Obsolescence Of The 30-Year Mortgage

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This paper examines the relationship between the microeconomics of real-estate and the negative impact of the innate flaws of the 30 year mortgage as it relates to elevated Housing Cost To Income Ratio averages (HCTI). The average borrowers housing expense has risen to approximately 50% of an American's average net income. As a consequence of this dilemma, it is not uncommon that homeowners find themselves financially ill-equipped to handle moderate downturns in the economy. Our research suggests that by having a thorough understanding of how these intricate components work together, allow for a more enhanced comprehension of the past, present, and future of our financial system. Furthermore, we explore how the proper management of the Nation's HCTI averages can be used to help avoid economic recessions.

JEL Codes: C53, D00, G01, G02, G21, N00.

I. INTRODUCTION

The real-estate market in the United States has a direct and substantial effect on the past, present and future of the economy (Green, 2013). People need shelter and corporations need a physical place to conduct their affairs. It is with this understanding, economists and governments have considered real-estate as the economic nucleus of a functional capitalist society (Bluhm, Overbeck and Wagner, 2010). By being aware of the different stages of real estate, and how it affects the expansion and contraction of our economy, we are better equipped to deal with the ever changing state of the economy(Alexander and Moloney, 2011)

We examine the conceptualization of the real-estate market cycles as being a clock with different progressive stages of economic time, which can be advanced, slowed down, or to some degree reversed. Our research suggests this as being a key element in controlling its periodic booms and busts. If we can recognize which direction our real-estate cycle is currently heading, we may be able to alter its trajectory to our economy's advantage. Is it really possible to manage economic time, which could conceivably lead to the end of real-estate markets booms and busts? If so, could the real-estate cycle be used as a sort of economic time machine to facilitate a positive stabilizing effect on the economy? In this paper we will investigate in detail the driving forces we believe, could lead to the answers to these, and other questions economist and policy makers alike have been pondering for many years. All the data we utilized were both, individually and collectively extrapolated from the following resources: Case - Shiller Indices, The Federal Reserve and U.S. Census Bureau. We examined and share the results of a number of past and present economic conditions, which have had a positive and or negative effect on our economy. We began by exploring a number of economic variable data points in hope of identifying leading indicators that have historically effected the economy. We then dissected the broad range of empirical data we amassed. All the indices used clearly and concisely showed to represent a natural occurring regression of related data. We reexamined these indices for relevance and cohesion, then narrowed down our selection even further. Once the final selections were made we used all of the historical data to help us formulate an algorithm to be used as the building blocks of our model, which we commonly refer to as "The Economic Genome".

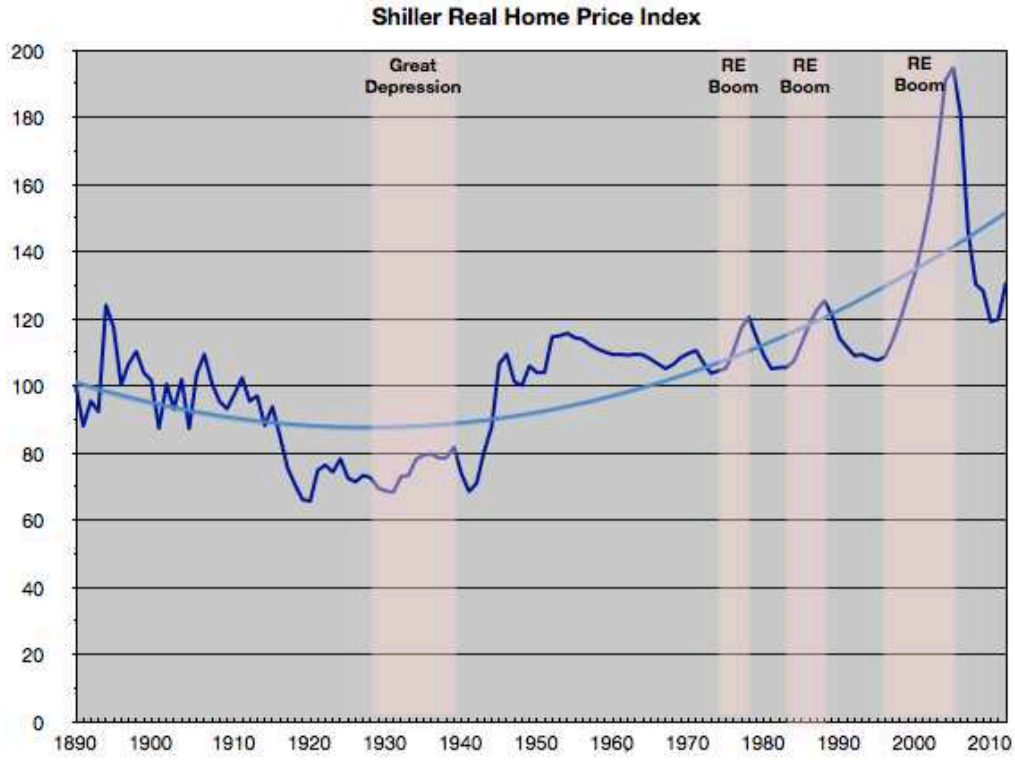
II. THE MICROECONOMIC EFFECTS OF HOUSING INITIATIVES

Over the past several decades, FDR's affordable housing initiative was responsible for a rapid expansion of home ownership throughout the United States (Allen and Barth, 2012). This was accomplished through the creation of The Federal National Mortgage Association, which extended mortgage payments for borrowers over a 30-year period of time. According to the 1940 U.S. Census Bureau, the median price of a single family home in the U.S. was approximately $2,938 (Aalbers, 2012). The median yearly wage was $1,730. The Housing Cost to Income ratio (HCTI) was just over 2:1. Most borrowers kept their mortgages for the majority of the loan term (Wolfson, 2013). The HCTI ratios were 3 - 4:1 for most of 1950s - 1960s. Until the 1970s most borrowers kept their mortgages for the majority of the loan term (Bluhm, Overbeck and Wagner, 2010).

In the late 1970s, the HCTI was inflated to a ratio of 5:1 (Aalbers, 2012). Since the 1970s and 1980s borrowers have exhibited a major behavioral change by ceasing to keep their mortgage until full term (Allen, 2013). Most borrowers either sold or refinanced their homes within ten years. This neutralized the benefit of compounding interest, which was once provided by the 30-year mortgage model (Bluhm, Overbeck and Wagner, 2010). Under the MBS system, the highest yields are paid to the riskiest tranches of bonds, which are tied to the first ten years of a mortgage pool (Green, 2013). When a borrower prepays their mortgage, all future compounded interest payment streams, needed to offset higher yields prepaid during the first ten years, are lost. This dramatically affects the overall yield of the more secure bonds left in the mortgage pool (Johnson, 2013). As a consequence of this trend, bond investors are resigned to invest large sums of capital, 30-years' worth of capital for only 10 years of compounding interest, into the riskiest portion of the bond pools. These revenue streams are all too often dependent on borrowers that have an average HCTI approaching 6:1 (Wolfson, 2013).

Figure 1 shows the housing appreciation trend in light blue. The average housing appreciation accelerated at a higher rate during the past thirty years (Shiller, 2005). While medium income appreciation depicted in Figure 4 has slowed compared to the 1950s through mid 1970s. These two opposing trends have a negative effect on HCTI ratios.

Figure 1 Shiller Real Home Price Index (Shiller, 2005).



Most of the anchoring principles of the 30-year mortgage have been lost due to its inability to reduce loan balances quick enough to keep up with our modern economy, borrowers are no longer keeping their mortgages until full term, and are more willing to carry higher debt than the previous generations of borrowers (Bluhm, Overbeck and Wagner, 2010). Borrowers who have more equity in their homes are less likely to default on their mortgages. A modern day mortgage amortization model should offer the capability and flexibility to sustain the following factors (Wolfson, 2013):

1. It should entice borrowers to stay in their mortgages for a longer period of time (Alexander and Moloney, 2011).
2. It must quickly and effectively de-leverage the current banking system while providing more equity to borrowers in a shorter period of time.
3. It should decrease the weighted average risk of bonds attributable to the first ten years of a borrower's, mortgage (Wiedemer and Baker, 2013).

A new amortization model that is mutually beneficial to lenders, borrowers, and bond investors in today's economy is essential (Jones, 2013). In most cases, bond investors and mortgage lenders are left with little hope of realizing the full benefit of compounding interest, or find themselves highly exposed to risk during a recession (Allen, 2013).

Throughout the United States economic history dating back to the New Deal, the rationale behind the United States Federal Reserve policy has been to encourage Americans to purchase homes (Bluhm, Overbeck and Wagner, 2010). The alternative would lead to more potential homebuyers turning into renters driving lease rates higher as was observed in the years 2010-2013. All tax revenue derived from jobs through the expansion of home ownership is lost as a consequence. In the long-run, renting leads to less disposable income to feed the economy (Green, 2013).

III. THE ECONOMIC GENOME

The Economic Genome model in Figure 2 is comprised of the following historical interconnecting relatable indices: Industrial Production of Durable Consumer Goods (IPDCG), The Number of New Home Sales, Unemployment Rates, Median New Home Appreciation and Housing Cost to Income ratio (HCTI). We have tracked the movements of these specific interrelated indices, which collectively have shown us to positively or negatively effect the U.S. economy over the past 47 years. The HCTI index in Black consists of the greater Male or Female Single Median Income divided by New Home Sale Cost. We have further observed the HCTI to be the leading index, which affects home appreciation, New Median Home Sales, Durable Consumer Goods sales, and the rise ***r*** and decline ***d*** of Unemployment Rates ***U*** (Jones, 2013). Figure 2 has shown, a rising HCTI ***Hr*** lowers IPDCG home sales and appreciation, which was observed to lead to a ***r*** in unemployment rates ***Ur***.

When HCTI levels remain elevated for an extended period of time, a recession was likely to follow (Allen and Barth, 2012). The opposite was shown to occur when HCTI ratios began to decline ***Hd***. We noted a rising HCTI ***Hr*** is attributable to the decline of IPDCG. This eventually led to a rise of unemployment rates:

Ur = Hr.

Conversely, a decline in HCTI **H*d*** led to a rise in New Median Housing sales and IPDCG that leads to a decline ***d*** in the Unemployment rate ***Ud***:

Hd =Ud.

We have therefore concluded the rise and decline ***rd*** of ***H*** led to ***rd*** of **U:**

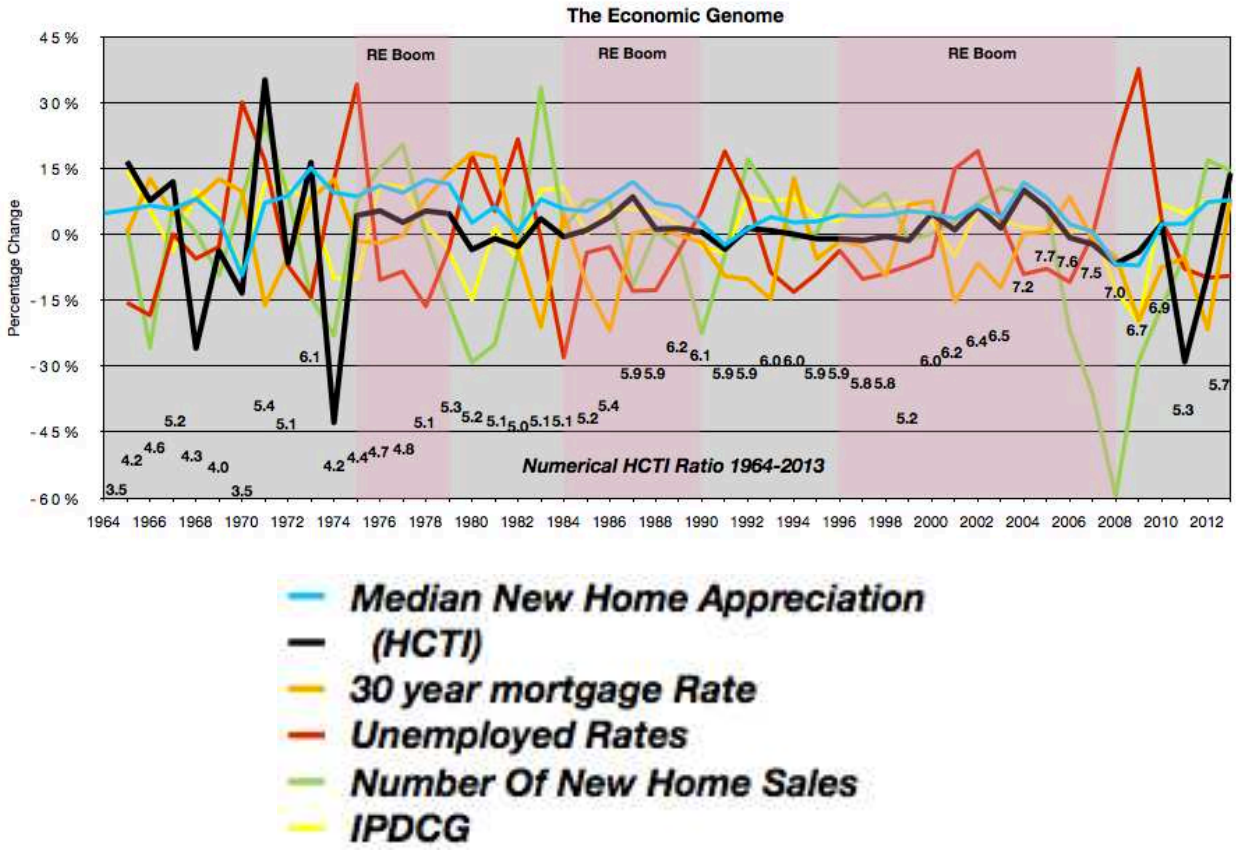
Hrd = Urd.

We further observed through the use of our Economic Genome model, when HCTI rises, it intersects with the rising unemployment. As viewed in, 1973, 1979, 1989, and 2005. The opposite was true when HCTI decreased as observed in the years 1968,1972,1982, 2003 and 2011 (Allen, 2013).

The following chain of events were also noted; A spike or prolonged elevation of the HCTI approaching a 6-1 ratio led to a negative effect on the New Home Sales index, as was the case in the following years: 1968-1971, 1978, 1985-1987, 1989-1990, and 2006-2008 (Wolfson, 2013). These same indices were observed acting in the opposite manner when HCTI ratios were in decline in the following years (Allen and Barth, 2012): 1974-1977, 1981-1986, 1990-1992, and 1995-1999 (Alexander and Moloney, 2011).

Viewing the data along the bottom of Figure 2, "The Numerical HCTI Ratio" we noted, real-estate booms preceded lower HCTI ratios in the following years; 1974,1984 and 1997. As HCTI levels soared to a peak in 1979,1989 and in 2005, real-estate market crashes soon followed. This observation led us to ask, was Prof. Milton Friedman's free market economic system the main cause of the real-estate crash of 2008 as some economists have suggested, or was there the possibility of an innate flaw embedded within our financial system? The results of the data we viewed in Figure 2 suggest the latter. The repetition of the sequential events observed over the past decades led us to conclude, if we could resolve the HCTI Paradox explained in the following section, the Economic Genome could be used as a tool to help avoid future economic contractions. (Blinder, 2013). The goal being, to create an algorithm, which will achieve a sustained stabilized economy as experienced in the mid-1940s throughout the 1950s. We would start by optimizing all the aforementioned interconnected leading indicators we identified within the Economic Genome led by the HCTI index (Green, 2013).

Figure 2 The Economic Genome



IV. THE HCTI PARADOX

We believe through the preponderance of data observed, the rationale for buying a home to stimulate the economy is being undermined by the 30-year amortization model (Allen, 2013). U.S. Census Bureau reports has shown housing values on average have increased nearly 100% each decade. Based on U.S. Census Bureau reports viewed in Figure 4 borrowers median income has historically lagged far behind the appreciation of housing cost. Our observations have concluded the 30-year model being partly responsible for past prolonged economic contractions. Our study shows the central issue at hand is the amount of equity the 30-year mortgage produces within a ten-year period has proved to be insufficient for our modern day economy (Jones, 2013). In its present state, the slow rate of median income appreciation coupled by 10 years of inflation, financially strapped borrowers often find themselves with a mortgage payment, which exceeds their ability to pay (Wiedemer and Baker, 2013). As Figure 5 demonstrates, during a time of economic contraction mortgages may become higher than the value of borrowers homes, which inhibits them from either selling or refinancing the homes they may no longer be able to afford (Allen, 2013). We call the drive to stimulate the economy through homeownership, which enables borrowers to over extend themselves beyond their ability to pay, resulting in a negative effect on the economy, The HCTI Paradox (Shiller, 2005). Our research based on the data viewed in Figure 3 shows a faster Principal Reduction Amortization Model (PRAM) would offset the negative results of The HCTI Paradox. Figure 1 demonstrates the frequency of this occurrence is approximately once in every ten years (Shiller, 2005). The historical data provided by Freddie Mac has led us to conclude without the intervention of the Federal Reserve, the 30-year mortgage interest rate would rise above 6% (Green, 2013). It takes a 30-year mortgage with a 6% interest rate approximately 12 years to obtain 20% equity as shown in Figure 3. In the same time period PRAM would lower the balance of a borrowers mortgage by approximately 50%.

Figure 3 PRAM VS 30-Year Mortgage Model Principal Reduction Comparison

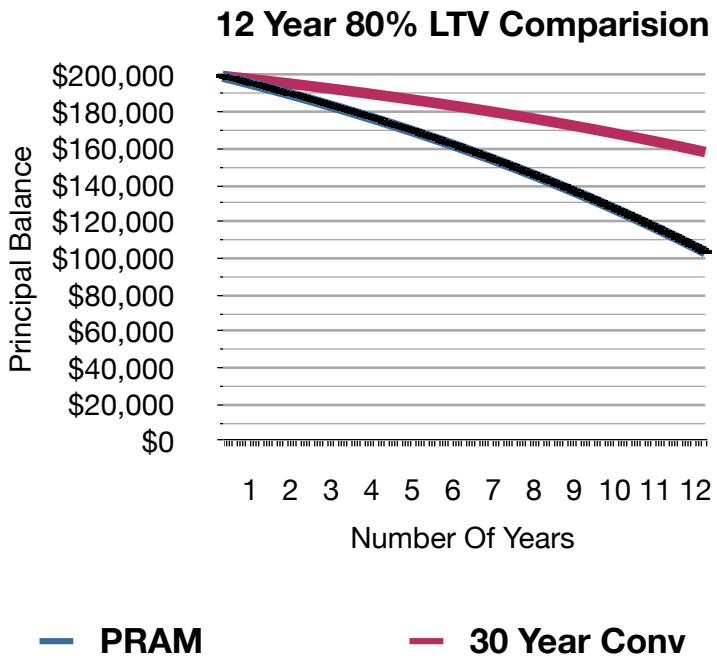


Figure 4 depicts historical data from the U.S. Census. The data presents a cyclic pattern of events leading to a real-estate crash. It also shows the interconnected relationship between real-estate crashes and rising HCTI ratios. It is crucial that we have a mortgage model that will allow borrowers to have enough equity in their homes during the most difficult economic times. The inability of the 30-year model to do so, has shown to result in foreclosures for the most financially strapped borrowers (Jones, 2013). Foreclosures during past recessions have proven to weigh heavily on housing values and the economy, which contributed to sending home values spiraling down even further. Based on all the data on display the 30-year mortgage model has proven to be incapable of offsetting the historically low increase in wages to keep up with past appreciation in housing and inflation rates (Wolfson, 2013).

Figure 4 Median Income VS New Home Appreciation During The Last Three Recessions.

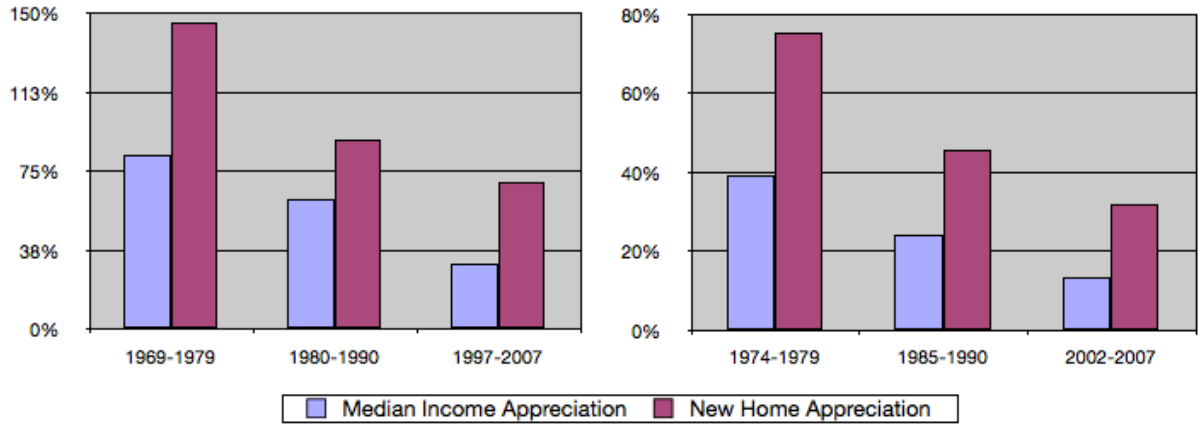
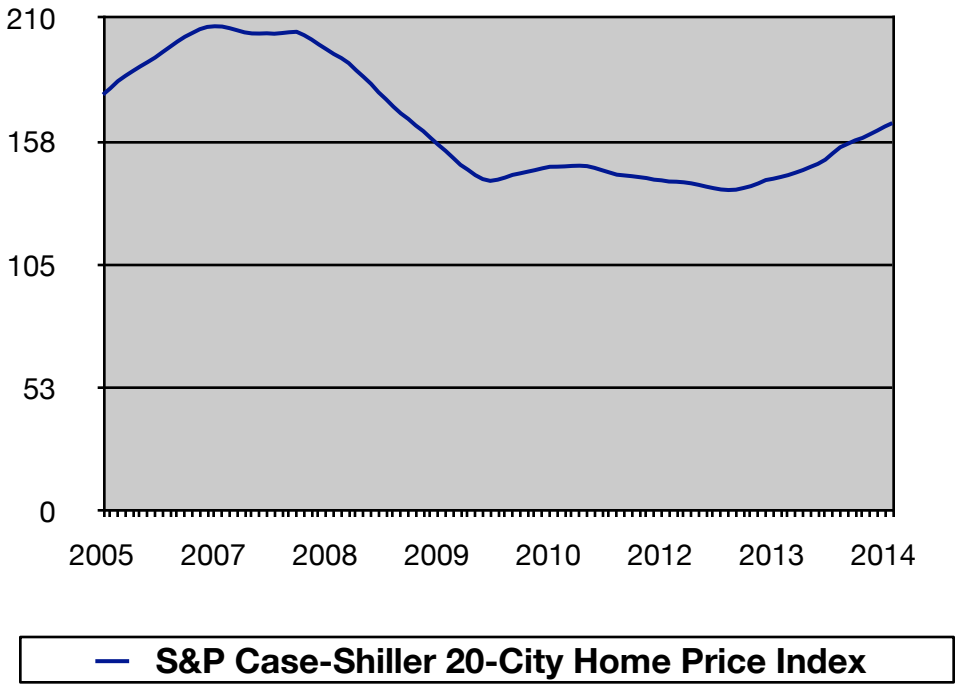


Figure 5 based on data derived from Case-Shiller 20 City Home Price Index supplies us with further evidence for the need of a new amortization model that would reduce a loan balance 50% faster than the 30-year models capacity. Figure 3 shows nearly 100% of all mortgages still underwater viewed In Figure 5 would have been sufficiently de-leveraged Under PRAM by 2013 (Macdonald, 2012).

Figure 5 Case-Shiller 20-City Home Price Index



A formula for determining when the next real-estate bubble is likely to occur can be derived from our observation of past HCTI's effects on the leading indices provided by the U.S. Census Bureau depicted in Figure 2 (Stone and Zissu, 2012). If we start from the onset of the last real-estate crash, one can pinpoint when a subsequent crash is likely to occur by using the following formula: HCTI ***H*** = (Median new home price) divided by (Single median income). Interest rates have a dramatic effect on housing payments, which in turn effects HCTI levels. (Johnson, 2013). Therefore we subtract a coefficient value of ***C*** from the total sum of ***H*** when the current interest rates ***ci*** falls below 6% interest. ***C = 6% - ci*** (Blinder, 2013):

HCTI= H - C.

When the HTCI ratio in the past have risen to a level of 6:1 a real-estate bubble is likely to occur unless immediate measures are taken to lower the HTCI levels (Baig and Choudhry, 2013).

The Economic Genome model can be used as an accurate tool by economists to unmask abnormalities in the real-estate market, which would eventually lead us to a recession. For instance, in the early 1980s, the real-estate market crashed despite the HCTI visible along the bottom of Figure 2 being approximately 5:1 (Blinder, 2013). This was likely to have been a result of efforts of the Federal Reserve to stem inflation by raising interest rates from 11% to 16%. From 2002 until 2008 the HCTI was well above 6:1. This leads to ask the following question: Why did it take six years for the real-estate market to crash? The most probable answer is likely the substantial number of borrowers that opted to choose interest only subprime loans during this period of time. (Stone and Zissu, 2012). Both catalysts to these recessions were telegraphed long in advance of their impending negative results on the economy by our Economic Genome model.

VI. CONCLUSION

It is apparent that most, if not all, of the classes rated below AAA would receive an increase in yield through the use of the PRAM model, which will have a positive effect on mortgage rates (Johnson, 2013). As Figure 1 should prove to confirm the mortgage meltdown of the 70s, 80s, 90s, and yet again in 2008, is a habitual reminder to the banking industry of the inherit risks associated with the inability of the 30-year amortization model to sufficiently de-leverage mortgage pools within the first ten years (Alexander and Moloney, 2011). A 30-year amortization model as demonstrated in Figure 3 takes nearly 12 years to reduce the LTV to 80%. In contrast, the PRAM model would take approximately five years (Alexander and Moloney, 2011). As of 2013 there are approximately three million mortgages still underwater in the U.S. (Blinder, Alan.S., 2013). If all of the mortgage pools originated in 2006-2007 were based on the PRAM amortization model, nearly 100% of all MBS pools would have been sufficiently de-leveraged according to the data viewed in Figure 3. (Macdonald, 2012).

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