

The economic impact of the Troubled Assets Relief Programme (TARP) in the USA: an assessment of the level to which an optimal allocation of funds occurred

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ABSTRACT

The 2009 international financial crisis has led to many countries, including the USA, bailing out their financial institutions. This article provides a unique perspective of the bailout issue by looking at the impact of the quantitative easing in monetary policy on competitiveness as well as providing multiplier impacts through the use of the US 2002 I–O table. Specifically, three areas are considered within this model: whether the Troubled Assets Relief Programme (TARP)¹ bailout will give rise to greater economic efficiencies and productivity, which would include determining whether the TARP bailouts give rise to the survival of financial institutions and the stabilisation of the financial sector; determining the direct, indirect and induced impacts of the TARP bailout on the economy (short-term); and determining the long-term benefits of the TARP 1 bailout on the economy (by focusing on long-term capital realisation). The findings of this econometric analysis raise questions of the validity of government intervention in the form of bailouts.

Key words: bailout, competitiveness, input–output analysis, economic impact assessment, Troubled Assets Relief Programme (TARP)

Introduction

The recent financial turmoil in the world's economies can be traced to the collapse of some financial institutions in the USA since September/October 2008 (although there

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is evidence that the initial slowdown can be traced as far back as 1999). The World Bank chief economist Justin Yifu Lin (2009) aptly described what happened when he wrote that the credit crisis was preceded by six years of global economic boom, which encouraged the US Federal Reserve Board to opt for expansionary monetary policies leading to large increases in the value of real estate and equity investment in the USA. This led to a boom in the housing market, which turned sour and resulted in an equity bubble due to rapidly increasing sub-prime risks. The reason for the economic boom giving rise to the equity bubble can be explained in the words of the great economist Walter Bagehot (1873), who wrote: "... we need not be alarmed at the magnitude of our credit system and its refinement, for that we have learned by experience the way of controlling it, and always manage it with discretion. But we do not always manage it with discretion." In September 2008 the equity bubble gave rise to a liquidity crisis in the global credit market, which was further exacerbated by the threats of insolvencies to numerous financial institutions in the USA, including Lehman Brothers and other institutions such as the US government-sponsored housing enterprises, Fannie May (Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation). Given the turmoil resulting from banks refusing to lend (both to other banks and to businesses), this article assesses the effectiveness of the allocation of bailout funds by the US government with the intention of stabilising the financial sector, resuscitating (slowing) economic activity and encouraging banks to get into the business of lending. A number of reasons have been put forward for the current situation (see Liebowitz 2008), while blame has been attached to various institutions ranging from the rating agencies to deregulation by government. This article does not go into detail regarding what caused the calamity, but rather focuses on the economic impact of the bailout packages employed, especially with regard to whether bailout funds were optimally allocated to address the financial crisis.

Research problem

The role of government in a country's economy can vary from complete control (interventionist) to absolute absence (free marketism). The extent of government's involvement can also vary, depending on circumstances. It has been normal practice for governments to regulate the financial systems in their countries, and governments have on occasion intervened directly in financial markets. According to Hanohan and Klingebiel (2003), the following two broad approaches are followed by governments when faced with banking crises:

- An accommodating approach involving measures such as liquidity support for banks experiencing cash-flow problems, depositor guarantees, tolerance of banks

violating bank solvency and minimum capitalisation rules and debtor support schemes

- A non-accommodating approach involving abiding by the rules and requiring banks either to meet requirements or face official intervention.

In the United States, the government decided to take the accommodating approach to banks experiencing crises. The Emergency Economic Stabilization Act of 2008 was enacted as a financial sector bailout package authorising the Secretary of the Treasury to spend \$700 billion to buy distressed assets, especially mortgage-backed securities, and to effect capital injections into banks with the aim of 'stabilising' such institutions. This Act was adopted on 3 October 2008, creating the Troubled Assets Relief Programme (TARP) to purchase failing bank assets (Wikipedia 2009). Through TARP funds, the US government buys illiquid mortgage-backed securities with the aim of increasing the liquidity of secondary mortgage markets, thereby reducing the losses suffered by financial institutions owning such securities in order to 'bail out' such institutions. Although there are many TARP supporters in favour of ensuring financial stability in the United States, there are also groups that are sceptical of TARP's ability to stabilise the US financial sector as well as its ability to boost the economy.

Many analysts view the possible squandering of TARP funds (which were used to pay bonuses as well as chase losses) as a reason to question the efficacy of TARP in bailing out affected financial institutions. Their point of view is that should financially unsound institutions be bought out by other institutions, it would be less of a burden on taxpayers. Government, however, regards certain institutions as being 'too big to fail', and will put in place whatever measures are deemed appropriate to ensure the survival of such companies. Critics of this practice question the basis of such decisions, particularly in the light of the perception that governments tend to assist their friends. For example, why was Lehman Brothers allowed to fail, while similarly large institutions such as Goldman Sachs were bailed out? It should be noted that government effectively buys the shares of distressed companies and then sells these shares at some point in the future (in most cases at a higher price than was paid), thus ensuring that the taxpayer benefits over the medium to long term.

However, it must be noted that it is not unusual for governments to provide some funding to institutions requiring assistance. For example, governments provide subsidies for institutions offering unique or rare services, such as to offset capital expenditure, for research and development, and possibly to implement policies of a political nature. It is not uncommon for governments to provide some basis on which economic activity takes place, such as expropriations of land for certain projects.

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Government's role in the handling of the USA's financial crisis may have been regarded as having been more effective if it had guided financial control rather than trying to solve the problem. In this regard, government should be more vigilant of the ways in which financial practices and procedures are accounted for. The recent Madoff case (for more details on this, see, for example, Wikipedia 2010) indicates that the relevant authorities (including the US Securities and Exchange Commission) were not fully acquainted with the ways in which financial transactions were handled. The burden on the fiscus thus increases, and the resulting pressures are then passed on to the rest of the economy (including government borrowing and reprioritisation of government goals).

The current financial crisis has spread to all areas of the economy, with varying effects. These include a drop in economic activity (encompassing, among other things, the associated increased unemployment, decrease in new ventures, and stricter control measures by most institutions), as well as general uncertainty regarding the extent of the slowdown. Many governments have tried to address the situation by making funds available to banks and other institutions (see Table 1).

On the basis of the foregoing discussion, this article will focus on the question of whether TARP represented an optimal allocation of bailout funds by the US government to stabilise the US financial sector and to safeguard the US economy. With that in mind, the following three objectives for this study were formulated:

- To determine whether the TARP bailout will give rise to greater economic efficiencies and productivity. This would include indicating whether the TARP bailouts give rise to the survival of financial institutions and the stabilisation of the financial sector.
- To determine the short-term direct, indirect and induced impacts of the TARP bailout on the economy.
- To reflect on the medium- and longer-term implications and/or benefits of the TARP bailout on the economy (by focusing on long-term capital realisation).

This paper addresses these three stated objectives by means of the following four methodologies: (1) a financial stability assessment to determine whether the TARP bailout package did give rise to higher efficiencies; (2) an economic competitiveness/efficiency analysis to determine whether the TARP bailout did give rise to increased levels of competitiveness of the US economy on international markets; (3) input-output modelling using a US social accounting matrix (SAM) to determine the direct, indirect and induced impact of the bailout package; and (4) a long-term economic assessment to assess the long-term benefits of the bailout package.

For the purposes of this article, an optimal allocation of bailout funds would have been effective if the bailout package had given rise to: (1) higher efficiencies, (2) increased levels of competitiveness, (3) strong positive direct, indirect and induced impacts with strong economic multipliers and (4) long-term benefits to the economy. This approach is in line with that of Kriebel and Raviv (1980) in terms of which input-output analyses using a social accounting matrix (SAM) could be used to determine the performance of an economic input (TARP funds in the case of this article) in order to determine whether such funds were optimally allocated.

Theoretical and empirical background

The estimated value of bailouts globally (at the end of January 2009) was about \$2 145 886 745 000 (or just over \$2.1 trillion). In addition, the total value of all country or regional guarantees was \$6 235 262 500 000 (or just over \$6.2 trillion). While these figures are impressive, it is when they are considered as percentages of GDP that the full impact of such injections is realised. Global bailout amounts as well as bailouts as a percentage of GDP are shown in Table 1.

It appears from Table 1 that bailout amounts differ from as little as \$518 million in Serbia (constituting 1.2% of Serbia's GDP) to \$725 trillion in the USA (constituting 5.2% of the USA's GDP). Furthermore, bailouts as a percentage of GDP differ from as low as 0.1% in India to 39.9% in Latvia. Although governments have poured huge sums of money directly into the financial sector, as is evident from Table 1, various other options have been considered (and are continually being reviewed), such as:

- The way in which companies mark up their assets in their balance sheet. The common practice has been to reflect assets at what were perceived to be market values. However, it became evident that these valuations differed from the actual value of the relevant asset. Therefore banks and other institutions reflected inflated values on their balance sheet. It was also evident that the various accounting practices (for example, the International Financial Reporting Standards) were fairly flexible in the way asset values were recorded.
- The United States government also reduced its key lending rates from over 5% to almost 0% (the official rate is: 0–0.25%). This resulted in homeowners paying lower bond repayments, but ensured that banks were receiving slightly more income from bonds. However, many sub-prime bondholders were unable to meet this reduced payment.
- Governments also tried to encourage inter-bank lending. Due to the worsening crisis, banks almost stopped lending to each other as they had no confidence that their money would be recovered. In this regard, the Federal Deposit Insurance

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Corporation (FDIC) ensured that financial institutions spent \$12.5 billion to cover the deposits of 64 banks that had become bankrupt during the first seven months of 2009 (Goldseek 2009).

Table 1: Comparative analysis of bailout amounts paid in selected countries and their associated bailout to GDP ratios

Country	Bailout amount (\$) ('000)	GDP (2007) (\$) ('000)	Bailout as % of GDP
Latvia	10 830 000	27 154 000	39.9
Iceland	5 100 000	19 510 000	26.1
United Arab Emirates	32 600 000	129 702 000	25.1
Hungary	31 930 000	138 182 000	23.1
United Kingdom	511 237 000	2 727 806 000	18.7
Russia	229 472 400	1 291 011 000	17.8
Norway	56 320 770	381 951 000	14.7
Switzerland	59 300 000	415 516 000	14.3
Netherlands	94 240 800	754 203 000	12.5
Qatar	5 300 000	42 463 000	12.5
Ukraine	16 500 000	140 484 000	11.7
Belarus	4 500 000	44 771 000	10.1
Luxembourg	4 197 470	47 942 000	8.8
Belgium	26 606 570	448 560 000	5.9
Denmark	17 885 000	308 093 000	5.8
Oman	2 000 000	35 729 000	5.6
Austria	20 300 000	377 028 000	5.4
Pakistan	7 600 000	143 597 000	5.3
USA	725 000 000	13 811 200 000	5.2
Greece	17 663 100	360 031 000	4.9
Spain	69 157 243	1 429 226 000	4.8
Kazakhstan	5 000 000	103 840 000	4.8
South Korea	42 180 000	969 795 000	4.3
Germany	136 650 000	3 297 233 000	4.1
El Salvador	800 000	20 215 000	4.0
Ireland	7 690 000	254 970 000	3.0
France	65 900 680	2 565 288 000	2.6
Sweden	8 739 552	444 443 000	2.0
Canada	21 570 000	1 326 376 000	1.6
Serbia	518 000	41 581 000	1.2
Chile	850 000	163 915 000	0.5
China	8 000 000	3 280 053 000	0.2
Australia	1 283 000	821 716 000	0.2
India	719 000	1 170 968 000	0.1

Source: Grail Research (2009)

- Quantitative monetary easing, or printing of money, makes it easier for government to provide funds to the various institutions. The obvious risk is that the increase in liquidity will lead to inflation, but the recent decrease in commodity prices seems to indicate that the near-term deflation effects are more serious than the medium-term inflation.
- Governments may nationalise banks and other institutions. In many cases, governments now own a majority share of various institutions. For example, the United States government is already a majority shareholder in the American Insurance Group (AIG), while they also have significant interests in other industries such as the automotive sector (in the United States, Ford), aviation (in India, Air India) and real estate (in Germany, Hypo). Funding in this regard has taken place through soft loans, bank guarantee schemes, the creation of stabilisation funds for banks, guaranteed inter-bank loans and provision of emergency loans.
- There has been talk of creating institutions that would absorb all bad debts. These so-called 'bad banks' remove troubled assets from financial institutions, thereby allowing them to continue with their core business. However, there are a number of challenges in this regard. These include who is responsible for the cost of removing the inferior assets, the burden on the taxpayer, and the possibility that institutions may abuse the facility to dispose of other unwanted toxic assets.
- The International Monetary Fund (IMF) has been requested to assist several countries experiencing balance of payments problems (including Hungary, Serbia, Ukraine and Pakistan).
- Some governments took measures to support currencies. For example, both the G7 and the Japanese government considered taking measures to support other currencies against the yen.

Economic impact modelling methodology

As indicated in the statement of the research problem, the economic impact assessment methodology used in this study encompassed four types of economic impact analyses: (1) financial stability assessment, (2) economic competitiveness/efficiency analysis, (3) input-output modelling to determine the direct, indirect and induced impact of the bailout package and (4) long-term economic assessment. The methodologies used in conducting such impact analyses will be discussed.

Financial stability assessment

The IMF (2009) makes use of financial stability maps to assess global financial stability. Such maps make use of the following six criteria:

- Macroeconomic risks
- Emerging market risks
- Credit risks
- Market and liquidity risks
- Risk appetite
- Monetary and financial risk.

In this study, these criteria were applied to the US financial system to determine whether the TARP bailout package in fact gave rise to higher levels of financial stability. It appears from information provided by the IMF (2009) that the six criteria are jointly excellent indicators of the financial stability of a country. Furthermore, the 2009 international credit crisis has shown that should one of these indicators (namely, credit risk) be negatively impacted on by one or more of the other indicators (namely, macro-economic, market and liquidity risks), financial instability will increase.

Competitiveness/efficiency impact analysis methodology

The Global Competitiveness Index provides an analytical tool for assessing the efficacy of bailouts in either strengthening or weakening the competitive advantage of a specific country. This is done by determining whether an injection – such as a bailout – will strengthen, weaken or have no effect on a specific competitive aspect. The Global Competitiveness Index (Porter & Schwab 2008) consists of the following 12 sub-indices:

- Institutional efficacy
- Quality of infrastructure
- Macroeconomic stability
- Health and primary education
- Higher education and training
- Goods market efficiency
- Labour market efficiency
- Financial market sophistication
- Technological readiness
- Market size
- Business sophistication
- Innovation.

For the purposes of this article, the criteria making up each of these sub-indices were used to determine whether the United States bailout package had had a positive or negative impact, or had had no impact, on each of the competitive aspects reflected in the World Competitiveness Index sub-indices.

Input–output analysis methodology

The calculations of the economic impact of a financial bailout package are based on the multisectoral input-output model. The benefit of this framework is that the impact of a government investment in the economy can be determined.

It suffices to mention that the input-output model comprises mathematical equations linking the economic flows between sectors. This model is ideally suited to application in the field of economic impact analysis. For impact analysis, the following can be measured in terms of both backward and forward linkages:

- Initial impact on sector being bailed out (direct impact)
- Impact of bailouts on value added throughout the total economy, both upstream and downstream (indirect impact)
- Impact on compensation and tax (induced impacts).

It should be noted that the impacts are measured as follows:

- **Initial impact:** The initial impact is the impact of a particular project or activity on the economy. The initial impact on gross value added of the bailout package is brought about by the ‘financial shock’ introduced into a specific sector. This impact is sometimes referred to as a direct impact.
- **Indirect impact:** Indirect impacts are determined from the activities of suppliers. For example, suppliers include those industries that deliver goods and services to producers and service providers and include, for example, suppliers of computers and paper to sectors being ‘financially shocked’. Activities of these industries are expanded as a result of the said shock. Such industries are referred to as first-round suppliers that could in turn stimulate further demand in, for example, the mining sector supplying additional steel to computer manufacturers for the production of computers. All these transactions originate from the initial production of the bailout package.
- **Induced impact:** Induced impacts are the impact/s on the economy due to increased aggregate demand by households for goods and services as a result of income earned due to the bailout packages provided (in other words, the income of employees and shareholders of companies increases because of additional income arising through backward linkages of spending in the economy). Backward (or upstream) linkages are, for example, the additional employment

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created by computer manufacturers resulting from the increased demand for their products, which in turn stimulates production in the mining industry supplying steel for computer casings. Forward (or downstream) linkages are, for example, the additional employment created by manufacturers and mining plants due to a bigger demand for their products.

In summary, it can be stated that the initial impact of the bailout package may be regarded as the actual economic contribution of the government investment, while the indirect and induced impacts may be regarded as the spill-over or multiplier effects of the government bailout package on the US economy.

It is important to note that there are a variety of input-output (I-O) models ranging from the simplest versions such as Supply and Demand Matrices (SDM) to more complex tools/models such as Social Accounting Matrices (SAM). Whereas the SDM models include only a limited number of national accounts modules, the typical SAM model includes many national accounts modules such as supply and demand matrices, employment and compensation modules, and tax modules. An input-output (I-O) model was used in this study to determine the economic impact of the TARP bailout package on the American economy. This model is based on a 2002 input-output model constructed by the US Bureau of the Census. The structure of the I-O model used is shown in Table 2.

Table 2: Structure of I-O model

	Intermediate consumption	Final consumption			
Supply of goods	Economic sectors	Households	Government	Exports	Inventories
Economic sectors					
Value added	Employment, profit-type income, capital consumption, compensation of employees and taxes	Gross national product			

Source: Miller & Blair (2009); Leontief (1986)

In the study under discussion, the economic shocks injections of \$700 billion dollars were effected, and the impact of such injections were assessed in terms of direct, indirect and induced impacts on the US economy. Different types of \$700 billion injections were effected to determine the optimal distribution thereof, namely:

- Injection 1: Unisectoral financial injections by the US government of \$700 billion dollars in the various economic sectors to determine *inter alia* the direct, indirect and induced impacts of the TARP injection of \$700 billion dollars into the financial sector alone.
- Injection 2: A multisectoral injection by the US government of \$700 billion, part of which goes to the financial sector to stabilise the financial sector and the rest to other economic sectors to serve as stimulus package. Various distributions of \$700 billion across sectors were assessed to obtain an optimal allocation of bailout funds. Eventually the optimal sectoral distribution of TARP money across sectors could be compared with the unisectoral approach adopted by the US government to determine the level to which bailout funds were optimally allocated.

Long-term economic impact assessment methodology

In an analysis of the fiscal impact of the 9/11 disaster in New York City, Thompson (2002) distinguishes between short-term economic impacts that are generally measured through input-output analysis as described, as well as long-term economic impacts that are made up of long-term wealth, infrastructure, economic contribution, long-term output and long-term capital (physical, social and human capital) impacts. To determine long-term impacts, the extent to which an economic injection gave rise to sustainable higher levels of economic output, employment, compensation, domestic investment and fixed capital formation needs to be investigated.

Results and discussion of results

Results of financial stability analysis

When scrutinising TARP transactions data released by the US Treasury Department (2009), it is clear that numerous banks have benefited from the TARP bailout programme. Such bailouts of financial institutions succeeded in mitigating several of the risks to financial stability, as discussed, including:

- Monetary and financial risks by stabilising the financial sector and enhancing investor confidence in the US economy
- Macroeconomic risks by preventing a run on US banks and by mitigating against many banking clients being hard hit by banks becoming insolvent
- Credit risks by purchasing inferior assets, thereby 'standing in' for large amounts of bad debt in the United States
- Emerging market risks by mitigating some of the effects of a struggling US financial system on emerging economies.

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Although the TARP bailout plan did not fully succeed in restoring risk appetite and mitigating against market and liquidity risks, it can be expected that a more stable US financial system would over the medium term give rise to a restored appetite for risk and market liquidities. The question could, however, be asked whether the broad-brush approach in which bailouts were effected would ensure financial institution survival over the longer term.

Results of competitiveness/efficiency analysis

The current financial crisis indicates that, without government assistance in the form of financial injections, many companies become uncompetitive. In normal circumstances, governments assist many sectors by providing incentives for their initial survival. For example, a company working with new technologies may be given additional or substantial tax breaks, special subsidies and other benefits to ensure its survival. In many other cases, it is possible that government may subsidise the activities of the specific company until it is able to fend for itself. In this article, we are not looking at start-up companies but are rather indicating the possible consequences of government bailing out existing companies for them to survive. For example, funds injected into the AIG ensured that it remained competitive. With the realisation that government will make funds available, such companies may be less efficient in the way they do business. This study excludes possible international ramifications due to currency depreciation and other export/import incentives.

Most of the capital injection in the US took place in the last three quarters of 2009. It is therefore unrealistic to determine at this stage whether the assisted companies have become as competitive as they should have been had government not intervened, or whether it would have been better to allow them to fail in the first place. However, it is well known that some sectors in the US, such as the medical sector, are in any event uncompetitive. If it were not for the US government continuing to support this sector, even before the financial crisis, it would not be able to compete with other sectors.

The results of the analysis regarding the competitiveness impacts of the United States bailout package are shown in Table 3.

Table 3 shows six neutral impacts, five negative impacts, and one with both positive and negative impacts (namely, macroeconomic stability). This is due to the bailout package, which to a certain extent will give rise to short-term financial stability while negatively impacting on an already large fiscal deficit, inflation as well as high levels of government debt. Further concerns have to be noted with respect to the current practice of quantitative easing of monetary policy, which could lead to various possible

Table 3: Results of competitive analysis

Variable	Current rank (out of 134)	Impact (+, -, 0)	Comment
Institutional efficacy	29	-	Negative impact on the favouritism in decisions of government officials; on wastefulness of government spending; on the burden of government regulation; on the ethical behaviour of firms; on the strength of auditing and reporting standards; and on the efficacy of corporate boards
Quality of infrastructure	7	0	Bailout package is silent on infrastructural development
Macroeconomic stability	66	+ & -	Positive impact on the stability of the financial sector Negative impact on the government deficit; inflation; interest rate spread and government debt
Health and primary education	34	0	Bailout package is silent on health and primary education
Higher education and training	5	0	Bailout package is silent on higher education and training
Goods market efficiency	8	-	Negative impact on local competition; market dominance by large institutions; anti-monopoly policies; foreign portfolio and direct investments
Labour market efficiency	1	0	Bailout package is silent on labour market efficiency
Financial market sophistication	9	-	Negative impact on the level of sophistication; soundness of banks, and restriction on capital flows
Technological readiness	11	0	Bailout package is silent on technological readiness
Market size	1	0	Bailout package is silent on market size
Business sophistication	4	-	Negative impact on cluster development; competitive advantage and value chain breadth (not being extended)
Innovation	1	-	Negative impact on capacity for innovation; research and development

+: positive; -: negative; 0: neutral

negative consequences, varying from severe deflation (given the large loss of jobs), decreased real values of property, depressed equity values and/or inflation resulting from flooding of the monetary system.

Results of input–output analyses

Having completed an analysis of the impact of the United States bailout package on various aspects pertaining to the competitiveness of the US economy, an analysis was conducted of the direct, indirect and induced impacts of the bailout package using input-output analysis methodology.

Tables 4 and 5 show the direct, indirect and induced impacts of the government injection over the short term. For these tables, each of the different sectors was ‘shocked’ with a government capital injection equivalent to \$700 billion. The resulting impact (quadrant description) in dollar terms (billions of dollars) can be seen in Table 4, while the associated economic multipliers derived from Table 4 are shown in Table 5.

Table 4: Direct, indirect and induced impacts resulting from a \$700 billion injection by sector (\$ billion)

Sector	Total intermediate inputs	Compensation of employees	Taxes on production and imports, less subsidies	Gross operating surplus	Total value added	Total industry output
Agriculture	8 606	1 175	41	1 035	2 250	10 856
Utilities	2 472	659	73	348	1 080	3 552
Construction	944	96	13	88	197	1 141
Manufacturing	3 123	711	52	329	1 092	4 215
Wholesale	1 788	339	42	164	544	2 333
Retail	838	49	4	26	79	917
Transport and warehousing	2 998	864	128	418	1 409	4 408
Information	2 027	573	55	329	956	2 983
Finance	1 822	419	79	446	944	2 767
Professional and business services	7 436	2 908	320	1 526	4 754	12 190
Education	745	29	1	6	36	781
Arts and culture	1 162	215	21	117	354	1 516
Non-governmental organisations (NGOs)	1 289	263	27	147	437	1 727

Table 5: Multipliers obtained by means of input–output modelling

Sector	Total intermediate inputs	Compensation of employees	Taxes on production and imports, less subsidies	Gross operating surplus	Total value added	Total industry output
Agriculture	12.295	1.678	0.058	1.478	3.214	15.509
Utilities	3.531	0.942	0.104	0.497	1.543	5.075
Construction	1.348	0.137	0.019	0.126	0.281	1.630
Manufacturing	4.461	1.016	0.074	0.470	1.560	6.022
Wholesale	2.555	0.484	0.060	0.234	0.778	3.333
Retail	1.198	0.070	0.006	0.037	0.113	1.310
Transport and warehousing	4.283	1.234	0.182	0.597	2.013	6.296
Information	2.895	0.818	0.078	0.470	1.366	4.262
Finance	2.603	0.598	0.113	0.637	1.349	3.952
Professional and business services	10.623	4.154	0.457	2.180	6.791	17.414
Education	1.065	0.041	0.001	0.009	0.051	1.116
Arts and culture	1.660	0.307	0.031	0.168	0.506	2.166
Non-governmental organisations (NGOs)	1.842	0.375	0.039	0.211	0.625	2.467

For example, if the agricultural sector had an injection of \$700 billion, based on the US I-O table for 2002 (basic values, imports shown separately), the resulting total intermediate inputs would increase by about \$8 606 billion, while the compensation of employees would increase by about \$1 175 billion; net taxes on production and imports by \$41 billion; gross operating surplus by \$1 035 billion; total value added to the economy by \$2 250 billion, resulting in the total industry output being boosted by \$10 856 billion. This could, for example, be compared to the financial sector, which showed total intermediate input increasing by \$1 822 billion, and total industry output by \$2 767 billion. It is evident from this example that the \$700 billion injection into the agricultural sector gave rise to almost four times higher total industry output growth than was the case when the financial sector was subjected to a \$700 billion injection. Table 5 shows the multiplier effects of the injection on the different sectors.

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For example, by government injecting \$700 billion into the financial sector, the multiplier effect of such an injection would be 2.6 with respect to total intermediate inputs, 0.6 to compensation of employees and 3.9 to total industry output. This is far lower when compared to the professional and business services sector, where a similar injection resulted in a total intermediate input multiplier of 10.6, an employee compensation multiplier of 4.1, and a total industry output multiplier of 17.4.

It should be noted that Tables 4 and 5 refer to direct injections of \$700 billion per sector in individual economic/I-O analyses. However, government may wish to spread the injection across the economy. Table 6 shows the economic impact brought about by an optimal injection mix obtained by conducting a variety of input-output simulations using different injection mixes.

Table 6: Optimal injection mix determined by means of input-output modelling

Economic impact variable	\$ billion	Multiplier
Total intermediate inputs	4 581	6.54
Compensation of employees	1 280	1.83
Taxes on production and imports, less subsidies	139	0.20
Gross operating surplus	822	1.17
Total value added	2 240	3.20
Total industry output	6 822	9.75

It appears from Table 5 that by injecting the \$700 billion into the financial sector, a relatively low multiplier pay-off is realised, compared to other sectors. The said multiplier for the financial sector was the seventh highest (of 13 sectors). Also, with respect to employee compensation, the financial sector multiplier was 0.6 (it also was the seventh highest of 13 sectors). Similarly, the total industry output multiplier for the financial sector was the seventh highest. It should be noted from Table 5 that the professional and business sector realised the highest multipliers for all the economic variables used as outcome variables. Although at first glance it would appear to be the optimal solution to spend the full \$700 billion to boost the professional and business sector from a purely economic perspective, this may not necessarily address other sectoral challenges, particularly in the light of the financial and manufacturing sectors playing a crucial role as transmission mechanisms in the economy. This leads us to the logical conclusion that, firstly, while injecting the full \$700 billion into the financial sector could possibly save some inefficient institutions, it would result in comparatively low economic pay-offs. Secondly, the optimal solution would be to distribute the \$700 billion injection in such a way that the more vital and efficient

institutions in the financial and manufacturing sectors are saved, while having optimal economic pay-offs. The ultimate solution would be to ensure the survival of such institutions while enhancing economic efficiencies and productivity, ensuring optimal economic pay-offs in terms of economic and compensation growth together with the realisation of economic benefits over the long-term.

If the economy had only two sectors, the production possibility curve could be used to ensure maximum gains. Therefore, if only the two highest (multiplier) sectors (namely, agriculture and professional services) were taken into account, both could be maximised, or all energies could be concentrated on either one. However, the production possibility approach is limited to two sectors. It therefore becomes necessary to consider alternatives to a multisectoral approach, with the idea of ensuring a distribution that assists all sectors (or as many as possible). When contemplating the number of sectors to include in a multisectoral solution, cognisance must be taken of optimal multiplier effects as well as the need to save struggling sectors. Fortunately (or unfortunately), the sectors that need to be supported in the current US I-O are not those directly affected by the financial crisis. In relation to this study, it is clear which sectors produce the highest multipliers (agricultural, and professional and business services sectors) and which sectors need to be secured (financial and manufacturing sectors).

Therefore an analysis was done regarding the economic impact/s of spreading the \$700 billion injection across these four sectors, specifically by injecting \$100 billion into the agricultural sector, \$100 billion into the manufacturing sector, \$300 billion into the financial sector and \$200 billion into the professional and business services sector. The results obtained from such analyses are reflected in Table 6.

Long-term economic impact of bailout package

When focusing on the long-term impact of the bailout package, the big question is whether the bailout package over the long-term will be positive or negative for the financial sector (being 'bailed-out') and the United States economy as a whole. To determine this, a comparative analysis was conducted regarding the long-term positive and negative impacts resulting from such a bailout package. The results are shown in Table 7.

Overview and concluding remarks

First impressions of the bailout package are misleading. When looking at the package from a political and politico-economic perspective, it appears to be an absolute necessity as a mechanism to 'save the financial sector' and to 'save the economy'.

Economic impact of the Troubled Assets Relief Programme in the USA

Table 7: Long-term positive and negative impacts resulting from the bailout package

Aspect	Positive impact	Negative impact
\$700 billion injection	Stabilising the financial sector	Increasing fiscal deficit and government debt
Focusing total bailout package on financial sector	Focused approach to dealing with toxic assets and ensuring financial institution survival	Low general economic stimulus value
Bailing out struggling financial institutions	Ensuring continuity in the financial sector	Skewing competitiveness in the financial sector
Buying up toxic assets	Taking over assets impacting negatively on financial stability that could be sold later when the crisis is over	Good money being used to buy out toxic assets, the value of which will probably only increase marginally
Using taxpayer money to effect the bailout	Government as custodian of the fiscus demonstrating its commitment to financial sector stability	Such money could have been spent more optimally to the benefit of taxpayers as shown in Tables 4 and 5, and effected by means of TARP2
Government intervening in the economy	Government acting as a stabilising agent in the economy	Government actions distorting market dynamics, which over the long term gives rise to lower levels of economic growth and development

However, when analysing this package from an econometric perspective, as was done in this article, it appears that the package generally is not facilitative towards higher levels of competitiveness, increasing output, employment and incomes nor to ensuring long-term financial stability, economic growth and development. It can further be concluded from the three sets of results presented in this article that TARP did not represent an optimal allocation of bailout funds to ensure the stabilisation of the financial sector specifically and the broader US economy in general.

Endnotes

- 1 The TARP was implemented to mitigate the economic impact of the credit crisis. The US government introduced two TARP programmes. The aim of TARP1 was to bail out affected financial institutions by ‘buying out’ their ‘toxic’ mortgaged assets with the aim of preventing such institutions from failing. TARP2 was introduced as a financial stimulus package to ‘kick start’ growth in various sectors of the US economy.

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