocks. Assuming the model is calibrated to produce such a pattern,
Figure 1 provides a simple graphical analysis showing how output, borrowing, and debt evolve in response to an exogenous increase in the debt ceiling \( D^*_0 < D^*_1 \). A higher debt ceiling causes agents to borrow more which spurs aggregate demand and output. The economy therefore expands which causes additional borrowing. However, as debt grows that closes the gap between the debt ceiling and actual debt, causing borrowing to gradually decline. As borrowing tapers off, the expansionary impulse weakens. At the same time past borrowing raises debt that now exerts a debt drag. The strengthening debt drag gradually comes to dominate the weakening borrowing impulse, causing output to fall. That causes debt repayment which further lowers output. When the economy finally settles it has higher equilibrium debt and lower equilibrium income owing to the accumulated debt burden.

< Insert Figure 1 >

**IV Using the model to explain the neo-liberal period and deleveraging**

The model can now be used to provide a stylized account of the US economy over the past thirty years. This involves linking developments in the real economy regarding wages and income distribution with developments in the financial sector. Both pieces together constitute financialization (Palley, 2008b).

*IV.a The US Economy, 1980 – 2007*

The election of Ronald Reagan in 1980 can be thought of as the official inauguration of the era of neoliberalism. The goal of neoliberalism was to increase the profit share. It did so by severing the link between wages and productivity growth. That was accomplished by abandoning commitment to full employment in favor of concern
with inflation, implementing a new labor market flexibility agenda, and inaugurating a new era of corporate globalization. In terms of the model, the effect of lower wages and widened income inequality can be thought of as lowering aggregate demand by lowering the autonomous spending coefficient, $\alpha_0$.

Financial markets, through the processes of financial deregulation and innovation, then served to offset these deflationary forces. This can be thought of as increasing the parameters $\beta$, $\gamma_0$, and $\gamma_1$. That yields a temporary economic shot in the arm via borrowing that offsets the contractionary impact of wage stagnation and widening income inequality. However, the aggregate demand effect of wage stagnation is permanent, while the aggregate demand effect of borrowing is temporary and borrowing also leaves behind a permanent negative aggregate demand effect through higher debt. Therein lies the contradiction of neoliberal financialization.

Financial innovation and financial deregulation increased the debt ceiling and also provided access to credit by introducing new products and increasing the spectrum of assets that could be collateralized. Examples of financial innovations include home equity loans, the spread of defined contribution pension plans that could be borrowed against, lower down-payments on mortgages, new mortgage products with initial low interest rates, and increased use of leasing arrangements.

This process is captured in Table 3 which shows the evolution of household and non-financial corporate debt by business cycle peak years. Having been relatively stable over the period 1960 – 1981, the past thirty years have seen an explosion in household
indebtedness. Non-financial corporate indebtedness also increased significantly, albeit not as fast.

< Insert Table 3 >

Figure 2 uses the logic of the model to provide a stylized graphical history of the US economy. The 1980s saw the first jump in borrowing and household debt, and that helped propel the long expansion. When it ended, both the household and non-financial corporate sector had higher debt-to-GDP ratios.

< Insert Figure 2 >

The expansion formally ended in 1991 and there followed a first period of extended jobless recovery. That jobless recovery ended in 1995 when the economy took off again, spurred by a new wave of financial exuberance linked to the emergence of the Internet. The result was further increased debt along with a stock market boom and the beginnings of a ten year house price bubble.

The Clinton era business cycle expansion ended in 2001 and was followed by a second period of jobless recovery during which the Federal Reserve lowered its short term target interest rate to the then post-World War II record low of one percent. Low interest rates plus continuing financial innovation, particularly as regards mortgage products and home equity loans, caused a further jump in debt ceilings and borrowing. This eventually triggered a new expansion centered on housing, which became a house price bubble that peaked in mid-2006 and imploded in summer of 2007.
The important feature of the model is that each cycle relies on borrowing to spur recovery and expansion, but the expansions die out because of higher debt burdens caused by borrowing. That burden then lowers output – in a de-trended sense \( g = 0 \).

Offsetting the deflationary real economy forces of neoliberalism and the deflationary effect of higher debt burdens requires continuously increasing the debt ceiling to enable a new round of borrowing. That jump starts a new expansion and buys temporary relief, but when the expansion ends the economy is saddled with yet larger debt burdens.

**IV.b The US Economy after 2007**

According to the model, when borrowing stops the economy enters a period of stagnation in which it is burdened by debt. That stop can be thought of as beginning the first leg of the recession which was worsened enormously by the financial crisis triggered by Lehman Brothers’ collapse in September 2008. The financial crisis should be thought of as an additional negative shock to output.

The second leg, which corresponds to the stage of deleveraging, is when agents start to pay back debt. In terms of the model, deleveraging is triggered by a reduction in either or both the parameters \( \gamma_0 \) and \( \gamma_1 \). That causes borrowing to turn negative, causing an additional fall in output on top of the recession shock.

This pattern is captured in Figure 3 in which borrowing and output decline. Whereas in prior expansions there was an initial positive leveraging multiplier, now there is a negative deleveraging multiplier that works as follows. Debt repayment lowers aggregate demand and income, which in turn lowers allowable debt thereby forcing more
debt re-payment. The silver lining is loan re-payment shrinks debt, thereby reducing the
debt burden and setting the stage for an eventual rebound of demand and output. The big
question is how long the deleveraging process goes on, which depends on how large is
the fall in D* owing to the deleveraging shock.

< Insert Figure 3 >

IV.c Is a depression possible?

Interpreted through the lens of the model, an economic depression can be
identified with model instability. That leads back to the necessary stability conditions
discussed and the parameters $\gamma_1$ and $\beta$. Financialization and its accompanying financial
culture can be thought of as increasing the magnitude of the parameters $\gamma_1$ and $\beta$, making
instability more likely. Indeed, as discussed above, the economic logic of neoliberalism
drove the system toward instability by requiring financial innovation and deregulation
increase the value of these parameters to offset stagnationary forces in the real economy.

If the economy is unstable, interest policy becomes critical. Upward instability
can be countered by raising the central banks’ short-term interest rate that affects the loan
rate, $i$. Downward instability can be countered by lowering the short-term policy rate.
This stabilizing effect of counter-cyclical interest rate policy can be seen from inspection
of equation (1) in which counter-cyclical $i$ offsets pro-cyclical variation of the term
$\alpha_2 \beta \gamma_{1t-1}$. The problem in the current de-leveraging environment is that the nominal
interest rate floor may block the monetary authority’s ability to sufficiently lower $i$. 
The lesson from this simple model is that deleveraging in a highly financialized environment with an interest rate floor is extremely problematic. Consequently, a depression remains in the cards.
References


Table 1. Personal saving rate (PSR) as percent of personal income.
Source: Bureau of Economic Analysis

<table>
<thead>
<tr>
<th>Year</th>
<th>PSR (%)</th>
<th>Year</th>
<th>PSR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>9.8%</td>
<td>2008.I</td>
<td>1.2%</td>
</tr>
<tr>
<td>1981</td>
<td>10.6</td>
<td>2008.II</td>
<td>3.4</td>
</tr>
<tr>
<td>1991</td>
<td>7.0</td>
<td>2008.III</td>
<td>2.2</td>
</tr>
<tr>
<td>2001</td>
<td>2.7</td>
<td>2008.IV</td>
<td>3.8</td>
</tr>
<tr>
<td>2007</td>
<td>1.7</td>
<td>2009.I</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2009.II</td>
<td>4.9</td>
</tr>
</tbody>
</table>
Table 2. Annualized growth of consumer credit (%).
Source: Board of Governors of the Federal Reserve.

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<thead>
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<tr>
<td>2004</td>
<td>5.6%</td>
<td>4.5</td>
<td>4.1</td>
<td>5.6</td>
<td>4.8</td>
<td>4.1</td>
<td>0.6</td>
<td>-3.0</td>
<td>-3.7</td>
<td>-6.6</td>
<td>-9.1</td>
<td>-5.8</td>
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</table>
Source: FRB Flow of Funds Accounts and author’s calculations.

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP ($ billions)</th>
<th>Household debt (H) ($ billions)</th>
<th>H/GDP</th>
<th>Non-financial Corp debt (C) ($ billions)</th>
<th>C/GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>526.4</td>
<td>215.6</td>
<td>0.41</td>
<td>201.0</td>
<td>0.38</td>
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<td>1969</td>
<td>984.6</td>
<td>442.7</td>
<td>0.45</td>
<td>462.0</td>
<td>0.47</td>
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<td>1973</td>
<td>1,382.7</td>
<td>624.9</td>
<td>0.45</td>
<td>729.5</td>
<td>0.53</td>
</tr>
<tr>
<td>1981</td>
<td>3,128.4</td>
<td>1,507.2</td>
<td>0.48</td>
<td>1662.0</td>
<td>0.53</td>
</tr>
<tr>
<td>1990</td>
<td>5,803.1</td>
<td>3,597.8</td>
<td>0.62</td>
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<td>2001</td>
<td>10,128.0</td>
<td>7682.9</td>
<td>0.76</td>
<td>6,954.0</td>
<td>0.69</td>
</tr>
<tr>
<td>2007</td>
<td>13,807.5</td>
<td>13,765.1</td>
<td>1.00</td>
<td>10,593.7</td>
<td>0.77</td>
</tr>
</tbody>
</table>
Figure 1. The evolution of output, borrowing, and debt in response to an increase in the debt ceiling ($D^*_0 < D^*_1$).
Figure 2. A stylized history of the US economy from 1981 – 2007.
Figure 3. The US economy and the effect of deleveraging ($D^*_{0} < D^*_{1}$).