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LIQUID ASSET HOLDINGS
INTO PRODUCTIVE
INVESTMENTS

Robert Pollin, James Heintz,
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Political Economy Research Institute
University of Massachusetts, Amherst
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POLITICAL ECONOMY RESEARCH INSTITUTE

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HIGHLIGHTS OF MAIN FINDINGS

Starting with the financial collapse and Great Recession of 2008-09, the U.S. economy has been experiencing the most severe and protracted employment crisis since the 1930s Depression. As the employment crisis has proceeded, U.S. commercial banks and large non-financial corporations have been building up huge hoards of cash and other liquid assets. This study examines the impact on job creation of mobilizing these excess liquid assets into productive investments within the U.S. economy over the next three years.

- **$1.4 trillion in excess liquidity.** Commercial banks are carrying a total of $1.6 trillion in cash reserves and the nonfinancial corporations are holding $2 trillion in liquid assets. After accounting for the safety needs of these businesses in a highly risky economic environment, we conclude that the banks are holding $1 trillion in excess cash and the corporations are carrying $400 billion in excessive liquid assets. This brings the total of excess cash held by the banks plus excess liquid assets held by the corporations to $1.4 trillion.

- **Credit market lockout for small businesses.** As a corollary to the banks piling up cash reserves, smaller non-corporate businesses have experienced a massive contraction in the supply of credit available to them since the onset of the recession. Total net borrowing for these businesses has been in the negative since 2009.

- **Unemployment would fall below 5 percent by 2014.** Approximately 19 million new jobs would be generated within the U.S. economy over three years if the $1.4 trillion in excess liquid asset hoards were channeled into productive investments and job creation. This would push the unemployment rate below 5 percent by the end of 2014. We document how this would create new opportunities for workers at all credential levels within the U.S. economy. We also

show the regional benefits for both the Los Angeles and Seattle metropolitan areas.

- **Policies to mobilize excess private liquidity for job creation.** We propose a range of policy approaches that can expand overall demand in the economy, reduce the level of risk for borrowers and lenders, and/or raise the costs for banks and nonfinancial corporations to continue holding excess liquid assets. These policy approaches include further federal stimulus initiatives, measures to reduce the existing debt burdens of homeowners, taxing the excess reserves of banks, and extending federal loan guarantees for small businesses.

- **Targeting priority sectors for growth.** We propose targeting four areas for growth:
  - businesses which would benefit substantially by raising efficiency even if market demand is not growing;
  - small businesses that face larger than normal credit constraints;
  - more labor intensive businesses; and
  - businesses that generate large social as well as private benefits.

SUMMARY OF STUDY

Amid the ongoing employment crisis in the U.S. economy, U.S. commercial banks and large corporations are sitting on huge hoards of cash and other liquid assets. The banks are carrying $1.6 trillion in cash in their accounts at the Federal Reserve while the corporations are carrying about $2 trillion in liquid assets. In combination, these holdings amount to about 23 percent of U.S. GDP.

At the same time that the commercial banks and large corporations are carrying these hoards of cash and other liquid assets, smaller non-corporate businesses (i.e. those with fewer than 500 employees) have experienced a massive contraction in the supply of credit available to them. This pattern is the corollary to the banks piling up cash reserves. For smaller, non-corporate businesses, total borrowing fell from $526 billion in 2007 to negative $346 billion in 2009 — a nearly $900 billion reversal. The small business sector overall continued to obtain zero net credit over both 2010 and 2011.

The central question this study examines is: what would be the impact on employment in the U.S. if some significant share of these liquid asset hoards were channeled into the expansion of productive activities and investments by private businesses? Our basic finding is that U.S. employment could expand by about 19 million jobs between 2012 and 2014. This would drive the official unemployment rate down to below 5 percent by the end of 2014. We reach this conclusion after taking full account of the need for the banks and corporations to carry a large fraction of these funds as a safety cushion in the currently risky environment. We also take account of the prospects for rising inflation and gains in average real wages for workers if job opportunities were indeed to increase rapidly.

How Much Excess Liquidity is Available for Job Creation?

As of the most recent September 2011 data, the commercial banks are carrying an unprecedented $1.6 trillion in cash reserves.

They obtained most of this money through the Federal Reserve having maintained the interest rate at which banks can borrow at nearly zero percent — that is, the banks have access to nearly unlimited liquid funds at no borrowing costs. In addition, U.S. nonfinancial corporations are holding about $2 trillion in liquid assets. They are using a large proportion of these funds to engage in financial engineering, such as buying back shares of their own stocks, as opposed to investing in new productive equipment and expanding their operations. We recognize that a significant fraction of these funds needs to be held by banks and corporations as a safety cushion in the currently highly risky environment. After making highly conservative assumptions about the safety requirements of the banks and nonfinancial corporations, we conclude that the *excess* liquid holdings of the private sector are about $1.4 trillion, with $1 trillion held by the commercial banks and the remaining $400 billion by the nonfinancial corporations.

How to Mobilize Excess Private Liquidity to Support Job Creation?

Private businesses operate to earn a profit. As such, the fact that banks and nonfinancial corporations are sitting on approximately $1.4 trillion in excess liquidity rather than expanding their businesses and hiring workers must mean that, at some level, they do not see adequate profit opportunities in the U.S. economy today through investments and job creation. The first problem facing businesses in general is the insufficient level of demand in the economy. The economy is also operating with a severe credit constraint — that small businesses in particular are being locked out of credit markets. We therefore consider a range of policy approaches that can expand overall demand in the economy, reduce the level of risk for borrowers and lenders, and/or raise the costs for banks and nonfinancial corporations to continue holding excess liquid assets. These policy approaches include further federal stimulus initiatives, measures to reduce the existing debt burdens

of homeowners, taxing the excess reserves of banks, and extending federal loan guarantees for small businesses.

Targeting Priority Sectors for Growth

An expansion of private business investment on the order of $1.4 trillion will need to be spread throughout all sectors of the economy to be effective on this large a scale. At the same time, there are areas of the economy where conditions are more favorable for a large expansion. These include, first, the range of businesses for which market demand does not have to be growing in order for firms to profit substantially from investments that raise productivity and thereby lower costs. One example of this would be energy efficiency building retrofits, where investments can save business owners 20-30 percent on their energy costs, relying only on existing proven technologies. Another example is investments in privately-owned infrastructure, including the electrical grid system, freight rail, airports, and water ports.

Other priority sectors should include businesses facing larger than normal credit constraints, including especially various types of small businesses; businesses that are more "labor intensive," i.e. rely more heavily on employing workers as a means of expanding their operations; and businesses that generate strong positive social benefits as well as private benefits. An example of businesses with strong positive social benefits would be community health clinics. Expanding such clinics as part of the reform of the U.S. healthcare system will create substantial improvements in care, especially within lower-income communities throughout the country.

Estimating National Employment Impacts

Of the $1.4 trillion total that we estimate is available now in excess liquidity held by commercial banks and nonfinancial corporations, we assume that when these funds are channeled into new productive activities, about $200

billion, or 14 percent will be needed to cover a rise in prices — i.e. inflation — as well as real wage gains. We assume that both inflation and real wages grow by 3 percent per year over 2012 – 2014. This leaves $1.2 trillion that would be available for creating new jobs. We estimate that this level of new private investment would generate about 19 million new jobs. If this level of job creation were to occur between 2012 and 2014, it would drive down the official unemployment rate below 5 percent by the end of 2014. We also show the range of jobs that will be created by this level of spending, including breaking down the total numbers of jobs created according to educational credentials. We find that about 5.7 million jobs, roughly 30 percent of the total, would be for people with college degrees or higher, and another 30 percent for people with some college experience. The remaining 7.8 million jobs, about 40 percent of the total, would be for those with less than high school degrees. In other words, we reach the unsurprising result that an employment expansion of this magnitude will generate large numbers of new opportunities for people at all educational credential levels, and with a wide range of experience and skills.

Employment Impacts for Los Angeles and Seattle

Of course, a program to inject $1.4 trillion in new private business spending for job creation will reach into every region, state and community of the country. We illustrate what the effects would be in two specific metropolitan areas: Los Angeles, which includes both Los Angeles and Orange Counties, and the cities of Glendale, Santa Clarita, Pomona and Pasadena; and Seattle, which includes King, Pierce and Snohomish Counties, and the cities of Tacoma and

Bellevue. We show that the impact in the Los Angeles metro area of receiving its proportional share of the overall expansion in business spending would be to create a total of 780,000 jobs over three years. This would drive the official unemployment rate in the Los Angeles metro area down from its current level of 11.5 percent to 6.1 percent by the end of 2014. The Seattle metro area's proportional share of overall spending would be about $19 billion. This would generate about 230,000 new jobs in the region. This would drive the Seattle region's official unemployment rate down from its current level of 9.8 percent to 5.8 percent.

Overall, moving the $1.4 trillion in excess cash and other liquid assets now held by commercial banks and large nonfinancial corporations into productive investments would transform the U.S. economy, creating millions of new job opportunities throughout the country.

Of course, getting these funds to move out of their hoards and into productive investments and job creation will require that a challenging combination of policies be implemented successfully. The main point on policy is that realistic options are available, both in terms of supporting overall demand in the economy as well as ending the credit crunch for small businesses. As such, there is no reason that the U.S. needs to remain stuck in a long-term unemployment crisis. Rather, through a combination of policy measures, overall demand can be strengthened and the credit constraint weakened. This will be the combination of measures necessary to start fulfilling the needs of U.S. citizens for decent job opportunities at all levels.

I. INTRODUCTION

Unemployment in the United States as of November 2011 stood officially at 8.6 percent. This represents more than 13 million people out of work. By a broader official measure that includes people employed fewer hours than they would like and those discouraged from looking for work, the unemployment rate as of November was 15.6 percent. This amounts to 24 million people in total, a figure roughly equal to the combined populations of New York, Los Angeles, Chicago and the other seven largest cities in the country. Prior to November, unemployment had been stuck at over 9 percent since May 2009, the longest such stretch since the 1930s Depression. Moreover, the most important factor pushing the unemployment rate below 9 percent in November was that nearly 500,000 people left the labor force between October and November. These are mostly people who have been discouraged by poor job prospects.

Accompanying the jobs crisis is another major departure from past economic patterns. This is that both U.S. commercial banks and large non-financial corporations are sitting on outsized hoards of cash and other liquid assets. The hoard now held by the commercial banking sector in total is historically unprecedented.

In fact, it is appropriate that all types of business firms should hold larger reserves of liquid assets than after previous recessions, given the severity of this recession and the high levels of ongoing risk. However, even after making allowances for the current high-risk environment, we still calculate that the total level of excess liquid holdings in the economy is about $1.4 trillion, i.e. an amount nearly equal to 10 percent of U.S. GDP. This includes $1 trillion in excess cash reserves held by commercial banks and $400 billion in excess liquid funds held by non-financial corporations.

Moreover, since the onset of the 2008-09 recession, while the commercial banks and nonfinancial corporations are carrying massive hoards of cash and other liquid assets, smaller non-corporate businesses (i.e. those with fewer than 500 employees) have experienced a huge

contraction in the supply of credit available to them. This pattern is the corollary to the banks piling up their cash reserves. For smaller, non-corporate businesses, total borrowing fell from $526 billion in 2007 to negative $346 in 2009— a nearly $900 billion reversal. The smaller businesses have then continued in this pattern ever since, undertaking zero net borrowing.

The most basic question we ask in this study is this: what would be the impact on employment opportunities in the United States if this $1.4 trillion in excess liquid assets were to be channeled into the expansion of productive activities and investments by private business firms, especially smaller businesses?[1] As we document in detail in the following sections of the study, our conclusion is that injecting $1.4 trillion of new business investments into the U.S. economy over a roughly three-year period would create about 19 million new jobs. Total employment would rise from about 140 to 159 million people by the end of 2014. By this time official unemployment would stand below 5 percent — i.e. about a four percentage point decline from the most current November 2011 rate of 8.6 percent. We reach this conclusion while also recognizing that the employment creation from $1.4 trillion in new private sector investment and business expansions will likely be diminished by two factors: 1) A rise in the economy's inflation rate, which we assume will reach an average rate of 3 percent over the three year period; and 2) A corresponding rise in average real wages, also at an average annual rate of 3

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[1] In the U.S. National Income and Product Accounts, the term "private investment" has a specific definition. It consists of spending by business firms on: 1) structures, equipment and software for businesses; 2) building residences; and 3) changes in private inventories. It also includes spending on replacement of the existing stocks of business structures, equipment, software and private residences. In more common usage, the term "investment" by private businesses can also refer to the expansion of a firm's existing operations by hiring more employees and utilizing their existing capital stock in various ways to produce more goods and services. For the current discussion, we use the term "investment" in this broader, less formal sense, to refer to all business spending activities — including hiring more employees — that enable private output to expand.

percent. We allow that workers will receive wage increases beyond the rise of inflation because they will gain increased bargaining power in correspondence with a falling unemployment rate.

This study consists of six sections in addition to this introduction. In Section 2, we examine how much liquidity is being held within the U.S. private sector today. We start with the commercial banks and other depository institutions. As of the most recent September 2011 data, the commercial banks are carrying an unprecedented $1.6 trillion in cash reserves. They obtained most of this money through the Federal Reserve having maintained the interest rate at which banks can borrow at nearly zero percent — that is, the banks have access to nearly unlimited liquid funds at no borrowing costs. In addition, U.S. nonfinancial corporations are holding about $2 trillion in liquid assets. As we discuss in this section, we do not assume that all of these funds are available to be used for new business investments and job creation. Some significant fraction should be held by the banks and corporations as a safety cushion in the currently highly risky environment. Yet, after making highly conservative assumptions about the safety requirements of the banks and nonfinancial corporations, we still conclude in this section that the excess liquid holdings of the private sector are about $1.4 trillion, with $1 trillion held by the commercial banks and the remaining $400 billion by the nonfinancial corporations.

By contrast, as we show in this section, nonfinancial corporate businesses — including most small businesses — are not holding excess liquid assets. Rather, they have been substantially locked out of credit markets since the 2008-09 financial crisis and recession. A high percentage of small businesses are seeking loans to expand their operations, but are being turned down by financial institutions. These are the same institutions that are sitting on an unprecedented cash hoard.

The findings of this section thus set the terms for the subsequent discussions. The issues that emerge out of this section are: how to mobilize

the $1.4 trillion in excess liquid assets to support new business investments and job creation; and what would be the impact of moving funds at this magnitude into productive investments, business expansions, and job creation?

Section 3, "Policy Approaches for Mobilizing Excess Liquidity," begins with the simple recognition that businesses operate to earn a profit. As such, the fact that banks and nonfinancial corporations are sitting on hoards of liquid assets rather than expanding their businesses and hiring workers must mean that, at some level, they do not see adequate profit opportunities through investments and job creation. We therefore review in this section the major obstacles to the economy moving onto a healthy recovery path. The first problem facing businesses in general is the insufficient level of demand in the economy. The low level of demand is in turn a consequence of three factors: high unemployment itself; the collapse of household wealth; and the austerity policies being imposed at the state and local levels of government. However, it is also true that the economy is operating with a severe credit constraint — that small businesses in particular are being locked out of credit markets. In fact, a high percentage of businesses, most especially smaller businesses, are likely to be both demand- and credit-constrained, to varying degrees within sectors and between firms. As such, a more generally applicable way of assessing current conditions is to recognize that businesses are *risk constrained*. We thus review in this section a range of policy approaches that can expand overall demand in the economy, reduce the level of risk for borrowers and lenders, and/or raise the costs for banks and nonfinancial corporations to continue holding excess liquid assets. These policy approaches include further federal stimulus initiatives, measures to reduce the existing debt burdens of homeowners, taxing the excess reserves of banks, and extending federal loan guarantees for small businesses.

In Section 4, "Inflation, Real Wage Growth and Targeting Priority Sectors," we address two sets of questions that need to be sorted out before we are able to conduct our estimates of employment possibilities through mobilizing the $1.4 trillion in excess liquidity. The first is to consider the effects of a large-scale increase in investment, business operations and corresponding job expansion on both inflation and the growth of real wages. That is, if the economy does succeed in moving onto a path of sustained expansion, there is a good possibility that this would create increased inflationary pressures as a byproduct of the economy growing at a healthy rate. We would also expect that, once the unemployment rate begins declining steadily, conditions will improve for workers to begin receiving real wage gains. To the extent that both inflation and real wages increase, that means that some part of the total $1.4 trillion in excess liquidity will be needed to pay for this. For the purposes of our discussion, we assume that both inflation and average real wages will rise by 3 percent per year over the three years of the expansion period we discuss. If this does occur, the result will be that about $200 billion of the $1.4 trillion total — i.e. about 14 percent of the total amount of excess funds available — will be needed to cover the rise in prices and improvements in real wages. This means that a total of about $1.2 trillion will still be available to support an increase in the numbers of people who are employed. We thus proceed in the next sections of our study under the assumption that $1.2 trillion will be the overall amount available to support job creation per se, as opposed to either inflation or real wage increases.

The second issue we consider in this section is whether specific sectors of the private economy should be prioritized for promoting a healthy expansion of employment opportunities, and if so, on what grounds should any such priority sectors be chosen? We pursue the idea of choosing sectors of the economy as priority areas either because 1) the prospects in these sectors for generating a job expansion are relatively favorable; or 2) achieving an expansion in these sectors would generate relatively large social benefits in addition to the gains generated by

the greater job opportunities themselves. On these grounds, we argue for prioritizing building retrofits with $60 billion of the total $1.2 trillion available from the excess liquidity supply; private and public infrastructure, with $180 billion of the overall $1.2 trillion; healthcare, including community health clinics, also with an additional $180 billion, and small businesses with $300 billion, i.e. 25 percent of the $1.2 trillion total. In addition, we allow that $480 billion, i.e. 40 percent of the $1.2 trillion total, will be spread fairly evenly throughout the economy.

In Section 5, "Employment Estimates for the National Economy," we proceed with our estimates of the employment impact of injecting $1.2 trillion in private funds into productive investments and job creation (allowing that $200 billion will also be spent to cover the increase in prices and real wage gains tied to the expansion). We begin by explaining our estimating methods, based on the input-output modeling technique along with data provided by the U.S. Departments of Commerce and Labor. Within the framework of the input-output technique, we first show the level of job creation that would result through spending $1 million in each of our priority sectors of the economy — building retrofits; infrastructure; healthcare, including community health clinics; and small businesses; as well as the impact of such spending within the U.S economy more generally. We then generate our estimates as to how many jobs will be created by this level of new investment spending. We conclude that that, over three years, this $1.2 trillion is capable of creating about 19 million new jobs. If this level of job creation were to occur between 2012 and 2014, it would drive the official national unemployment rate below 5 percent by the end of 2014.

We also show in this section the range of jobs that will be created by this level of spending, including breaking down the total numbers of jobs created according to educational credentials. We show that about 5.6 – 5.7 million jobs, about 30 percent of the total, would be for people with college degrees, and another 30 percent for people with some college experience. The remaining 7.8 million jobs, about 40 percent of the total, would be for those with less than high school degrees. In other words, we reach the unsurprising result that an employment expansion of this magnitude will generate large numbers of new opportunities for people at all educational credential levels, and with a wide range of experience and skills.

In Section 6, "Employment Estimates for Regional Economies," we proceed with the same set of exercises as in the previous section, to generate estimates of the impact of the $1.2 trillion in new business investments on job creation as they would proceed in the Los Angeles and Seattle metropolitan areas. Of course, a program to inject $1.2 trillion in business investments will reach into every region, state and community. It is nevertheless useful to illustrate what the effects of the program will be in terms of specific regions. As we show, the impact in Los Angeles of receiving its proportional share of the overall $1.2 trillion in private investments would be to create a total of 780,000 jobs over three years. This would drive the official unemployment rate in the Los Angeles region down from its current level of 11.5 percent to 6.1 percent by the end of 2014. Seattle's proportional share of overall spending would be about $19 billion. This would generate about 230,000 new jobs in the region. This would drive the Seattle region's official unemployment rate down to below 6 percent. We also document in this section the range of new employment opportunities in both the Los Angeles and Seattle regions. As we show in these specific cases, as with the national economy, there will be a wide range of new opportunities available for people at all credential levels and with different types of experiences and skills.

In the brief concluding Section 7, we argue that there is no reason that the U.S. needs to remain stuck in a long-term unemployment crisis. Rather, through a combination of policy measures, the economy's $1.4 trillion in excess liquidity can be mobilized to fulfill the needs of U.S. citizens for decent job opportunities at all levels.

## II. HOW MUCH EXCESS LIQUIDITY IS IN THE U.S. ECONOMY TODAY?

Commercial Banks and Other Depository Institutions

Figure 1 shows the level of cash reserves held by U.S. commercial banks and other depository institutions — including savings banks, savings & loans, cooperative banks and credit unions — between 2001 and the second quarter of 2011 (the most recent data available).[2] As the figure shows, between 2001 and 2007, commercial banks held between $17 and $20 billion in total cash reserves. The banks then increased their cash reserves from $20.8 to $860 billion between 2007 and 2008, an $840 billion increase. By the second quarter of 2011, bank reserves had increased still further to an astronomical $1.6 trillion, which is more than 10 percent of U.S. annual GDP for 2010. Of course, banks need to maintain a reasonable supply of cash reserves as a cushion against future economic downturns. One of the main causes of the 2008-09 crisis and other recent financial crises was that banks' cash reserves were far too low. But increasing reserves to $1.6 trillion is a new form of financial market excess.

This point is compounded by the fact that, since 2009, the commercial banks have made *no net loans* within the United States economy. As reported by the most recent September 2011 edition of the Federal Reserve's own *Flow of Funds Accounts*, net lending by U.S. commercial banks considered as a whole amounted to negative $417.2 billion in 2009, negative $212.6 in 2010, and an average of negative $154.8 for the first two quarters of 2011. The pattern is similar for savings banks, for which, over the first two quarters of 2011, average net lending was at negative $108.7 billion. Considered as a whole, this means that the banks have received more money through their outstanding

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[2] As a shorthand hereafter, we will use the terms "commercial banks" or just "banks" to refer to the full set of U.S. depository institutions.

FIGURE 1. CASH RESERVE HOLDINGS BY U.S. COMMERCIAL BANKS, 2001 – 2011.[2]

BILLIONS OF DOLLARS
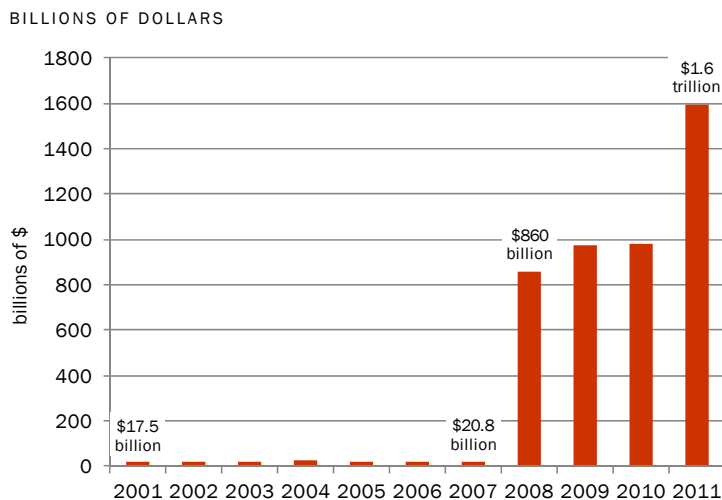
Sources: Flow of Funds Accounts of U.S. Federal Reserve System.

loans being repaid than they have moved into the nonfinancial economy in new lending.

WHY ARE BANKS HOLDING SO MUCH CASH?

The main reason the banks have built up this unprecedented cash hoard is that, since the recession began, the Federal Reserve has pursued an aggressive accommodative monetary policy, in an effort to counteract the recession and promote a strong recovery. The main tool deployed by the Fed in this regard has been to hold the short-term interest rate that it controls — the so-called "federal funds rate" — at near zero percent since mid 2008. We see in Figure 2 (page 6) the movement of the federal funds rate since 2006, before the recession began. As we see, the Fed aggressively pushed this interest rate down beginning in mid-2007 as the financial market crisis began to spread. After peaking at 5.26 percent in July 2007, the Fed pushed this rate down to 0.15 percent as of January 2009. Since then through September 2011, the federal funds rate has ranged between 0.07 and 0.22 percent. Moreover, in its August 9, 2011 policy announcement, the Board of Governors of the Fed stated that it anticipated holding down interest rates at between 0 and 0.25 percent "at least through mid 2013."

In short, the commercial banks have built up this unprecedented cash hoard primarily

because they have been able to obtain these funds virtually for free. Still further, since October 2008, for the first time in its history, the Federal Reserve has paid the commercial banks an interest rate of 0.25 percent for holding these reserves within the Fed's coffers (Keister and McAndrews 2009). This means that the banks are actually earning profits through a pattern whereby they borrow at a zero percent rate on the federal funds market, then collect a 0.25 guaranteed return by depositing these funds with the Federal Reserve. The banks also have the option of borrowing at the Federal Funds rate, then purchasing virtually risk-free U.S. Treasury debt at rates between 2 and 3 percent, depending on the maturity of the bonds. Meanwhile, they have been providing no net loans for the nonfinancial economy since 2008.

For U.S. monetary policy to fulfill its mandate of promoting the maximum level of employment along with stable prices, it is obviously necessary that the cheap credit that the Fed is providing to commercial banks not continue sitting as idle cash hoards, but rather be injected into the economy, promoting productive investments and job creation. Thus far, the Federal Reserve, and federal government more generally, have failed to accomplish this crucial step in support of a healthy economic recovery.

HOW MUCH CASH SHOULD BANKS HOLD TO BE SAFE?

What would be an appropriate level of cash reserve holdings for commercial banks and other depository institutions today, even while taking full account of the high level of risks in the economy, the weak recovery over the past two years, and the real threat of a double-dip recession?

One way to answer that question is to examine the level of cash reserves that these institutions have held at similar points during previous economic recovery periods, while still making some significant allowances for the severity of the

FIGURE 2. POLICY TARGET INTEREST RATE FOR U.S. FEDERAL RESERVE

MONTHLY DATA FOR FEDERAL FUNDS RATE, 2006.01 – 2011.09
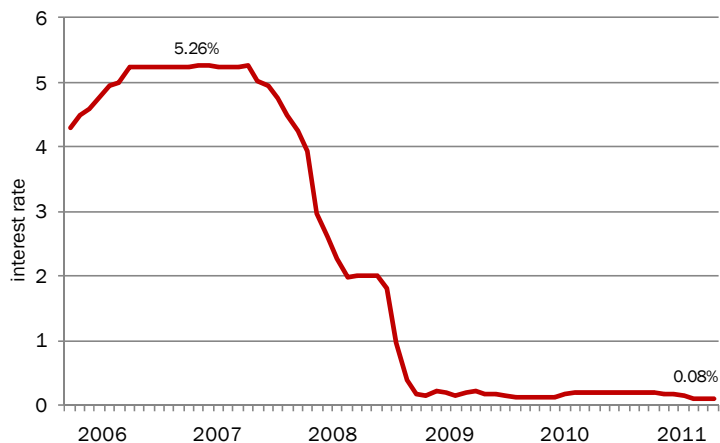
Source: Economagic website.

most recent recession and weakness of the current recovery.

To pursue these points, we present in Table 1 (page 7) the figures for cash reserves held by U.S. commercial banks and other depository institutions in time periods approximately two years subsequent to the onset of an economic recovery out of a recession. We then measure that level of cash reserves in proportion to overall U.S. GDP in each of the time periods.

As we see in the second column of the table, cash reserves (shown in current dollar figures) have actually ranged fairly narrowly from 1973 – 2004, at between $24 and $35 billion. Considered as a share of U.S. GDP, bank cash reserves were at their peak during the recovery of 1973, at 1.94 percent of GDP. This ratio then falls steadily in each subsequent recovery period prior to the current one — i.e. from 1.31 percent of GDP in 1977 to 0.20 percent in 2004. We then see the figure for the second quarter of 2011 at 10.5 percent of GDP.

TABLE 1. COMMERCIAL BANK CASH RESERVE LEVELS HELD AT FEDERAL RESERVE DURING SIX ECONOMIC RECOVERY PERIODS

FIGURES ARE FOR TWO YEARS INTO ECONOMIC RECOVERIES

	Commercial bank reserves (billions $)	GDP (billions $)	Reserves as percent of GDP
1973 (following 11/70 recession trough)	27.1	1,349.9	1.94%
1977 (following 3/75 recession trough)	26.9	2,050.5	1.31%
1985 (following 11/82 recession trough)	28.6	4,244.0	0.67%
1993 (following 3/91 recession trough)	35.0	6,698.5	0.52%
2004 (following 11/01 recession trough)	24.0	11,944.5	0.20%
2011.2 (following 6/09 recession trough)	1,595.9	15,253.8	10.46%

Source: Flow of Funds Accounts of U.S. Federal Reserve System.

Given the severity of the financial crisis of 2008-09, it would be reasonable to allow that banks should currently hold cash reserves well in excess of any previous economic recovery period as a share of GDP. Again, the previous peak level of bank cash reserve holdings was in 1973, at 1.94 percent of GDP. If, in support of the principle of erring on the side of extreme caution, we then allow that the ratio of cash reserves/GDP should be approximately double the ratio reached during the 1973 peak — at approximately 4 percent of GDP — this would imply a level of cash reserves at around $600 billion.[3] This is in contrast with the actual current level of $1.6 trillion. Making this adjustment would mean the amount of excess cash reserves is about $1 trillion.

ALLOWANCES FOR UNSTABLE MORTGAGE MARKET

In addition to making unprecedented allowances strictly on the basis of broad historical ratios for the generally highly risky current economic environment, one could also approach the issue from another angle — i.e. with respect to the ongoing vulnerabilities that the banks have faced concerning home mortgages. A review of some basic evidence here can provide useful guidance for establishing an appropriate level of cash holdings by commercial banks.

The Federal Deposit Insurance Corporation (FDIC) provides data on mortgages held by all U.S. depository institutions, including savings and loans and credit unions in addition to commercial banks. The total is about $2.5 trillion in outstanding mortgages for family residential properties. Of the total stock of outstanding residential mortgages, about 70 percent are direct mortgages to purchase homes secured by the value of the property. Another 25 percent of current mortgages are home equity loans. The remaining five percent are mortgages secured by junior liens only (i.e. liens that have a lower priority in terms of their legal claim on a property).[4]

What is the current level of default risk associated with these loans? According to the New York Federal Reserve, the mortgage delinquency rate nationwide is 5.3 percent.[5] This is the fraction of mortgages whose payments are 90 days or more past due. If we assume that all these delinquent mortgages will lead to a

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[3] With U.S. GDP for the second quarter of 2011 at $15.2 trillion, 4 percent of this is around $600 billion.

[4] FDIC Statistics on Banking, www2.fdic.gov/SDI/SOB/. Note that total outstanding mortgage debt within the U.S. economy as of 2011.2 is $10.4 trillion. This means that commercial banks hold approximately 24 percent of total outstanding mortgage debt. The remaining 76 percent of total mortgage debt is held by non-bank financial institutions. However, for estimating the needs of commercial banks themselves for a cash reserve safety cushion given current conditions in the mortgage market, the relevant reference point is banks own holdings of $2.5 trillion in outstanding mortgages, not the economy-wide total of $10.4 trillion.

[5] New York Federal Reserve Bank, U.S. Credit Conditions, Mortgages, data.newyorkfed.org/creditconditionsmap.

default — an implausibly high proportion of defaults relative to delinquent loans — this represents a potential loss for the banks and other depository institutions of $132.5 billion in asset values.[6] Assume also that *all* of the defaulted mortgages are held by commercial banks, as opposed to the other depository institutions. If we finally assume that the banks should hold cash reserves to cover *double* the amount of the potentially defaulted loans, that would suggest a total additional level of cash holdings of $265 billion. This figure is still less than half of the $600 billion we propose that banks hold in reserve to operate with extreme caution in the current environment.

Another way of assessing the banks' needs for cash reserves specifically in terms of default risk for outstanding mortgages in this regard is to consider the costs to depository institutions of having to write off residential mortgages. We present the relevant figures in Figure 3. As we see there, in the aftermath of the financial crisis, residential write offs for all depository institutions rose from $8.0 billion in 2007 to $27.2 billion in 2008, and peaked at $55.3 billion in 2009. The figure then falls to $50.1 billion for 2010. If we assume that the commercial banks should carry cash reserves to cover write-offs at the peak 2009 level of $55 billion for five years, that would imply a total need for cash reserves for this purpose of $275 billion. Once again, this figure is less than half the $600 billion that we are proposing the banks retain as a safety cushion in cash.

To summarize, according to both the approaches we have taken to derive a very high-end estimate of the needs for cash reserves by commercial banks at present based on conditions in the home mortgage market, we conclude that the figure could reach close to about $300 billion. Thus, for the banks to carry instead $600 billion in reserves would entail holding roughly twice as much as may be needed to heavily fortify

themselves in handling the ongoing crisis with mortgage delinquencies and foreclosures. In doing so, the banks would still be carrying $1 trillion in excess reserves, given that their present reserve holdings are at $1.6 trillion.

FIGURE 3. WRITE-OFFS FOR RESIDENTIAL MORTGAGES BY DEPOSITORY INSTITUTIONS
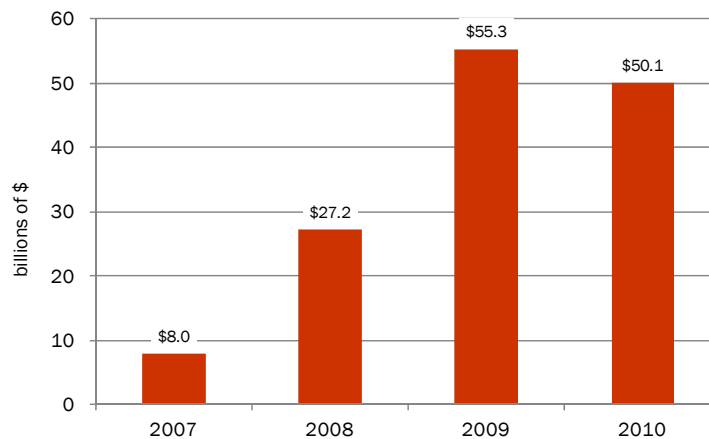
Source: Federal Deposit Insurance Corporation.

We therefore conclude that this $1 trillion in excess reserves is an appropriate amount of funds that should be moved into supporting productive investments and job creation throughout the economy.

CHANGE IN LIQUID ASSET HOLDINGS OF LARGEST U.S. COMMERCIAL BANKS

This overall pattern of cash hoarding by the U.S. commercial banking sector can also be observed by examining changes in the balance sheets of the country's largest commercial banks, i.e. JP Morgan Chase, Bank of America, Citibank, and Wells Fargo. In Table 2, we show the changes in the levels of overall liquid assets of these four institutions between the end of 2007 and September 2011 as reported in their consolidated balance sheets.[7] Because of differences in the ways each of these institutions reports its balance sheet data in public documents, it is not possible to establish the levels of cash reserves held within the Federal Reserve only, which is

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[6] At present, the proportion of delinquent loans that end in default is 60 percent, based on data for the Standard and Poor's consumer default index.

[7] In the table, liquid assets include cash, deposits at banking institutions (including the Federal Reserve), and repurchase/resale agreements.

the data category we have described above for the commercial banking sector as a whole, based on figures reported directly in the Federal Reserve's Flow of Funds Accounts.

TABLE 2. CHANGE IN LIQUID ASSET HOLDINGS FOR FOUR LARGEST U.S. COMMERCIAL BANKS

	Liquid assets on 12/31/07	Liquid assets on 9/30/11	Change in liquid assets between 12/31/07 and 9/30/11	Percent change in liquid assets between 12/31/07 and 9/30/11
JP Morgan Chase	$222.5 billion	$433.7 billion	+$211.2 billion	+94.9%
Bank of America	$183.9 billion	$351.2 billion	+167.3 billion	+91.0%
Citibank	$381.6 billion	$480.5 billion	+$98.9 billion	+25.9%
Wells Fargo	$17.5 billion	$108.1 billion	+$90.6 billion	+517.7%
Totals	$805.5 billion	$1,373.5 billion	+$568.0 billion	+70.5%

Sources: Consolidated balance sheets from annual reports and supplemental quarterly financial information (2007-2011): J.P Morgan Chase; Bank of America; Citibank; and Wells Fargo. Liquid assets include cash, deposits at banking institutions, and repurchase/resale agreements.

We can however present individual firm information on the overall level of liquid asset holdings. These liquid assets include cash, deposits at the Federal Reserve and other financial institutions, short-term loans to other banks, and, in the one case of Wells Fargo, additional unspecified liquid assets.

As the table shows, overall liquid asset holdings grew sharply for three of the leading institutions, with the increases between 12/31/07 and 9/30/11 ranging between about 90 and 520 percent for JP Morgan Chase, Bank of America and Wells Fargo. Citibank increased its liquid asset holdings in this period by only 26 percent. Nevertheless, overall, liquid assets for these leading institutions grew by $568 billion in this nearly four-year time period, an average of more than 70 percent for the four institutions combined. Moreover, as of 9/30/11, the total liquid assets of these institutions added to nearly $1.4 trillion. This figure is closely in line with the $1.6 trillion in total cash reserves of all U.S. commercial banks, even though, with these four

banks, we are not only measuring cash reserves being held at the Federal Reserve, but also repurchase agreements. In short, the pattern of substantially increasing liquid asset holdings represents a major change in the portfolios of three of the leading four commercial banks, even while, for these banks, the rate of increase is more modest than what we observe with the gigantic increase in cash reserve holdings for the commercial banking sector as a whole.

Nonfinancial Corporations

The Federal Reserve's Flow of Funds Accounts defines total liquid assets held by nonfinancial corporations broadly, including various types of credit market instruments, in addition to checkable deposits and currency.[8] In the first column of Table 3 (page 10), we show the level of liquid asset holdings by nonfinancial corporations for 2001 – 2011.2. As we see, there has been a significant rise in total liquid assets. Indeed, the figure more than doubled over the decade, from about $1.0 to $2.05 trillion between 2001 and the second quarter of 2011. Just relative to the 2007 figure of $1.5 trillion, i.e. before the recession began, the 2011.2 figure is about $500 billion higher.

Table 3 also shows a more pertinent figure in its second column, which is the ratio of liquid asset holdings by nonfinancial corporations relative to their short-term liabilities. These liabilities include their short-term debt obligations as well as their taxes and upcoming payment obligations to other business entities. With the liquid asset/short-term liability ratio, we reach a high point in 2011.1 of 56.6 percent. But this figure is not significantly higher than the range reached in 2004-06 of between 42 and 45 percent, the period prior to the onset of the financial crisis.

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[8] The Federal Reserve's full definition of liquid assets includes checkable deposits and currency; time and savings deposits; money market fund shares; security repurchase agreements; commercial paper; Treasury securities; Federal Agency securities; municipal government securities, and trade receivables. See Table L.102 of Flow of Funds Accounts, Federal Reserve (2011).

TABLE 3. LIQUID ASSET HOLDINGS OF U.S.
NONFINANCIAL BUSINESSES, 2001 – 2011.2

	Nonfinancial corporations		Non-corporate businesses	
	Total liquid assets (billions of $)	Liquid assets relative to short-term liabilities (percentages)	Total liquid assets (billions of $)	Liquid assets relative to short-term liabilities (percentages)
2001	1020.8	32.2%	524.6	60.8%
2002	1034.4	33.7%	543.8	59.1%
2003	1172.1	40.6%	597.9	65.7%
2004	1265.7	41.5%	700.9	72.0%
2005	1497.0	45.1%	809.2	67.7%
2006	1521.2	42.4%	907.3	67.1%
2007	1526.7	38.0%	992.5	64.6%
2008	1396.9	35.8%	987.8	58.8%
2009	1672.2	48.1%	910.7	63.5%
2010	1737.7	49.4%	866.2	64.7%
2011.2	2047.1	56.6%	859.9	63.9%

Source: Flow of Funds Accounts of U.S. Federal Reserve System.

Given this pattern for the corporations' ratio of liquid assets/short-term liabilities, a conservative approach to assessing the amount of excess liquid funds now being held by corporations would be to assume that the ratio should be close to the peak level reached prior to the recession. This ratio was 45.1 percent in 2005. Based on this assumption, as of the second quarter of 2011, the corporations are carrying about $414 billion in excess liquid assets.[9] We can round that figure down to $400 billion.

We should also factor in two other considerations in assessing the amount of excess liquidity now being held by nonfinancial corporations. The first is that corporations are using a significant share of their overall financial resources for financial engineering, in particular to buy back their own equity shares that are now held by outside investors. The purpose of such buy backs is to drive up the value of the stock, to benefit the remaining shareholders as well as employees who are compensated through stock

options. Stock buybacks fell dramatically in the aftermath of the financial crisis and recession, from an annual level of $589 billion in 2007 to $138 billion in 2009. However, buybacks have been recovering strongly since early 2010. For the most recent full year of data, 2010.3 – 2011.2, buybacks have risen back up to $365 billion, 2½ times the spending level for 2009.

A recent *New York Times* article described this pattern of rising expenditures on buybacks, occurring at the same time that businesses are unwilling to spend on new productive investments and job creation. Highlighting the situation at the giant drug manufacturer Pfizer, the *Times* story begins as follows:

> *When Pfizer cut its research budget this year and laid off 1,100 employees, it was not because the company needed to save money. In fact, the drug maker had so much cash leftover, it decided to buy back an additional $5 billion worth of stock on top of the $4 billion already earmarked for repurchases in 2011 and beyond. The moves, announced on the same day, might seem at odds with each other, but they represent an increasingly common pattern among American*

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[9] Total short-term liabilities for nonfinancial corporations in 2011.2 were $3.62 billion. Thus, lowering the liquid assets/short-term liabilities ratio to 45 percent would imply that corporations would carry about $1.63 trillion in liquid assets. That means that their present liquid holdings of $2.047 trillion are about are about $414 billion too high.

corporations, which are sitting on record amounts of cash but insist that growth opportunities are hard to find.[10]

At the same time that nonfinancial corporations have increased their expenditures on financial engineering, their long-term liabilities — i.e. credit market debts — have also risen substantially since the low point of the recession. This pattern on the liabilities side of nonfinancial corporations' balance sheets is a counterbalance to the rise in buybacks and other financial engineering activity on the asset side. Since these two factors are counterbalancing each other, with more funds being available on the asset side for financial engineering, but more debt also being piled up on the liability side, that then suggests that our original estimate of excess corporate cash remains approximately correct. That is, we conclude that, given all the various considerations in terms of both short- and long-term factors in nonfinancial corporate balance sheets, the most accurate assessment of excess liquid assets being held by these firms is about $400 billion.

However, it is also crucial to recognize that this estimate of $400 billion in excess liquid assets is based on highly conservative premises. This is because the corporations could, at the very least, be using their available liquid assets to pay down their long-term liabilities rather than deploying these funds for financial engineering. More importantly, they could be channeling these same available funds into productive investments and job creation, and not creating any more long-term liabilities than they have through maintaining their focus on financial engineering.

Non-Corporate Businesses

The last two columns of Table 3 report comparable figures on liquid assets relative to short-term liabilities for non-corporate businesses. This group of businesses is much more heavily

weighted to smaller enterprises. We see here that the overall level of liquid asset holdings relative to short-term liabilities is higher than is the case for nonfinancial corporations, with the ratio ranging between about 60 and 70 percent. Smaller businesses typically must carry a higher proportion of liquid assets to conduct their operations, since they do not have access to financial markets to anywhere near the extent available for nonfinancial corporations. But beyond this general issue, we do not see with the data for non-corporate businesses any indication of a recent build-up of liquid assets. To the contrary, liquid assets in 2011.2 of $860 billion were well below the figures for 2007-08, which were around $990 billion. Moreover, as of 2011.2, the ratio of liquid assets/short-term liabilities for non-corporate businesses is basically in line with the ratios in 2001-02.

Cash Holdings of Other Financial Institutions

In Table 4 (page 12), we provide data on the cash and cash equivalent holdings of non-bank financial institutions as a share of these institutions total assets as of 2011.2. These non-bank financial firms include insurance companies, private pension funds, mutual funds, finance companies, and security brokers. The assets that we are counting as part of these firms "cash and cash equivalents" include bank deposits and repurchase agreements along with cash reserves themselves. As we see from the table, none of these sets of institutions are carrying significant amounts of cash equivalents as a share of their total asset portfolios. The percentage ranges between 2.2 and 5.1 percent of total assets. Certainly, with these institutions, there is no evidence of a build-up resembling a cash hoard in the aftermath of the recession.

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[10] Nelson A. Schwartz, "As Layoffs Rise, Stock Buybacks Consume Cash," *The New York Times,* November 12, 2011, p. 1.

Institutions	Cash and cash equivalents as a share of total assets (percentages)
Insurance companies	2.2%
Private pension funds	3.9%
Mutual funds	2.6%
Finance companies	4.1%
Security brokers	5.1%

Source: Flow of Funds Accounts of U.S. Federal Reserve System.
Note: Cash equivalents assets include banks deposits and repurchase agreements.

Overall then, we conclude that, based on highly cautious assumptions, a total of about $1.4 trillion in excessive liquid assets are available at present in the U.S. economy to be mobilized in support of business investment and job creation. This includes $1 trillion in the reserves of the commercial banks and $400 billion with the nonfinancial corporations.

Lending and Borrowing for Businesses

While the U.S. commercial banks and other depository institutions have been carrying an unprecedented supply of cash reserves, the level of borrowing and lending within the business sector fell dramatically as a result of the recession. For non-corporate businesses, including again most smaller firms, the level of borrowing and lending is still not close to achieving a recovery as of the most recent second quarter 2011 data, even while borrowing has shown some initial signs of recovery.

We can observe these patterns in Figure 4. As the figure shows, for nonfinancial corporations, borrowing fell from $871 to $4.3 billion between 2007 and 2009. Corporate borrowing did then recover strongly in 2010-11. However, the pattern is much more severe for non-corporate businesses. For these firms, borrowing fell from $526 billion in 2007 to negative $346 billion in 2009. That is, in 2009, non-corporate businesses did no net borrowing, but rather paid back $346 billion in outstanding loans. Put another way, over 2009, smaller businesses made repayments at a level of more than 2 percent of total U.S. GDP rather than borrowing to inject new spending into the economy. Non-corporate businesses in the aggregate then continued this basic pattern through the second quarter of 2011, undertaking zero net borrowing. The net contraction of credit flowing to small businesses represents a huge reverse flow of investible funds, away from private business entities that are capable of undertaking a large-scale expansion of job opportunities throughout the U.S. economy.

FIGURE 4. REAL U.S. NONFINANCIAL CORPORATE AND NON-CORPORATE BUSINESS BORROWING, 2001 – 2011.2

IN BILLIONS, NOMINAL BORROWING ADJUSTED BY PPI
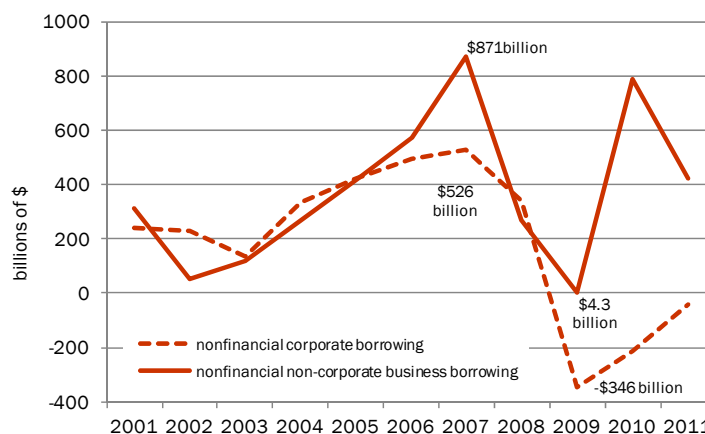
Source: Flow of Funds Accounts of U.S. Federal Reserve System.

III. POLICY APPROACHES FOR MOBILIZING EXCESS LIQUIDITY

In reviewing evidence on the collapse of credit flowing to small businesses and the hoarding of $1.4 trillion in excess cash by commercial banks and nonfinancial corporations, it is clear that badly functioning financial markets are at the root of the U.S. economy's overarching problems of stagnation and mass unemployment. But this does not mean that these financial market malfunctions are the unique, stand-alone cause of stagnation and mass unemployment themselves. In fact, there is one other major proximate factor causing stagnation and mass unemployment. This is the inadequate level of overall market demand. Indeed, it is the toxic combination of inadequate demand and badly performing financial markets that is the most basic obstacle to moving the $1.4 trillion in excess cash now sitting with banks and non-financial corporations into financing millions of productive, job-generating investments. We now consider briefly both of these causes and their interrelationship — examining, in other words, the economy's *demand constraints*, *credit market constraints*, and how these combine into the broader category of *risk constraints*.

Demand Constraints

Businesses — both financial and nonfinancial entities — operate to earn a profit. If these businesses are choosing to hoard cash rather than channel funds to job-generating investments, at some level this must be because they do not see adequate profit opportunities by moving the funds into productive investments. In turn, the single most important reason why they do not see adequate profit opportunities for new investments is that there are insufficient levels of market demand in the economy. The low level of demand is a direct consequence of three factors: 1) the persistently high unemployment rate itself; accompanied by 2) the collapse of household wealth tied to the bursting of the financial bubble in 2008; and 3) the austerity policies being imposed by state and municipal governments. The negative impact of these patterns on overall market demand is reinforced by the persistently high levels of income and wealth inequality. We consider these factors in turn.

PERSISTENTLY HIGH UNEMPLOYMENT

Persistently high unemployment feeds on itself in a vicious cycle. This is because when unemployment is high, people have less money in their pockets to spend, making markets less buoyant. As their incomes fall, households also now have to spend an increasing amount of their overall financial resources to covering their outstanding debts. This means still less money is available for new spending. High unemployment also creates a broadly shared sense of anxiety about the future, even among those who are employed. This further dampens household spending and weakens market demand. Correspondingly, if the unemployment rate begins to fall significantly, this will create a self-supporting virtuous cycle. That is, falling unemployment will encourage banks and nonfinancial corporations to begin channeling their $1.4 trillion in cash hoards into new job-generating investments.

COLLAPSE OF HOUSEHOLD WEALTH

Figure 5 (page 14) shows the movements of real household wealth in the U.S. between 2001 and the second quarter of 2011. As the figure makes clear, household wealth rose sharply between 2002 and 2006, from $51.0 to $70.7 trillion, in step with the inflating financial bubble. But household wealth then collapsed along with the bubble — falling by $17.6 trillion between 2006 and 2008 to $53.1 trillion, a nearly 25 percent decline in just two years. Even with household wealth having recovered as of mid-2011, it was still, at $58.1 trillion, 17.8 percent below the 2006 peak. Research examining the wealth effect on consumption (e.g. Federal Reserve researchers Maki and Columbo 2001) generally finds that households will reduce their spending by between 3 and 5 cents for every dollar of wealth that they lose, i.e. a

wealth effect of between 3 and 5 percent in total spending relative to the change in household wealth. This does assume, as is likely under the recent circumstances, the households see this loss of wealth as a long-term change in their financial situation. Thus, even taking the lower-end 3 percent estimate as the size of the wealth effect, the loss of $17.6 trillion in household wealth would imply a roughly $525 billion reduction in household spending.

A crucial component in this overall pattern of household wealth decline was the fall in housing market values. The decline in household real estate values between 2006 and 2011.2 was $6.8 trillion, i.e. nearly 40 percent of the overall $17.6 billion fall in overall household wealth. This fall in home values was by far the most significant effect for the overwhelming majority of non-wealthy households in the U.S., since these households have never held significant portfolios of assets other than their own homes. The collapse in home values in turn pushed 23 percent of U.S. homeowners "underwater" — that is, the market value of their homes has fallen below the outstanding mortgage debt on the home. Having one's home fall underwater creates further financial difficulties. A homeowner is no longer able to borrow against the value of his/her home. It also becomes much more difficult to sell one's home and relocate, and therefore to find employment by moving to another community. These factors in turn contribute to the overall weakening of market demand.[11]

AUSTERITY POLICIES

The recession blew a massive hole in state and municipal government finances. Tax receipts — particularly income and sales taxes — dropped severely along with household incomes, spending, and real estate values. Meanwhile demand for public services, such as Medicaid and heating oil assistance, rose automatically as the recession created worsening circumstances for

tens of millions of people. The net result of the collapse of tax revenues and the rising demand for state services has been budgetary shortfalls of $191 billion in 2010, $130 billion in 2011, and a projected $112 billion in 2012. The 2011 shortfall is equal to 19 percent of all state spending commitments (See Pollin and Thompson 2011).

FIGURE 5. REAL U.S. HOUSEHOLD NET WORTH, 2001 – 2011.2

IN TRILLIONS, NOMINAL NET WORTH ADJUSTED BY CPI-U
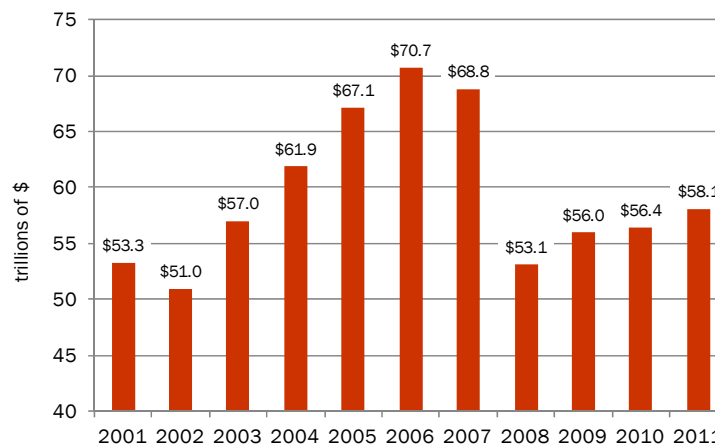
Source: Balance Sheets of U.S. Economy

Revenue-sharing support from the federal government did help cover about one-third of these revenue shortfalls in 2009-2010, as part of the American Recovery and Reinvestment Act (ARRA) stimulus program. But federal stimulus funds have now run out. A smaller portion of the overall spending gap was covered in 10 states by raising taxes, in some cases in a progressive way. But the biggest adjustment has been through state and local governments enacting budgetary cuts. These spending cuts have major impacts on living standards for non-wealthy people throughout the country, since state and local governments are the most important providers in the U.S. of education, healthcare, public safety, and other vital forms of social support. In addition, state and local governments are, collectively, the largest employer in the country, responsible for creating thirty million jobs, either directly or through purchasing supplies or services from private businesses. This is 20 percent of the U.S. workforce. Thus,

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[11] The problem of underwater mortgages is surveyed well in the 2011 study by New Bottom Line.

cuts to state and local governments will lead to significant declines in employment, which, again, produces declining household spending. The cuts also mean weakening markets for those private businesses who sell supplies to state and local governments.

RISING INEQUALITY

The combination of high unemployment, the collapse of household wealth, and austerity policies are also contributing to the worsening of the longstanding problem of rising income and wealth inequality in the U.S. economy. By the end of World War II, in 1946, the highest income families — the top 1 percent — obtained 13 percent of all income and the top 10 percent obtained 37 percent. By the mid-1970s, the share of the top 10 percent had fallen to 33 percent of total income. However, beginning in the early 1980s, with the election of Ronald Reagan as President, this trend toward increasing income equality reversed itself. By 2007, just as the economic crisis was emerging, the top 1 percent's share of total income had risen to 24 percent — 2½ times its share in 1970. The top 10 percent received 50 percent of all income, 17 percentage points more than in 1970.[12] The main factors behind the long-term rise in inequality were 1) outsized increases in salaries, and financial market returns for those in the top income categories; and 2) the stagnation in wages for working people over the past generation. Thus, in 2009, the average non-supervisory worker in the United States earned $18.62 an hour (in 2009 dollars). This figure is 7 percent below the 1972 peak of $20.20 per hour (also in 2009 dollars). But this is only half the story. While wages fell, average labor productivity in the United States rose by 105 percent. This means that in exchange for being twice as productive as they were in 1972, American workers took at 7 percent pay cut.

This high level of inequality further contributes to weakening market demand, since the non-

wealthy devote virtually all the income they receive on purchasing goods and services, while the wealthy use a disproportionate share of their high incomes for speculating on financial markets. Correspondingly, if the trend toward rising inequality is reversed, this in turn will help strengthen overall market demand. It will also contribute toward reducing speculative forces in financial markets.

Credit Market Constraints

The severe problem of insufficient market demand — and the need to counteract that problem through further federal stimulus measures — is operating in conjunction with the equally severe problems resulting from the malfunctioning U.S. credit market. We have seen economy-wide aggregated data on the absence of credit flowing to small businesses since the recession began. We can also observe this same pattern at the level of individual firms. Indeed, considering individual firm-level data, there is strong evidence of a high proportion of small businesses being willing to borrow to expand their operations, even under weak recovery conditions, but have been denied credit or see the costs of borrowing as still too high relative to the levels of market risk. Thus, a summer 2011 survey by Pepperdine University's Graziadio School of Business found that 95 percent of business owners reported wanting to execute a growth strategy, but only 53 percent were obtaining the funding they needed to execute that strategy (Paglia 2011). Meanwhile, bankers were reporting that they were rejecting 60 percent of their loan applications.

These results are similar to those from a survey conducted by the New York Federal Reserve Bank in October 2010, about 10 months earlier. The Fed survey reported that roughly three-quarters of those who applied for credit were either turned down outright or had only part of their request met, with fully one-third receiving no funds. The two sectors facing the most difficulties in obtaining credit were construction and retail. The Fed survey did also find that these

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[12] The patterns on inequality are surveyed well in MacEwan and Miller (2011).

credit market obstacles were operating in tandem with declining sales as major factors facing small businesses in the aftermath of the financial crisis and recession.[13]

In addition to businesses getting their loan applications turned down outright, borrowing rates for average businesses have remained relatively high through the recession, even while commercial banks have been able to borrow on the federal funds market at near-zero rates since the beginning of 2009. We can see this in Figure 6, which shows the monthly movements of the federal funds rate and the Baa corporate borrowing rate from 2001 – 2011.09. The Baa rate applies to corporations that are perceived as sufficiently low-risk to obtain an investment-grade bond rating, while still being at the high-risk end of investment-grade firms. The rates that would apply to non-corporate businesses would generally be higher than the Baa rate, as they would be perceived as more risky than an average corporation. As Figure 6 shows, the Baa rate did fall in correspondence with the Federal Reserve maintaining the federal funds rate at close to zero since 2009.1. However, the decline of the Baa rate is relatively modest, especially given the Fed's extremely accommodating policy stance. That is, the Baa rate as of 2011.9 was 5.27 percent, only modestly lower than the Baa rate of 5.86 percent that prevailed in mid-2005 when the federal funds rate was 3.04. Even when the Fed set the federal funds rate as high as 5.25, the Baa rate averaged about 6.4 percent.

Risk Constraints: Demand Plus Credit Constraints

In fact, a high percentage of businesses, most especially smaller businesses are likely to be both demand- and credit-constrained, to varying degrees within sectors and between individual firms. That is why a more generally applicable

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[13] "Access to Credit: Poll Evidence from Small Businesses," *Facts & Trends,* Federal Reserve Bank of New York, October 2010, www.newyorkfed.org/regional/2010_Facts_Trends_Vol_3_2.pdf

FIGURE 6. INTEREST RATES FOR BUSINESS BORROWERS VERSUS COMMERCIAL BANKS: BAA BONDS AND FEDERAL FUND RATES

MONTHLY FIGURES, 2001.01 – 2011.09
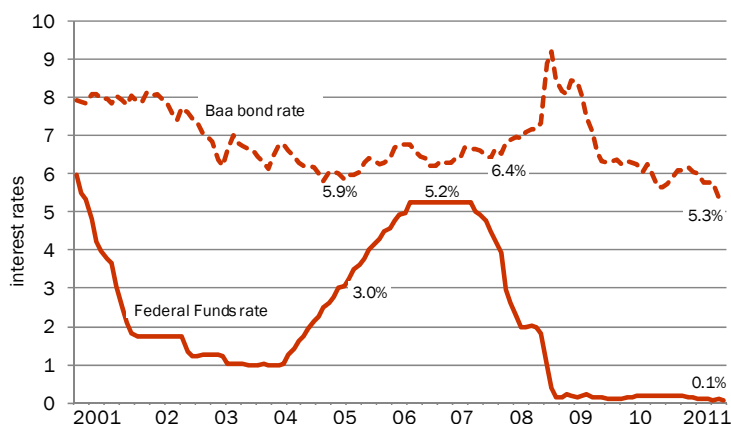
Source: Economagic website

way of assessing current conditions is to recognize that businesses are 'risk-constrained.' That is, it is not that most firms see no market opportunities *at all* — which would make them demand constrained only — or that they are unable to obtain a loan at *any* rate, making them purely credit constrained. It is more likely that firms cannot obtain a loan on terms that are favorable enough for them to realize profit opportunities through investments, given current market conditions. This is what we mean by 'risk constraints': that business firms face a combination of demand and credit constraints. From this perspective, the collapse of net borrowing and lending, especially with respect to smaller non-corporate businesses, reflects an ongoing high level of risk aversion by both borrowers and lenders with respect to new productive investments. The case is similar with respect to large corporations, who are flush with cash, but are using the funds for financial engineering rather that productive investments and job creation. The reason they are committed to financial engineering as opposed to expanding their productive activities is not that they see no market opportunities at all. Rather, they anticipate better returns and lower risks through buybacks as opposed to expanding their operations.

In addition, government policies have continued to provide a highly supportive policy environment for both commercial banks and nonfinancial corporations, despite the fact that both group-ings of large businesses have been unwilling to use the support provided for them as a founda-tion for moving investments back into job crea-tion. Government policies therefore need to begin demanding more from the large banks and corporations in exchange for the highly fa-vorable treatment they continue to receive.

Policy Approaches to Overcoming Constraints and Mobilizing Excess Liquidity

CONTINUED FEDERAL GOVERNMENT STIMULUS SPENDING

Given inadequate demand in the economy, it is imperative for the federal government to pro-ceed through a new round of fiscal stimulus pol-icies until the recession is clearly behind us. Expanding government spending is the only way to establish a solid floor to overall market de-mand. Business can then begin evaluating op-portunities to invest and expand, with a basic level of assurance that the markets they are targeting will not collapse in the near future. The linkages between these businesses that are government vendors and the rest of the private economy are spread still further throughout the economy.

Many features of the jobs program proposed by President Obama last September can serve ef-fectively in this regard, as long as the levels of government spending are sufficiently large. The most important targets for new spending pro-posed by Obama include revenue-sharing sup-port for state and local governments, extending unemployment insurance benefits, and new rounds of public investment in infrastructure, education and the green economy. The amounts devoted to these areas should be at least as large as the roughly $400 billion per year that was budgeted through the ARRA. A new fiscal stimulus of sufficiently large magnitude should then help encourage commercial banks and

nonfinancial corporations to see growing profit opportunities, and thus to begin moving a significant share of their cash hoards into pro-ductive investments.

Of course, there is strong opposition to further fiscal stimulus measures by both Democrats and Republicans alike. The basis for this opposi-tion flows from concerns that the federal defi-cits and debt levels emerging out of the recession and ARRA stimulus program are al-ready at historic highs, and have nevertheless failed to achieve a recovery. It is true that the federal deficit has indeed been historically large since the recession began, running at about 10 percent of GDP for the past three years, as op-posed to the historic average of 2 percent of GDP. But that is only because the recession and jobs crisis are themselves of historic magnitude. Solving the unemployment crisis would accom-plish far more than any other measure toward bringing the federal deficit down. This is simply because when more people have jobs, they also pay more taxes and rely less on government support, such as unemployment insurance and Medicaid.

There is another point to emphasize here. De-spite the historically large fiscal deficits, the federal government is now paying interest on the total outstanding debt at a rate that is his-torically low, not high. This is because the inter-est rates on U.S. Treasury bonds are themselves at historic lows, at around 2 percent. As such, while it is true that the government will need to reduce its borrowing once the recession is behind us, there is no immediate crisis what-soever in terms of the government paying off the debt obligations it faces now or over the next few years.

CREDIT MARKET POLICIES

Monetary policy has certainly been expansionary by any conventional measure since the reces-sion began. This is evident from the federal funds rate being held at near zero since the re-cession began. However, the real aim of expan-sionary monetary policy must be to produce

conditions in credit markets that will encourage household spending and business investments which in turn, can generate millions of decent jobs. Indeed, the more apt term here should be "credit market policy" as opposed to "monetary policy." It is therefore crucial now that the federal government pursue direct credit market policies that complement federal stimulus spending to stabilize and raise the overall level of demand in the economy. A range of constructive credit market initiatives have recently been proposed.

DEBT FORGIVENESS

One important set of approaches are focused around banks writing off a significant share of their outstanding household debts, starting with mortgage debts of the 10.9 million homeowners who are remain underwater with their mortgages. That amounts to 22.5 percent of all residential properties with mortgages.[14] There is a two-fold logic to such proposals. The first is that, since the crisis began in 2008, the banks have been given extraordinary levels of support to keep them functioning, even while giving out outsized bonuses to their top executives. The bailout operations at the outset of the crisis are the most obvious examples. But as we have discussed at length here, maintaining the federal funds rate at near zero for 2½ years has been the basis for enabling the banks to build up $1.6 trillion in cash reserves, as of the most recent data. As we have shown, with cash reserves at this extraordinary level, the banks are currently well fortified to write off all of their non-performing mortgage loans and still have more than $1 trillion available to support new lending.

From the other side, if homeowners generally, and those that are underwater with their mortgages most immediately, could receive some significant debt relief, this would enable them to start spending again. This shift in the households' budgetary situation would thus provide a boost to overall market demand. It would there-

fore serve to lower the overall risk constraint in the economy through the channel of strengthening market demand.

TAXING EXCESS BANK RESERVES AND GUARANTEEING SMALL BUSINESS LOANS

Another approach would combine two initiatives, one carrot and one stick. The carrot would be measures to substantially reduce the level of risk being faced by both borrowers and lenders. This can be done through the government's existing loan guarantee program. In 2009, the total level of loans guaranteed by the federal government was about $340 billion.[15] The two largest categories were subsidized mortgage and student loans. About $50 billion went to business loans, through the Small Business Administration and Export-Import Bank. In the current climate, the federal government could consider roughly doubling its overall loan guarantee program — that is, inject another $300 billion in guaranteed loans into the credit market, and shift the focus of the new guarantee programs to business. Overall guarantees would therefore be about $600 billion, with a $300 billion increase from 2009. For this initiative to be effective at reducing risk and encouraging new investment, the terms on the guaranteed loans will have to be generous — that is very large guarantees, in the range of 90 percent; low or no fees on the loans; and low interest rates for borrowers.[16]

The stick would be for the federal government to tax the excess reserves now held by banks. This should create a strong disincentive for banks to continue holding somewhere around $1 trillion in excess reserves (again, assuming

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[14] The figures come from CoreLogic, 9/13/11 Negative Equity Report, www.corelogic.com/about-us/research_trends/asset_upload_file630_13079.pdf.

[15] Data on federal loan guarantee programs are provided in Office of Management and Budget (2011).

[16] The U.K. Treasury is about to undertake a similar program in Britain, according to the *Wall Street Journal*. The story reports that "The U.K. Treasury will guarantee bank lending to small and midsize companies in a bid to reduce the costs of such debt and stimulate lending to a part of the British economy that has struggled to get new funds." See Alistair Macdonald, "Business Loans Get U.K. Backing," *Wall Street Journal,* November 27, 2011.

the banks require an unprecedented $600 billion of their total $1.6 trillion in total cash reserves to cover their risks in the current high-risk environment). It is difficult to know in advance what the appropriate tax rate should be for this purpose — probably in the range of 1-2 percent. But any such initiative should also allow Congress to operate with flexibility, to adjust the rate as needed for channeling excess reserves into job-generating investments. For starters, the Fed needs to stop paying interest on bank reserves. It currently pays 0.25 percent on these accounts.

One crucial feature of this combination of policies is that its impact on the federal budget will be negligible. Loan guarantees are contingent liabilities for the federal government. Expanding the existing level of guarantees would entail some modest increase in administrative costs. Beyond this, the government would incur costs only as a result of defaults on the guaranteed loans. Even if we assumed, implausibly, that the default rate on the new loans was twice the proportion that prevailed in 2007, prior to the recession, this would still increase the federal budget by only 0.6 percent. A significant share of this budgetary expense could be covered by the revenues generated by the excess reserve tax.[17]

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[17] If we assume $300 billion in new loan guarantees which carry a 90 percent guarantee, then allow for a default rate of 3.5 percent, the net government liability is $9.5 billion (i.e. $300 billion x .90 x .035). One could adjust the calculations based on an increase in either the default rate or the extent of the guarantee.

IV. INFLATION, REAL WAGE GROWTH AND TARGETING PRIORITY SECTORS

Before proceeding with our employment estimates themselves in Section 5, in this section we focus on two prior questions. The first is to consider the effects of a large-scale increase in public and private investments, and a corresponding expansion in job creation, on both inflation and the growth of real wages. If the economy does succeed in moving onto a path of sustained expansion, there is a good possibility that this would create increased inflationary pressures as a byproduct of the economy growing at a healthy rate. We would also expect that, once the unemployment rate begins declining steadily, conditions will improve for workers to begin receiving real wage gains — i.e. wage increases in dollar terms that are in excess of inflation.

The second issue we want to consider here is whether specific sectors of the private economy should be prioritized for policies to promote a sustainable recovery, and if so, on what grounds should any such priority sectors be chosen? As we will discuss below, we pursue the idea of choosing sectors of the economy as priority areas either because 1) the prospects in these sectors for generating a job expansion are relatively more favorable than the average for the economy as a whole; or 2) achieving an expansion in these sectors would generate relatively large social benefits in addition to the gains generated by the greater job opportunities themselves.

Economic Recovery, Inflation and Real Wage Growth

Inflationary pressures tend to increase in economic expansions and decrease during slumps, though these patterns do not always emerge. Under the classic trade-off pattern long studied by economists, as the unemployment rate declines, workers acquire greater bargaining power, enabling them to bid up their wages. Faced

with higher labor costs, business then try to mark up their prices to protect their profit margins. This same dynamic works in reverse during period of high or rising unemployment. Workers' lose bargaining power, their wages erode, and labor costs for businesses decline. This brings declining prices, and thus, a softening of inflationary pressures.[18]

To be sure, this pattern has not always held up over the past decades with the U.S. economy. It did prevail in the 1950s, 1960s and again over the past full decade. For the years 2008-11, with the exception of spiking oil and food prices, the overall inflation rate has been close to zero, if not negative, while unemployment rose above 9 percent.[19] However, this pattern decidedly did not hold in the 1970s, when inflationary pressures resulted from the two periods of spiking oil prices in global markets, which in turn led to global "stagflation." The classic unemployment/inflation trade-off pattern also did not emerge in the 1990s, when unemployment fell below 4 percent, but inflation remained negligible. This was due to the combination of low oil prices and workers experiencing steadily eroding bargaining power even with low unemployment. The decline in worker bargaining power was recognized at that time by many observers. Then Federal Reserve Chair Alan Greenspan himself referred to the "traumatized worker" effect in keeping down inflationary pressures in the 1990s while the unemployment rate was low.

The point of this study is to show how, over the next few years, unemployment can be driven down through moving the current massive cash hoards of commercial banks and nonfinancial corporations into productive, job-generating investments. If this were to actually happen, it

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[18] The enormous literature on these questions falls under a family of terms, including the Phillips curve, natural rate of unemployment and NAIRU. Brief surveys of the literature and data on this question are in Pollin (1998, 2003, 2011).

[19] The rise in oil and food prices, in turn, have been driven mainly by excessive speculative activity in commodities futures markets, not changes in supply/demand dynamics in the markets for these physical products (see Ghosh, Heintz and Pollin 2011 and Pollin and Heintz 2011).

would be prudent to expect that the classic pattern of higher inflation will emerge, at least to some extent. For the purposes of our calculations, we therefore assume that inflation will be sustained at 3 percent per year over the three year period in which banks and nonfinancial corporations are moving their cash hoards into productive investments and unemployment is falling.

Based on this same dynamic of workers obtaining greater bargaining power as unemployment is falling, it is also reasonable to expect that workers' wages will not merely rise in step with inflation — yielding no real wage increases — but that workers will obtain increases in real wages. This means wage increases above the assumed three percent inflation rate. For the purposes of our calculations, we therefore assume that workers will receive real wage gains averaging three percent per year — that is, again, above the three percent average inflation rate.

When we add the impact of a three percent annual inflation rate as well as an average three percent increase in real wages over 2012-14 as accompaniments to the growth in business investments and job creation, this will entail that roughly $200 billion of the $1.4 trillion in total excess liquidity would be spent on businesses paying either higher prices or higher wages.[20] In other words, this $200 billion cannot be counted as funds available for increasing the total number of jobs to be created. This amounts to about 14 percent of the full $1.4 trillion in excess liquid funds. Moreover, note that in making these calculations, it is not crucial that our assumptions of a three percent rate of increase for both inflation and average real wages be precisely accurate. The main point is that, in accounting for both inflationary effects and real wage increases over three years, we are allowing that the total amount of funds available for job creation will be about 14 percent less than would be the case if neither

rising inflation or real wage increases were to occur. It is not of significance for our employment estimates per se what percentage of the total $200 billion total is due to either inflation or wage increases (though the breakdown between inflation and real wage increases is of course of great significance for the workers receiving the wage increases).

The net effect, then, is that if $1.4 trillion is spent over three years, and $200 billion is needed to pay higher prices and higher real wages for workers, then a total of $1.2 trillion can be used for new investment activities and hiring more workers. We therefore will proceed with our estimations of employment effects on the assumption that, from the total of $1.4 trillion in excess liquid assets now held by commercial banks and nonfinancial corporations, the total amount of funds available for increasing the number of workers employed will be $1.2 trillion.

Targeting Priority Sectors

Pushing the private sector of the U.S. economy into utilizing the $1.2 trillion in excess liquidity for productive investments and job creation will be a massive undertaking. This is after allowing that about $200 billion will be needed to cover inflationary cost increases as well as real wage increases averaging about 3 percent per year. The expansion will necessarily need to be spread throughout all sectors of the U.S. economy in order to be mounted on this large a scale.

At the same time, there are areas of the economy where conditions are more favorable for a large expansion. We would focus on the following four criteria for identifying areas of the economy where there are disproportionately large opportunities that are attainable. These include:

Investments for improving productivity with given market demand. There is a wide range of businesses for which market demand does not have to be growing in order for firms to profit substantially from investments that lower their

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[20] In Appendix 1, we show the calculations through which we derive this $200 billion figure.

cost of operations. This would especially include sectors where businesses have the capacity to increase their profits significantly through investments in improving productivity and thereby lowering costs. Under such circumstances, market demand does not need to be rising for businesses to see major new profit opportunities.

One important example of this is energy efficiency building retrofits. On average, spending on energy efficiency retrofits can save business owners between 20 and 30 percent on their energy costs, relying only on existing proven technologies. Of course, buildings that presently operate at low efficiency levels are located in every community in the United States. The employment benefits of an investment expansion in this area can therefore be spread equitably throughout the country. We consider other examples of this sort below, in presenting details of our proposed employment program for job creation today.

Businesses facing larger than normal credit constraints. These sectors would, by definition, benefit the most by any initiatives to relax credit constraints. The clearest target here would be various types of small businesses.

Businesses that rely more heavily on employing workers. The term economists use for this is more 'labor-intensive' activities. Businesses that rely more on utilizing machines, energy, and natural resources in their production processes are termed 'capital-intensive' firms. Again, by definition, the more an investment expansion is concentrated in more labor-intensive sectors of the economy, the more jobs that will get generated for a given level of overall spending.

Businesses that generate strong social as well as private benefits. Certainly, investments in energy-efficient building retrofits is a good example here, since enabling buildings to burn less fossil fuels in their operations will produce positive environmental benefits. There are other examples as well of similar opportunities for achieving significant social benefits through higher levels of new private investment.

Target Areas for New Investment

We now provide more details on specific priority areas for investment, following the criteria listed above. These priority areas include:

ENERGY EFFICIENCY BUILDING RETROFITS

Studies by the National Academy of Sciences (2010), among others, provide extensive evidence showing that energy consumption in buildings are likely to fall by approximately 30 percent on average through relatively modest investments that utilize existing technologies and are relatively labor intensive. Further, this research shows that the rates of return on such investments are around 30 percent or above. This means that investors making such investments will be fully repaid in the form of lower energy costs in about three years through making such investments. Investments in energy efficiency building retrofits will also rely substantially on employing construction workers within various trades as well as on expanding manufacturing employment to supply the needed materials. These are both areas where employment losses have been severe during the recession, and where improvements in job opportunities have been occurring at a slow pace, if at all.

For the most recent 2009 data, about $175 billion was spent on building retrofits and related repair and maintenance construction throughout the U.S. economy. If we allowed for the spending increase in this area to be $60 billion over three years, or $20 billion per year, this would represent an annual increase in spending of about 11 percent in the industry relative to the 2009 level. Given both the large-scale cost savings as well as the environmental gains available through improving the energy efficiency of the U.S. building stock, an expansion of the sector by about 11 percent per year for three years is certainly feasible, assuming attractive financing arrangements can be developed on a large enough scale.

PRIVATE AND PRIVATE/PUBLIC INFRASTRUCTURE

It is widely held that traditional infrastructure investments — that is, investments in transportation systems, water management and energy transmission — are the domain of the public sector alone. In fact, a high proportion of U.S. infrastructure is owned and managed privately or through private/public partnerships. In previous research work, we have strongly supported the idea of expanding public infrastructure investments (e.g. Heintz, Pollin and Garrett-Peltier 2009). For the purposes of this discussion, in which we are focused on expanding job opportunities in the private sector, we concentrate on areas of infrastructure that are either privately owned or involve private/public partnerships. The primary areas of private or private/public ownership of infrastructure include:

- the electrical grid system — private/public partnerships;
- freight rail — all private;
- airports — private/public partnerships; and
- water ports — private/public partnerships.

As with the case of building retrofits, private sector investments in upgrading the stock of infrastructure will improve efficiency and lower costs. This will enable the private owners of these businesses to increase their profits, even allowing for the prospect of no increase in market demand.

In recent years, various federal government agencies have developed assessments of the long-term infrastructure investments needed to close the gaps created by inadequate investment levels over the previous 30 years. Focusing on their specific areas of jurisdiction, these agencies include the U.S. Department of Transportation, Association of American Railroads, Federal Aviation Administration, Army Corps of Engineers, Environmental Protection Agency, and Energy Information Agency. In Table 5, we summarize the assessments made by these agencies in the areas of electrical grid,

freight rail, and airports. To our knowledge, there has not been any equivalent needs assessment for water ports.

TABLE 5. INCREMENTAL INVESTMENT NEEDS IN PRIVATELY-OWNED OR PRIVATE/PUBLIC INFRASTRUCTURE

SPENDING NEEDS OVER 20 YEARS BASED ON GOVERNMENT AGENCY ASSESSMENTS

	Total investment spending needs	Average annual spending needs over 20 years
Electrical grid	$900 billion	$45 billion/year
Freight rail	$106 billion	$5.3 billion/year
Airports	$64 billion	$3.2 billion/year
Totals	$1.1 trillion	$53.5 billion/year

Source: See Heintz, Pollin and Garrett-Peltier (2009).

As we see in Table 5, these estimates come to a total of over $1 trillion over a 20-year span, with nearly 90 percent of the total being in the area of upgrading the electrical grid system. If businesses were to spread out these investments equally over a 20-year period, that would amount to $53.5 billion per year. The additional investment needs for water ports would almost certainly be a small addition to this total investment level. To take account of water port upgrades, let's assume an overall total figure of $55 billion per year. But in the current environment of high unemployment and slack capacity, especially in the construction industry, and if policymakers could succeed in maintaining low costs for productive investments, conditions would be highly favorable toward increasing the level of private infrastructure investments over the next three years beyond this average annual figure of around $55 billion. These private infrastructure investments could of course be combined with additional public-sector spending on infrastructure, to accelerate the overall rate of investment growth and job creation still further.

For the purposes of our discussion, we assume a level of spending on private and private/publicly-held infrastructure at around $60 billion per year, or $180 billion for three years. Total spending in the construction and manufacturing industries involved in infrastructure upgrades in 2009 was approximately $880

billion. Thus, an increase in private-sector spending on infrastructure of $60 billion per year would mean represent a 6.8 percent annual increase. Here again, an expansion at this pace is certainly feasible, assuming adequate funding would support this scale of activity. Moreover, even with such a substantial increase in private-sector infrastructure investments, there should still be adequate capacity for additional public sector investments, as one major component of a new federal stimulus program.

GENERAL HEALTHCARE AND COMMUNITY HEALTH CLINICS

The new healthcare system that became law in March 2010, the Patient Protection and Affordable Care Act, will generate major changes in the U.S. healthcare industry. Among other things, the law mandates that approximately 32 million more people will be covered with health insurance.[21] This will create major new costs for the system. One of the central features of the new law is that it aims to offset the additional costs of insuring more people by focusing on primary care and prevention. This will reduce the need for emergency room visits and costly late-stage interventions. There is evidence from the experience with the healthcare system in Massachusetts that was instituted in 2006, on which the Obama plan was modeled, that this system increased demand for community healthcare centers.[22]

Expanding investments now in private community healthcare clinics is therefore equivalent to investments in building retrofits and private infrastructure, in that good profit opportunities are available without assuming that the overall level of demand will be rising in the industry. Overall demand for healthcare services may indeed rise as roughly 30 million more people receive insurance coverage. However, the attraction of investments in community health clinics will result through being able to deliver healthcare in a more cost-effective way. Invest-

ments in the healthcare industry, and community healthcare in particular, are also analogous to building retrofits and infrastructure in that there are needs to be met in every community throughout the country.

In addition, of course, expanding the availability of community health clinics, especially in lower-income neighborhoods throughout the country, will generate major benefits in terms of increasing access to decent healthcare and thereby expanding overall well-being throughout the country.

We would assign the increased spending on healthcare, community clinics in particular, at about $180 billion per year in total, or $60 billion per year over three years. Given that the U.S. healthcare industry is a roughly $2.2 trillion sector overall, a $60 billion annual increase is a relatively small 2.7 percent of total spending. Community health clinics alone operated at $167 billion in total spending in 2009. If we allowed that the expansion of community health clinics absorbed about 20 percent of the total annual increase in healthcare spending, that would mean about $12 billion in new annual spending — an expansion of spending on healthcare clinics of about 7.2 percent per year for three years.

SMALL BUSINESSES

Small businesses — defined as those with fewer than 500 employees — account for more than 60 percent of all jobs in the U.S. economy. They are also the main source of both job expansions and contractions. Thus, between 2003 and 2008, overall employment in small businesses grew from 86.8 to 93.8 million, an expansion of 7 million jobs. But from 2008-10, small business employment fell by 6.7 million jobs, nearly the full amount of the prior expansion (Bureau of Labor Statistics Quarterly Census of Wages and Employment).

In addition, as we have seen, small businesses have faced more serious credit constraints since the onset of the recession. As such, policy measures to relax the credit constraints for

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[21] Congressional Budget Office (2010).

[22] Ku et al. (2009).

small businesses are likely to have a disproportionately large positive impact on job creation throughout the U.S. economy.

Small businesses operate in virtually all sectors of the economy. It will be necessary for most sectors of small businesses to grow to some significant extent in order for an overall jobs program to succeed at the approximately $1.2 trillion level we are proposing over three years. At the same time, small businesses are especially strongly represented in industries tied to the three areas in the economy on which we have already singled out for expansion — i.e. building retrofits, infrastructure, and community health clinics.

For example, the construction industry would experience the most rapid growth as a result of investments in both building retrofits and new infrastructure. Small businesses are predominant in construction, accounting for fully 85 percent of total employment in the construction industry. Community health clinics are small businesses by definition, though they may be affiliated with larger entities through a franchising arrangement (we discuss franchising as a business model below). Thus, we would necessarily be generating new opportunities for small businesses by promoting investments in building retrofits, infrastructure and community health clinics.

Two other areas within small business also warrant additional focus. One is business franchising. Franchise businesses are the dominant small business model in industries such as fastfood restaurants, leisure and hospitality and retail products and services. Franchises in these industries include many universally known brand businesses — of course McDonalds and Dunkin' Donuts, and many others in the fastfood industry; Holiday Inn, Marriot, and Motel 6 and others in the hospitality business; and Ace Hardware, Health Mart, H&R Block, Radioshack, and Service Master in retail products and services.

Franchise operations represent a middle ground between small and big businesses. They are usually small enterprises when viewed as individual entities. But similar to large businesses, commercial banks are broadly familiar with their business plans and operations. Each franchise operation has also been pre-screened and approved by the franchiser, and therefore offers a lower credit risk than most unaffiliated small businesses.

Despite these relative advantages, a March 2011 survey conducted by the industry group International Franchise Association reported that 60 percent of the franchise operations have seen no improvement in credit access in recent months, i.e. in funds to support either the ongoing individual franchise units or applicants seeking to open a franchise. Moreover, 46 percent of the franchisors see this pattern as a significant barrier on their ability to expand the scale of their activities.[23] Overall then, franchise operations appear to offer major opportunities for business expansion and employment growth through relaxing the ongoing credit constraint facing the industry.

A final area for targeted growth within the small business sector should be community grocery stores. In particular, there is an inadequate supply of supermarkets within lower-income communities throughout the country. This problem began in the 1950s, as part of the general shift in focus for retail businesses from central cities to suburbs. Since that time, supermarket chains have been reluctant to establish sites within city borders, and in lower-income communities in particular. At the same time, research has found that locating grocery stores within low-income communities generates several positive effects:[24]

■ The addition of a supermarket in an underserved area offers residents a better variety of healthy food and expands consumer choice;

23 International Franchise Association (2011). See also Needleman (2011).

24 Goldstein et al. (2008).

- The customers of these supermarkets mostly reside in close proximity to the stores in which they shop;

- The employees of urban supermarkets tend to be residents of the local community in which the stores are located; and

- Having the community members do their food shopping within the community means that a higher proportion of the community members overall spending stays within the community, generating a net expansion of employment opportunities within the communities. This could also have positive spillover effects through raising property values and attracting other types of businesses to locate within these communities.

It is unlikely that opening more supermarkets in low-income communities will produce a net increase in overall employment throughout the U.S. This is because people will generally spend a fixed amount of money on food, regardless of whether these purchases take place at community grocery stores or elsewhere. The main benefits for locating more grocery stores in underserved areas will therefore be for the communities themselves. These community-based benefits in terms of convenience, employment opportunities and access to healthier food choices could be substantial, even while the impact on overall employment in the country through expanding community supermarkets is likely to be modest.

OVERALL LEVEL OF SMALL BUSINESS EXPANSION

As we have noted above, small businesses account for more than 60 percent of total U.S. employment and about 40 percent of total U.S. output. This amounts to about $11.4 trillion of a total of roughly $30 trillion in overall U.S. output.[25] We would therefore certainly expect that

this sector of the economy would grow by a large amount as part of the overall $1.2 trillion, three-year private-sector-led stimulus program. Even if we subtract the growth in the construction and healthcare industries as already accounted for through our having prioritized building retrofits, infrastructure and healthcare, there is still considerable capacity for the remaining components of the small business sector to accelerate their recovery in conjunction with construction and healthcare. The construction industry accounts for 15 percent of all small businesses measured by their level of production (output) and small-scale healthcare enterprises account for 11 percent, for a total of 26 percent of all small business output. The rest of the small business sector thereby accounts for around 75 percent of total output in the sector, amounting to about $8.5 trillion. Thus, we could readily assume an expansion for the rest of small businesses at $300 billion, i.e. 25 percent of the total $1.2 trillion in new spending. This would be spread over three years, at $100 billion per year.

In fact, this would be a very modest increase in business spending of about 1.2 percent per year. We would actually expect the final increase in small business spending to be significantly higher than this. The additional increases would follow from the "multiplier effects" associated with the initial increase tied to the stimulus. The multiplier effect refers to the second round of increased spending encouraged — or even induced — by the fact that more people become employed, with more money to spend and more confidence in their financial prospects moving forward. We discuss at some length below in the context of describing the generation of "induced" jobs within the stimulus framework.

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[25] Total U.S. output of $30 trillion is distinct from GDP of roughly $15 trillion. The difference is that the GDP figures measure "value added," i.e. it subtracts out from total output the "intermediate products" that are utilized in production processes to produce the goods and services that are

then sold as final products throughout the economy. Unfortunately, there are no publicly available statistics on value added generated by the small business sector.

Distribution of Overall Investment Expansion

In this section of our study, we have described a rough distribution of the total three-year $1.2 trillion increase in spending that we think is both feasible and desirable, given the present circumstances. That distribution is:

- *Building retrofits*: $60 billion (5 percent of total)

- *Private and public infrastructure*: $180 billion (15 percent of total)

- *Healthcare, including community clinics*: $180 billion (15 percent of total)

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- *Small business outside of construction and healthcare*: $300 billion (25 percent of total)

- *General economy-wide expansion*: $480 billion (40 percent of total)

Of course, we do not expect that any incentive programs for private business investments to break down exactly along the lines we have sketched here. The point of this exercise is rather to identify priority areas for growth and to show why expansion along the lines described here does represent a viable path to U.S. economic recovery.

V. EMPLOYMENT ESTIMATES FOR THE NATIONAL ECONOMY

In this section, we estimate the level of new job creation that is likely to result through a three-year, $1.2 trillion expansion of private sector spending, following the spending proportions described in the previous section, along with our assumptions of a 3 percent average annual inflation rate as well as 3 percent average annual increases in real wages.

Our Approach to Estimating Employment Effects

We begin by describing our approach to estimating these employment effects. As a general point, we emphasize that our estimates are not based on a forecasting model in the way this term is generally understood — i.e. as an exercise that attempts to predict the future growth path of the U.S. economy. Rather, our employment estimates are figures generated directly from data from the Commerce Department's surveys of businesses within the United States, and organized systematically within their input-output model. Within the given structure of the current U.S. economy, these figures provide the most accurate evidence available as to what happens within private and public enterprises when they produce the economy's goods and services — i.e. how many workers do they hire, and what are the materials they purchase? Our methodology is to work within this detailed survey evidence and data set, and to pose simple questions within it.[26]

For example, if we spend an additional $1 million on building retrofits, how will businesses utilize that million dollars to actually complete the service of the retrofit? How much of the $1 million total will they spend on hiring workers, and how much will they spend on non-labor inputs, including materials, energy costs, and renting office space? We then ask the same

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[26] We describe our modeling approach in detail in Appendix 2.

questions for infrastructure investments, the healthcare industry and small businesses. We also pose the same question for the U.S. economy taken as a whole.

There are certainly weaknesses with our use of the input-output model. The most important are that it is a) a static model; and b) a linear model. But these deficiencies need to be considered in the context of alternative approaches that, in our view, operate with even more deficiencies, certainly within a short-run framework. Consider these points:

STATIC MODEL

We are making estimates as though everything is happening at a fixed point in time. A more realistic picture of the economy would of course have to recognize that the spending effects of a three-year expansion program will take place over time, and that these timing effects are important. Adding a time dimension would make the model "dynamic," in the technical jargon.

The problem here is how to incorporate a time dimension in an effective way. This issue has plagued econometric forecasting efforts for a long time, and there is no sign of the problem abating. The dismal record of even the most prestigious forecasting models over the past few years attests to the acuteness of the problem.

In principle, a dynamic model does offer a more complete picture than a static model as to how the economy operates over time. But because dynamic forecasting models are so unreliable, we think it is preferable to work within a simpler framework. We are on relatively firm ground in doing so given that we are focused only on a three-year time period for channeling the $1.2 trillion into productive job-generating investments.

LINEAR MODEL

Our model assumes that a given amount of spending will have a proportionate effect on employment, no matter how much the level of spending changes, either up or down. For example, the impact of spending $1 billion on a

building retrofit project will be exactly 1,000 times greater than spending $1 million on the exact same project.

There are three significant problems with this. The first is that we take no account of potential supply constraints in moving from a $1 million to a $1 billion project. Under some circumstances, this could be a significant deficiency in the model. But under current conditions in the U.S. economy, with widespread slack pervasive in the aftermath of the recession — i.e. with deep unemployment and with private-sector investment weak — we are on safe grounds with our assumption that supply constraints will not exert a major influence on how the spending on building retrofits and private infrastructure impacts the economy.

The second problem with the linear model is that it assumes productivity will remain constant, rather than allowing that productivity will improve over time as businesses invest in new equipment and improve the organization of their operations. However, here again, we are on safe grounds in assuming that overall level of productivity in the economy will be approximately stable over the short run. Precisely because investment growth in the economy has been low since the recession began, the growth of productivity has also been weak. Indeed, according to the official statistics of the Bureau of Labor Statistics, overall productivity in the U.S. economy actually fell over the second quarter of 2011. As such, several months of strong productivity gains will be needed for the economy just to regain a stable level of productivity, much less significant improvements.

The third significant problem with our linear framework is that it assumes that prices remain fixed, regardless of changes in demand. For example, the model does not take account of the effects of prices for building materials as demand for these materials rises with increased spending on building retrofits and private infrastructure. Again, a more fully specified model would take account of such factors — that is, if this business expansion program leads to

increased demand for building materials, prices of these materials will rise, all else equal. Then for a given level of spending, fewer such materials will be purchased at the higher prices. The rise in prices could therefore dampen the overall impact of the $1.2 trillion in new spending. In fact, we are compensating partially for this lack of price adjustments in the model, by assuming that the overall price level will be rising, at an average inflation rate of 3 percent per year.

Beyond these relatively abstract analytic considerations, we do also have strong on-the-ground evidence that our method of estimating job effects is effective, at least on a short-run basis. In considering work we conducted over 2009-10 for the U.S. Department of Energy, we utilized this same approach to estimate the job-generating effects of the environmental programs within the overall ARRA. Because we made these estimates while the ARRA was actually being implemented, we were able later to observe closely how accurately our estimates had been relative to the reported figures on actual job creation coming back to the DOE from around the country, in particular with respect to various building retrofitting initiatives advanced in various parts of the country. These data from the field demonstrated that our model was highly robust. Specifically, working with the most recent data that were available, we found that for every 100 jobs we had predicted would be created by spending on the building retrofit programs in the ARRA, 97 jobs were actually created.[27]

Categories of Job Creation

There are three sources of job creation associated with any expansion of spending — direct, indirect and induced effects. For purposes of illustration, consider these categories in terms of investments in retrofitting a building or opening a community health clinic.

Direct effects: the jobs created, for example, by bringing workers onto a building site and

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[27] Heintz, Pollin and Wicks-Lim (2011).

undertaking the retrofitting work; or by treating patients at a community health clinic.

Indirect effects: the jobs associated with industries that supply intermediate goods for the building retrofits or health clinics. These would include windows, insulation, heating system equipment for retrofits; and pharmaceuticals and x-ray equipment for a health clinic.

Induced effects: the expansion of employment that results when people who are paid in the construction or healthcare industries spend the money they have earned on other products in the economy. The employment expansion through this effect will spread throughout the economy, following the overall spending patterns of consumers.

Job Creation per $1 Million in Spending

We begin in Table 6 by presenting figures for direct and indirect job creation per $1 million in spending on the output in each of our priority sectors of the economy, as well as for the economy as a whole. Thus, with building retrofits, we see that $1 million in spending will generate 8.5 direct and 4.0 indirect jobs, combining for a total of 12.5 jobs.

TABLE 6. DIRECT AND INDIRECT JOB CREATION PER $1 MILLION IN OUTPUT FOR OVERALL U.S. ECONOMY

Sector	Direct job creation per $1 million in output (# of jobs)	Indirect job creation per $1 million in output (# of jobs)	Direct + indirect job creation per $1 million in output (# of jobs)
Building retrofits	8.5	4.0	12.5
Infrastructure	5.3	4.0	9.3
Healthcare	8.4	3.9	12.3
Small business other than construction and healthcare	10.2	3.1	13.3
Overall U.S. economy	6.3	4.1	10.4

With infrastructure, we assume that 65 percent of the new spending will be on the electrical grid, with the remaining 35 percent distributed between freight rail, airports, and water ports.

Spending for infrastructure in these proportions will generate 9.3 jobs per $1 million in spending, with 5.3 direct and 4.0 indirect jobs.

With our estimate for the healthcare industry, we assumed that community health clinics will expand by about 20 percent over the next two years. If this were to happen, that would increase this sub-sector's total share of the healthcare sector to about 12 percent of the total industry. To adjust for this significant expansion of community health clinics, we then assumed that the relative size of both traditional hospitals and doctors' offices are reduced, so that they both would constitute about 73 percent of the industry subsequent to the expanded role for community health clinics. Overall, as the table shows, the healthcare industry will generate 12.3 direct and indirect jobs per $1 million of spending.

The final two categories — small businesses and the overall economy — are of course far broader than the priority sectors. As we see, the levels of direct and indirect job creation for spending in these broad areas are 13.3 and 10.4 jobs per $1 million in new spending.

Direct and Indirect Job Creation for $1.2 Trillion in Private Investment/Business Expansion

In Table 7 (page 31), we report on the estimates we have generated for direct and indirect job creation, based on the sectoral employment figures per $1 million in spending reported above. Table 7 first shows the combined estimates of direct and indirect job creation for each priority sector, as well as for the U.S. economy as a whole. We then show the amounts within the full $1.2 trillion in new business investments over three years that we have allocated to each sector. For example, we estimate that with building retrofits, $60 billion in spending over three years will generate 750,000 direct and indirect jobs. We also see that, considering all categories, the injection of $1.2 trillion in business investments will produce a total of 13.6 million new jobs over the three-year period of expansion.

TABLE 7. DIRECT AND INDIRECT JOB CREATION THROUGH THREE-YEAR $1.2 TRILLION SPENDING EXPANSION

Sector	Direct + indirect job creation per $1 million	Level of increased spending	Total direct + indirect job creation
Building retrofits	12.5	$60 billion (5% of total)	750,000 jobs
Infrastructure	9.3	$180 billion (15% of total)	1.67 million jobs
Healthcare	12.3	$180 billion (15% of total)	2.21 million jobs
Small business other than construction and healthcare	13.3	$300 billion (25% of total)	3.99 million jobs
Overall U.S. economy	10.4	$480 billion (40% of total)	4.99 million jobs
Totals	—	$1.2 trillion	13.6 million jobs

To achieve this level of job creation is based on the assumption that when the $1.2 trillion is spent, it will indeed be spent on expanding business operations in ways that generate jobs. If funds are received by businesses, and are spent to reduce their debt levels or to make bigger distributions to the owners, then clearly the level of new job creation for a given additional injection of credit will be less than what we have estimated here.

Induced Job Creation

It is more difficult to estimate the size of the induced employment effects — or what, within standard macroeconomic models, is commonly termed the 'consumption multiplier' — than to estimate direct and indirect effects. We referred briefly above to the multiplier effects generated by the initial expansion of direct and indirect jobs throughout the U.S. economy.

There are aspects of the induced effects which we can estimate with a high degree of confidence. In particular, we have a good sense of what is termed the 'consumption function' — what percentage of the additional money people receive from being newly employed will be spent. But we cannot know with an equivalent degree of confidence what the overall employment effects will always be of that extra spending. To begin with, the magnitude of the induced effect will depend on existing conditions in the economy. If unemployment is high, this will mean that there are a good number of people able and willing to take jobs if new job opportunities open up. But if unemployment is low, there will be less room for employment to expand, even if newly employed people have more money to spend.

Similarly, if there is slack in the economy's physical resources, the capacity to expand employment will be greater — and the induced effects larger. If the economy is operating at a high level of activity there is not likely to be a large employment gain beyond what resulted from the initial direct and indirect effects. Given the ongoing high rate of unemployment three years after the onset of the financial crisis and recession, the U.S. economy is not likely to bump up against this kind of capacity constraint in the near future. We would therefore expect the induced effects to be significant in the current climate. However, the uncertainty about the length and severity of the crisis makes it difficult to pinpoint the magnitude of induced effects with a high degree of accuracy.

We have developed a formal model to estimate more systematically the broad magnitude of the induced employment effects. We present the details of our procedure in the appendix. The basic approach is straightforward. We begin by estimating how much of the additional employment income earned as a result of the increased infrastructure investments is spent on household consumption. Using our basic input-out model, we then estimate the number of jobs that this additional consumption spending would generate, assuming that there is ample excess capacity in the economy due to the prevailing high levels of unemployment.

Out of this exercise, we are able to conclude that a rough estimate of the induced job effect is 0.4 for all sectors combined in the U.S. — i.e. that for every 10 jobs that are generated either

directly or indirectly through the $1.2 trillion spending program, another four jobs will be induced. We show the results of this additional exercise in Table 8. As we see, the overall level of job creation through the three-year, $1.2 trillion expansion in private spending is 19 million new jobs, including all direct, indirect and induced jobs.

TABLE 8. TOTAL JOB CREATION, INCLUDING INDUCED JOBS, THROUGH THREE-YEAR $1.2 TRILLION SPENDING EXPANSION

Direct + indirect job creation	13.6 million
Induced job creation	5.4 million
Total job creation	19.0 million

Impact of 19 Million New Jobs on Unemployment Rates for 2012-2014

The U.S. economy's official unemployment rate is calculated as the total number of people who report being unemployed divided by the total number of people in the labor force. This official unemployment rate (the Labor Department's U-3 series) as of September 2011 was 9.1 percent. [28] By the Labor Department's broader measure of labor underutilization (U-6), which includes those who are underemployed and discouraged from looking for work ("marginally attached"), the rate is 16.5 percent. This broader measure is a more accurate indicator of people experiencing distress in the labor market. However, for the purposes of this illustrative exercise, we focus here on the official unemployment rate.

As we saw from the calculations summarized in Table 8, a three-year $1.2 trillion expansion of private sector spending will generate 19 million new jobs by the end of 2014. To understand the impact of this level of job creation, it is first important to distinguish between total job creation and "job years," i.e. new jobs per year.

According to our exercise, the initial $400 billion in spending in 2012, the first installment in the

three-year $1.2 trillion in new private investment spending, will generate 6.3 million new jobs, based on the priority sectors we have laid out above. These jobs will be paid for over the course of 2012 — that is, 6.3 million "job years" will have been generated by the $400 billion in new spending. If we assumed that, at the end of 2012, the initial $400 billion injection did nothing to promote a broader recovery beyond that year, then in 2013, as a result of the second $400 billion injection of new spending into the economy, that money would only cover a second year of 6.3 million "job years" again. We could think of this pattern in terms of the same 6.3 million people who first got jobs in 2012 through the initial $400 billion in spending would keep their jobs in 2013, but nobody else would become newly employed. As such, the total jobs expansion would be 6.3 million jobs, carried through at this point for two years.

However, we are assuming that both the initial and subsequent $400 billion will promote a broad and sustainable recovery. As such, we assume that the jobs generated in 2012 will be maintained in 2013 and that, in 2013 itself, the additional $400 billion in spending will expand total jobs by an additional 6.3 million jobs. The same basic pattern would then carry forward into 2014 as well. Again, here is where additional rounds public-sector stimulus spending — including support for state and local government budgets, unemployment insurance, and new public infrastructure projects — will be crucial for undergirding and complementing the expansion of private-sector investments.

Overall then, this is how the three-year $1.2 trillion program can create a total of 19 million new jobs, or 19 million "job years" between 2012 and 2014. If 19 million new jobs were indeed created by the end of 2014, we estimate that this would generate an official unemployment rate of 4.6 percent at that time.

We can observe how we reach this conclusion through considering the hypothetical exercise we present in Table 9. In Panel 9A, we work through the employment scenario for 2011-

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28 September 2011 is the month on which we based our employment estimates in this study, even though, as of this writing, employment figures have been reported through November 2011, as noted in our introduction.

2012, in 9B, we show 2012-2013, and in 9C we conclude with 2013-2014. We begin in Panel 9A, with the actual level of employment, 140.0 million people, as of the September 2011 figures. An increase of 6.3 million jobs by the end of 2012 — one-third of the total 19 million jobs that we have estimated for our total $1.2 trillion expansion of private investment — would mean 146.3 million people would be employed by the end of 2012.

To estimate the unemployment rate from this figure would then require us to know the labor force participation rate — that is, the percentage of people who are of working age — i.e. 16 years or older — who are either employed or are attempting to find work. As of September 2011, the labor force participation rate was 64.2 percent, close to the 63.9 percent of the previous July, which was the lowest figure since January 1984. Labor force participation does always fall in a recession. By the same token, if we are allowing for a strong employment expansion over 2012-14, then labor force participation will rise. For example, during the peak of the employment expansion at the end of the 1990s to 2000, labor force participation reached as high as 67.3 percent. Let's assume that large numbers of people become fully attached to the labor force as a result of the strong level of employment expansion, and as such labor force participation rises, to 66 percent in 2012, 67 percent in 2013, and 67.5 percent in 2014.

For the year 2012, we can estimate from figures from both the U.S. Census Bureau and U.S. Labor Department that the U.S. working age population will be about 242 million. If 66 percent of these working-age people are in the labor force, that translates into 159.7 million people in total. If 146.3 million are employed by the end of 2012, that means that 13.4 million will be unemployed (159.7 million labor force – 146.3 million employed = 13.4 million unemployed). The official unemployment rate would therefore be 8.4 percent by the end of 2012.

TABLE 9. CALCULATION OF U.S. UNEMPLOYMENT RATE AFTER THREE-YEAR $1.2 TRILLION PRIVATE SPENDING EXPANSION, 2011 - 2014

9A. EMPLOYMENT EXPANSION BETWEEN 2011 AND 2012	
1) Actual unemployment rate as of September 2011	9.1%
2) Actual total employment as of September 2011	140.0 million
3) Total employment by the end of 2012 with 6.3 million new private sector jobs	146.3 million
4) Approximate working-age population in 2012	242 million
5) Assumed labor force participation rate in 2012	66 percent
6) Labor force by end of 2012 (= row 4 x row 5)	159.7 million (= 242 million x .66)
7) Unemployment by end of 2012 (= row 6 – row 3)	13.4 million (= 159.7 million – 146.3 million)
8) Unemployment rate by end of 2012 (= row 7/row 6)	8.4%
9B. EMPLOYMENT EXPANSION BETWEEN 2012 AND 2013	
1) Estimated total employment as of December 2012	146.3 million
2) Total employment by the end of 2013 with 6.3 million new private sector jobs	152.6 million
3) Approximate working-age population in 2013	244 million
4) Assumed labor force participation rate in 2013	67 percent
5) Labor force by end of 2013 (= row 3 x row 4)	163.5 million (= 244 million x .67)
6) Unemployment by end of 2013 (= row 5 – row 2)	10.9 million (= 163.5 million – 152.6 million)
7) Unemployment rate by end of 2013 (= row 6/row 5)	6.7%
9C. EMPLOYMENT EXPANSION BETWEEN 2013 AND 2014	
1) Estimated total employment as of December 2013	152.6 million
2) Total employment by the end of 2014 with 6.3 million new private sector jobs	158.9 million
3) Approximate working-age population in 2014	247 million
4) Assumed labor force participation rate in 2014	67.5 percent
5) Labor force by end of 2014 (= row 3 x row 4)	166.6 million (= 247 million x .675)
6) Unemployment by end of 2014 (= row 5 – row 2)	7.7 million (= 166.6 million – 158.9 million)
7) Unemployment rate by end of 2014 (= row 6/row 5)	4.6%

In Panels 9B and 9C, we work through the same exercise, beginning with our estimated employment level of 146.3 million as of December 2012. We also assume that the working age population rises to 244 million in 2013 and to 247 million in 2014. We assume that the labor force participation rate also rises, to 67 percent in 2013 and to 67.5 percent in 2014. By the end of 2013, this generates a labor force of 163.5 million people, a level of unemployment of 10.9 million people and an official unemployment rate of 6.7 percent. By the end of 2014, the labor force would be at 166.6 million, the number of unemployed would be 7.7 million and the official unemployment rate would be 4.6 percent.

Is This Rate of Employment Expansion Implausibly Large?

If employment grew by nearly 19 million jobs in the three years between 2012 and 2014, from 140 million to 158.9 million jobs, that would represent an average annual growth of jobs of 4.3 percent. This would be the most rapid rate of employment growth over a three-year period that the U.S. economy has experienced since World War II. However, employment has grown rapidly as the economy emerged out of previous recessions. The most robust period of employment growth since World War II was in the expansion period after the 1974-75 recession. Over the four year period 1976-79, employment grew at an average rate of nearly 4 percent per year under Presidents Ford and Carter. In the three years 1977-79, average employment growth was even faster, at 4.2 percent per year.

Employment could realistically grow equivalent to, or even faster than the 1976-79 period for two reasons. The first is that there are now such massive cash reserves sitting idly with the country's commercial banks, at a level far beyond 1976-79 or any other period since such statistics have been recorded on a systematic basis. The second is that the proportion of the total labor force that is now unemployed or underemployed is also substantially higher than

in 1976-79. With this combination of abundantly available people looking for work and financial resources available to spend on employment, the challenge for advancing a rapid rate of employment growth is to implement effective policies to mobilize the economy's unused resources.

Range of Jobs

We now provide a fuller sense of the range of jobs generated by the three-year $1.2 trillion expansion in business investment and spending that we have described. In Table 10, we present a listing of a representative sample of jobs that are likely to expand significantly through this initiative in each of our priority areas of building retrofits, infrastructure, healthcare and small business generally. Since the aim of this policy will be to spread its benefits as widely as possible, it is important to consider the profile of jobs created according to the range of educational credential levels required to move into any given job type. As such, we have sorted out our set of representative occupations according to three educational credential categories — 'college degree jobs,' requiring at least a B.A. degree; 'some college jobs,' requiring some college but not a B.A., and 'high school or less jobs,' requiring a high school degree or less.[29] We then show representative jobs in each of these credential categories within each of our four priority sectors.[30]

Considering this listing of occupations as a whole, some of the jobs associated with each of

[29] We differentiate jobs using categories of "education credentials" as opposed to the more traditional categories of skill levels. We believe the terms we are using more accurately reflect the actual distinctions between job categories. Many jobs are referred to as "low-skilled" only because they do not require high education credentials or formal training even while such jobs frequently require operating at a high skill level to deliver a satisfactory product or service. Jobs in needle trades, childcare, farm work, and elderly care provide a few cases in point.

[30] Appendix 3 explains in detail our methodology for generating estimates of the range and characteristics of the jobs documented in this section and the subsequent one focused on the Los Angeles and Seattle regional economies.

TABLE 10. OCCUPATIONS WITH LARGE GROWTH
POTENTIAL WITHIN PRIORITY INVESTMENT AREAS

BUILDING RETROFITS	INFRASTRUCTURE	HEALTHCARE	SMALL BUSINESS
College degree jobs			
Accountants	Accountants	Accountants	Accountants
Chief executives	Chief executives	Chief executives	Chief executives
Civil engineers	Civil engineers	Dentists	Computer software engineers
Construction managers	Electrical engineers	Human resource specialists	Financial managers
Financial managers	Financial managers	Medical service managers	General operations managers
General managers	Lawyers	Physical therapists	Lawyers
Lawyers	Marketing managers	Physicians	Management analysts
Marketing managers	Postsecondary teachers	Real estate brokers	Marketing managers
Postsecondary teachers	Real estate brokers	Registered nurses	Real estate brokers
Real estate brokers	Wholesale sales representatives	Social workers	Wholesale sales representatives
Some college jobs			
Bookkeepers	Bookkeepers	Billing clerks	Bookkeepers
Customer service representatives	Bus drivers	Bookkeepers	Customer service representatives
Electricians	Customer service representatives	Dental assistants	First-line supervisors of office workers
First-line supervisors of office workers	Electricians	Dental hygienists	First-line supervisors of retail sales workers
First-line supervisors of retail workers	First-line supervisors of office workers	Diagnostic technicians	Food service managers
Heating and air conditioning mechanics	First-line supervisors of retail sales workers	First-line supervisors of office workers	Hairdressers
Office clerks	Heating and air conditioning mechanics	General office clerks	Receptionists
Receptionists	Machinists	Licensed practical nurses	Retail salespersons
Retail salespersons	Retail salespersons	Medical assistants	Secretaries
Secretaries	Secretaries	Secretaries	Security guards
High school or less jobs			
Carpenters	Carpenters	Cashiers	Automotive service technicians
Cashiers	Cashiers	Cooks	Cashiers
Construction equipment operators	Construction laborers	Freight and stock movers	Cooks
Construction laborers	Electronics assemblers	Home care aides	Freight and stock movers
Drywall and ceiling installers	First-line supervisors of construction workers	Housekeepers	Grounds maintenance workers
First-line supervisors of construction workers	Freight and stock movers	Janitors	Housekeepers
Painters	Janitors	Nurse aides	Janitors
Pipelayers and plumbers	Painters	Receptionists	Sales truck drivers
Roofers	Pipelayers and plumbers	Sales truck drivers	Stock clerks
Sales truck drivers	Sales truck drivers	Waiters and waitresses	Waiters and waitresses

Source: U.S. Current Population Survey 2007-2010.

Note: These occupations are selected from the top 50 out of 491

occupations with the largest growth potential within each

educational category.

the priority sectors will be in specialized areas, such as civil engineers for retrofitting and infrastructure spending, and physicians, physical therapists and dentists in healthcare. Most of these specialized jobs fall within the 'college degree' job category. But others will be available with fewer educational credentials. The overall point is that the expansion will generate a wide range of new opportunities across all credential levels.

Proportions and Totals of Jobs Created by Credential Categories

In Table 11, we provide a more detailed breakdown of the total number of direct, indirect, and induced jobs generated within each of our priority sectors, sorted by our three educational credential categories. Within each of our priority sectors, we show both the number of jobs generated by a $1 million level of spending in each sector, then the total number of jobs created according to the level of new spending we have proposed for each of the sectors.

TABLE 11. BREAKDOWN OF JOB CREATION IN U.S. BY FORMAL EDUCATIONAL CREDENTIAL LEVELS

11A. BUILDING RETROFITS

	Jobs per $1 million in spending	Jobs for $60 billion in spending
Total job creation	17.5	1.05 million
College degree jobs ▪ B.A. or above ▪ $25.00 average wage	3.7 *(20.9% of retrofit investment jobs)*	222,000
Some college jobs ▪ Some college but not B.A. ▪ $16.20 average wage	4.8 *(27.6% of retrofit investment jobs)*	288,000
High school or less jobs ▪ High school degree or less ▪ $14.00 average wage	9.0 *(51.5% of retrofit investment jobs)*	540,000

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details.
Note: Average wage is the median wage for all workers across all industries within each of the credential categories above. Figures for credentials categories may not add up to totals due to rounding.

11B. INFRASTRUCTURE

	Jobs per $1 million in spending	Jobs for $180 billion in spending
Total job creation	13.0	2.34 million
College degree jobs ▪ B.A. or above ▪ $26.30 average wage	3.3 *(25.5% of infrastructure investment jobs)*	594,000
Some college jobs ▪ Some college but not B.A. ▪ $16.25 average wage	3.7 *(28.4% of infrastructure investment jobs)*	666,000
High school or less jobs ▪ High school degree or less ▪ $13.70 average wage	6.0 *(46.1% of infrastructure investment jobs)*	1,080,000

11C. HEALTHCARE

	Jobs per $1 million in spending	Jobs for $180 billion in spending
Total job creation	17.2	3.10 million
College degree jobs ▪ B.A. or above ▪ $25.30 average wage	5.9 *(34.4% of healthcare investment jobs)*	1.06 million
Some college jobs ▪ Some college but not B.A. ▪ $14.70 average wage	5.7 *(33.1% of healthcare investment jobs)*	1.03 million
High school or less jobs ▪ High school degree or less ▪ $11.45 average wage	5.6 *(32.5% of healthcare investment jobs)*	1.01 million

11D. SMALL BUSINESS

	Jobs per $1 million in spending	Total jobs for $300 billion in spending
Total job creation	18.6	5.59 million
College degree jobs ▪ B.A. or above ▪ $24.00 average wage	5.3 *(28.2% of small business investment jobs)*	1.58 million
Some college jobs ▪ Some college but not B.A. ▪ $13.00 average wage	5.5 *(29.6% of small business investment jobs)*	1.65 million
High school or less jobs ▪ High school degree or less ▪ $10.70 average wage	7.9 *(42.2% of small business investment jobs)*	2.36 million

11E. OVERALL U.S. ECONOMY

	Jobs per $1 million in spending	Total jobs for $480 billion in spending
Total job creation	14.6	7.00 million
College degree jobs ▪ B.A. or above ▪ $26.30 average wage	4.6 *(31.3% of overall jobs)*	2.19 million
Some college jobs ▪ Some college but not B.A. ▪ $15.25 average wage	4.2 *(29.1% of overall jobs)*	2.03 million
High school or less jobs ▪ High school degree or less ▪ $12.50 average wage	5.8 *(39.6% of overall jobs)*	2.77 million

Thus, with building retrofits, we estimate that $1 million in new spending will generate a total of 17.5 direct, indirect and induced jobs. Of these, 21 percent are 'college degree' jobs, 28 percent are 'some college' jobs, and 51 percent are 'high school or less' jobs. Considering these proportions within a three-year $60 billion spending expansion, we see that total of direct, indirect and induced job creation will be nearly 1.1 million jobs, with about 540,000 of these being in the 'high school or less' category.

The proportions of jobs in each credential category within infrastructure are comparable to those within retrofits, since spending on infrastructure will also engage large numbers of people working in the construction industry. We see in Table 11B that $180 billion in new infrastructure spending in three years will generate a about 2.3 million jobs, with about 1.1 million of these — 46 percent — in the 'high school or less' category.

The distribution of jobs within the healthcare industry — in the industry in general as well as community health clinics specifically — is distinct from that of either retrofitting or infrastructure. As Table 11C shows, spending $1 million on healthcare generates 17.2 direct, indirect, and induced jobs, about the same as retrofitting. But with healthcare, the division of jobs according to educational credentials is roughly equal among college degree, some college and high school or less. We see in Table 11C that increasing spending by $180 billion in healthcare over three years will generate about 3.1 million new jobs in total. With community health clinics, an even higher share of jobs — 38 percent as opposed to 34 percent for healthcare generally — is filled by people with college degrees or higher. The proportion of jobs for people with high school degrees or less is correspondingly lower with community health clinics, at 30 percent as opposed to 33 percent for healthcare overall.

Table 11D shows the relevant job figures for small business as a broad category. With small business, 18.2 direct, indirect and induced jobs are created through spending $1 million, a figure that is higher than the other three priority areas.

Therefore a $300 billion increase in spending in this broad category will generate about 5.6 million new jobs. The distribution of jobs across credential categories is also different than with the other three priority areas, with 29 percent college degree jobs, 30 percent some college jobs and 42 percent high school or less jobs.

Table 11E shows the figures on job creation when funds are invested proportionally throughout all sectors of the U.S. economy. In the overall investment framework we have outlined, we, again, allow that $480 billion, 40 percent of the $1.2 trillion total, will be spent proportionally throughout all sectors of the U.S. economy. If this were to be done, it would generate 7 million jobs overall. About 2.8 million, or 40 percent of these 7 million jobs, would be filled by people in the high school or less category. The remaining 60 percent of total jobs are divided nearly evenly between those with either some college or a college degree credential.

Finally, Table 12 gives a full breakdown by educational credential categories of all 19 million jobs that would be generated by mobilizing $1.2 trillion into business expansions and productive investments. As we see, 5.6 - 5.7 million jobs, again about 30 percent each, would be for people either with college degrees or some college. About 7.8 million, about 40 percent would be for those with less than high school degrees. Not surprisingly, this breakdown is virtually identical to that which we saw in Table 11E, documenting the employment impact of the 40 percent of the $1.2 trillion that would be spread evenly across the U.S. economy.

TABLE 12. TOTAL JOB CREATION BY EDUCATIONAL CREDENTIAL LEVEL

College degree jobs • B.A. or above	5.6 million (29.6%)
Some college jobs • Some college but not B.A.	5.7 million (29.7%)
High school or less jobs • High school degree or less	7.8 million (40.7%)
Total job creation	19.0 million

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details. Note: Figures for educational credentials categories may not add up to total due to rounding.

VI. EMPLOYMENT ESTIMATES FOR REGIONAL ECONOMIES: LOS ANGELES AND SEATTLE

A program to inject $1.2 trillion in new private business investments and expansion — again, after allowing that that $200 billion will be needed to cover inflation and real wage increases — will of course reach into every region, state and community, generating new job opportunities throughout the country. While this is evident, it is nevertheless useful to illustrate what the effects of the program will be regionally by focusing on the impacts on specific metropolitan areas.

We have chosen to examine two important case studies, the situations for the Los Angeles and Seattle metropolitan areas. The Los Angeles metropolitan area includes both Los Angeles and Orange Counties. The largest cities in the L.A. metro area other than L.A. itself are Glendale, Santa Clarita, Pomona, and Pasadena. The Seattle metro area includes King, Pierce and Snohomish Counties. The other large cities in the metro area are Tacoma and Bellevue.

As our initial foray into examining these regional impacts, we present here some basic statistical evidence. Specifically, we will simply scale the size of the effects in the Los Angeles and Seattle metro areas based on the 2009 levels of GDP in each region as a share of total 2009 U.S. GDP.[31] In a forthcoming follow up study, we will examine conditions in these two regions through a more detailed, on-the-ground type approach.

To begin, we present in Table 13 the 2009 GDP figures for both of these regions, both in dollar terms and as a share of 2009 U.S. GDP, which was $14.1 trillion. As the table shows, GDP for the L.A. metro area was about $716 billion, which was about five percent of U.S. GDP in 2009. As such, for the purposes of our exercise, we assign a total of $60 billion (rounding $61.2

billion down by $1 billion) — $20 billion per year for three years — to L.A. as its proportionate share of the $1.2 trillion in total increased spending. For the Seattle metro area, 2009 GDP was $222 billion, or 1.6 percent of U.S. GDP. We thus assign Seattle $19 billion in new spending, or $6.3 billion per year over three years.

TABLE 13. SHARE OF THREE-YEAR $1.2 TRILLION STIMULUS FOR LOS ANGELES AND SEATTLE METROPOLITAN AREAS (MSAS)

	Los Angeles metropolitan area	Seattle metropolitan area
2009 regional GDP	$715.8 billion	$221.8 billion
Regional GDP as share of U.S. GDP	5.1%	1.6%
Proportional share of 3-year $1.2 trillion spending program	$61.2 billion	$19.2 billion
Annual spending increase per year over 3 years	$20.4 billion	$6.4 billion
Annual spending increase as share of regional GDP	2.8%	2.9%

Source: See Appendix 1.

Los Angeles

We now present figures on job creation for the Los Angeles region through a $60 billion jobs program, broken out in terms of the priority sectors for the jobs program as well as for the Los Angeles economy as a whole.

Table 14 presents figures for direct and indirect employment expansion per $1 million of spending in the Los Angeles region. Comparable to the figures we presented earlier in Table 6 for the entire U.S. economy, we show in this table the impact of employment per $1 million in spending for each of our four priority areas within Los Angeles. In Table 15, we then show the same employment estimates for the L.A. metro region as a whole. As we see, overall, the $60 billion in new private business investment for the Los Angeles metro region will generate about 585,000 direct plus indirect jobs in total.

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[31] 2009 is the most recent full year for which regional GDP data were available at the time of writing.

TABLE 14. DIRECT AND INDIRECT JOB CREATION PER $1 MILLION IN OUTPUT FOR LOS ANGELES METROPOLITAN AREA

Sector	Direct job creation per $1 million in output (# of jobs)	Indirect job creation per $1 million in output (# of jobs)	Direct + indirect job creation per $1 million in output (# of jobs)
Building retrofits	7.1	2.9	10.0
Infrastructure	4.8	2.9	7.7
Healthcare	7.8	3.6	11.4
Small business other than construction and healthcare	9.2	2.9	12.1
Overall Los Angeles regional economy	5.8	2.6	8.4

TABLE 15. DIRECT AND INDIRECT JOB CREATION THROUGH THREE-YEAR $60 BILLION SPENDING EXPANSION IN THE LOS ANGELES METROPOLITAN REGION

Sector	Direct + indirect job creation per $1 million	Level of increased spending	Total direct + indirect job creation
Building retrofits	10.0	$3.0 billion (5% of total)	30,000
Infrastructure	7.7	$9.0 billion (15% of total)	69,300
Healthcare	11.4	$9.0 billion (15% of total)	102,600
Small business other than construction and healthcare	12.1	$15 billion (25% of total)	181,500
Overall Los Angeles regional economy	8.4	$24 billion (40% of total)	201,600
Totals	9.8	$60 billion	585,000

In Table 16, we then incorporate the effects of induced job creation into this scenario. For the case of regional economies, such as the Los Angeles and Seattle metro areas, we have adjusted downward the size of the induced effect, from the 40 percent increment to direct plus indirect job creation with our national model to 33 percent. The reason for this downward adjustment is that, within in any given regional economy such as the Los Angeles metro area, a share of the increased spending generated by

newly employed people having more money to spend will be for products they purchase outside their home region. For example, people in Los Angeles who experience a recent increase in employment will certainly spend some of their increased income in regions other than Los Angeles itself, including in other countries. They will also be making online purchases from businesses that are located throughout the U.S. as well as in other countries. We explain the reasoning behind this downward adjustment in the regional induced effects in Appendix 2.

TABLE 16. TOTAL JOB CREATION, INCLUDING INDUCED JOBS, THROUGH THREE-YEAR $60 BILLION SPENDING EXPANSION IN THE LOS ANGELES METROPOLITAN REGION

Direct + indirect job creation	585,000
Induced job creation	195,000
Total job creation	780,000

We see in Table 16 that when we add total direct plus indirect employment for the Los Angeles metro area of 585,000 plus an induced job creation level of 195,000 (= 585,000 x 0.333), the total job creation from injecting $60 billion in new spending into the region will be about 780,000 new jobs.

In Table 17 (page 40), we then calculate what the impact will be of adding about 780,000 jobs into the Los Angeles economy in terms of the regional unemployment rate. As of September 2011, official unemployment in the Los Angeles area stood at 11.5 percent. Using the same set of calculations that we presented in Table 9 for the national economy case, we show that, with a $60 billion increase in private investment, targeted in the way we have documented for Los Angeles, the unemployment rate for the region will fall to 6.1 percent by the end of 2014.

TABLE 17. CALCULATION OF LOS ANGELES REGIONAL UNEMPLOYMENT RATE AFTER THREE-YEAR $60 BILLION PRIVATE SPENDING EXPANSION

17A. EMPLOYMENT EXPANSION BETWEEN 2011 AND 2012	
1) Actual unemployment rate as of September 2011	11.5%
2) Actual total employment as of September 2011	5.70 million
3) Total employment by the end of 2012 with 260,000 new private sector jobs	5.96 million
4) Approximate working-age population in 2012	10.08 million
5) Assumed labor force participation rate in 2012	66 percent
6) Labor force by end of 2012 (= row 4 x row 5)	6.65 million (= 10.08 million x .66)
7) Unemployment by end of 2012 (= row 6 – row 3)	690,000 (= 6.65 million – 5.96 million)
8) Unemployment rate by end of 2012 (= row 5/row 4)	10.4%
17B. EMPLOYMENT EXPANSION BETWEEN 2012 AND 2013	
1) Estimated total employment as of December 2012	5.96 million
2) Total employment by the end of 2013 with 260,000 new private sector jobs	6.22 million
3) Approximate working-age population in 2013	10.15 million
4) Assumed labor force participation rate in 2013	67 percent
5) Labor force by end of 2013 (= row 3 x row 4)	6.80 million (= 10.15 million x .67)
6) Unemployment by end of 2013 (= row 5 – row 2)	580,000 (= 6.80 million – 6.22 million)
7) Unemployment rate by end of 2013 (= row 6/row 5)	8.5%
17C. EMPLOYMENT EXPANSION BETWEEN 2013 AND 2014	
1) Estimated total employment as of December 2013	6.22 million
2) Total employment by the end of 2014 with 260,000 new private sector jobs	6.48 million
3) Approximate working-age population in 2014	10.22 million
4) Assumed labor force participation rate in 2014	67.5 percent
5) Labor force by end of 2014 (= row 3 x row 4)	6.90 million (= 10.22 million x .675)
6) Unemployment by end of 2014 (= row 5 – row 2)	420,000 (= 6.90 million – 6.48 million)
7) Unemployment rate by end of 2014 (= row 6/row 5)	6.1%

In Tables 18A-G, we then break down this total job creation effect according to our four priority sectors, retrofits, infrastructure, healthcare, small business. We also again show the levels of job creation according to our three categories of credential levels — 'college degree' jobs; 'some college' jobs; and 'high school or less' jobs for each of our prioritized growth sectors and for the Los Angeles regional economy as a whole.

Finally, in Table 19 (page 41), we show total employment in the region sorted by the three job credential categories. Again, as we saw with the national case, the jobs program we have described will produce a wide range of new job opportunities across all sectors and levels of credentials, with 310,000 (40 percent) new jobs being available to less credentialed workers, 210,000 (27 percent) for people with some college background, and 260,000 (33 percent) for those with college degrees or better.

TABLE 18. BREAKDOWN OF JOB CREATION IN THE LOS ANGELES METROPOLITAN AREA BY FORMAL EDUCATIONAL CREDENTIAL LEVELS

18A. LOS ANGELES BUILDING RETROFITS		
	Jobs per $1 million in spending	Total jobs for $3.0 billion in spending
Total job creation	13.4	40,050
College degree jobs ▪ B.A. or above ▪ $28.90 average wage	2.9 (21.7% of retrofit investment jobs)	8,690
Some college jobs ▪ Some college but not B.A. ▪ $17.20 average wage	3.3 (24.4% of retrofit investment jobs)	9,770
High school or less jobs ▪ High school degree or less ▪ $13.70 average wage	7.2 (53.9% of retrofit investment jobs)	21,590
18B. LOS ANGELES INFRASTRUCTURE		
	Jobs per $1 million in spending	Total jobs for $9.0 billion in spending
Total job creation	10.3	92,520
College degree jobs ▪ B.A. or above ▪ $28.45 average wage	2.6 (25.7% of infrastructure investment jobs)	23,780
Some college jobs ▪ Some college but not B.A. ▪ $17.90 average wage	2.6 (25.3% of infrastructure investment jobs)	23,410
High school or less jobs ▪ High school degree or less ▪ $12.20 average wage	5.0 (49.0% of infrastructure investment jobs)	45,330

18C. LOS ANGELES HEALTHCARE		
	Jobs per $1 million in spending	Total jobs for $9.0 billion in spending
Total job creation	15.2	136,970
College degree jobs ▪ B.A. or above ▪ $27.00 average wage	6.3 (41.5% of healthcare investment jobs)	56,840
Some college jobs ▪ Some college but not B.A. ▪ $16.20 average wage	4.4 (29.0% of healthcare investment jobs)	39,720
High school or less jobs ▪ High school degree or less ▪ $10.95 average wage	4.5 (29.5% of healthcare investment jobs)	40,410

18D. LOS ANGELES SMALL BUSINESS		
	Jobs per $1 million in spending	Total jobs for $15.0 billion in spending
Total job creation	16.2	242,300
College degree jobs ▪ B.A. or above ▪ $26.00 average wage	4.8 (29.9% of small business investment jobs)	72,450
Some college jobs ▪ Some college but not B.A. ▪ $14.00 average wage	4.4 (27.1% of small business investment jobs)	65,660
High school or less jobs ▪ High school degree or less ▪ $10.35 average wage	6.9 (43.0% of small business investment jobs)	104,190

18E. OVERALL LOS ANGELES ECONOMY		
	Jobs per $1 million in spending	Total jobs for $24 billion in spending
Total job creation	11.2	269,140
College degree jobs ▪ B.A. or above ▪ $28.35 average wage	4.1 (36.4% of overall jobs)	97,970
Some college jobs ▪ Some college but not B.A. ▪ $16.20 average wage	3.0 (27.0% of overall jobs)	72,670
High school or less jobs ▪ High school degree or less ▪ $11.40 average wage	4.1 (36.6% of overall jobs)	98,500

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details. Note: Average wage is the median wage for all workers across all industries within each of the credential categories listed above. Figures for educational credentials categories may not add up to total due to rounding.

TABLE 19. TOTAL JOB CREATION BY EDUCATIONAL CREDENTIAL LEVEL FOR LOS ANGELES METROPOLITAN AREA

College degree jobs ▪ B.A. or above	260,000 (33.3%)
Some college jobs ▪ Some college but not B.A.	211,000 (27.0%)
High school or less jobs ▪ High school degree or less	310,000 (39.7%)
Total job creation	781,000

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details. Note: Figures for educational credentials categories may not add up to total due to rounding.

Seattle

In Tables 20-25, we replicate the same set of calculations and findings for Seattle we just presented for Los Angeles. Of course, in the case of Seattle, the size of the stimulus is much smaller at $19 billion total, to reflect that the regional GDP for the Seattle metro area, at $222 billion, is less than one-third that of the Los Angeles metro area. There are also small differences in the employment generation per $1 million in spending in Seattle relative to Los Angeles.

As we see in Tables 20 – 21, the impact of injecting $19 billion into the Seattle metro economy in private business investment spending will be to create about 177,000 new direct plus indirect jobs. In addition, this program will produce another 55,000 in induced jobs for the region, as we show in Table 22. Overall, job creation from the stimulus program will be about 232,000 jobs.

TABLE 20. DIRECT AND INDIRECT JOB CREATION PER $1 MILLION IN OUTPUT FOR SEATTLE METROPOLITAN AREA

Sector	Direct job creation per $1 million in output (# of jobs)	Indirect job creation per $1 million in output (# of jobs)	Direct + indirect job creation per $1 million in output (# of jobs)
Building retrofits	7.4	3.0	10.4
Infrastructure	5.0	2.7	7.7
Healthcare	7.5	3.2	10.7
Small business other than construction and healthcare	8.9	2.5	11.4
Overall Seattle regional economy	5.7	2.3	8.0

TABLE 21. DIRECT AND INDIRECT JOB CREATION IN SEATTLE METROPOLITAN AREA THROUGH THREE-YEAR $19 BILLION SPENDING EXPANSION

Sector	Direct + indirect job creation per $1 million	Level of increased spending	Total direct + indirect job creation
Building retrofits	10.4	$950 million (5% of total)	9,900
Infrastructure	7.7	$2.85 billion (15% of total)	21,900
Healthcare	10.7	$2.85 billion (15% of total)	30,500
Small business other than construction and healthcare	11.4	$4.75 billion (25% of total)	54,200
Overall Seattle regional economy	8.0	$7.60 billion (40% of total)	60,800
Total	9.3	$19 billion	177,300

TABLE 22. TOTAL JOB CREATION, INCLUDING INDUCED JOBS, THROUGH THREE-YEAR $19 BILLION SPENDING EXPANSION

Direct + indirect job creation	177,300
Induced job creation	54,900
Total job creation	232,200

In Table 23, we again consider what the impact will be of this expansion of jobs on the unemployment rate for the Seattle region. As we see, unemployment in the region stood at 9.8 percent as of September 2011. From this baseline, creating 232,000 new jobs over three years will push the regional unemployment rate down to 5.8 percent by the end of 2014.

Finally, in Tables 24 – 25 (page 43), we again show the total employment breakdown according to both our priority areas as well as our three educational credential levels. The main finding in all of this is that, as with the U.S. and Los Angeles regional case, the distribution of 232,000 new jobs in the Seattle region will create new opportunities across all credential levels. That is, 85,000 (37 percent) will be for those with college degrees, 76,000 (33 percent) will be for those with some college, and 71,000 (31 percent) for those with high school or less as their educational credential.

TABLE 23. CALCULATION OF SEATTLE REGIONAL UNEMPLOYMENT RATE AFTER THREE-YEAR $19 BILLION PRIVATE SPENDING EXPANSION

23A. EMPLOYMENT EXPANSION BETWEEN 2011 AND 2012	
1) Actual unemployment rate as of September 2011	9.8%
2) Actual total employment as of September 2011	1.70 million
3) Total employment by the end of 2012 with 77,000 new private sector jobs	1.78 million
4) Approximate working-age population in 2012	2.83 million
5) Assumed labor force participation rate in 2012	69 percent
6) Labor force by end of 2012 (= row 4 x row 5)	1.95 million (= 2.83 million x .69)
7) Unemployment by end of 2012 (= row 6 – row 3)	170,000 (= 1.95 million – 1.78 million)
8) Unemployment rate by end of 2012 (= row 7/row 6)	8.7%
23B. EMPLOYMENT EXPANSION BETWEEN 2012 AND 2013	
1) Estimated total employment as of December 2012	1.78 million
2) Total employment by the end of 2013 with 77,000 new private sector jobs	1.85 million
3) Approximate working-age population in 2013	2.87 million
4) Assumed labor force participation rate in 2013	70 percent
5) Labor force by end of 2013 (= row 3 x row 4)	2.01 million (=2.87 million x .70)
6) Unemployment by end of 2013 (= row 5 – row 2)	160,000 (= 2.01 million – 1.85 million)
7) Unemployment rate by end of 2013 (= row 6/row 5)	8.0%
23C. EMPLOYMENT EXPANSION BETWEEN 2013 AND 2014	
1) Estimated total employment as of December 2013	1.85 million
2) Total employment by the end of 2014 with 77,000 new private sector jobs	1.93 million
3) Approximate working-age population in 2014	2.91 million
4) Assumed labor force participation rate in 2014	70.5 percent
5) Labor force by end of 2014 (= row 3 x row 4)	2.05 million (=2.9 million x .705)
6) Unemployment by end of 2014 (= row 5 – row 2)	120,000 (= 2.05 million – 1.93 million)
7) Unemployment rate by end of 2014 (= row 6/row 5)	5.8%

TABLE 24. BREAKDOWN OF JOB CREATION IN THE SEATTLE METROPOLITAN AREA BY FORMAL EDUCATIONAL CREDENTIAL LEVELS

24A. SEATTLE BUILDING RETROFITS		
	Jobs per $1 million in spending	Total jobs per $950 million in spending
Total job creation	13.6	12,940
College degree jobs ▪ B.A. or above ▪ $27.50 average wage	3.2 (23.8% of retrofit investment jobs)	3,080
Some college jobs ▪ Some college but not B.A. ▪ $19.80 average wage	4.6 (33.5% of retrofit investment jobs)	4,340
High school or less jobs ▪ High school degree or less ▪ $17.45 average wage	5.8 (42.7% of retrofit investment jobs)	5,530

24B. SEATTLE INFRASTRUCTURE		
	Jobs per $1 million in spending	Total jobs for $2.85 billion in spending
Total job creation	10.1	28,750
College degree jobs ▪ B.A. or above ▪ $28.30 average wage	3.1 (30.3% of infrastructure investment jobs)	8,710
Some college jobs ▪ Some college but not B.A. ▪ $19.50 average wage	3.3 (32.5% of infrastructure investment jobs)	9,340
High school or less jobs ▪ High school degree or less ▪ $15.80 average wage	3.8 (37.2% of infrastructure investment jobs)	10,690

24C. SEATTLE HEALTHCARE		
	Jobs per $1 million in spending	Total jobs for $2.85 billion in spending
Total job creation	14.0	39,950
College degree jobs ▪ B.A. or above ▪ $28.30 average wage	5.4 (38.5% of healthcare investment jobs)	15,380
Some college jobs ▪ Some college but not B.A. ▪ $17.50 average wage	5.0 (35.8% of healthcare investment jobs)	14,300
High school or less jobs ▪ High school degree or less ▪ $13.70 average wage	3.6 (25.7% of healthcare investment jobs)	10,270

24D. SEATTLE SMALL BUSINESS		
	Jobs per $1 million in spending	Total jobs per $4.75 billion in spending
Total job creation	14.9	70,940
College degree jobs ▪ B.A. or above ▪ $25.80 average wage	5.5 (36.6% of small business investment jobs)	25,960
Some college jobs ▪ Some college but not B.A. ▪ $15.25 average wage	4.9 (32.7% of small business investment jobs)	23,200
High school or less jobs ▪ High school degree or less ▪ $12.35 average wage	4.6 (30.7% of small business investment jobs)	21,780

24E. OVERALL SEATTLE ECONOMY		
	Jobs per $1 million in spending	Total jobs per $7.6 billion in spending
Total job creation	10.5	79,650
College degree jobs ▪ B.A. or above ▪ $29.30 average wage	4.2 (40.3% of overall jobs)	32,100
Some college jobs ▪ Some college but not B.A. ▪ $18.20 average wage	3.2 (30.9% of overall jobs)	24,610
High school or less jobs ▪ High school degree or less ▪ $14.65 average wage	3.0 (28.8% of overall jobs)	22,940

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details. Note: Average wage is the median wage for all workers across all industries within each of the credential categories listed above. Figures for educational credentials categories may not add up to total due to rounding.

TABLE 25. TOTAL JOB CREATION BY EDUCATIONAL CREDENTIAL LEVEL FOR SEATTLE METROPOLITAN AREA

College degree jobs ▪ B.A. or above	85,200 (36.7%)
Some college jobs ▪ Some college but not B.A.	75,800 (32.6%)
High school or less jobs ▪ High school degree or less	71,200 (30.7%)
Total job creation	232,200 (100.0%)

Source: 2007-2010 Current Population Survey and MIG, Inc. IMPLAN data and software. See Appendices 2 and 3 for details. Note: Figures for educational credentials categories may not add up to total due to rounding.

VII. CONCLUSION

The U.S. economy is experiencing a protracted crisis of unemployment at the same time that the country's commercial banks and nonfinancial corporations are holding — based on highly conservative assumptions — about $1.4 trillion in excess cash and other liquid assets. Moreover, with respect to the commercial banks in particular, the main reason they have been able to build up a total cash reserve supply of $1.6 trillion — of which we estimate conservatively that $600 million could be needed as a safety cushion while the other $1 trillion represents an excess cash hoard — is that Federal Reserve policies for the past 2 ½ years have enabled the banks to borrow cash at a near-zero interest rate. Of course, the purpose of the Federal Reserve maintaining such an extremely low interest rate for commercial bank borrowers is not simply to enable the banks to build up huge cash reserves. The real purpose of the Federal Reserve's policy is to move funds into productive investments that can generate millions of new jobs. With the large nonfinancial corporations, we have seen that despite their massive holdings of $2 trillion in liquid assets, they are more committed at present to utilizing these funds for various forms of financial engineering, such as stock buybacks, rather than expanding their operations, investing in research, development and productive equipment, and hiring more workers.

We have shown in this study that if the roughly $1.4 trillion now being held as excess liquid assets were indeed channeled into productive investments and job creation over a period of three years, this could, virtually on its own, solve the country's employment crisis. If the funds were to begin moving into productive investments early in 2012, about 19 million new jobs would be generated by the end of 2014, with the unemployment rate falling below five percent. The 19 million jobs overall would be spread across all sectors, regions, occupations and credential levels. In addition, we have sketched an approach in which priority sectors

— building retrofits, infrastructure, community health clinics and other healthcare activities, and small businesses generally — would receive an extra share of the total increase in investments. The grounds for doing so are either 1) these sectors are primed for investment expansions now, since they could gain substantially from raising productivity, while their market demand is at least relatively stable; 2) they would create a high number of jobs for a given dollar amount of expenditures, i.e. are "labor intensive" investments; or, 3) they would provide social benefits, such as improved access to healthcare for lower-income neighborhoods via community health clinics.

We also saw the impact of this increase in private-sector investments through the regional case studies of Los Angeles and Seattle. With Los Angeles, we saw that getting its share of the overall $1.4 trillion in new investments and business expansions would expand employment by 785,000 by 2014, and drop the metropolitan unemployment rate from the September 2011 rate of 11.5 percent rate to 6.1 percent. Similar benefits would result in Seattle.

Overall then, moving the $1.4 trillion in excess cash and other liquid assets held by commercial banks and nonfinancial corporations into productive investments would transform the U.S. economy, creating millions of new job opportunities throughout the country.

Of course, getting these funds to move out of their hoards and into productive investments and job creation will require that a challenging combination of policies be implemented successfully. The first need with policy will be to raise the economy's overall level of demand. Demand has collapsed due to the effects of unemployment itself as well as the dramatic loss of household wealth since the recession. Austerity policies are still mainly operating at the state and local levels, but the prospect of austerity at the federal level is also being widely discussed. Such austerity measures will only make the unemployment crisis more severe, by lowering the floor for overall demand in the economy.

Beyond all such policies aimed at increasing overall demand, it will also be necessary to introduce direct measures to end the credit lockout for small businesses. We have not presented details on how to proceed with these various policies. The main point on policy that we tried to convey is that realistic options are available, both in terms of supporting overall demand in the economy as well as ending the credit crunch for small businesses.

In short, there is no reason that the U.S. needs to remain stuck in a long-term unemployment crisis. Rather, through a combination of policy measures, overall demand can be strengthened and the credit constraint weakened. This will be the combination of measures necessary to start fulfilling the needs of U.S. citizens for decent job opportunities at all levels.

Appendix 1. Calculating the Impact of Inflation and Real Wage Growth on Funds Available for Job Creation

The calculations on which we based our assumption that approximately $200 billion of a total of $1.4 trillion in new spending over 2012 – 2014 proceeds as follows:

1. Inflation and real wage growth. As we note in the main text, we assume that over a three-year expansion, in which an additional $1.4 trillion in new business spending occurs, inflation will rise to 3 percent per year, and that real wage growth will also be three per cent per year — that is, wage increases will be 6 percent per year in nominal terms, 3 percent above the annual inflation rate.

2. Annual business investment/spending increases and cumulative employment expansion. We assume the $1.4 trillion in new business investments and expansions will occur in equal increments over three years between 2012 and 2014. This amounts to $470 billion per year. As we describe in the main text, we also assume that this increase in business spending will encourage a broader economic expansion. As such, the employment increases in 2012 — i.e. one year's worth of increased "job years" — will be the new level for further employment expansions in 2013. The employment level in 2013 will then be the base for further employment growth in 2014. For our purposes, this means that we need to calculate the effects of an annual 3 percent inflation rate with respect to the new flow of $470 billion in new spending over 2012 – 2014. We then need to calculate the additional costs of 3 percent real wage increases on all cumulative jobs created over 2012 – 2014.

3. Impact of 3 percent inflation on composition of annual $470 billion in new spending. Table A1.1 shows the calculations of a 3 percent annual inflation rate on $470 in new private business spending. As we see, for the year 2012, that would mean that $14.1 billion of the total spending would cover price increases as opposed to spending on investments and hiring new workers. In 2013, that figure rises to $28.7, since, due to 2 years of inflation at 3 percent each year, the price level has risen to 1.061 relative to the January 2012 base of 1.0. For 2014, covering inflationary price increases will account for $43.7 billion of the total new spending of $470 in 2014. As the table shows, adding up the costs for 2012 – 2014 to cover price increases for all three years amounts to $86.5 billion.

4. Additional impact of 3 percent real wage growth on increase in wage bill Of course, the impact of real wage increases will be additional to those tied to the 3 percent annual rise in the price level. Moreover, as discussed above, the 3 percent wage increases will need to cover the cumulative increase in employment over the three years — i.e. the total increase in "job years" between

TABLE A1.1. IMPACT OF 3 PERCENT ANNUAL INFLATION ON COMPOSITION OF $1.4 TRILLION IN NEW BUSINESS INVESTMENT/SPENDING

	Total incremental investment/spending	Changes in price level, with 3% annual inflation and 2011 as base year	Spending needed to cover annual inflation
2011	—	1.0	—
2012	$470 billion	1.03	$14.1 billion (= $470 billion x 0.03)
2013	$470 billion	1.061	$28.7 billion (= $470 billion x 0.061)
2014	$470 billion	1.093	$43.7 billion (= $470 billion x 0.093)
Total	$1.4 trillion	—	$86.5 billion

2012 and 2014. This is a calculation based on the stock of employment, as opposed to the previous inflation calculation, which was based on the flow of new spending. Moreover, the incremental spending increases will apply only to that share of total spending that covers wages. We assume that the wage share over these three years is 60 percent of total spending. This 60 percent figure is close to the actual wage bill of 2010. In Table A1.2, we show these additional costs to cover 3 percent wage increases over-and-above the 3 percent increase in inflation we are assuming for 2012 – 2014. As we see, the figure for covering total wage increases for these three years adds to $51 billion.

TABLE A1.2. IMPACT OF 3 PERCENT ANNUAL INFLATION ON COMPOSITION OF $1.4 TRILLION IN NEW BUSINESS INVESTMENT/SPENDING

	Total additional spending to cover employment expansion	Wage share of total spending	Spending increases to cover 3% real wage increases for newly hired workers
2012	$470 billion	$282 billion (= $470 x .6)	$8.5 billion (= $282 billion x .03)
2013	$940 billion (= $470 billion x 2)	$564 billion (= $940 billion x .6)	$16.9 billion (= $564 billion x .03)
2014	$1.4 trillion (= $470 billion x 3)	$840 billion (= $1.4 trillion x .6)	$25.2 billion (= $840 billion x .03)
Total	$2.8 trillion	$1.7 trillion	$50.1 billion

5. Costs of 3 percent inflation and real wage increases totals $136.9 billion, but we round up to $200 billion. As we have seen, the total amount of $1.4 trillion in new spending that will be needed to cover a 3 percent annual rate of inflation is $86.5 billion. Adding the 3 percent annual wage increases for all workers who are hired and retain their jobs over 2012 – 2014 adds an additional $51 billion, bringing the total for inflation and real wage increases to $136.9 billion. For the purposes of our study, we have rounded the figure up to $200 billion. This way, we are giving a conservative round estimate of

$1.2 trillion as the amount of funds that are available for new investments and job creation. In other words, our assumption that $200 billion of the $1.4 trillion total that is available as excess liquid assets allows for inflation and real wage increases beyond the annual 3 percent rates that we are assuming will occur.

Appendix 2. Employment Estimates: Data and Methodology

ESTIMATING DIRECT AND INDIRECT EMPLOYMENT IMPACTS WITH THE INPUT-OUTPUT MODEL

The employment estimates in this report are derived from an input-output model. The input-output model allows us to observe relationships between different industries in the production of goods and services. We can also observe relationships between consumers of goods and services, including households and governments, and the various producing industries. For our purposes specifically, the input-output modeling approach enables us to estimate the effects on employment resulting from an increase in final demand for the products of a given industry. For example, we can estimate the number of jobs directly created in the construction industry for each $1 million of spending on building weatherization. We can also estimate the jobs that are indirectly created in other industries through the $1 million in spending on building weatherization — industries such as insulation, windows, and hardware. Overall, the input-output model allows us to estimate the economy-wide employment results from a given level of spending in any one industry or combination of industries.

For this report, we used the IMPLAN 3.0 software with IMPLAN 2009 data compiled by the Minnesota IMPLAN Group, Inc. This data provides 440-industry level detail and is based on the Bureau of Economic Analysis (BEA) input-output tables, which are compiled from millions of surveys of businesses nationwide as well as administrative records. IMPLAN provides this data at both the national and county level therefore we were able to model the national economy as well as the metropolitan areas of Los Angeles and Seattle. Below, following our discussion of induced effects, we present the industry composition for each area of the jobs program.

INDUCED EMPLOYMENT ESTIMATES

Induced effects refer to the additional employment, output, and value-added that is produced when the additional employment income generated by an initial demand stimulus – as captured by the direct and indirect effects – is spent. The magnitude of the induced effects depends on how the additional employment income translates into household expenditures and the size of the multiplier effects associated with the increase in household spending.

Induced effects are often estimated by endogenizing the household sector in the input-output model. The assumption is that increases in employee compensation (or value added) finance greater household spending, as reflected in the vector of household consumption in overall final demand. The endogenous household model often yields very large induced effects, in part because the propensity to consume out of employee compensation (or value-added) implicit in the endogenous household input-output model is large.

Instead of relying on the consumption function which is implicit in the input-output accounts, we estimate the relationship between real gross employee compensation and real personal consumption expenditures econometrically using a dynamic empirical model. This gives us a more accurate sense of how household consumption responds to changes in employee compensation. We then integrate this estimated relationship into our basic input-output model to calculate induced effects.

The first step of the process is to estimate the relationship between personal consumption expenditures and employee compensation. To do this, we begin with the following dynamic empirical model:

$$C_t = \alpha + \beta_1 C_{t-1} + \beta_2 C_{t-2} + \beta_3 C_{t-3} + \gamma E_t + \mu_t$$

In the above equation, C_t represents real personal consumption expenditures in time period 't,' E_t represents real employee compensation, and μ_t is a stochastic error term. We are interested in how changes in employee compensation affect changes in personal consumption expenditures. Therefore, we estimate the model in first differences. First differencing also insures that the variables are stationary (based on augmented Dickey-Fuller unit root tests). The GDP-deflator for personal consumption expenditures is used to transform nominal values into real variables. The time series is quarterly, and extends from 1950 to 2007. All data comes from the Bureau of Economic Analysis, U.S. Department of Commerce.

The estimated model is (rounding off the coefficients):

$$C_t = 7.83 + 0.10\ C_{t-1} + 0.20\ C_{t-2} + 0.21\ C_{t-3} + 0.30\ E_t$$
$$\quad (3.2)\quad (1.7)\qquad (3.5)\qquad (3.6)\qquad (5.9)$$

T-values are reported in parentheses. From this model, we can calculate the impact of a change in employee compensation on personal consumption expenditures, taking into account the dynamic feedback effects captured by the lagged endogenous variables:

$$\frac{\gamma}{1-(\beta_1 + \beta_2 + \beta_3)} = \frac{0.2952}{1-0.5186} = 0.6132$$

This implies that a $1 million increase in gross employee compensation will be associated with a $613,200 increase in household consumption. Next, we need to estimate the feedback effects – that is, the impact of the increase in household consumption on employee compensation. Additional household consumption expenditures will increase the vector of final demand in the input-output model and, through direct and indirect employment effects, raise employee compensation. Using our input-out model and restricting the estimates to direct and indirect effects only, we find that a $1 increase in household final demand is associated with an increase in employee compensation of $0.416.[32]

We can now estimate the number of jobs that would be created for each additional $1 million in employee compensation generated by the direct and indirect effects of any particular final demand stimulus. First, we calculate the total impact on household consumption of a $1 increase in employee compensation. This would be given by the following expression:

Total impact on HH consumption =
$x + x^2y + x^3y^2 + x^4y^3 + \ldots$

In which 'x' is the estimated propensity to consume out of additional employee compensation (0.6132 according to our estimates described above) and 'y' is the additional employee compensation generated by a $1 increase in final household demand (0.416 from the basic input-output model). We can factor out a single 'x,' giving us:

Total impact on HH consumption =
$x[1 + xy + (xy)^2 + (xy)^3 + \ldots]$

The expression in the brackets is an infinite series. Since xy<1, we know that the series converges to:

Total impact on HH consumption = $x/(1-xy)$.

Using our estimates, the total impact on household consumption expenditures of a $1 increase in employee compensation is +$0.8232.

Finally, we use these estimates to calculate a general induced employment multiplier. From the basic input-output model, we estimate that a $1 million change in final household consumption would create 10.6 additional jobs. However, we are interested in the number of jobs that would be generated by an additional $1 million in employee compensation. We know that $1 in employee compensation will generate $0.8232 in induced household consumption. Therefore, $1 million in additional employee compensation generates $823,200 in new household expenditures and approximately 8.7 additional jobs (10.6 * 0.8232) – when all dynamic multiplier effects are taken into account.

We can apply this general analysis of induced effects to any specific stimulus. All we need to know is the direct and indirect effects of the stimulus in terms of employee compensation. For each $1 million in additional employee compensation generated, we know that 8.7 additional jobs would be generated through induced effects. For example, an additional $10 million spent on building weatherization generates $6.49 million in additional employee compensation through the direct and indirect effects. These direct and indirect effects would generate about 125 new jobs. These numbers come directly from the basic input-output model. The induced job creation – taking into account all multiplier effects – would amount to approximately 56 additional jobs ($6.49*8.7) for a total employment impact of 181 jobs. In this case, we see that the induced jobs represent 44.8 percent of the combined direct and indirect employment.

Using this modeling approach to estimate induced employment effects across multiple industries, we have found that, on average, induced effects represent approximately 40 percent of the combined direct and indirect effects. This level of induced effects is supported by other estimates reported in the literature. A 2002 article by economists at the International Monetary Fund surveyed the professional literature estimating the size of the induced effects in the United States, among other economies, in a range of circumstances and time periods.[33] They report wide variations in these estimates. This includes some estimates of a negative induced effect, to a doubling of the initial expansion.

The stimulus program we propose is designed specifically to generate a large induced expansion of jobs. This is because the economy at present is operating with high unemployment, with plenty of slack resources to be utilized; spending will be focused on domestic industries rather than imports; and it aims specifically to encourage private-sector investment rather than relying on government spending. Given these factors, one might expect that the induced effect would be closer to the higher end estimates of the IMF study — that the total number of jobs would be double the level of direct and indirect job creation. Nevertheless, to be cautious, it is appropriate to underestimate rather than overestimate the induced employment effect, even if the program is designed, and conditions are favorable, for a relatively large induced effect. We therefore assume that the induced employment effects of this program will add forty percent to the overall level of job creation generated by

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[32] We use the IMPLAN calibrated model and restrict our focus to households with annual incomes between $10,000 and $100,000, under the assumption that the vast majority of the jobs created would affect households with incomes in this range.

[33] Hemming, Kell, and Mahfouz (2002).

the direct and indirect effects nationwide. This is in line with the lower-end estimate of such effects for the U.S. economy reported in the IMF survey study.

While the forty percent induced effect has a straightforward application at the national level, it becomes more complicated at the city level due to regional trading patterns. A city which imports a high percentage of its goods from outside the area will have lower induced job creation than a city that imports a smaller percentage of its goods and buys more "domestically-produced" goods and services. Thus, to account for these differences, we adjusted the .4 induced effect by each city's regional trade patterns. We calculated a weighted average of the ratio of local supply to local demand for all industries in each city and multiplied that by the national induced effect of 0.4. In the Seattle Metropolitan Statistical Area, this results in an induced effect of 0.31. In the Los Angeles MSA, the induced effect is 0.335.

INDUSTRY COMPOSITION

Building retrofits consist of 50% residential repair and 50% non-residential repair.

Infrastructure is composed of rail, aviation, transit, ports, and electrical grid. The industry composition of each of these categories is presented in the table below. The weighting of each of these categories within the "infrastructure" program here is based on the needs assessment reported in Heintz, Pollin, and Garrett-Peltier (2009) and shown in Table A2.1 below. The exception to this is "ports." Ports are owned both publicly and privately and the needs assessment for these was not conducted by the American Society of Civil Engineers as it was for other types of infrastructure. As a proxy, we use the "inland waterways" needs assessment from the Heintz et al. (2009) report. In the 2007 Economic Census, deep water transportation is larger than inland water transportation both in the amount of revenues and the number of establishments.

Therefore we might expect the infrastructure needs of ports to be at least as high as the needs for inland waterways, which were listed in the Heintz et al infrastructure study as $6.2 billion annually.

Healthcare consists of all of the healthcare industries within the healthcare sector, including doctors' offices, home healthcare, clinics and labs, hospitals, and nursing and residential care facilities. We first obtained the levels of output of each of these healthcare industries from the 2009 IMPLAN US data set, and calculated the share of each industry within the healthcare sector. Then, since the jobs program includes a focus on expanding community health clinics, we increased the healthcare output share of clinics by 2 percentage points, which nationally represents a 20% increase in the output of clinics, and decreased the shares of doctors' offices and hospitals 1 percentage point each. The final weighting for the healthcare sector nationally thus becomes 36% doctors' offices, 4% home health, 12% clinics, 37% hospitals, 11% nursing and residential care.

Small Business multipliers are derived by constructing a vector of final demand based on the revenues of small businesses across all industries. Using data from the Small Business Administration, we totaled the revenues of all small businesses that had employees and whose annual revenues were under $5 million in each 2-digit NAICS sector. We used these values to calculate the shares of revenue for each industry within our model. To avoid double-counting, we eliminated the construction sector and the healthcare sector (since these are included in the building retrofit and healthcare components of our jobs program) and calculated the shares of total output attributable to the remaining industries, based on revenues of small businesses. As shown in Table A2.2 (p. 50), we then used the IMPLAN model with data aggregated to the 2-digit NAICS sector level to estimate employment multipliers for this category.

TABLE A2.1 WEIGHTS AND INDUSTRY COMPOSITION FOR INFRASTRUCTURE PROGRAM

	Annual spending amount as reported in Heintz et al. (2009) ($ billions)	Weight within infrastructure	Industry composition of each infrastructure area
Rail	5.3	0.08	50% infrastructure construction, 25% rolling stock manufacturing, 25% rail transportation operations
Aviation	3.2	0.05	50% runway construction, 50% airport building construction
Transit	9.2	0.13	25% infrastructure construction, 25% bus mfg, 25% subway and rail car mfg, 25% transit operations
Ports	6.2	0.09	50% new infrastructure construction, 50% repair infrastructure construction
Electric grid	45	0.65	67% electric power goods (transformers, motors and generators, switchgears, relays and industrial controls, storage batteries, communication and energy wire, wiring devices), 33% infrastructure construction

TABLE A2.2. WEIGHTS FOR SMALL BUSINESS, BY 2-DIGIT NAICS INDUSTRY

(CONSTRUCTION AND HEALTHCARE EXCLUDED)

Forestry, fishing, hunting, and agriculture support	0.52%
Mining	0.54%
Utilities	0.11%
Construction (omitted to avoid double-counting)	--
Manufacturing	8.55%
Wholesale trade	11.02%
Retail trade	20.27%
Transportation and warehousing	3.64%
Information	1.70%
Finance and Insurance	4.64%
Real estate and rental and leasing	5.27%
Professional, scientific, and technical services	14.25%
Management of companies and enterprises	0.13%
Administrative and support and waste management and remediation services	5.77%
Educational services	1.56%
Healthcare and social assistance (omitted to avoid double-counting)	--
Arts, entertainment, and recreation	2.18%
Accommodation and food services	9.20%
Other services	10.64%

REFERENCES AND METHODS FOR LOS ANGELES AND SEATTLE EMPLOYMENT CALCULATIONS

LOS ANGELES MSA:

Data: 2009 IMPLAN data for Los Angeles County and Orange County

Industry Composition

Building Retrofits: weights same as national

Infrastructure: weights same as national

Healthcare: weighting methodology same as national, weights for L.A. MSA are: 41% doctors' offices, 3% home health, 15% clinics, 32% hospitals, 9% nursing and residential care

Small business: weights same as national

SEATTLE MSA:

Data: 2009 IMPLAN data for King, Snohomish, and Pierce Counties

Industry Composition

Retrofits: weights same as national

Infrastructure: weights same as national

Healthcare: weighting methodology same as national, weights for Seattle MSA are: 37% doctors' offices, 2% home health, 20% clinics, 31% hospitals, 10% nursing

Small business: weights same as national

Appendix 3. Characteristics of Jobs Created by New Business Spending

Our basic strategy for identifying the types of jobs that would be added to the economy due to any particular spending activity in the economy involves two steps. The first step is to calculate each of the 440 industry shares of total employment created through a specific investment program. We calculated the percentage of new employment generated in each of these 440 sectors with our input-output model. These industry shares take into account the direct, indirect, and induced effects as discussed earlier.

The second step is to combine this information on the industry composition of the new employment created by an investment program with data on workers currently employed in those industries. We use the characteristics of these workers to create a profile of the types of jobs that will be added with a specific investment program, including what types of occupations, the credential requirements, and wages.

The worker data we used is from the 2007-2010 data files of the Current Population Survey (CPS). The CPS is a monthly household survey conducted for the Bureau of Labor Statistics by the U.S. Census Bureau. The basic monthly survey of the CPS collects information from about 50,000 households every month on a wide range of topics including current employment status, wages and work schedules.

Specifically, we used the industry shares to weight the worker data in the CPS so that the industry composition of the workers in the CPS sample matches the industry composition of the new jobs that will be added by a particular investment program (e.g., an investment in retrofitting buildings). We do this by using the industry shares to adjust the CPS-provided sampling weights. The CPS-provided sampling weights weight the survey sample so that it is representative at the national and state levels. We use the industry shares to adjust these sampling weights so that the sample of workers in the CPS is representative of the industrial mix of jobs that IMPLAN estimates will be produced by a particular investment.

We merge the industry share data from our IMPLAN input-output model to the CPS worker data using the most detailed industry variable (peio1icd) provided in the CPS. Some of the IMPLAN industries had to be aggregated to match the industry variable in the CPS which has 273 categories, and vice versa. So, for example, at the 440-sector level there are 7 construction sectors, while the CPS has only one construction industry. In the end, 181 industry sectors are common to both sets of data.

We adjust the CPS-provided sampling weights by multiplying each individual worker's sampling weight with the following:

$$S \times \frac{\text{IMPLAN's estimate of the share of new jobs in worker } i\text{'s industry } j}{\sum \text{CPS sampling weights of all workers in industry } j}$$

where S is a scalar equal to the number of jobs produced overall by the particular level and type of investment being considered. For example, say a national investment of $1 billion investment would generate 18,000 jobs, then S is equal to 18,000.

We use these adjusted sampling weights to estimate the proportion of workers in jobs associated with each investment program that has 1) a high school degree, and no college experience, 2) some college, but no B.A. degree, and 3) a B.A. degree or more. We then assume that the same proportion of jobs produced by each investment program requires each level of education credentials. These figures are presented in the main text in tables that breakdown jobs by educational credential level for the overall U.S. economy, for the Los Angeles metropolitan area, and for the Seattle metropolitan area.

The average (median) wage data presented in the main text are based on the 2007-2010 CPS outgoing rotation files (ORG) of the basic monthly survey and are inflated to 2010 dollars. These data files have detailed information about hourly rates for hourly-paid workers, and weekly earnings and weekly hours for non-hourly paid workers. We divide weekly earnings by weekly hours to estimate hourly rates for non-hourly paid workers. For some non-hourly paid workers, we do not have data on their usual weekly hours (some report usual hours vary). For these workers, we impute their usual weekly hours by assigning their *actual* hours worked as their usual hours worked as long as the actual hours they worked is consistent with what they report is their usual work schedule – part-time or full-time. For example, if a worker reports that his hours usually vary, but he reports that he worked 15 hours last week and that he usually works part-time, we impute that worker's usual hours to be 15 hours per week. However, if this worker reports that he usually works full-time, we assigned his usual hours as missing. Roughly five percent of the hours, and thus hourly wages, in our data set are imputed in this fashion.

For the small business investment program, our industry shares data from IMPLAN is at the 2-digit NAICS level. Correspondingly, we match these shares to the more aggregated detailed industry variable (prdtind1) in the CPS data.

MSA-LEVEL ANALYSIS FOR LOS ANGELES AND SEATTLE

We use the same methodology used for the national estimates for the MSA-level estimates with the following additional step. For some industries, the number of observations on workers within a particular MSA falls too low to provide a reasonable picture of the industry's job requirements, wages, and occupations. In those cases, we estimated these industry characteristics from worker data drawn from a larger geographic area such as the state, Census region, or the entire nation. Specifically, if an industry had fewer than 25 observations at the MSA-level, we used the next largest geographic area that provided at least 25 observations.

In Seattle, we derived worker/job characteristics of 36 percent (65) of the industries from workers in the Seattle MSA only, 14 percent (25) based on workers from the state of Washington, 36 percent (65) based on workers from the Pacific region, and 14 percent (26) based on workers across the U.S. In Los Angeles, we derived worker/job characteristics of 58 percent (105) of the industries from workers in the Los Angeles MSA only, 19 percent (35) based on workers from the state of California, 9 percent (16) based on workers from the Pacific region, and 14 percent (25) based on workers across the U.S.

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A full list of the authors' related publications can be found here.

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