

The Real Cause for the U.S. Subprime, Financial, Economic Crises in 2007-2009

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Abstract

This paper is devoted to investigate the real cause of the U.S. subprime, financial, economic crises. It will first review related literature, and then examine a number of key economic factors related to oil production and consumption. The resulting insight will help answer the question on the impacts of ARRA because the knowledge of the fundamental cause of these crises will help determine what the most effective solutions to the economic recovery should be and examine if ARRA succeeded to deliver these solutions.

Keywords

rising oil price, short supply of oil, suburban housing market, oil dependence, crisis, sustainability

1 Introduction

Since the 2008 global economic crisis, economic and financial theorists and practitioners have widely discussed and acknowledged the lax economic and financial regulations and legislations as structural problems of the existing US and global economy that allowed mounting economic and financial risks to be overlooked and to have directly triggered the global financial and economic crisis. However, studies on some of more fundamental issues, such as rising energy prices and climate change, their relationship to the carbon-based global economy's consumption of fossil fuels, especially of oil, and their relationship to the global financial and economic crisis, were scarce and largely ignored.

This study will examine the U.S. economy's dependence on the consumption of carbon-based energy sources, especially oil. It will also investigate several related key indicators, including energy consumption per unit of GDP for selected economies, world GDP, world energy consumption, world oil price, and U.S. delinquency rate.

2 Literature Review

There was a consensus that the collapse of the housing market triggered the 2007 U.S. financial crisis. Major factors identified as leading to the boom and bust of the housing market included subprime lending, government regulation in expanding home ownership through mortgage subsidies for impoverished borrowers, monetary policy in the United States and Europe, corporate pay structures, credit-default swaps, banks' leverage, lax financial deregulation, etc. (Acharya, Philippon, Richardson, and Roubini 2009; Bordo 2009; Caballero and Krishnamurthy 2009; Reinhart and Rogoff 2008; Acharya and Richardson 2010; Caballero, 2010; Mian and Sufi 2010; Mayer 2011).

However, studies exploring the relationships between the rising oil prices and the housing and financial crisis in 2008 were scarce and largely ignored. These studies explored the issue from two main perspectives, with one focusing on the causes of the housing boom and the other focusing on what caused the collapse of the housing market.

One of the popular explanations of the housing boom between 1996 and 2006, in which real housing prices rose by 53 percent, was easy credit in the form of low real interest rates, high loan-to-value levels and permissive mortgage approvals. If this explanation were valid, then the financial crisis could be considered less a systemic or structural problem of the U.S. and world economy. Improved monetary and financial mechanisms would be capable of preventing this kind of irrational housing bubble in the future. However, if easy credit was not the primary culprit of the housing bubble, then more research is necessary to investigate what actually caused housing first to boom and bubble and then to collapse and burst to trigger the financial crisis.

Glaeser et al. disputed the low interest rate and easy credit explanations. Their study reexamined the housing prices and found that the predicted impact of interest rates on housing prices is much lower once the standard user cost model of housing prices is generalized to include mean-reverting interest rates, mobility, prepayment, elastic housing supply, and credit-constrained home buyers. This theoretical impact of interest rates on prices was found in line with their empirical estimates. Based on this study, the

authors concluded that low real interest rate can explain only 20 percent of the price increase of the housing boom. The study did neither find convincing evidence that changes in approval rates or loan-to-value levels could explain the bulk of the housing boom. The authors pointed out the need of “better corrections for the endogeneity of borrowers’ decisions to apply for mortgages” (Glaeser, et al., 2010).

Other studies focus on what caused the housing bubble to burst. Carr and Beese (2008) found a moderate correlation between the rise in interest rates and the rise in oil prices between 2004 and 2007, which led to home foreclosures between 2005 and 2008. Theramus (2009) found that volatility in the oil prices caused the financial crisis in 2008. Hamilton (2009) reviewed several approaches (Blanchard and Gali, 2007; Edelstein and Kilian, 2007; Blinder and Rudd, 2009) to estimating the impact of oil price shocks on the economy, including some methods that had previously shown an economic decline following previous oil price shocks.

Hamilton further explored similarities and differences between the run-up of oil prices in 2007–08 and the earlier oil price shocks. He found that different from previous oil price shocks, which had been primarily caused by physical disruptions of supply, the price run-up of 2007–08 was caused by “strong demand confronting stagnating world production” (Hamilton, 2009). His observation seemed to concur with the view of a growing number of studies that world oil production has reached its peak (Campbell and Laherrère, 1998; Almeida and Silva, 2009; Höök et al., 2009; Shafiee and Topal, 2009; Zhao et al., 2009).

At the same time, he observed that despite the different causes of soaring oil prices, the 2007–08 oil shock had the same economic depressing consequences as the previous oil shocks, for the economy in general and for consumption spending and purchases of domestic automobiles in particular, which caused home market crash, severe financial and economic crises, and economic recession. He concluded that the increase in oil prices in the period of 2007 through 2008 had made a “material contribution” to the subsequent U.S. financial crisis (Hamilton, 2009).

Sexton et al. also found in their recent empirical study that high gas prices caused the U.S. housing bubble to burst (2012). Their study went beyond the mainstream economists’ view that blamed the U.S. housing collapse in 2007 for inducing a financial crisis that spread to the entire economy and causing a severe and prolonged economic downturn.

The authors investigated the role of skyrocketing gas prices and a dramatic gas price shock in triggering the housing market collapse. They did this by developing a model of housing demand that integrates the Alonso-Muth urban model and the Poterba model of housing investment. The Alonso-Muth urban model showed that, in equilibrium, suburban residents are compensated for increased commuting costs by lower land prices. The Poterba model was used to simulate the likely effects of gas prices on house prices.

The authors showed how low gas prices had first fueled the housing boom along with low interest rate, easy access to credit, and new mortgage products, which made suburban housing affordable to high leveraged and long work commuting homebuyers who were otherwise low credit worthy because of low incomes.

The study showed how the persistently rising and subsequently skyrocketing gas prices, which doubled between 2005 and 2008, then increased the costs of commuting between suburban homes and workplaces in city centers and the costs of distant, commuting-based suburban living, and forced the vulnerable homeowners to abandon their commuting lifestyle. The authors concluded that suddenly rising commuting costs lowered the values of distant homes away from the city centers and made them undesirable, and caused rising foreclosure rates.

This view was echoed by Anderson (2009) who argued that the recent financial crisis was largely caused by the long-term problem of the current world economy lacking a sustainable path of development. He based his findings on the theory of “limits to growth” – expressed principally through rises in the price of oil and other commodities – created a crisis for the global financial system, which essentially assumes an indefinite economic growth. These findings supported an increasing public recognition of and increased calls for the need for sustainable development (Strange and Bayley, 2008), a development pattern that “meets the needs of the present without compromising the ability of future generations to meet their own needs” or meets “the needs of the present while contributing to the future generations’ needs” (Needham, 2011).

3 Examinations and Results

Drawing on the existing studies that link the recent financial crisis to the conflict between the U.S.-led world economy’s oil dependence and the recent changes in the world oil market, this study will examine the relationship between the recent economic and financial crises and the problems of the U.S. economy.

To pin point more exactly the impact of oil price surges on the United States and other developed economies, the study investigated these economies’ respective oil dependence (**Fig. 1**) from two perspectives—the one concerning the oil consumption as a share of the respective economy’s total primary consumption and the other concerning the correlations of the growth of the world economy and the growth of the world oil consumption.

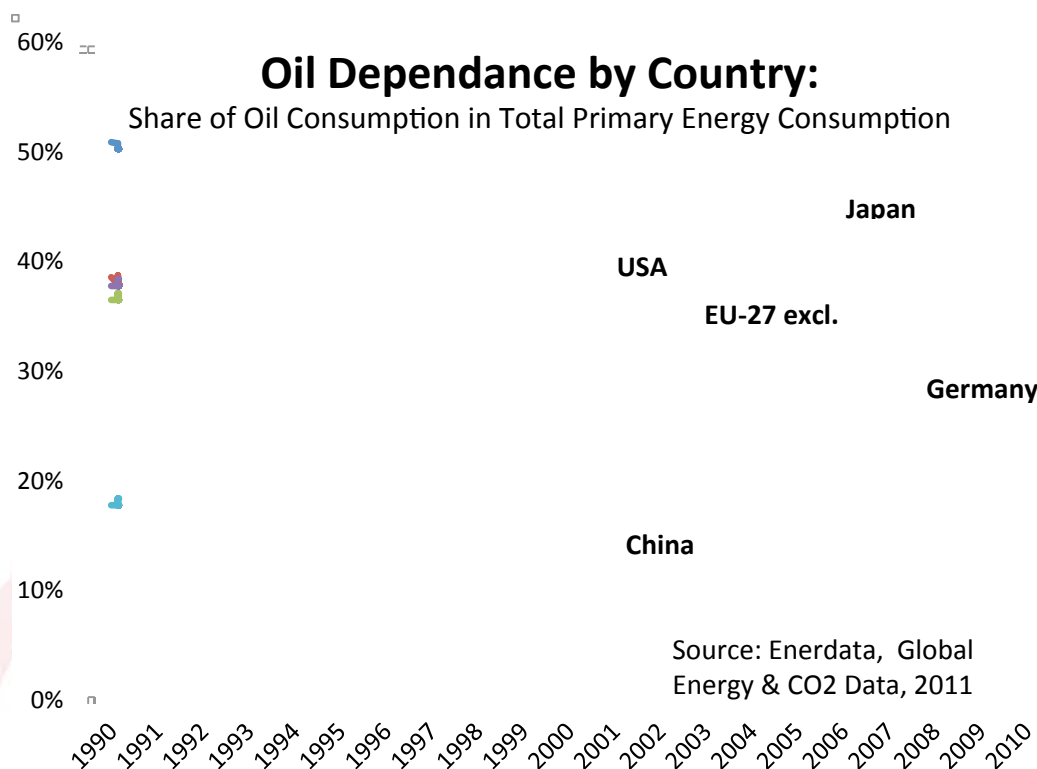


Fig. 1 Oil Dependence of Major Economies (Data Source: Enerdata, 2011)

The results of the investigation showed both a promising trend of reduced oil dependence and a concerning reality of high oil dependence of the major developed economies. On the one hand, the major developed economies' oil dependence experienced a notable reduction, with a 14 percent decrease from 51 percent in 1990 to 37 percent in 2010 in Japan, and a three percent decreased respectively in the United States, Germany and other EU-27 countries in the same period. On the other hand, the developed economies still displayed significant oil dependence between 31-37 percent. While the reduced oil dependence was induced by high oil prices and the gradual advancement of renewable energy, the persistently high oil dependence of the United States and other major developed economies made them particularly vulnerable in the face of volatile oil markets and rising oil prices.

A sectorial analysis of the U.S. oil dependence revealed an even depressing picture. While the economy-wide oil dependence in the United States was only around 35 percent in 2010, the oil dependence in manufacturing and transportation were much higher: 43 percent and 96 percent respectively. While the overall high oil dependence explained well why U.S. economy was especially vulnerable to soaring oil prices, the extremely high oil dependences of the key economic sectors manufacturing and transportation in the United States made it self-explanatory why the oil price hikes in 2007-2008 damaged, as Train and Winston (2008) observed, these economic sectors most severely.

The examination of the long-term oil production and oil consumption relation revealed an interesting two-factor trend. On the one hand, the world oil demand has been steadily increased from approx. 1500 megatons in 1965 to approx. 4000 megatons in 2011, a 167 percent increase. On the other hand, while the oil production was able to offer a sustained supply surplus over the oil consumption in the long period from 1965 to 2000, this

surplus turned into a frequent supply shortfall since then. This two-factor trend indicated the difficulty the world oil production had to meet the increasing world oil consumption, which explained well the continuously rising oil prices (Fig. 2).

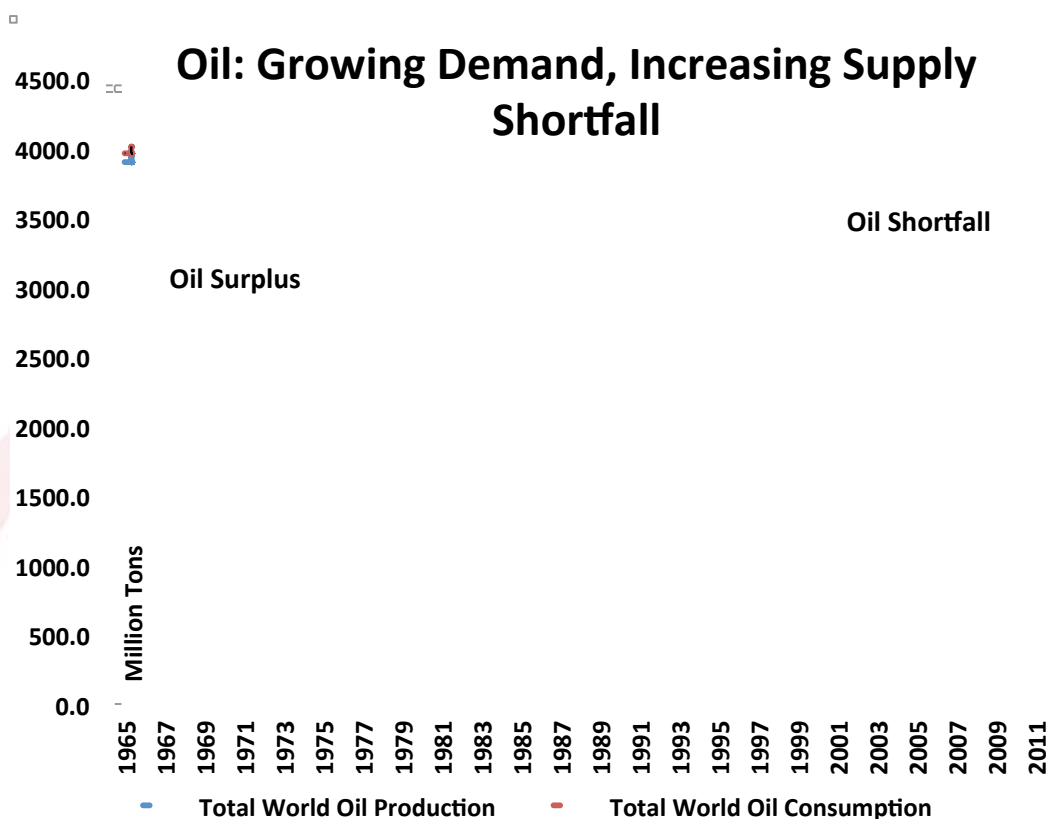


Fig. 2 Rising Oil Demand: From Supply Surplus to Supply Shortfall (Data Source: BP, 2012)

The composition examination of the world oil consumption showed two interesting observations. First, the oil consumption of the major developed economies such as the United States, the EU, and Japan still constitutes a major share of the world oil consumption. Second, the increase of the oil demand did not come from these major developed economies, but came rather from other countries, especially from the rapidly developing countries such as China and India (Fig. 3).

Considering the size of population and the further developing needs in these developing economies, their demand for oil represented On the one hand a strategic approach to energy consumption because of oil's less environmental and ecological impact than that of the major energy source in these countries—coal. However, this increased oil demand called for an inevitable oil supply shortfall and rising oil prices in the face of insufficient oil production since the turn of the new millennium. The correlation coefficient of .46 between the oil supply shortfall and the rising oil prices in the period between 2002 and 2011 showed that the rising oil prices in this period were closely related to the short supply in the world oil markets.

□

Oil Consumption by Country

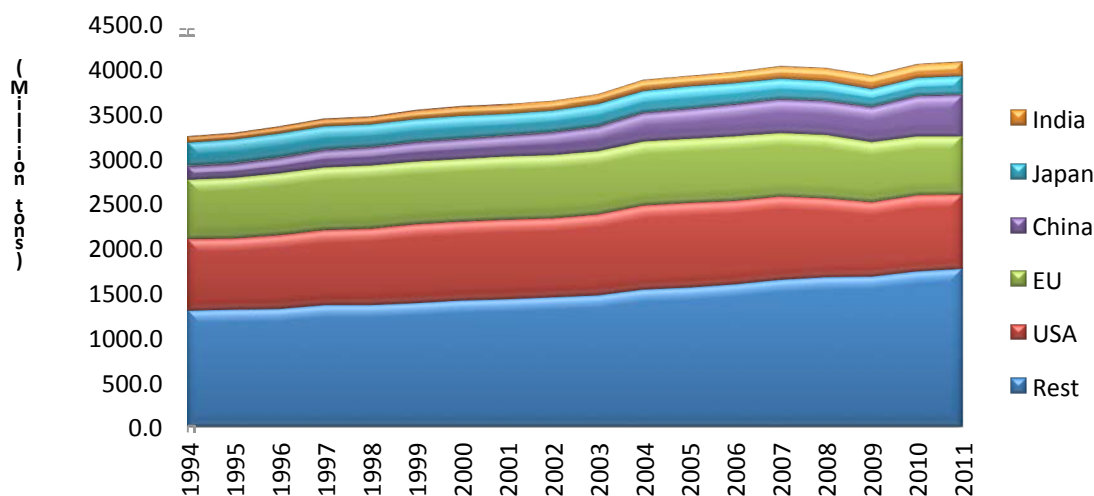


Fig. 3 Oil Consumption of Major Economies (Data Source: BP, BP Statistical Review of World Energy 2012)

The investigation of the correlations of the growth of the world economy and the growth of the world oil consumption revealed that the current world economy was highly oil dependent. The growth in the world GDP and the change in the world oil consumption showed a high correlation (.79). The world economy’s high oil dependence informed us that, in the absence of other significant alternative energy sources, the any GDP growth would further intensify the world economy’s oil demand and oil consumption. However, the U.S. economy had an even higher oil dependence of .85, much higher than other major economies, which indicated that the world biggest economy was also the world’s most oil dependent major economy in the last 20 years (Fig. 4).

□

Oil Dependence: Correlation Coefficient between GDP and Oil Consumption (1991-2011)

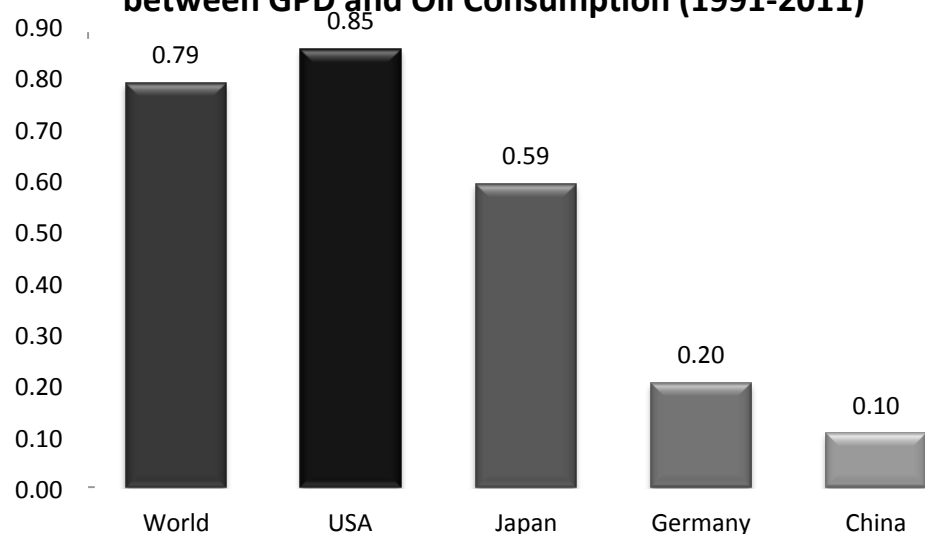


Fig. 4 Oil Dependence Measured by Correlation between GDP and Oil Consumption in 1991-2011 (Data Sources: World Bank, 2012; IMF, 2012; BP, 2012)

Based on this basic investigation of the oil production and oil consumption in recent years, this study compiled and analyzed data related to the growth in the world GDP, the world oil consumption, the increase in world oil price index, first mortgage default index; and decline in the U.S. auto sales.

Fig. 5 shows the dynamic impact of skyrocketing oil price since 2002 the U.S. economy in general and on the U.S. first mortgage delinquency rates and the U.S. auto sales in particular before, during, and after the U.S. economic crisis. As a long term trend, rising oil prices already caused the mortgage default rate to rise sharply before the 2007 U.S. financial crisis. In this period, the U.S. auto sales also felt the strong downward pressure caused by the oil price rises and kept a gradual downward trend from 2004, several years before the economic crisis.

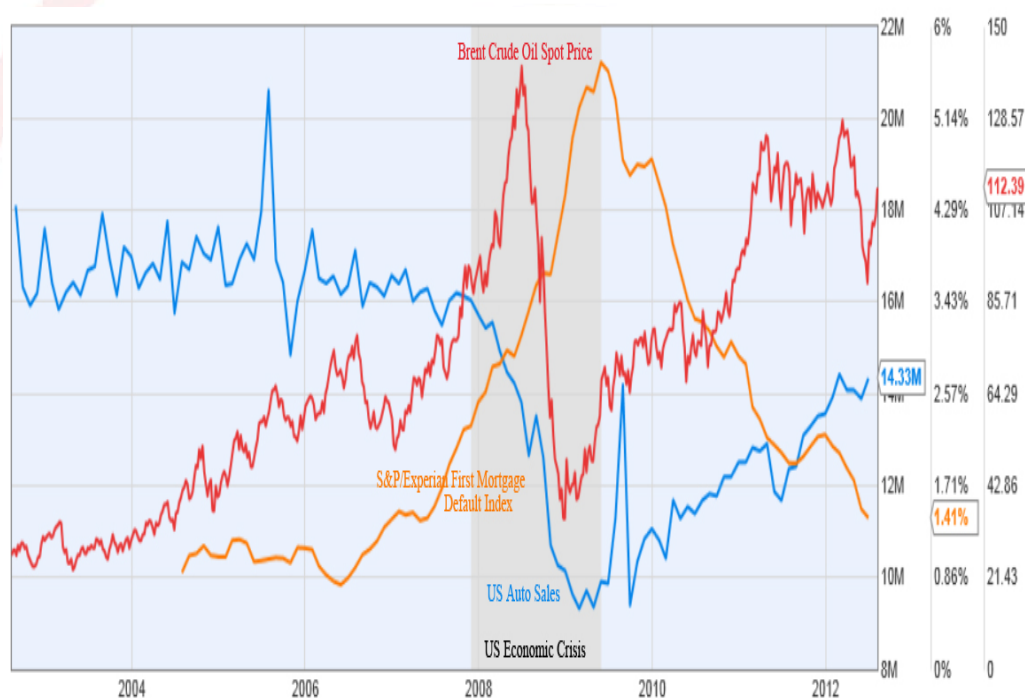


Fig. 5 Oil Price, U.S. Mortgage Default, U.S. Auto Sales, and U.S. Economic Crisis (Data Sources: BP, 2012; S&P/Experian, 2012; Autodata, 2012)

During the U.S. economic crisis, both the surge in the U.S. mortgage delinquency rates and the drop in the U.S. auto sales were intensified, which constituted a sharp contrast to the rigid oil price hike. The continued skyrocketing oil price lasted for a month, despite the strong market signal of a dramatic economic downturn, until it reached its record high and plunged into a free fall to the 2004 price level.

The rigid oil price hike at the beginning of the economic crisis contributed to forcing the mortgage default rate to surge to a record high and the U.S. auto sales to drop to a record low during the economic crisis. This insensitive upward movement in the oil prices can be read as its “overreaction” to the oil supply shortfall caused by the growing oil-dependent world economy. The continued surge in oil prices even during the early months of the economic crisis was paralleled, with a delay, by the continued surge in U.S. delinquency rate. This observation confirms the findings of Carr and Beese (2008) and

the assumption made by Anderson (2009) and Hamilton (2009) that there is a positive relationship between the rises in the oil price and the financial crisis.

Although the mortgage delinquency flood did not reverse its rising trend and the U.S. auto sales did not reverse its plunge until the economic crisis was over, the oil price started already to rise again before the economic crisis was over.

4 Conclusions

This study investigated the relationship between the rising oil prices and the economic crisis in the United States. The investigation found a substantial relationship of the U.S. economy's high oil dependence as its structural weakness and economic and financial vulnerability and the rising oil prices since 2004 and skyrocketing oil price hikes in 2007 as the primary culprit of the 2007 U.S. financial crisis and the subsequent U.S. and global economic crisis and the long-term financial constraint of the oil-dependent U.S. and global economy.

The findings of this study suggest the need of the transition from the carbon-based economy to a greener and more sustainable economy and the need to develop and implement a comprehensive green economic transformative strategy. Such a transformation can play a significant role in proactively dealing with the financial constraint of the future economic growth, and allow the U.S. and global economy to grow in an economically and financially more sustainable and healthy manner.

Certainly, the recent financial crisis was immediately triggered by the mortgage crunch as a result of the subprime lending and related "shoddy" subprime lending practices. However, one should not ignore the economic factors that caused the housing bubble and subsequently the housing bust on the one hand, and the fatal impact of oil price surge on housing market in particular and on the overly oil dependent U.S. economy in general. In other words, we must see what caused the mortgage crunch to trigger the financial crisis. As the expansion of the world GDP and the increase in oil demand and oil supply shortfall fueled oil price hikes, the skyrocketing oil prices, in turn, put significant strain on U.S. living, manufacturing, and transportation in terms of rising costs (World Bank, 2012), related job markets (rising unemployment rate), and financial markets (subprime market bust).

To be sure, the drastic drop in oil prices during the financial and economic crisis was only a temporary phenomenon as a result of substantially reduced energy demand in response to the contracted size of the wasteful and inefficient carbon economy. Now that the existing carbon-based economy returns to "business as usual," the hard financial constraint, as we now are witnessing, has started haunting the economy again and causing the economic recovery to take place at a painfully slow pace. As matter of the fact, the resurged high gas prices are constraining the U.S. economic recovery in general and the recovery of the U.S. oil-dependent sectors such as manufacturing and transportation, as well as housing markets in particular. The latter is especially true for distant houses that are associated with high commuting costs.

If the current still relatively "low" oil prices were mistaken as a turning point from the long-term oil constraint and rising oil prices, the U.S. economy could sadly miss the

opportunity of switching over to a greener sustainable economy based on increased renewable energy generation and reduced oil dependence. To sum up, in addition to the U.S. mortgage crunch as the direct trigger of the 2008 global economic crisis, this study found the rising oil prices as the main culprit of the U.S. mortgage, financial, and economic crises in 2007-2008. In addition, the study found the carbon-based, oil-dependent energy structure of the U.S. economy, especially its key economic sectors manufacturing and transportation, as the one of the main reasons for the severity of the U.S. mortgage, financial, and economic crises caused by the skyrocketing oil prices and the difficulty of the U.S. economic recovery.

Based on these findings, this study concludes that without a green transformation that significantly improves the efficiency of fuel consumption and the carbon-based, oil-dependent energy structure of the U.S. economy and the other major economies, the U.S. led global economy will not be able to avoid the fundamental contributing factors of the recent economic crisis and frequent future economic crises it will be facing: soaring energy prices, pollution and climate change, and the global financial mess. As Pavan Sukdhev pointed out, the carbon-based “economic models of the 20th century are now hitting the limits of what is possible” (UNEP, 2008).

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