

# **Economic impacts of reforming the Financial Claims Scheme**

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# Executive summary

## Introduction

The Financial Claims Scheme (FCS) was introduced as part of the Government's response to the Global Financial Crisis (GFC). Like other bank deposit insurance schemes around the world, its primary aim is to reduce the risk of severe runs on banks by providing a guarantee that the insured deposits are safe. This is important because severe bank runs can lead to bank failures that generate high economic costs.

At the same time, there are three aspects of the FCS that may be leading to higher than necessary costs in achieving the desired benefits.

- 1) First, the FCS does not impose an ex ante premium on ADIs for the insurance cover that is provided. "Free" insurance cover with ADIs can distort the choice of consumers in favour of investing in ADI versus non-ADI financial institutions.
- 2) Second, by lowering the costs of bank failure, the FCS may lead to more risky bank lending. Some jurisdictions address this "moral hazard" problem by applying risk-rated insurance premiums that penalise excessively risky lending with higher premiums.
- 3) Third, FCS insurance coverage is broader than in most major countries with deposit insurance, apart from the USA. The insured value is unusually high and is applied for each bank used by an account holder. This wide coverage adds to FCS costs.

Against this background, the IMF (2012) has recommended that Australia introduces insurance premiums and makes them risk rated. Currently, the Financial System Inquiry (FSI) is assessing the FCS as part of a wider examination of the financial system. In its Interim Report of July 2014, the FSI invited views on the costs and benefits of lowering the insured threshold or introducing an ex ante fee (Financial System Inquiry, 2014, p. 3-18).

This report, which was commissioned by Challenger Limited (Challenger), responds to the Inquiry's invitation with economic modelling of the costs and benefits of lowering the insured threshold and introducing an ex ante fee. It also models abolishing the FCS to test whether the costs of the scheme in its current form are covered by its benefits.

## Review of the FCS

In assessing potential reforms to the FCS, the potential benefits and costs of the FCS and alternative policies need to be weighed up. These are now discussed.

### Bank runs and insurance

Bank runs are costly. When enough depositors believe that a bank is no longer safe and attempt to withdraw their money, a bank will fail because most of its assets are illiquid. Thus, the bank failure becomes a self-fulfilling prophecy. The banking system is disrupted in playing its main roles of acting as intermediaries between borrowers and lenders and generating liquidity for depositors.

Bank runs also create inequities. Depositors who withdraw their funds early enough may not incur any loss, whereas other depositors may lose some or all of their money once the bank fails.

Bank deposit insurance means that insured depositors can receive all of their money back when a bank fails. If insurance makes depositors believe that their money is safe, they are less likely to join a run so the risk of bank failure is reduced. Thus, bank deposit insurance may increase the productivity of banking services both by making bank failures less likely and, when they do occur, less disruptive.

### Allocative Inefficiency

Under the FCS, the availability of “free” insurance from ADIs can distort the choice of consumers in favour of investing with ADI rather than non-ADI financial institutions. This non-level playing field may lead to allocative inefficiency, with the ADI sector oversized and the rest of the financial sector undersized. This is consistent with the shift to insured deposits that was observed during the GFC.

This distortion could be partly addressed by following many other countries with deposit insurance by applying an ex ante premium on the insured deposits of ADIs, in line with the principle of user pays. This also means a pool of funding would be accumulated to help fund future insurance payouts. Overseas experience, particularly during the GFC, shows that such funding pools may be emptied at times of financial crisis and governments then generally step

in with backup funding. Thus, in practice the introduction of premiums usually reduces rather than eliminates government support of bank deposit insurance. This will also be true for the associated allocative inefficiency from favouring bank over non-bank financial institutions.

### Moral Hazard

Insurance can create a “moral hazard” problem: by reducing the costs of risky behaviour, insurance may increase its prevalence. Because they are protected from bank failure, insured depositors choosing a bank may be less focussed on whether a bank lends prudently than uninsured depositors. This relaxation of market discipline from depositors may lead to excessively risky lending, making bank failure more likely. Thus, Barth et al. (2013) conclude that: “while instilling confidence in depositors that their funds are always safe, so as to prevent bank runs, deposit insurance simultaneously increases the likelihood of another serious banking problem in the form of moral hazard”.

Of course prudential regulation and supervision do aim to safeguard against excessively risky lending by banks. However, this task becomes more challenging when moral hazard from bank deposit insurance is introduced.

As Barth et al. (2013) observe: “it is important for government to realise when designing a scheme, one must take into account the effect the various features will have on both depositor confidence and moral hazard”. The existing design features of the FCS show more of a focus on depositor confidence than moral hazard. This is understandable in that the FCS was introduced in response to a potential crisis in depositor confidence from the GFC. However, the FSI provides an opportunity to review the FCS and make it a more balanced scheme.

Other countries, including the USA since 1993 (Ellis, 2013), and Canada (CDIC, 2014), apply risk-based insurance premiums calibrated to the level of risk of each bank. “The advantage of risk-based premiums is that they potentially can be used to induce banks to avoid engaging in excessively risky activities” (Barth et al., 2013).

Hence, one FCS reform option modelled is to introduce ex ante premiums, and make those premiums risk-rated. The former would partly address the competitive neutrality problem, while the later would address the moral hazard problem.

At the same time, premiums introduce a new cost. They are used to accumulate a pool of funds to finance future payouts to depositors of failed banks. These quarantined pools of funds that might otherwise be invested have an opportunity cost.

## Coverage

Another way to reduce moral hazard would be to reduce the coverage of the FCS. The scope of the FCS in its present form is broader than for bank deposit insurance schemes in most other major jurisdictions, apart from the USA, which has similar scheme coverage. This broad scope has three dimensions.

First, the insured value is capped at \$250,000, whereas it is capped at the equivalent of around AUD 100,000 in most other high-income countries with deposit insurance (Demirgüç-Kunt, Kane and Laeven, 2014). As Barth et al. (2013) note: “the higher the limit the more protection is offered to individual depositors, but the higher the limit the greater the moral hazard”.

Second, the insured cap under the FCS is provided for each bank used by an account holder. This provides an incentive for account holders to open accounts at more banks to obtain more insurance cover. The cost of opening additional accounts in response to regulation represents a deadweight loss to the economy (Shy, Stenbacka and Yankov, 2014).

Third, the FCS has no coinsurance. Countries with coinsurance require that depositors bear up to 10 per cent of losses. Barth et al. (2013) find that in practice this relatively small percentage of coinsurance is enough to “help to curb moral hazard”.

Reducing the broad coverage of the FCS in any or all of the above three areas would help to improve the focus of the scheme on containing moral hazard for bank lending. In this report, one FCS reform option modelled is to reduce the insured cap from \$250,000 to either \$100,000 or \$50,000, while removing the incentive for account splitting by aggregating over accounts at different ADIs before applying the cap.

Reducing coverage, and the associated government backing of bank deposits, also reduces the allocative inefficiency problem. It reduces the extent of the favouritism from government backing of bank deposits when there is no similar government backing of household investments with non-bank financial institutions.

## The Independent Extended CGE model and the FCS

This report simulates the economic impacts of various FCS reform options using the Independent Computable General Equilibrium (CGE) model, which was extended for this report. The three broad finance industries found in Australian CGE models were disaggregated to 12 industries, so that ADIs are identified as a separate industry. Further, the structure of modelling consumer choices was enriched to take into account that ADI financial services are more closely substitutable for non-ADI financial services than for other goods and services.

The above extensions to the usual CGE modelling approach are fundamental if a CGE model is to provide useful insights into the economic impacts of FCS policy options. Even so, the results provide a broad (rather than a more precise) guide, because of the complexities and uncertainties in the impacts of FCS policy options.

The model results refer to the long-term, after the economy has fully adjusted to economic shocks. This is fitting for policy analysis because economic policies should be judged against their lasting effects on the economy, not just their effects in the first one or two years.

## The FCS Scenarios

The model was used to simulate seven policy scenarios. The design of each of these scenarios is summarised in Table A. Some of these scenarios focus on the areas in which the Interim Report of the FSI invited submissions on the costs and benefits of incremental change. Other scenarios are designed to assess the costs and benefits of each policy scenario.

The *baseline scenario* refers to the existing policy of the FCS in its current form. It provides the point of comparison for the other scenarios.

### Lowering the insured amount

The next two scenarios lower the insured amount. The *\$100k scenario* reduces the coverage limit from \$250k to \$100k and applies it to each account holder once, after aggregating holding across ADIs. The *\$50k scenario* reduces the coverage limit by more, from \$250k to \$50k, and also applies it to each account holder once. These coverage reductions reduce, but do not eliminate, the moral hazard and allocative inefficiency costs of the FCS.

Table A Design of Policy Scenarios

Features	FCS (baseline)	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
coverage limit	\$250k	\$100k	\$50k	\$250k	\$50k	na	na
separate limit per ADI	yes	no	no	yes	yes	na	na
premium	no	no	no	yes, risk- based	yes, risk- based	no	no
severe bank runs	no	no	no	no	no	yes	no
moral hazard	yes	reduced	further reduced	no	no	no	no
allocative inefficiency	yes	reduced	further reduced	further reduced	largest reduction	no	no
insurance pool cost	no	no	no	yes	no	no	no

### Introducing insurance premiums

The *apply premium* scenario introduces an ex ante premium and calibrates it to the risk of each bank. This is in keeping with a recent IMF (2012) recommendation for the FCS.

The authorities should re-evaluate the merits of ex-ante funding for the FCS with a view toward converting it to an ex-ante funded scheme... with an objective to implement risk-based assessments over time. (IMF, 2012).

In the modelling, risk-rated premiums remove the moral hazard cost and reduce the allocative inefficiency cost of the FCS, while introducing a new cost of maintaining a funding pool.

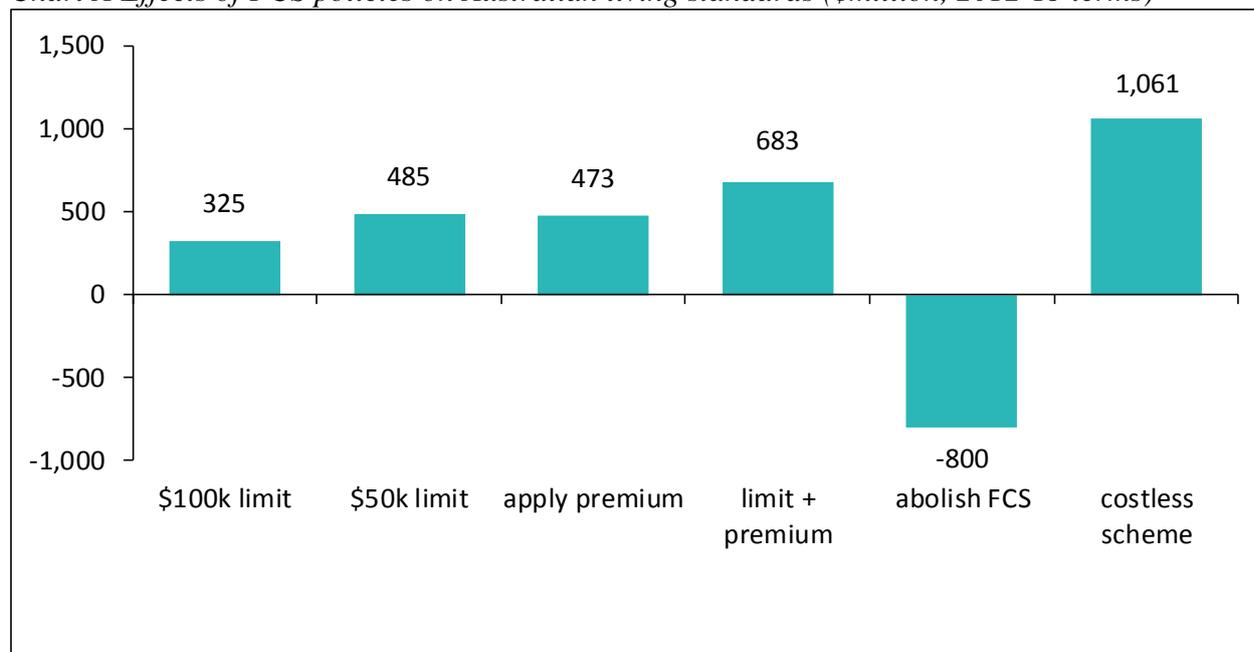
The *limit + premium* scenario combines the two ideas for improving the FCS i.e. it combines reducing the coverage limit from \$250k to \$50k with introducing risk-rated premiums.

### Abolishing the FCS

The *abolish FCS* scenario simulates the abolition of the FCS. Its costs disappear, but so does its benefit of eliminating severe bank runs. The *costless scheme* scenario makes the hypothetical assumption that an ideal scheme could be devised that prevented severe bank runs while incurring no costs. It is designed to identify the costs of the FCS.

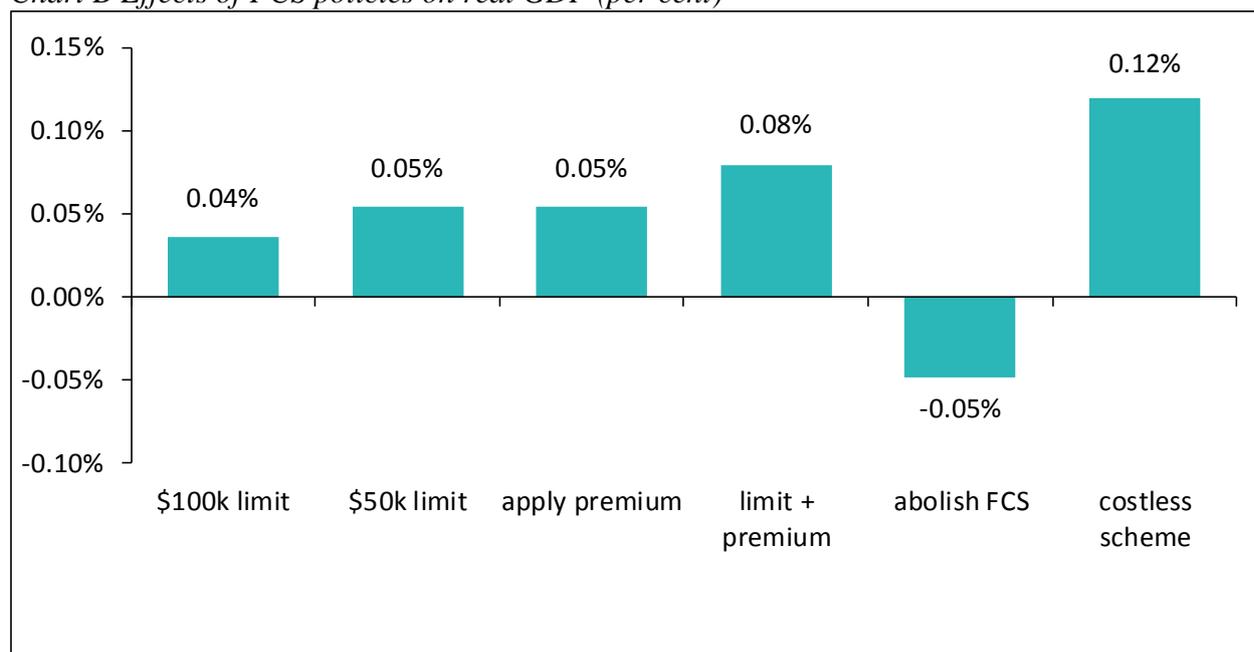
The comparative results from the scenarios are presented in Charts A to D. These results refer to long-run outcomes, after the economy has fully adjusted to each policy change. The results are expressed as deviations from the baseline scenario, which includes the FCS in its present form. Hence, they show the incremental economic impacts of alternative reforms to the FCS.

Chart A Effects of FCS policies on Australian living standards (\$million, 2012-13 terms)



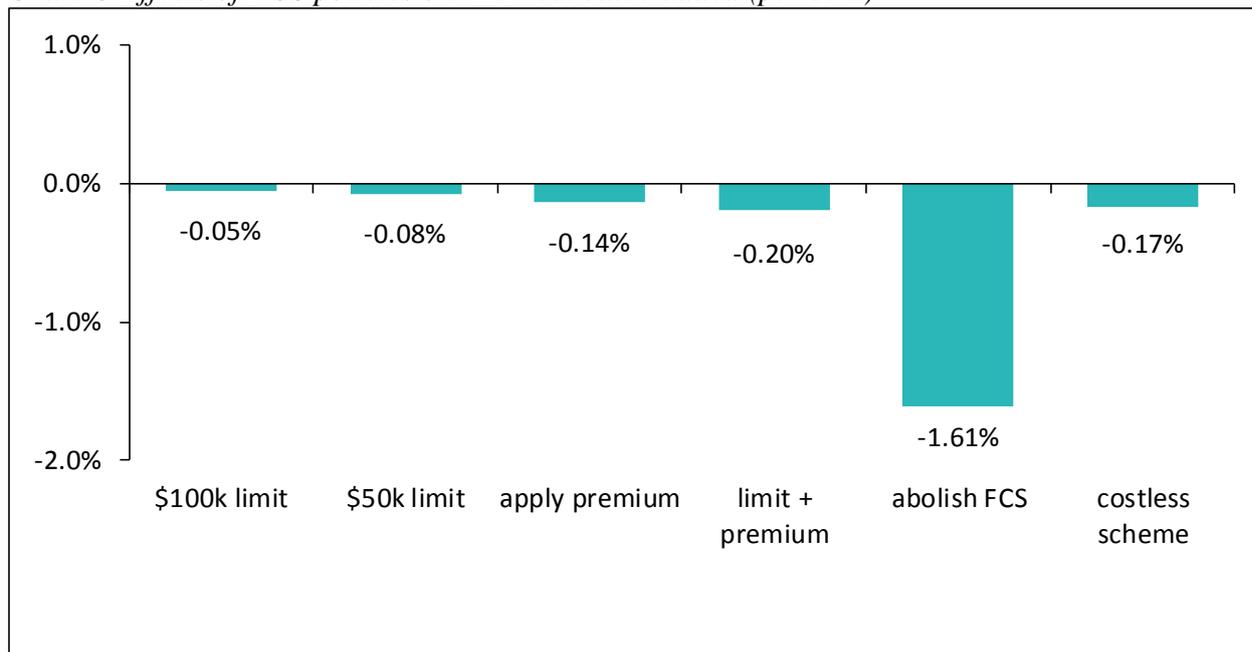
Source: Independent Extended CGE model

Chart B Effects of FCS policies on real GDP (per cent)



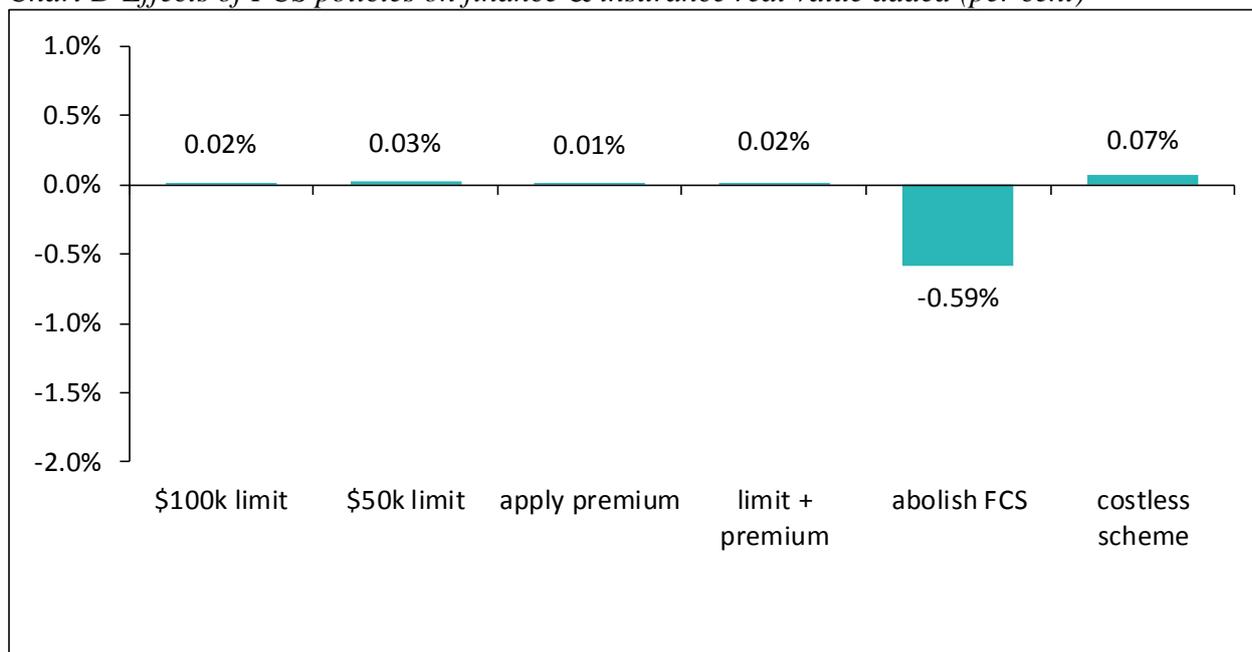
Source: Independent Extended CGE model

*Chart C Effects of FCS policies on ADI real value added (per cent)*



Source: Independent Extended CGE model

*Chart D Effects of FCS policies on finance & insurance real value added (per cent)*



Source: Independent Extended CGE model

## Lowering the insured amount

Reforming the FCS by lowering the insured threshold and closing the account splitting loophole lowers the moral hazard and allocative inefficiency costs of the FCS. This generates a sustained gain in consumer living standards on an annual basis of \$325 million under a reduction in the threshold to \$100k, or \$485 million under a larger reduction in the threshold to \$50k (Chart A). Similarly, reducing the insured threshold provides an ongoing boost to the level of GDP. This boost is 0.04 per cent or 0.05 per cent, depending on the extent of the reduction in the threshold (Chart B).

In both scenarios, activity in the ADI sector itself, as measured by real value added, is slightly lower (Chart C). This is the net result of significant effects operating in both directions. On the one hand it gains a boost in productivity from the reduction in moral hazard and the associated excessively risky lending. On the other hand, it loses because reduced coverage of the FCS means that ADIs have less free cover to provide to consumers, prompting a small shift in consumer demand away from ADIs. However, this development reflects a partial unwinding of the allocative inefficiency from free deposit insurance, and so is a positive development for living standards and the economy as a whole.

For example, the shift in consumer demand away from ADIs benefits non-ADI financial institutions. This contributes to slightly higher real value added for the financial sector as a whole (Chart D).

## Introducing insurance premiums

Reforming the FCS by introducing insurance premiums and making them risk-rated removes the moral hazard problem, while developing an insurance pool of funding that has an opportunity cost. The second effect only partly offsets the first, leaving a small gain in productivity for the ADI sector. Introducing premiums also reduces the existing allocative inefficiency resulting from “free” insurance. This combine with the productivity improvement to lead to a significant overall gain in living standards on an annual basis of \$473 million (Chart A). Similarly, there is a significant gain in GDP of 0.05 per cent (Chart B).

Real value added in the ADI sector is down 0.14 per cent (Chart C). This is because the benefit to the ADI sector of its productivity gain is more than offset by the cost to it of partly restoring

a level playing field by requiring ADIs to pay for their deposit insurance. This development causes a shift in consumers from ADI to non-ADI financial institutions. The gain for non-ADIs is sufficient to maintain activity in the finance sector as a whole (Chart D).

The estimated gains in living standards and GDP are very similar for introducing risk-rated premiums or lowering the insured limit to \$50k. These two policies are combined in the *limit + premium* scenario.

As would be expected, this shows a larger gain in annual living standards of \$683 million. The gains from the two policies are not fully additive ( $\$485m + \$473m < \$683m$ ) because there is some overlap in the sources of the gains from the two reforms. Similarly, the gain in GDP is boosted to 0.08 per cent, compared to 0.05 per cent from either policy in isolation.

## Abolishing the FCS

Abolishing the FCS removes both its benefits and costs. Losing the benefit of eliminating severe bank runs is only partly offset by the savings from eliminating the moral hazard and the allocative inefficiency costs of the FCS. Hence, abolishing the FCS results in a significant loss in living standards on an annual basis of \$800 million (Chart A). Similarly, there is a significant loss in GDP of 0.05 per cent (Chart B). Thus, the results suggest that the FCS should be retained rather than abolished.

Abolishing the FCS would have a substantial negative impact on the ADI sector. There is a loss in its real value added of 1.61 per cent (Chart C). This is the effect, averaged over time, of removing bank insurance. It reflects the disruptions to banking services resulting from severe runs, which are rare in Australia but potentially highly damaging when they do occur. It is also reflected in a loss in real value added for the finance sector as a whole of 0.59 per cent (Chart D).

The final scenario models a hypothetical costless solution to the problem of the risk of bank failures. Removing the costs of the FCS while retaining its benefit of eliminating severe bank runs results in a significant gain in living standards on an annual basis of \$1,061 million (Chart A). This can be interpreted as the potential economic “prize” from reforming the FCS.

Comparing the living standards results from the final two scenarios also provides a breakdown of the costs and benefits of the FCS on an annual basis. They imply that it provides a benefit of \$1,861 million and a cost of \$1,061 million, giving a net benefit of \$800 million.

Overall, the scenarios indicate that the FCS should not be abolished, but it should be reformed. Very similar gains are available from either reducing the coverage to be in line with international practice, or from introducing risk-based premiums. However, the largest gains are available from introducing both policy reforms.

# 1 Introduction

The Financial Claims Scheme (FCS) was introduced as part of the Government's response to the Global Financial Crisis (GFC). In its present form, it provides a government guarantee of retail deposits held at Authorised Deposit-taking Institutions (ADIs) up to the value of \$250,000 per account holder per ADI. Like other bank deposit insurance schemes around the world, it has two main aims. Its primary aim is to reduce the risk of severe runs on banks by providing a guarantee that the insured deposits are safe. This is important because severe bank runs can lead to bank failures that generate high economic costs. Second, it aims to protect smaller, less-informed depositors from the risk of losses that they did not understand when making deposits into their bank accounts.

At the same time, the FCS has three features likely to lead to two economic costs.

First, the FCS does not impose an ex ante premium on ADIs for the insurance cover that is provided. In that sense, the cover is “free” to ADIs. Free insurance for ADIs, backed by the government, can distort the choice of consumers between investing in ADI versus non-ADI financial institutions. The IMF (2012) has recommended that Australia partly address this distortion by introducing an ex ante premium on the insured deposits of ADIs, in line with the principle of user pays.

Second, the FCS reduces the normal market pressure from potential depositors for banks to be prudent in their lending. If depositors are protected from bank failure by deposit insurance, they are likely to be less concerned about the prudence of lending policies when choosing a bank. This “moral hazard” problem may lead to excessively risky lending by banks, adding to the risk of bank failures. This problem could be addressed by following the USA, Canada, and the IMF recommendation to Australia, by calibrating insurance premiums to the risk of each bank. Excessively risky lending would then be discouraged by the prospect of a higher insurance premium.

The scope of the insurance cover provided by the FCS is broader than in most other jurisdictions, apart from the USA. The insured value is capped at \$250,000, whereas it is capped at around \$100,000 in most other countries with deposit insurance. Further, the insured

cap is provided for each bank used by an account holder. This wide coverage may exacerbate the costs of the scheme.

The Financial System Inquiry (FSI) is currently assessing the FCS as part of a wider examination of how the financial system could be positioned to best meet Australia's evolving needs and support Australia's economic growth. In its Interim Report of July 2014, the FSI states that the Inquiry would value views on the costs and benefits of the following policy options for the FCS: "Modify the FCS, possibly including simplification, lowering the insured threshold or introducing an ex ante fee" (Financial System Inquiry, 2014, p. 3-18).

This report, which was commissioned by Challenger Limited (Challenger), responds to the Inquiry's invitation. Specifically, it uses economic modelling to estimate the costs and benefits to Australia of:

- a) lowering the insured threshold, and applying it per account holder, rather than per account holder per ADI;
- b) introducing an ex ante fee: this applies the user pays principle by charging ADIs a risk-calibrated premium for the insurance cover provided by the FCS; and
- c) abolishing the FCS: this is to test whether the costs of the FCS in its present form are covered by its benefits.

The economic impacts of these policy options are assessed using the Independent Computable General Equilibrium (CGE) model. For this purpose, the Independent CGE model has been extended so that it distinguishes the ADIs as a separate sector, further disaggregates the remainder of the financial sector and takes fuller account of the potential for substitution by consumers between the services provided by ADIs and the other subsectors of the finance industry. These extensions, which are not found in other CGE models of Australia, are fundamental if a CGE model is to provide useful insights into the economic impacts of FCS policy options.

The early sections of this report describe its economic approach. Section two reviews the costs benefits and costs of the FCS against the background of the reform options identified by the FSI Interim Report. Section three provides an overview of the model used to simulate the policy scenarios, the Extended Independent CGE model. It describes the model extensions for

this report, the general features of the model, and the model's limitations in analysing reforms to the FCS. Section four sets out the specification of each scenario and its assumptions. These scenarios aim to respond to the invitation in the Interim Report of the FSI for analysis of fees and thresholds.

The remaining sections of the report present the simulated economic impacts of each scenario. Section five models lowering the insured threshold, through both reducing the insured amount and applying it per account holder. Section six models introducing ADI premiums on a user pays basis in isolation as well as in conjunction with lowering the insured threshold. Section seven models abolition of the FCS.

Two Appendices are included to provide more detailed information. Appendix A provides further information on the Independent Extended CGE model, while Appendix B provides estimates of the economic impacts at a finer level of detail.

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of Challenger and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this report or information contained within it for another purpose, please contact us.

The specific purpose of this report is to provide Challenger with estimates of the economic impacts of policy options to reform the Financial Claims Scheme.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be taken whenever using this information. This report only takes into account information available to Independent Economics up to the date of this report and so its findings may be affected by new information. The information in this report does not represent advice, whether express or inferred, as to the performance of any investment. Should you require clarification of any material, please contact us.

## 2 Review of the FCS

The Financial Claims Scheme (FCS) was introduced as part of the Government's response to the Global Financial Crisis (GFC). In its present form, it provides a government guarantee of retail deposits held at Authorised Deposit-taking Institutions (ADIs) up to the value of \$250,000 per account holder per ADI. Like other bank deposit insurance schemes around the world, it has two main aims. "The primary purpose of a deposit insurance scheme is to minimise, if not entirely eliminate, the likelihood of bank runs" (Barth, Lee and Phumiwasana, 2013). It does this by providing a guarantee that the insured deposits are safe. "A secondary purpose is to protect small depositors from losses" (Barth et al, 2013). Small depositors may be less able to withstand losses and may be less likely to understand the risk of losses when making deposits.

In assessing potential reforms to the FCS, the potential benefits and costs of the FCS and alternative policies need to be weighed up. These are now discussed.

### 2.1 Bank runs and insurance

Bank runs are costly. When enough depositors believe that a bank is no longer safe and attempt to withdraw their money, a bank will fail because most of its assets are illiquid. Thus, the bank failure becomes a self-fulfilling prophecy. A bank may attempt to avoid failing by suspending convertibility of deposits into cash or trying to call in loans. In each case, the bank run will disrupt banks in playing either or both of their main roles of acting as intermediaries between borrowers and lenders and generating liquidity for depositors. Consequently, the banking system loses productivity and there may be general economic disruption.

Bank runs also create inequities. Depositors who withdraw their funds early enough may not incur any loss, whereas other depositors may lose some or all of their money once the bank fails.

Bank deposit insurance, of which the FCS is an example, means that insured depositors can receive all of their money back when a bank fails. This reduces the disruption to banking services and addresses the inequities from bank failures. Diamond and Dyvbig (1983) pointed out that bank deposit insurance can make bank runs less likely. If insurance makes depositors believe that their money is safe, they are less likely to join a run so the risk of bank failure is

reduced. Thus, bank deposit insurance may increase the productivity of banking services both by making bank failures less likely and, when they do occur, less disruptive.

This *productivity benefit from insurance* is factored into the modelling. This appears reasonable as the FCS, alongside other policies, did appear to play a role in stabilising the Australian banking system during the GFC.

## 2.2 Allocative Inefficiency

While the FCS is likely to have a productivity benefit for banking services, it also has costs. One of these costs arises because the FCS does not impose an ex ante premium on ADIs for the insurance cover that is provided. In that sense, the insurance is “free”. In the event of a bank failure, surviving ADIs may be levied to provide ex poste funding of the scheme, but it is unclear whether this would occur in practice.

The availability of “free” insurance from ADIs can distort the choice of consumers between investing in ADI versus non-ADI financial institutions in favour of ADIs. This non-level playing field may lead to allocative inefficiency, with the ADI sector oversized and the rest of the financial sector undersized.

This is consistent with the shift to insured deposits that was observed during the GFC. In particular, the Australian Centre for Financial Studies (2013) presents strong, detailed evidence that the FCS has caused allocative inefficiency by inducing households to shift funds from non-ADIs, such as finance companies and cash management trusts, to ADIs.

The modelling allows for this *allocative inefficiency from free insurance*.

This distortion could be partly addressed by following most other countries with deposit insurance schemes by introducing an ex ante premium on the insured deposits of ADIs, in line with the principle of user pays. This also means a pool of funding would be accumulated to help fund future insurance payouts. Overseas experience, particularly during the GFC, shows that such funding pools may be emptied at times of financial crisis and governments then generally step in with backup funding. Thus, in practice the introduction of premiums usually reduces rather than eliminates government support of bank deposit insurance. This will also

be true for the associated allocative inefficiency from favouring bank over non-bank financial institutions.

## 2.3 Moral Hazard

Insurance can create a “moral hazard” problem: by reducing the costs of risky behaviour, insurance may increase its prevalence. Because they are protected from bank failure, insured depositors choosing a bank may be less focussed on whether a bank lends prudently than uninsured depositors. This relaxation of market discipline from depositors may lead to excessively risky lending, making bank failure more likely. Thus, while insurance is expected to reduce the risk of bank failures arising from self-fulfilling prophecies of depositors, it may increase the risk of bank failures from risky lending by banks. Thus, Barth et al. (2013) conclude that: “while instilling confidence in depositors that their funds are always safe, so as to prevent bank runs, deposit insurance simultaneously increases the likelihood of another serious banking problem in the form of moral hazard” (Barth et al., 2013).

Thus the productivity benefit from insurance may be partly offset by a *productivity loss from moral hazard*. This is taken into account in the modelling.

Of course prudential regulation and supervision do aim to safeguard against excessively risky lending by banks. However, this task becomes more challenging when moral hazard from bank deposit insurance is introduced. Thus, “there is widespread agreement that regulation and supervision are particularly important to prevent banking problems once countries have established a deposit insurance scheme” (Barth et al., 2013).

The problem of moral hazard from an insurance scheme can also be reduced through careful design of the scheme. As Barth et al. (2013) observe: “it is important for government to realise when designing a scheme, one must take into account the effect the various features will have on both depositor confidence and moral hazard”.

The existing design features of the FCS show more of a focus on depositor confidence than moral hazard. This is understandable in that the FCS was introduced in response to a potential crisis in depositor confidence from the GFC. However, the FSI provides an opportunity to review the FCS and recommend a more balanced scheme.

Moral hazard can be addressed directly if insurers are able to observe risky behaviour and calibrate insurance premiums to the risks being taken. Other countries, including the USA, since 1993 (Ellis, 2013), and Canada (CDIC, 2014), apply insurance premiums and calibrate their level to the level of risk of each bank.

Excessively risky lending may then be discouraged by the prospect of a higher insurance premium. “The advantage of risk-based premiums is that they potentially can be used to induce banks to avoid engaging in excessively risky activities.” (Barth et al., 2013).

As noted above, the FCS does not impose an ex ante premium on ADIs. In the event of a bank failure, surviving ADIs may be levied to provide ex poste funding of the scheme, but it seems unlikely that applying levies to ADIs that acted more prudently and survive a crisis provides an incentive for prudent lending. Therefore, one way of reducing the moral hazard from the FCS would be to introduce ex ante premiums, which would also address the competitive neutrality problem, and make those premiums risk-rated. As discussed below, another way to reduce moral hazard would be to reduce the coverage of the FCS.

## 2.4 Adverse Selection

In most countries it is compulsory for all banks to join the bank deposit insurance scheme, but in some countries it is voluntary. Voluntary membership leads to adverse selection. A voluntary scheme attracts risky/weak banks, who need insurance to attract depositors, but not safe/strong banks who believe they can attract depositors without offering insurance. Barth et al. (2013) note that “the entire scheme may simply become a government bailout for weak banks”.

In Australia, participation in the FCS is compulsory. The Interim Report of the FSI has not called this positive design feature into question and so it is not discussed further in this report.

## 2.5 Insurance Pool Costs

While risk-rated, ex ante insurance premiums offer the prospect of addressing the competitive non-neutrality and moral hazard problems, they also have a cost. They use premiums to accumulate a pool of funds to finance future payouts to depositors of failed banks. For example, the Canadian scheme aims to accumulate a pool valued at the equivalent of 1 per cent

of insured deposits (CDIC, 2014), while the US scheme has a target of 2 per cent (Ellis, 2013) although both pools currently fall short of their targets. These pools have an opportunity cost as they are a potential source of investible funds.

The modelling allows for this *opportunity cost of the insurance pool*. Of course an insurance pool has the advantage of providing a source of funding for future insurance payouts. However, this benefit is difficult to quantify and Diamond (2007) argues that the government, with its taxing power, might in any case be needed to help provide the large-scale funding needed in a major financial crisis.

## 2.6 Coverage

The scope of the FCS in its present form is broader than for bank deposit insurance schemes in most other jurisdictions, apart from the USA, which has similar scheme coverage. This broad scope has three dimensions.

First, the insured value is capped at \$250,000 under the FCS, whereas it is capped at the equivalent of around AUD 100,000 in most other high-income countries with deposit insurance (Demirgüç-Kunt, Kane and Laeven, 2014). As Barth et al. (2013) note: “the higher the limit the more protection is offered to individual depositors, but the higher the limit the greater the moral hazard. Thus, the focus of the FCS on moral hazard could be improved by reducing the existing limit so that it is more in line with other countries.

This improvement could be substantial. Account holders with larger deposits of over \$100,000 may be more focussed on the prudence of a bank’s lending policies than smaller depositors. Therefore limiting the coverage of their insurance may substantially reduce the moral hazard for bank lending that arises from a bank deposit insurance scheme. Thus, Thomson (2001) reaches the conclusion that high coverage limits are unlikely to “enhance the stability and efficiency of the financial system”.

For the same reason, it may be fair to reduce the coverage limit. If account holders with deposits of over \$100,000 are generally aware of the small risk of loss involved with bank deposits, it is more reasonable to expose them to part of that risk by limiting their insurance cover.

Small depositors would continue to be protected with deposit insurance. As Thomson (2001) notes, small depositors may be “rationally ignorant” because the benefits to them of learning about the riskiness of different banks does not justify the cost. If US data is any guide, a very high percentage of depositors have account balances of well below \$100,000 and so would continue to be insured under this lower threshold.

Second, the insured cap under the FCS is provided for each bank used by an account holder. Providing the insured cap at each bank used by an account holder provides an incentive for account holders to open accounts at more banks to obtain more insurance cover. The cost to account holders of opening additional accounts in response to regulation represents a deadweight loss to the economy (Shy, Stenbacka and Yankov, 2014).

In the USA, a financial product has been developed known as “reciprocal brokered deposits” which can automate this process (Li and Shaffer, 2014). For example, four account holders might have originally each had one account of \$1,000,000 at banks A, B, C and D respectively. Only the first \$250,000 of each account would have been covered under the insurance cap. Reciprocal brokered deposits allow the four banks to swap account balances so that the four account holders now each have four accounts of \$250,000, spread across the four banks. Their deposits are now fully insured because all accounts are now within the \$250,000 insured cap, and the total deposit balances of each individual and each bank are unchanged at \$1,000,000. The insurance loophole exposed by this practice is causing concern in the USA.

The deposit-splitting loophole in the FCS could be closed by applying the insurance cap per account holder instead of per account holder per ADI. In the preceding example, this would mean the individuals would each have insurance cover of \$250,000, with the remaining \$750,000 uninsured, irrespective of how much they sub-divided their money between banks. This change would reduce the moral hazard costs of the FCS.

Third, the FCS has no coinsurance. Countries with coinsurance require that depositors bear up to 10 per cent of losses. Barth et al. (2013) find that in practice this relatively small percentage of coinsurance is enough to “help to curb moral hazard”. Introducing coinsurance would be another option for reducing the “moral hazard” from the design of the FCS. However, the Interim Report of the FSI does not specifically canvas coinsurance as a reform so it is not discussed further here.

Reducing the broad coverage of the FCS in any or all of the three areas discussed above would help to improve the focus of the scheme on containing moral hazard for bank lending. In this area, the FCS is currently well below world best practice.

Reductions in coverage would also reduce the allocative inefficiencies arising from the FCS. Large account holders may be better informed and hence more price-sensitive than other account holders. This would mean that a substantial part of the allocative inefficiencies under the FCS can be attributed to them, so reducing the schemes coverage of them may substantially reduce these inefficiencies. This could be done by reducing the insurance limit and/or applying the insurance cap per account holder instead of per account holder per ADI.

## 3 The Independent Extended CGE model and the FCS

This report simulates the economic impacts of various reform options for the FCS using the Independent Extended Computable General Equilibrium (CGE) model. This section provides an overview of the model, while the policy scenarios that are simulated are set out in section 4.

### 3.1 Model Extensions

For this report, the Independent CGE model has been extended to make it more suitable for assessing FCS policy options. This involved developing the level of detail within the financial sector, as well as more comprehensively modelling interactions within the sector.

The original Independent CGE model, like comparable CGE models of Australia, followed the standard ABS input-output tables in distinguishing the three industries within the financial sector that are shown in Table 3.1.

*Table 3.1 Broad Finance Sector Industries*

Code	Broad Industry
6201	Finance
6301	Insurance and Superannuation Funds
6401	Auxiliary Finance and Insurance Services

These broad industries are not suitable for modelling the FCS because it applies to ADIs, which are hidden within industry 6201. The first step of the model extension was to disaggregate the broad finance industries so that ADIs are separately identified, as shown in Table 3.2. ADIs are now identified by industry 6201A, which is banks, building societies and credit unions.

This extended detail makes it feasible to model the FCS and potential FCS reforms by changing inputs to the ADI industry, including its total factor productivity and subsidy rates.

*Table 3.2 Finance Sector Industries with Extended Detail*

Code	Detailed Industry
6201A	Banks, building societies, credit unions
6201B	Other Depository Financial Intermediation
6201C	Non-Depository Financing
6201D	Financial Asset Investing
6301A	Life Insurance
6301B	Health Insurance
6301C	General Insurance
6301D	Superannuation Funds
6301M	Marine insurance provision (Margin)
6401A	Financial Asset Broking Services
6401B	Other Auxiliary Finance and Investment Services
6401C	Auxiliary Insurance Services

In extending the level of detail in the finance industry, the opportunity was taken to extend the level of detail in all industries. As a result, the number of industries has been extended from 114 in the original model to 284 in the extended model.

Having extended the detail within the financial sector, the next issue was to further develop the modelling of consumer choices for financial services to fully capture the scope for consumers to shift between using ADI financial services and non-ADI financial services.

This involved developing the treatment of consumer choices to a 2-tier structure, compared with the 1-tier structure found in the original model and other models. Consumers choose between 19 broad categories of consumption in the top tier, including financial services, and then choose within each broad category, including within financial services. This allows the model to capture the high degree of substitutability between different types of financial services. This is particularly important in estimating the allocative inefficiency cost from providing consumers with “free” bank deposit insurance.

The above extensions are fundamental if a CGE model is to provide useful insights into the economic impacts of FCS policy options.

### 3.2 Model Features

The main features of the Independent Extended Computable General Equilibrium (CGE) model of the Australian economy are described here. These include some general features that are common to many CGE models, as well as some more distinctive features.

The Independent Extended CGE Model makes a number of general assumptions that are common in CGE models with its long-term time horizon.

Because it is a long-term model, its results refer to the ongoing effects on the economy after it has fully adjusted to economic shocks. In keeping with this, all markets are assumed to have reached equilibrium. This includes key markets such as the labour market, where the real wage for each type of labour adjusts so that demand from industries is equal to supply from households.

The behaviour of households and government is consistent with the inter-temporal budget constraints that they face so that the model outcomes are sustainable.

Further, households and firms engage in optimising behaviour. This means that households maximise their utility subject to their budget constraint while a representative firm in each industry maximises profit subject to its production technology.

The long-term time horizon of the model is fitting for policy analysis. Economic policies should be judged against their lasting effects on the economy, not just their effects in the first one or two years.

Some notable features which set the model apart from other models of the Australian economy are as follows.

- As noted above, following the latest model development work, the model now distinguishes 284 industries, compared to 114 industries for comparable models that rely on the standard ABS input-output tables.

- The model’s baseline scenario is designed to represent a normalised version of 2012/13 Australian economy, using the latest information available. It takes as its starting point the 2009/10 ABS Input-Output (IO) tables, which are the latest available.
- The model incorporates refined modelling of production in each industry. This includes nine types of produced capital, three fixed factors to capture economic rents, and 51 different occupations for labour.
- The model provides a valid measure of changes in consumer welfare or living standards based on the equivalent variation, so that policy changes can be correctly evaluated in terms of the public interest.
- The model includes refined modelling of consumer demand based on its new 2-tier approach that was described above. This 2-tier structure takes into account that there may be more scope for households to switch spending within broad categories than between broad categories.
- The model has a highly detailed treatment of business taxation, with a focus on important features of the current Australian system as well as tax designs that have been proposed around the world. This treatment was developed while working with the Australian Treasury to use the model to simulate options for business tax reform for the Business Tax Working Group.

### **3.3 Limitations of the FCS modelling**

Even with the extensions to the model, it captures some economic impacts of bank deposit insurance more robustly than others.

On the one hand, with the extensions to the modelling of consumer choice, the model is well designed to capture the allocative inefficiencies associated with the “free” provision of bank deposit insurance. Similarly, the opportunity cost of a pool of funding quarantined for insurance payouts has also been modelled with a good degree of accuracy.

On the other hand, the modelling of the benefits from avoiding damaging bank runs relies on making a broad judgment about the magnitude of this benefit outside of the model, and then introducing the estimated benefit as a gain in the total factor productivity of the ADI sector. A

similar approach was followed in modelling the costs of moral hazard. The adoption of this broad approach reflects both the complexities and uncertainties involved as well as the inherent limitations in dealing with issues of risk within the framework of a deterministic CGE model.

While it is considered that the judgements that have been made are reasonable, it is clear that the results provide a broad (rather than a precise) guide to the magnitudes of the economic impacts. This should be taken into account when using the results.

Appendix A provides a more detailed overview of the model. More detailed documentation is available at [www.independenteconomics.com.au](http://www.independenteconomics.com.au)

## 4 The FCS scenarios

### 4.1 Introduction

The policy scenarios in this report aim to identify the economic impacts of alternative reforms to the FCS. Some of these scenarios focus on the areas in which the Interim Report of the FSI invited submissions on the costs and benefits of incremental change. Other scenarios are designed to assess the costs and benefits of the FCS as a whole, and of the potential economic “prize” from removing its costs while retaining its benefits.

Six policy scenarios are simulated. The main assumptions of each scenario, which are summarised in Table 2.1, are now discussed in turn.

*Table 2.1 Design of Six Policy Scenarios*

Features	FCS (baseline)	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
coverage limit	\$250k	\$100k	\$50k	\$250k	\$50k	na	na
separate limit per ADI	yes	no	no	yes	yes	na	na
premium	no	no	no	yes, risk- based	yes, risk- based	no	no
severe bank runs	no	no	no	no	no	yes	no
moral hazard	yes	reduced	further reduced	no	no	no	no
allocative inefficiency	yes	reduced	further reduced	further reduced	largest reduction	no	no
insurance pool cost	no	no	no	yes	no	no	no

### 4.2 Baseline Scenario

The *baseline scenario* refers to the existing policy of the FCS in its current form. Thus, the limit of insurance cover is set at \$250,000 per account holder and applies separately for each ADI at which the account holder banks. Banks are not charged a premium for this cover. The FCS is assumed to be effective in preventing bank runs. This is at the cost of exposing bank lending to moral hazard, because depositors know that their deposits are protected by insurance and so do not apply market discipline to banks to avoid overly risky lending. Because the insurance of bank deposits is “free”, it also leads to an allocative inefficiency in which banks

are favoured over non-bank financial institutions. The baseline scenario provides the point of comparison for the other scenarios.

### 4.3 Lowering the insured amount

The *\$100k scenario* takes up the invitation of the Interim Report of the FSI to present views on the costs and benefits of “lowering the insured threshold” (FSI, 2014). It reduces the coverage limit from \$250k to \$100k and applies it to each account holder once, after aggregating holdings across ADIs. While this reduces the coverage of the scheme, the reduced coverage is more in line with international practice and is assumed to be sufficient to continue to prevent bank runs that are severe enough to lead to bank failures. At the same time, the reduced coverage of the scheme reduces the moral hazard and allocative inefficiency costs that are associated with the FCS.

The *\$50k scenario* reduces the coverage limit by more, from \$250k to \$50k and, like the preceding scenario, applies it to each account holder once. This further reduced coverage is assumed to be sufficient to prevent the severe bank runs that lead to bank failures. Compared to the \$100k scenario, the \$50k scenario involves a greater reduction in the coverage of the scheme and therefore a greater reduction in its moral hazard and allocative inefficiency costs.

Reductions in the coverage limit to below \$50k were not analysed. This is because it is considered this would call into question the assumption that the coverage of the scheme is wide enough to be effective in preventing bank failures from severe bank runs.

### 4.4 Introducing insurance premiums

The *apply premium* scenario takes up the invitation of the Interim Report of the FSI to present views on the costs and benefits of “introducing an ex ante fee” (FSI, 2014). The premium is assumed to be calibrated to the risk of each bank.

This policy scenario is in keeping with the IMF (2012) recommendations for the FCS. “This arrangement (of ex poste funding of the FCS) falls short of international best practices that banks should bear the cost of their own failures. The authorities should re-evaluate the merits of ex-ante funding for the FCS with a view toward converting it to an ex-ante funded scheme... with an objective to implement risk-based assessments over time”.

With risk-rated premiums, this scenario is assumed to be effective in eliminating the moral hazard in bank lending that arises under a flat rate or free system of premiums. This is a simplifying assumption in that it is challenging for insurers to accurately risk assess individual banks. However, the FCS is administered by APRA which, as the body responsible for prudential regulation and supervision, is uniquely well placed to risk assess banks. This policy scenario assumes the same insurance coverage as the existing FCS, and so it is assumed to be equally effective in preventing severe bank runs leading to bank failures.

Because the introduction of premiums applies the user pays principle to bank deposit insurance, it partly restores a level playing field between banks and non-bank financial institutions. However, some government favouritism to banks would remain, because government would continue to back the scheme and step in with top up funding if needed. This government backing is not be available to non-ADIs if they were to set up a similar insurance scheme. Thus, premiums are likely to partly, but not fully, eliminate the allocative inefficiency from free insurance under the FCS, because government backing would remain.

In estimating the subsidy to ADIs implied by the FCS, it is assumed that the average premium would be 10 basis points. This is similar to the weighted average of the premium targets set for Canada by the CDIC (2014). It also matches the premium rate used in calculations by the Australian Treasury (2013) for a “small financial stability fund”. It is also assumed that government backing of the scheme has a similar value. That is, it is assumed that, under the FCS, “free” insurance has a value of 10 basis points and government backing of the scheme in a crisis has a further value of 10 basis points. Introduction of a premium eliminates the first subsidy but not the second.

At the same time, the development of an insurance pool of funds also has the opportunity cost of quarantining investible funds. In assessing this cost, it is assumed that the target for the pool is the equivalent of one per cent of insured deposits. Similar to the premium rate assumption, this matches the Canadian target (CDIC, 2014) as well as the target under the “small financial stability fund” outlined by the Australian Treasury (2013).

The *limit + premium* scenario combines the two ideas for improving the FCS i.e. it combines reducing the coverage limit from \$250k to \$50k with introducing risk-rated premiums.

## 4.5 Abolishing the FCS

While the scenarios above examine incremental reforms to the FCS, the remaining scenarios assess the FCS more broadly.

The *abolish FCS* scenario simulates the abolition of the FCS. This is to assess whether its benefits outweigh its costs i.e. it answers the question of whether introducing the FCS was a policy improvement. The benefit of preventing severe bank runs that lead to bank failures is lost. At the same time, its costs of moral hazard and allocative inefficiency are saved.

The *costless scheme* scenario supposes that there is some way of maintaining the benefits of deposit insurance without incurring any of its costs. That is, the benefit of preventing severe bank runs that lead to bank failures is somehow achieved but there are no costs, including no moral hazard, allocative inefficiency or insurance pool costs. Thus, this scenario abolishes the costs, but not the benefits, of the FCS. It is designed to identify the costs of the FCS. Hence, it also shows the potential economic “prize” from reforming the FCS, while acknowledging that the full prize is unlikely to be obtainable.

## 4.6 Comparing scenario outcomes

The results from each scenario are discussed in the following three sections, which are sections 5-7. These results refer to long-run outcomes, after the economy has fully adjusted to each policy change. The results are expressed as deviations from the baseline scenario, which includes the FCS in its present form. They therefore show the incremental economic impacts of alternative reforms to the FCS. Four comparison charts are provided below as Charts 4.1 to 4.4. The results in these charts are explained when each scenario is discussed in the following three sections.

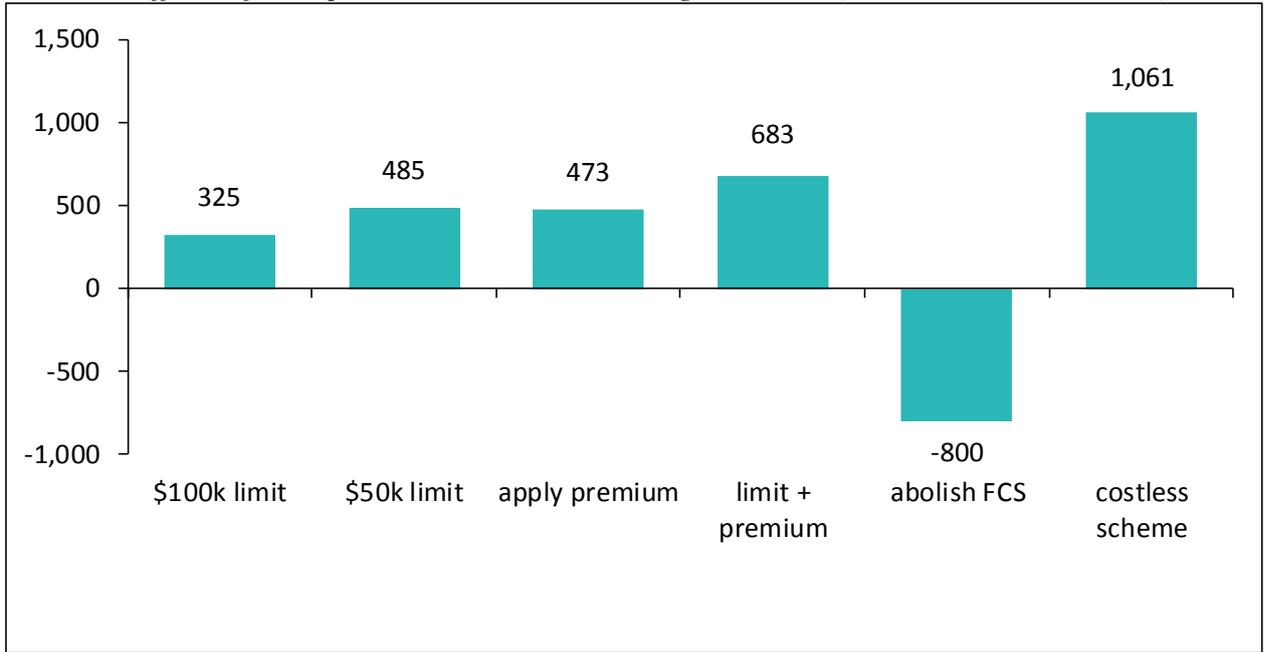
Before considering each scenario separately, the main policy implications can be drawn from Chart 4.1. It shows the impact of each scenario on consumer living standards in 2012/13 terms.

The “abolish FCS” scenario indicates that the FCS should not be abolished, as that would entail a loss in living standards on an annual basis of \$800 million. This indicates that the scheme has a net benefit of \$800 million, so its benefits outweigh its costs. The annual costs of the FCS, including the moral hazard and allocative inefficiency entailed in providing free,

government-backed insurance, are \$1,061 million. This estimate is obtained from the final scenario, which estimates the gain from moving to a hypothetical costless scheme. The gross benefit of the FCS is therefore estimated at \$1,861, which is calculated as the net benefit plus the costs.

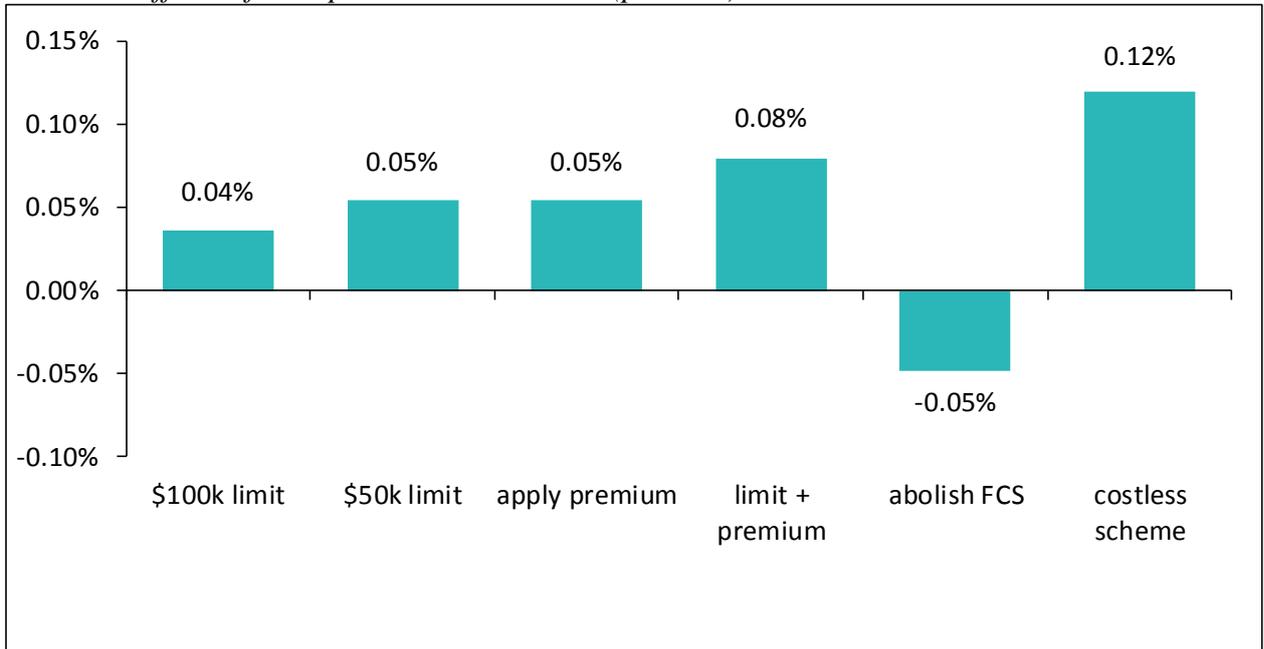
The other scenarios indicate that, while the scheme should not be abolished, it should be reformed. Broadly similar gains are available from either reducing the coverage to be in line with international practice (up to \$485 million), or from introducing risk-based premiums (\$473 million). Both reforms could be undertaken, giving a larger gain of \$683 million. The gains from the two policies are not fully additive ( $\$485\text{m} + \$473\text{m} < \$683\text{m}$ ) because there is some overlap in the sources of the gains from the two reforms.

Chart 4.1 Effects of FCS policies on Australian living standards (\$million, 2012-13 terms)



Source: Independent Extended CGE model

Chart 4.2 Effects of FCS policies on real GDP (per cent)



Source: Independent Extended CGE model

Chart 4.3 Effects of FCS policies on ADI real value added  
(per cent)

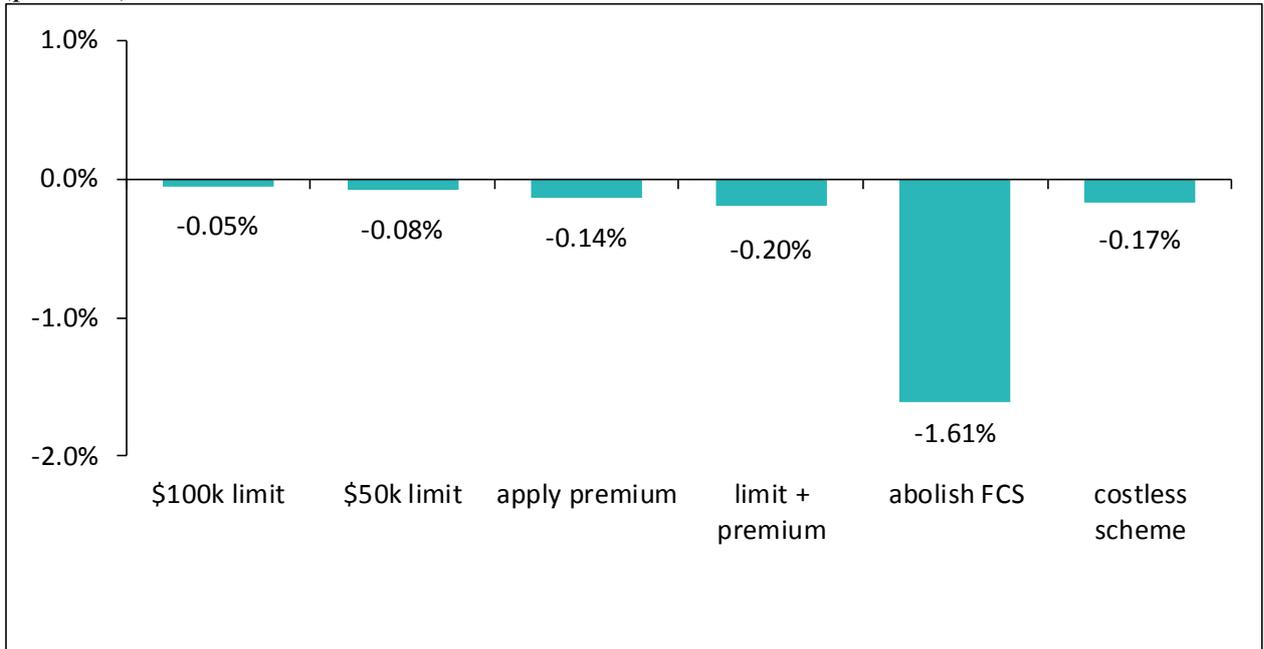
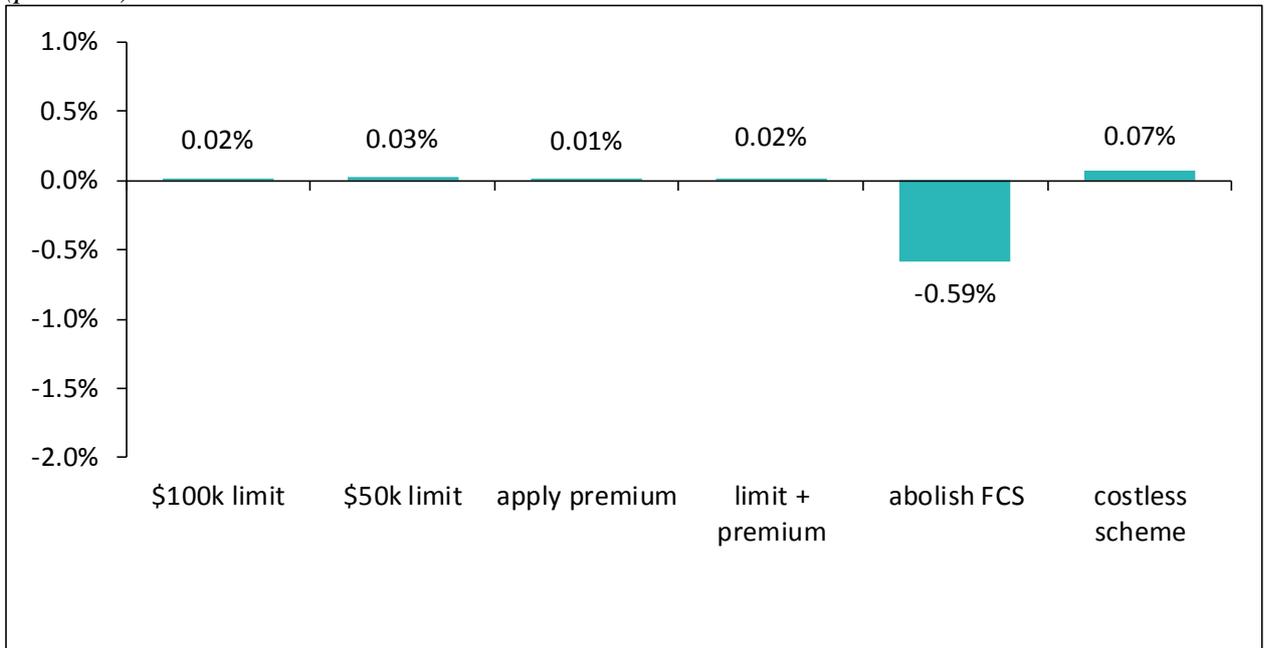


Chart 4.4 Effects of FCS policies on finance & insurance real value added  
(per cent)



## 5 Lowering the insured amount

Reforming the FCS by lowering the insured threshold and closing the account splitting loophole reduces the coverage of the FCS. It therefore lowers its costs, including moral hazard and allocative inefficiency costs of the FCS. This generates a sustained gain in consumer living standards on an annual basis of \$325 million under a reduction in the threshold to \$100k, or \$485 million under a larger reduction in the threshold to \$50k (Chart 4.1).

Similarly, reducing the insured threshold provides an ongoing boost to the level of GDP. This boost is 0.04 per cent or 0.05 per cent, depending on the extent of the reduction in the threshold (Chart 4.2).

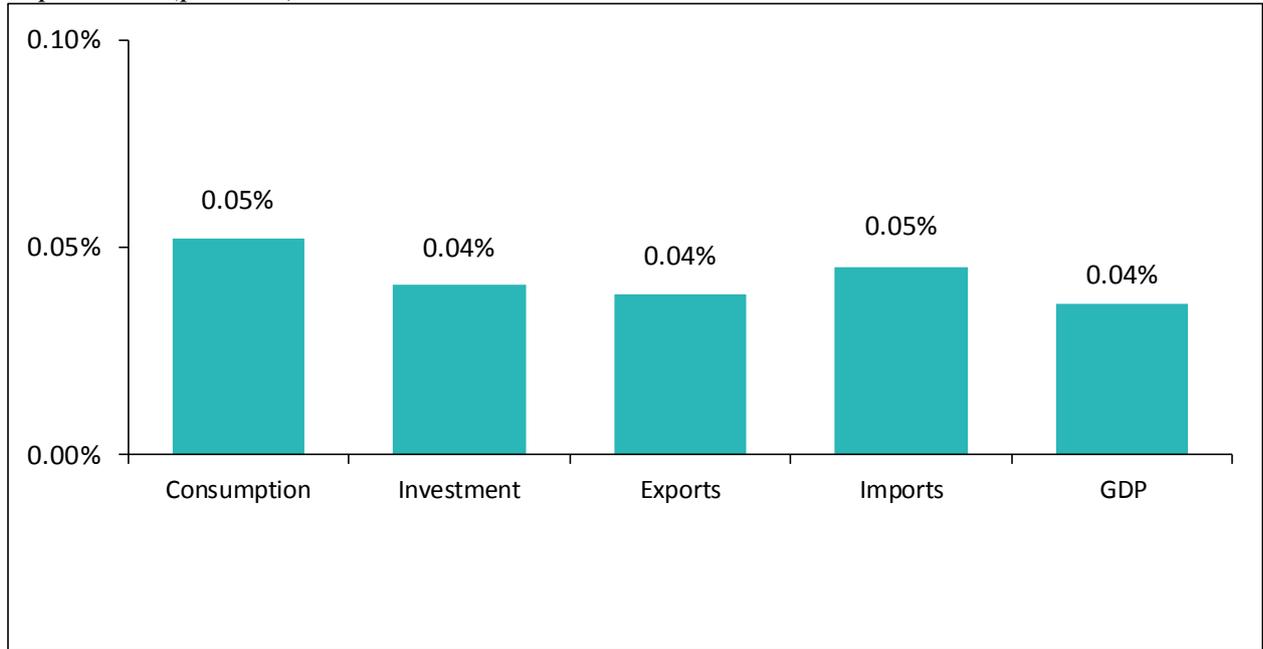
In both scenarios, activity in the ADI sector itself, as measured by real value added, is slightly lower (Chart 4.3). This is the net result of significant effects operating in both directions. On the one hand it gains a boost in productivity from the reduction in moral hazard and the associated excessively risky lending. On the other hand, it loses because reduced coverage of the FCS means that ADIs have less free cover to provide to consumers, prompting a small shift in consumer demand away from ADIs. However, this development reflects a partial unwinding of the allocative inefficiency from free deposit insurance, and so is a positive development for living standards and the economy as a whole.

For example, the shift in consumer demand away from ADIs benefits non-ADI financial institutions. This contributes to slightly higher real value added for the financial sector as a whole (Chart 4.4).

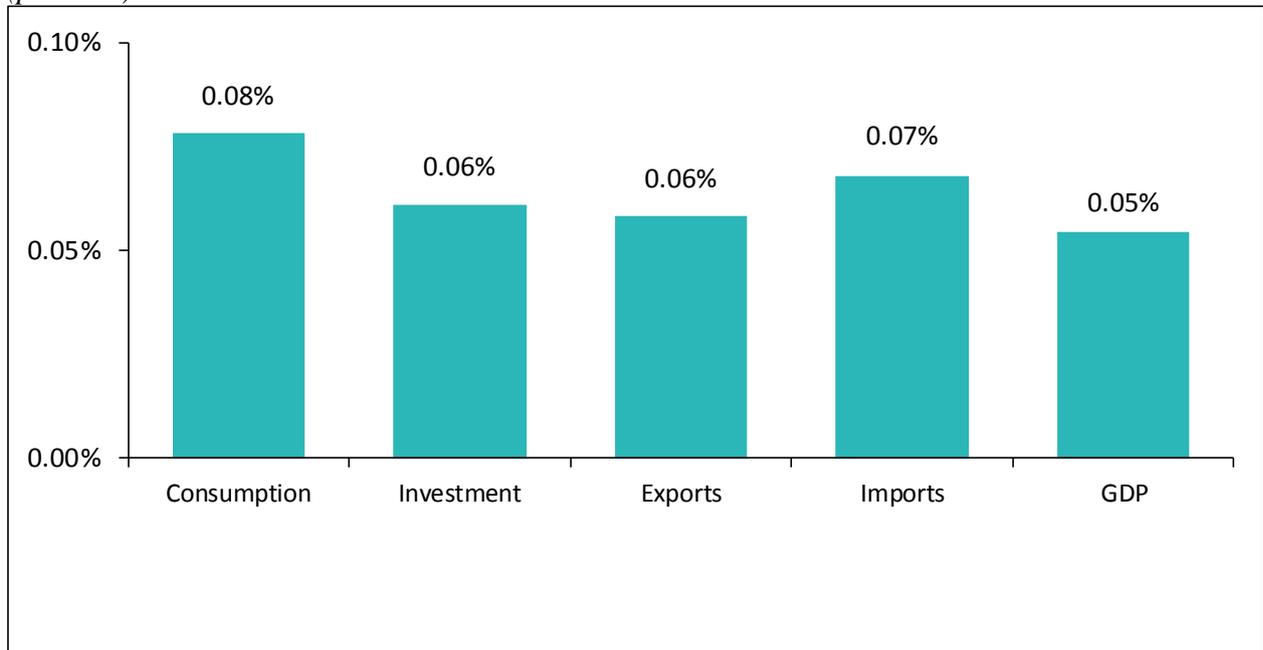
There are also widespread gains in GDP by expenditure. Charts 5.1 and 5.2 shows these gains when the threshold is reduced to \$100k and \$50 respectively. All components of expenditure gain by around 0.04 or 0.05 per cent respectively, in line with the gain in GDP as a whole.

As noted earlier, reductions in the coverage limit to below \$50k were not analysed. This is because it is considered this may call into question the assumption that the coverage of the scheme is wide enough to be effective in preventing bank failures from severe bank runs.

*Chart 5.1 Effects of Reducing Threshold to \$100k per account holder on real GDP by Expenditure (per cent)*



*Chart 5.2 Effects of Reducing Threshold to \$50k per account holder on real GDP by Expenditure (per cent)*



## 6 Introducing insurance premiums

Reforming the FCS by introducing insurance premiums and making them risk-rated has a number of impacts.

It is assumed that risk rating removes the moral hazard problem of excessively risky bank lending associated with bank deposit insurance. In principle, this would be the case if the premiums are precisely calibrated to the riskiness of each bank, because the prospect of higher premiums would then remove the incentive to engage in excessively risky lending. In practice, because of the complexities, the insurer's assessment of the riskiness of each bank will be imperfect. Hence the assumption that moral hazard cost is removed should be viewed as an approximation.

At the same time, developing an insurance pool of funding has an opportunity cost. This partly offsets the saving from removing moral hazard, leaving a small gain in productivity for the ADI sector.

Introducing premiums also reduces, but does not remove, the existing allocative inefficiency resulting from “free”, government-backed insurance. The insurance is no longer free, but it remains government-backed when such backing is not available to non-ADI financial institutions that compete with ADIs.

The reduction in allocative inefficiency combined with the small gain in ADI productivity, results in a significant gain in living standards on an annual basis of \$473 million (Chart 4.1). Similarly, there is a significant gain in GDP of 0.05 per cent (Chart 4.2).

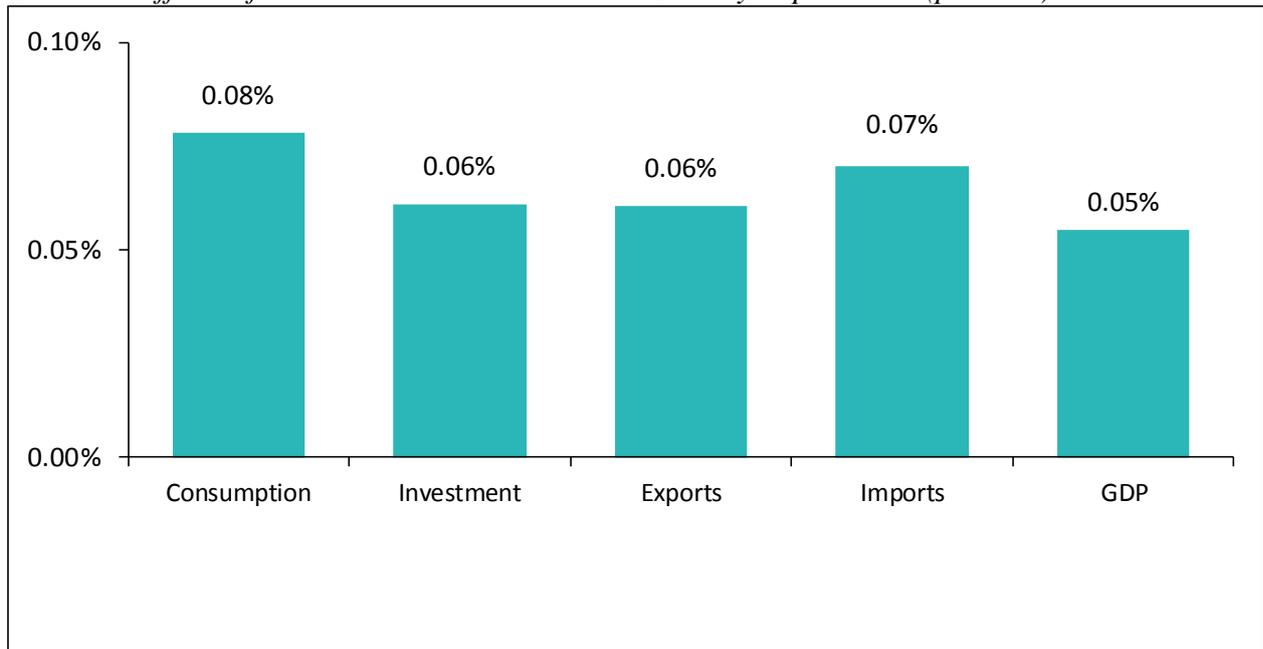
Real value added in the ADI sector is down 0.14 per cent (Chart 4.3). This is because the benefit to the ADI sector of its productivity gain is more than offset by the cost to it of partly restoring a level playing field by requiring ADIs to pay for their deposit insurance. This development causes a shift in consumers from ADI to non-ADI financial institutions. The gain for non-ADIs is sufficient to maintain activity in the finance sector as a whole (Chart 4.4).

The estimated gains in living standards and GDP are very similar for introducing risk-rated premiums or lowering the insured limit to \$50k. These two policies are combined in the *limit + premium* scenario.

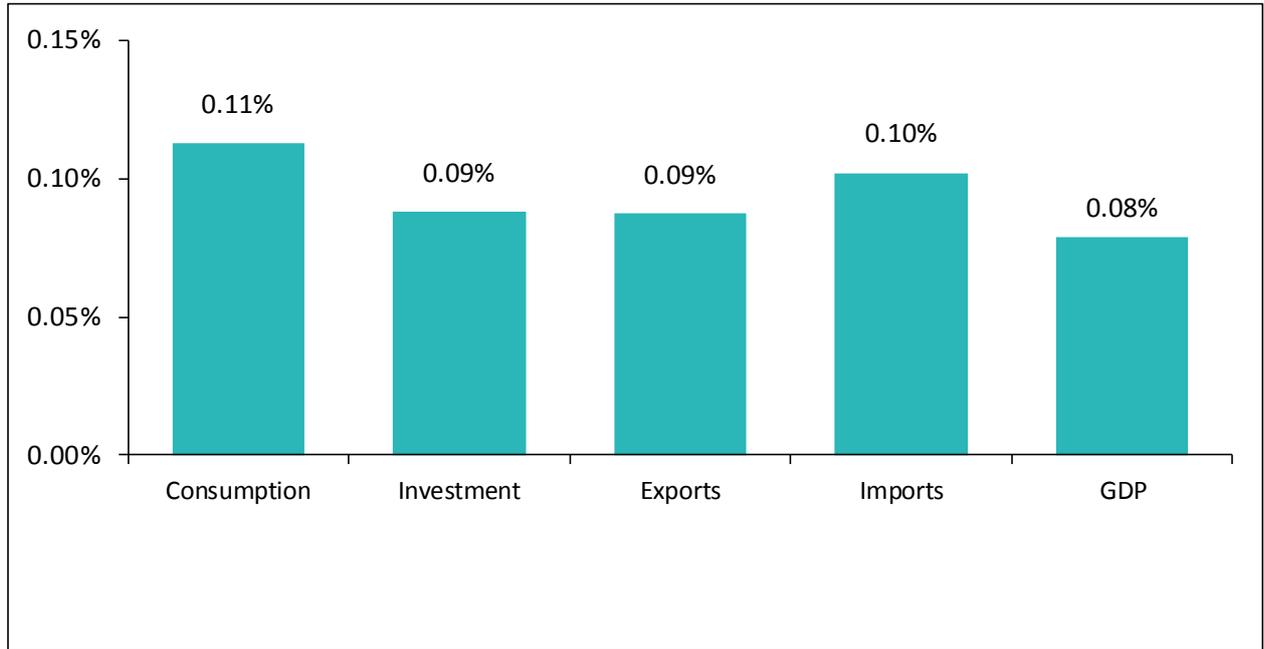
As would be expected, this shows a larger gain in annual living standards of \$683 million. The gains from the two policies are not fully additive (\$485m+\$473m < \$683m) because there is some overlap in the sources of the gains from the two reforms. Similarly, the gain in GDP is boosted to 0.08 per cent, compared to 0.05 per cent from either policy in isolation.

There are also widespread gains in GDP by expenditure. Charts 6.1 and 6.2 respectively show that all components of expenditure gain by around 0.05 per cent in the *premium* scenario and 0.08 per cent in the *limit + premium* scenario, in line with the percentage gains in GDP as a whole.

Chart 6.1 Effects of Risk-rated Premiums on real GDP by Expenditure (per cent)



*Chart 6.2 Effects of Reducing Threshold to \$50k combined with Risk-rated Premiums on real GDP by Expenditure (per cent)*



## 7 Abolishing the FCS

Abolishing the FCS removes both its benefits and costs. Removing the benefit of eliminating severe bank runs is assumed to result in a loss in total factor productivity for the ADI sector of 1.5 per cent. This more than offsets the savings from eliminating the costs of the FCS, including its moral hazard and allocative inefficiency. Hence, abolishing the FCS results in a significant loss in living standards on an annual basis of \$800 million (Chart 4.1).

Similarly, there is a significant loss in GDP of 0.05 per cent (Chart 4.2). These losses suggest that the FCS should be retained rather than abolished. However, the results in sections 5 and 6 indicate that the net benefit from the FCS could be substantially lifted through reform.

Abolishing the FCS would have a substantial negative impact on the ADI sector. There is a loss in its real value added of 1.61 per cent (Chart 4.3). This is the effect, averaged over time, of removing bank insurance. It reflects the disruptions to banking services resulting from severe runs, which are rare in Australia but potentially highly damaging when they do occur. It is also reflected in a loss in real value added for the finance sector as a whole of 0.59 per cent (Chart 4.4).

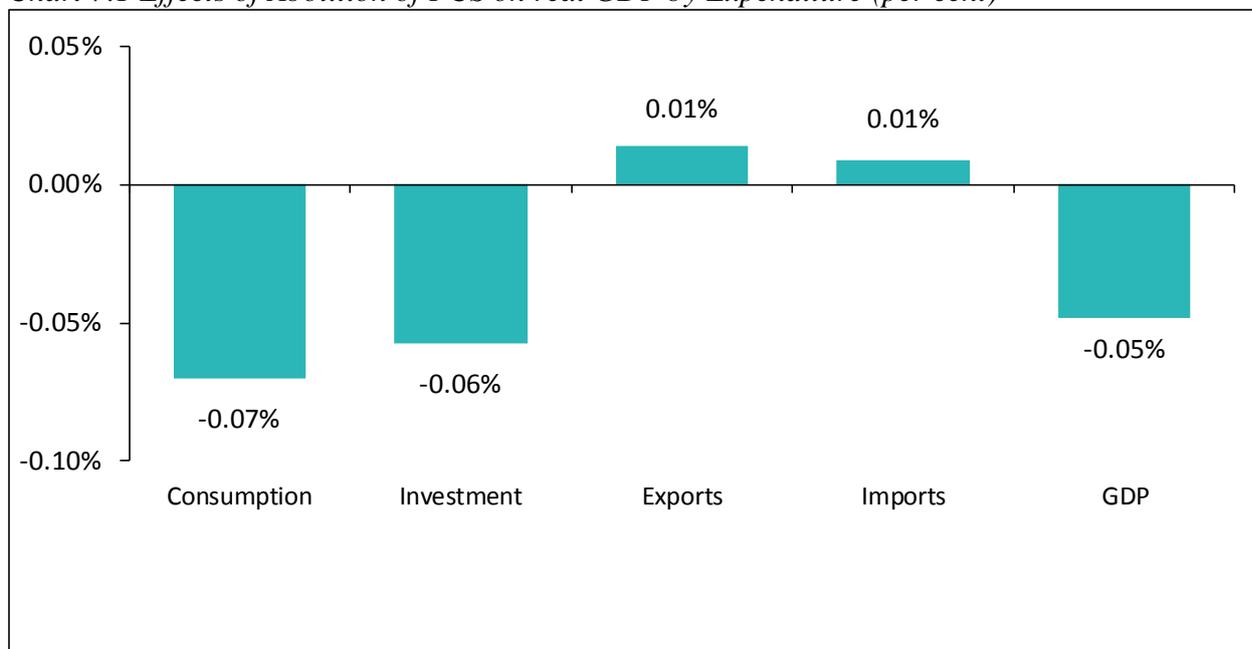
There are also widespread losses in GDP by expenditure. Chart 7.1 shows that all components of expenditure, other than trade volumes, fall by around 0.05 per cent, in line with the loss in GDP as a whole.

The final scenario models a hypothetical costless solution to the problem of the risk of bank failures. It results in a gain in GDP of 0.12 per cent (Chart 4.2) and all components of expenditure gain by a similar percentage (Chart 7.2).

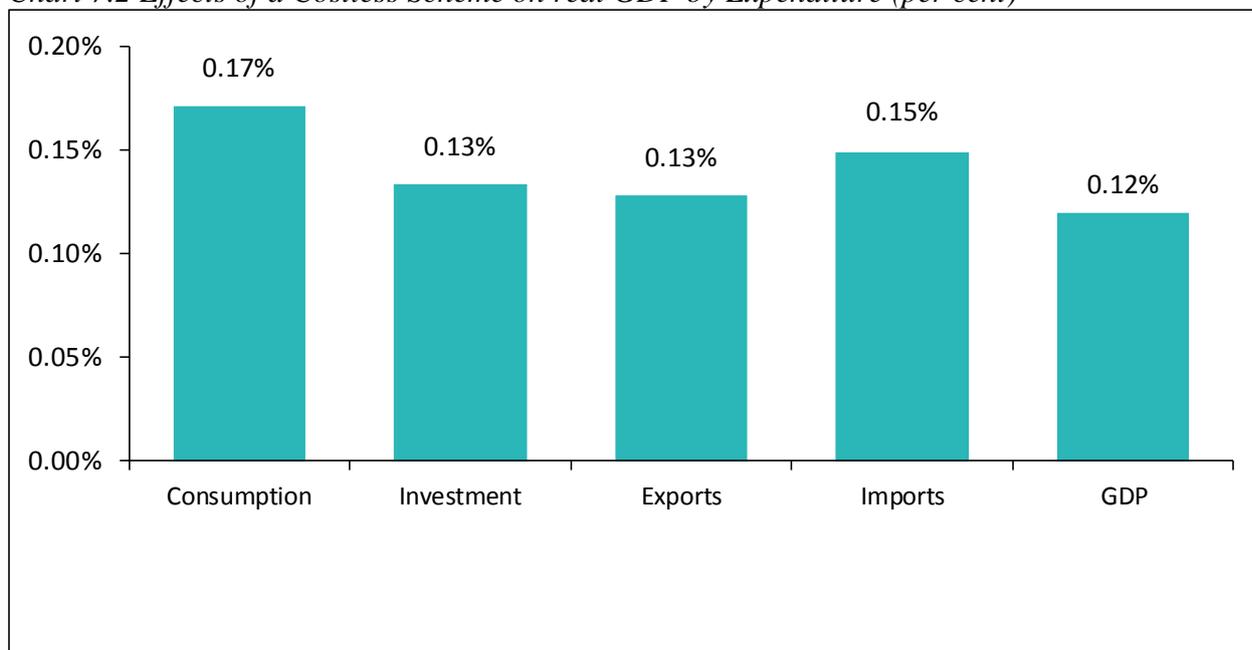
Removing the costs of the FCS while retaining its benefit of eliminating severe bank runs results in a significant gain in living standards on an annual basis of \$1,061 million (Chart 4.1). This can be interpreted as the potential economic “prize” from reforming the FCS, while acknowledging that the full prize is unlikely to be obtainable.

Comparing the living standards results from the final two scenarios also provides a breakdown of the costs and benefits of the FCS on an annual basis. They imply that it provides a benefit of \$1,861 million and a cost of \$800 million, giving a net benefit of \$1,061 million.

*Chart 7.1 Effects of Abolition of FCS on real GDP by Expenditure (per cent)*



*Chart 7.2 Effects of a Costless Scheme on real GDP by Expenditure (per cent)*



Finally, the effects of each scenario on living standards can be compared to derive a breakdown of the costs and benefits of alternative policies. It can be seen that the dual policy of reducing the coverage limit to \$50k per account holder and introducing risk-based premiums lifts the annual net benefit of the FCS from \$0.80 billion to \$1.48 billion. It does this by eliminating the moral hazard cost and most of the allocative inefficiency cost, while introducing the smaller cost of quarantining a pool of funds for payouts to depositors of failed ADIs.

*Table 7.1 Summary of Costs and Benefits for each Scenario (\$bn, 2012/13 terms)*

	FCS (baseline)	\$100k limit	\$50k limit	apply premium	limit + premium	costless scheme
benefit of insurance	1.86	1.86	1.86	1.86	1.86	1.86
moral hazard	0.62	0.43	0.34			
allocative inefficiency	0.44	0.31	0.24	0.22	0.12	
pool of funds				0.37	0.26	
total costs	1.06	0.74	0.58	0.59	0.38	
net benefit	0.80	1.12	1.28	1.27	1.48	1.86

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# Appendix A: The Independent Extended CGE Model

## A.1 Introduction

The Independent Extended CGE Model is Independent Economics' Computable General Equilibrium (CGE) model of the Australian economy, as recently extended. Some notable features which set the Independent CGE model apart from other models of the Australian economy are as follows.

- Following the latest model development work, the model has now been extended to distinguish 284 industries, compared to 114 industries for comparable models that rely on the standard ABS input-output tables. This finer level of detail in the extended model is obtained by using the ABS product details tables to disaggregate industry demand information and broad assumptions to disaggregate industry supply information.
- The model is designed to represent a normalised version of 2012/13 Australian economy, using the latest information available. It takes as its starting point the 2009/10 ABS Input-Output (IO) tables, which are the latest available. These are updated in a simulation of the model that allows for general growth in prices, productivity and labour supply from 2009/10 to 2012/13, includes a long-run assumption for the terms-of-trade, and adjusts investment rates and the trade balance to sustainable levels.
- The model incorporates refined modelling of production in each industry. This includes nine types of produced capital and three fixed factors to capture economic rents. For employment, the model distinguishes 51 different occupations. The model allows for different degrees of substitutability between these factors.
- The model provides a valid measure of changes in consumer welfare or living standards based on the equivalent variation, so that policy changes can be correctly evaluated in terms of the public interest.
- The model includes refined modelling of consumer demand based on a 2-tier approach. In the top tier households allocate their spending across 19 broad categories of consumption, and in the second tier they choose their pattern of consumption within each of these categories. This 2-tier structure takes into account that there may be more scope for households to switch spending within broad categories than between broad categories.
- The model has a highly detailed treatment of business taxation, with a focus on important features of the current Australian system as well as tax designs that have been proposed around the world. It takes into account factors such as: the different tax treatments of debt and equity financing; the complex system of depreciation allowances and tax concessions which differ by industry; franking credits; foreign tax credits; and the potential for international profit shifting.

This Appendix provides an overview of the model. More detailed documentation is available at [www.independenteconomics.com.au](http://www.independenteconomics.com.au)

## A.2 General features

The Independent Extended CGE Model makes a number of general assumptions that are consistent with its long-term time horizon. Many of these features are shared with other long-run CGE models.

### Long-term model

The Independent Extended CGE Model is a long-term model, meaning that results refer to the ongoing effects on the economy after it has fully adjusted to economic shocks. In keeping with this, all markets are assumed to have reached equilibrium. This includes key markets such as the labour market, where the real wage for each type of labour adjusts so that demand from industries is equal to supply from households. In addition, the behaviour of households and government is consistent with the inter-temporal budget constraints that they face. This involves levels of household saving and foreign capital inflow that are consistent with stocks of assets and liabilities growing at the same rate as GDP.

The long-term time horizon is fitting because economic policies should be judged against their lasting effects on the economy, not just their effects in the first one or two years.

### Optimising behaviour

Industries and households in the Independent CGE Model choose the best possible outcome, while still remaining within the constraints of production technology and budgets.

- Profit maximisation: the representative business in each industry chooses how to produce (with a mix of primary factors and intermediate inputs) and how much to produce to maximise its profit subject to the prices of its inputs and outputs.
- Utility maximisation: A representative household chooses their consumption levels of leisure and each consumer good and service in a way that maximises their well-being (or utility), subject to a budget constraint.

### Budget constraints

In a sustainable equilibrium, governments and households must meet their budget constraints. For simplicity, we assume that the government budget is balanced in the long run. Given its expenditure requirement, the government chooses its level of taxation consistent with achieving this outcome. In the private sector, a sustainable outcome is one in which household saving is sufficient to generate growth in household assets in line with growth in real GDP.

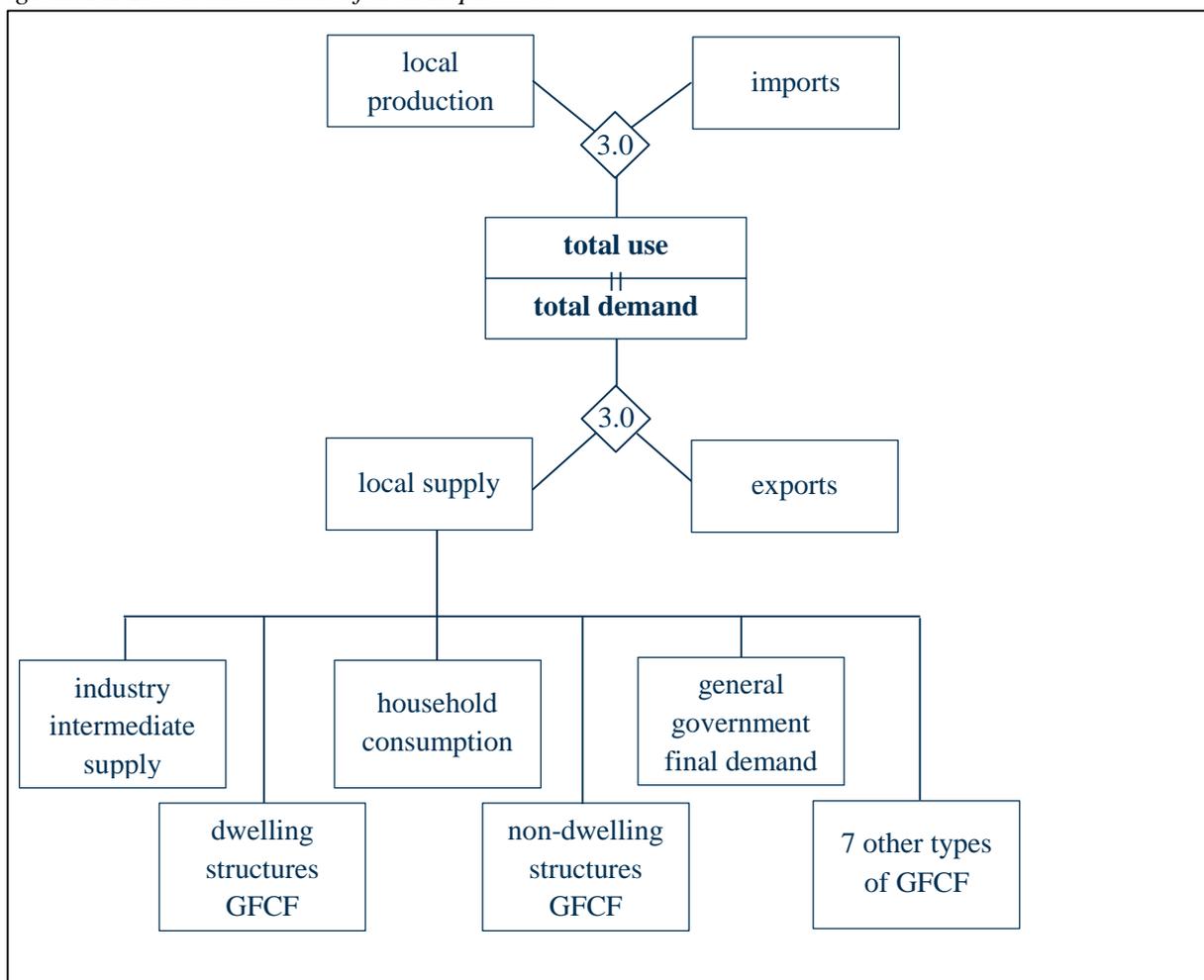
## A.3 Decision makers

This section discusses the interactions between the different decision makers, or ‘economic agents’ in the Independent CGE model – industries, households, government and the foreign sector.

### A.3.1 Trade and demand

The overall structure of each industry in the Independent Extended CGE Model is summarised in Diagram 3.1.

Diagram 3.1 Trade and demand for each product



Note: GFCF is Gross Fixed Capital Formation, or investment.

As shown in Diagram 3.1, total supply in the Independent CGE Model is made up of locally produced and imported varieties of each good. Local production competes with imports, and the elasticity of substitution has been set at 3.0 in most industries.

In each industry, the representative firm chooses the amount to supply to the export market and the amount to supply to the domestic market. It does this using a constant elasticity of transformation (CET) function, with an elasticity of 3.0.

Total supply must equal total demand in a long-run equilibrium. In the Independent Extended CGE Model, local production and imports supply the 13 different categories of demand that are shown in Diagram 3.1.

### A.3.2 Industry production

Local production in each of the 284 industries in the Independent CGE Model is modelled in a sophisticated way that identifies a large set of inputs used by industries. It distinguishes 9 types of capital and 51 types of labour according to occupation. It also identifies land and two industry-specific fixed factors, one of which is fixed in supply in Australia (location specific) and the other which is fixed in supply globally (or firm-specific). These primary factors are combined with intermediate inputs purchased from other industries. The structure of the production decisions is shown in Diagram 3.2.

Each industry can change the mix of inputs that it uses as relative prices change. Some types of primary factors are more substitutable with other factors, and other types of primary factors are less substitutable. To reflect this, the nesting structure of production decisions in the Independent CGE Model is set up in a way that provides for a high degree of flexibility.

Diagram 3.2 below shows an overview of the production technology used by firms in each industry in the Independent CGE model. Further details for non-structure capital, labour and structure services are provided in Diagrams 3.3, 3.4 and 3.5 respectively.

Diagram 3.2 Production in each industry

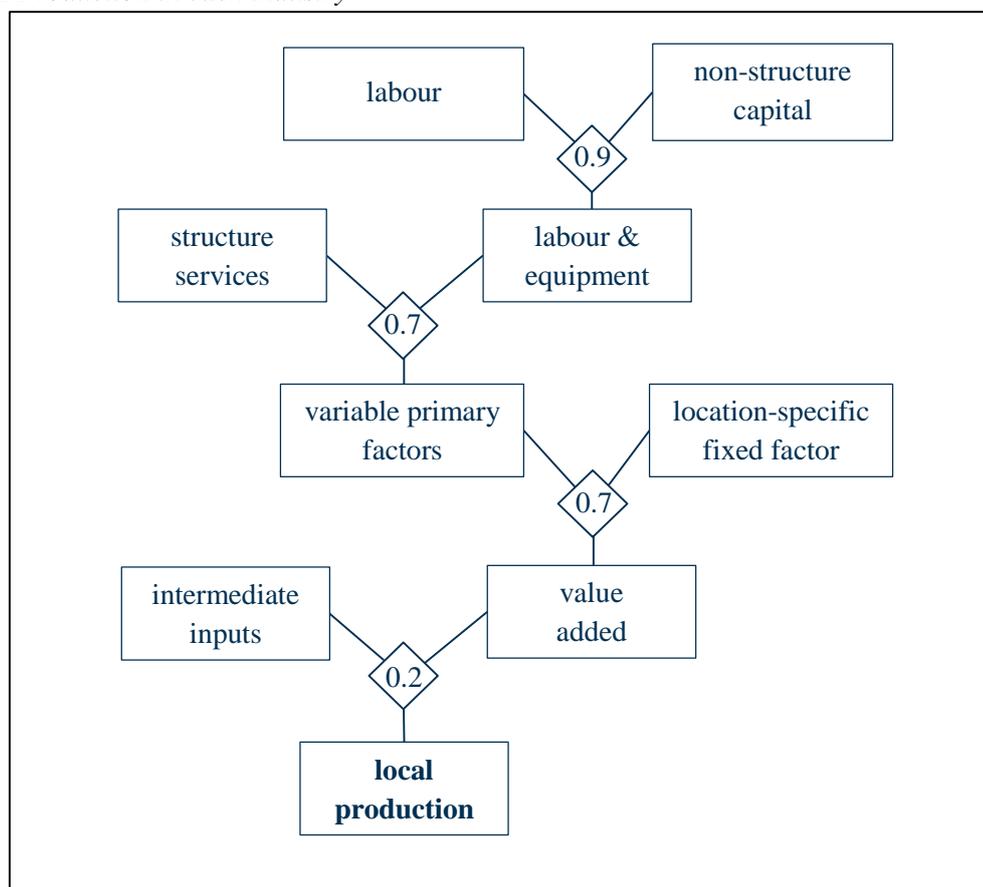
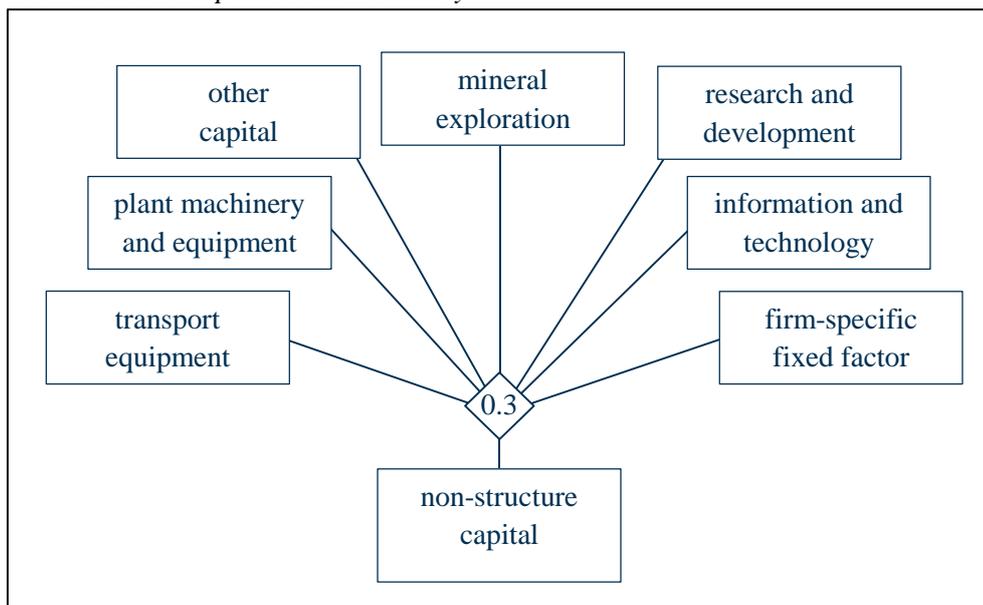


Diagram 3.3 Non-structure capital in each industry



As shown in Diagram 3.4, the modelling of industry demand for each occupation takes into account that while industries can substitute relatively easily between broad skill levels, they are less able to substitute between more specific occupations.

Diagram 3.4: Industry demand for labour

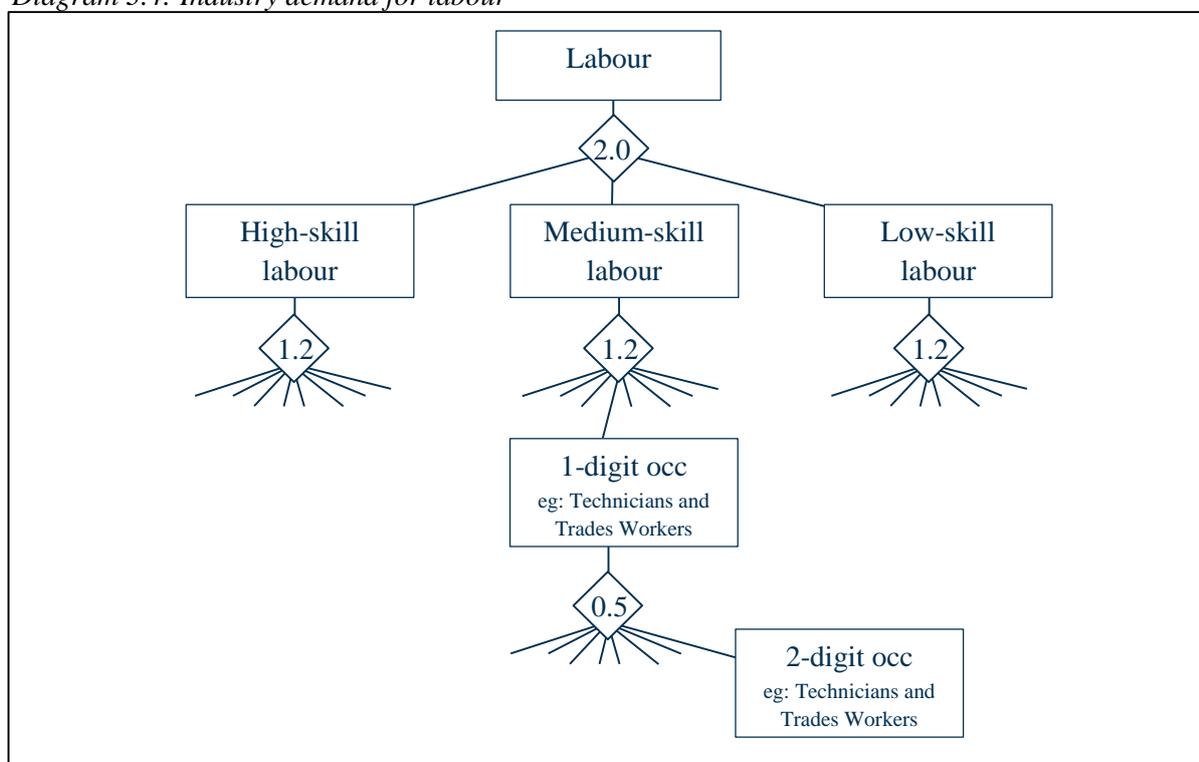
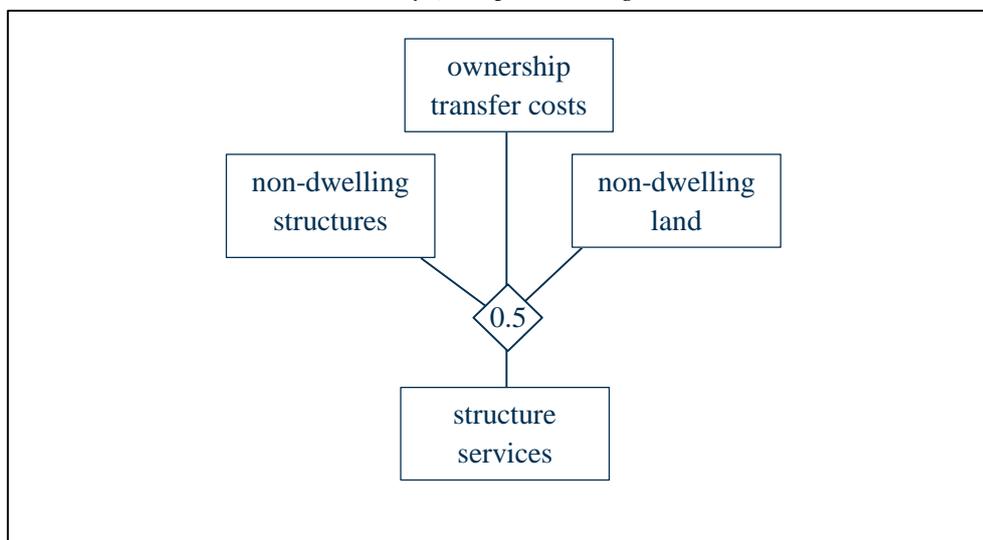


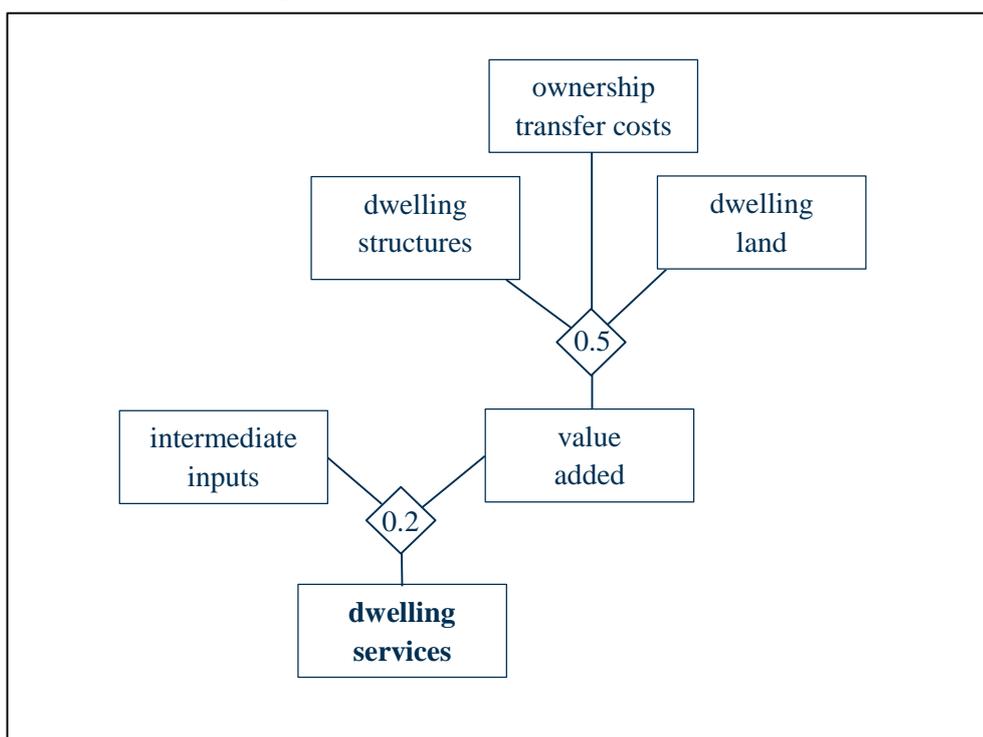
Diagram 3.5 shows that the structure services are produced using non-dwelling structures (which includes commercial buildings and engineering structures such as roads and bridges), non-dwelling land and ownership transfer costs. The need for non-dwelling structures and non-dwelling land to produce structure services is relatively obvious. Ownership transfer costs are incurred as businesses change premises as their needs changes in terms of location or building size or type.

Diagram 3.5 Structure Services in each industry (except Dwellings Services)



Dwelling services are produced in a broadly comparable way to structure services. The primary factors involved are dwelling structures, dwelling land and ownership transfer costs. This production technology for dwellings services is shown in Diagram 3.6 below. In the Independent Extended CGE model, there are two industries that produce dwelling services, namely, the owner-occupied sector and the rented sector. This is a useful distinction, partly because of differences in tax regimes.

Diagram 3.6 Production of Dwelling Services

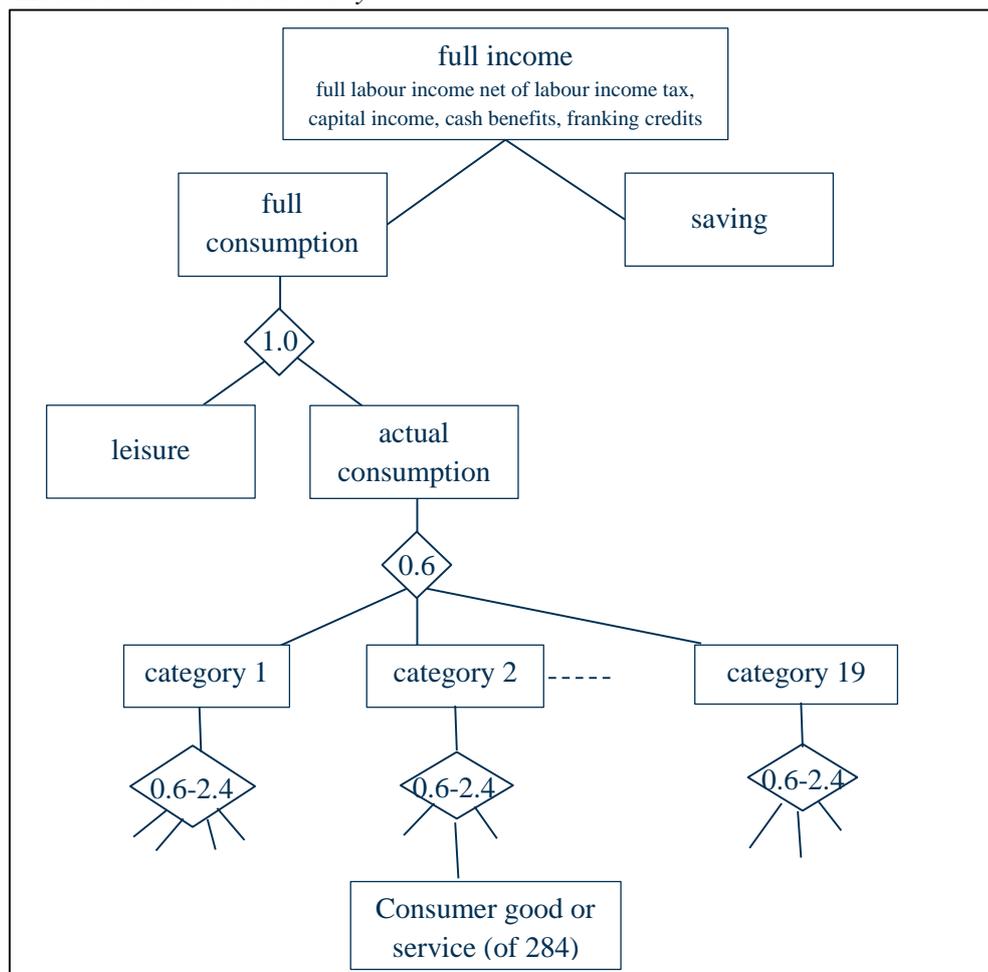


### A.3.3 Households

Households in the Independent Extended CGE model, after saving at a sustainable rate, choose between leisure and consumption, and then divide their consumption between the 284 goods and services. They do so in a way that maximises their utility. This behaviour is illustrated in Diagram 3.7.

Household full income is the amount of income that households would earn if they maximised their time working and consumed no leisure. Full income is made up of full labour income net of tax, after-tax income from owning capital, land and other fixed factors, and transfers from government.

Diagram 3.7 Household choices and utility



Household saving out of full income is set at a sustainable rate, namely the rate at which the capital assets owned by households grow in line with GDP. After saving at this rate, the remainder of full income is available for ‘full consumption’ – which includes the consumption of leisure and of goods and services.

As illustrated in Diagram 3.7, a 3-tier CES utility function is used in modelling the price-sensitive choices that households make concerning their labour supply and the level and pattern of their consumer demand. The first tier describes household choice between leisure and consumption, the second tier describes their choices between 19 broad categories of consumption, and the third tier their choices within each of these broad categories. These three tiers are now discussed in turn.

After meeting their savings target, in the first tier households decide how much of their time to spend in leisure, and how much to spend working. The cost of taking leisure is the amount that would have been earned if the time were instead spent working – which is the real after-tax wage.

Having made their saving and leisure decisions, households are left with a budget for actual consumption expenditure. This budget is allocated across the 284 goods and services distinguished in the model in the second and third tiers of decision making.

In the second tier, households allocate their spending across 19 broad categories of consumption. Those broad categories are listed in Table 3.1.

*Table 3.1 Broad Categories of Consumption*

Food  
Alcoholic beverages  
Cigarettes and tobacco  
Clothing and footwear  
Housing services  
Water and sewerage services  
Electricity, gas and other fuel  
Furnishings and household equipment  
Health  
Vehicle purchase and operation  
Transport services  
Communication  
Goods for recreation and culture  
Recreational and cultural services  
Education services  
Catering  
Accommodation services  
Other goods and services  
Financial services

In the final tier, households choose their pattern of consumption within each of the broad categories, which gives consumer demand for each of the model's 284 goods and services. There is likely to be more scope for households to vary consumption patterns within broad categories than between broad categories. This is taken into account by using a higher default elasticity of substitution of 1.2 in the final tier, compared to 0.6 in the preceding tier.

#### **A.3.4 Measuring household living standards**

Since household decisions are modelled using a consistent utility function, the Independent CGE model is able to provide valid measures of changes in consumer welfare, or living standards, from economic shocks or policy changes. The measure used is the equivalent variation, from welfare economics. This is the income transfer that would need to be given to households before the economic shock or policy change to enable the same level of utility as they would have after the change.

The equivalent variation can be used to determine the excess burden of taxes, which is a measure of the welfare loss per dollar of tax revenue raised. Excess burdens can be calculated for each tax and compared across taxes to assist policy makers in designing a tax system which minimises the adverse impact of raising revenue on household welfare.

### A.3.5 Government

On the expenditure side of the government budget, it is assumed that real government final demand for the 284 goods and services is determined exogenously by government spending policies. Because government expenditures are exogenous in real terms, if prices change, then nominal government expenditures change accordingly. Cash benefits paid to households, as well as franking credits, are modelled as transfers to households.

On the revenue side of the government budget, the model distinguishes indirect taxes on production and components of final demand, as well as direct taxes such as business income tax, labour income tax, and mining taxes. To ensure that the government budget position is sustainable, the model user designates a swing tax policy that adjusts automatically to keep the budget in balance in long run equilibrium. In the Independent CGE Model, either the tax rate on labour income or cash benefits or GST can be used for this purpose.

### A.3.6 Foreign sector

The modelling of Australia's relationship with the foreign sector recognises Australia's position as a small, open economy. This is the case for both trade and capital flows.

Australia is a price taker for imports, meaning that changes in the Australian economy do not influence the foreign-currency price of imports. Likewise, Australia is also close to being a price taker for exports, with a standard value for the export price elasticity of demand of -12. For some industries, where Australia has some market power or product differentiation (e.g. tourism services) a lower value of -6 is used.

Under the small country assumption, Australia can access the world market for funds, so long as the after-tax rate of return that is achieved matches the given rate required on the world capital market. That is, the after tax required rate of return on capital is determined overseas and is not influenced by changes in the domestic economy.

Australian ownership of the capital stocks is determined by initial asset holdings. The rate of household saving is so that the growth in Australian-owned assets from these initial levels is sustainable, matching the rate of growth in GDP. With levels of Australian-owned assets determined in this way, any change in the capital stock is funded by a change in foreign-owned capital.

Foreign ownership of the capital stock must also be in a sustainable long-run equilibrium. The annual inflow of investment funds, recorded on the capital account in the balance of payments, is an amount that ensures that the foreign-owned capital stock grows at a sustainable rate – the long-run rate of GDP growth. The payments to service this borrowing, an outflow on the current account, reflects the required after-tax return on the foreign-owned assets.

Together, the inflow on the capital account and the outflow on the current account imply a certain trade balance if external balance is to be achieved. Exchange rate adjustments ensure that this balance is achieved.

## A.4 Industry detail

The original Independent CGE model, which was developed in 2012, followed comparable models in basing its industry detail on the standard ABS input-output tables. Those tables distinguish around 110 industries, the precise number depending on the year of the tables. The Independent Extended CGE model was developed in 2014. Among its enhancements to the original model, it extends its detail to distinguish 284 industries. The 284 industries are listed in Table 4.1. The two main aspects of this development work were to devise a method for disaggregating the original 114 industries and to choose the specific disaggregation.

To split the original industries, a disaggregation is needed for both the demand and supply sides.

On the demand side, a disaggregation is available from the ABS product details tables. The 2009/10 edition of these tables provide the demand side information for as many as 1,231 products. These were aggregated to obtain the demand side information for the 284 industries used in the extended model.

On the supply side, there is no disaggregation available from the ABS. In disaggregating from 114 to 284 industries, on the supply side inevitably an initial, simplifying assumption was made that the cost structure of each sub-industry was the same as for its parent industry. This assumption will be refined over time. In particular, in undertaking model applications that may be sensitive to this assumption, the sub-industries that are important for the application will be identified and investigated and, where appropriate, adjustments will be made to the allocation of costs between sub-industries.

In principle, using the 2009/10 product details tables allows a model developer to distinguish anything between 114 and 1,231 industries. Choosing 284 industries involved a trade-off between model richness and model maintenance costs. The trade-off was resolved by distinguishing industries that are more likely to be useful in model applications.

A complication in using the product details tables is that there are a significant number of entries that are suppressed by the ABS to protect the confidentiality of individual businesses. However, the information that is provided, together with reasonable assumptions, were used to obtain estimates for these entries that are considered to be reasonable. This was a time-intensive process.

*Table 4.1 List of Industries in the Independent Extended CGE model*

0101A	Sheep Farming
0101B	Beef Cattle Farming
0101C	Grain Growing
0101D	Dairy Cattle Farming
0102A	Poultry Farming
0102B	Deer Farming
0102C	Other Livestock Farming
0103A	Nursery and Floriculture Production
0103B	Mushroom Growing
0103C	Vegetable Growing (Under Cover)
0103D	Potatoes
0103E	Other Vegetables
0103F	Fruit and Tree Nut Growing
0103G	Other Crop Growing
0201Z	Aquaculture
0301Z	Forestry and Logging
0401A	Fishing

0401B Hunting and Trapping  
0501A Forestry Support Services  
0501B Agriculture and Fishing Support Services  
0601Z Coal mining  
0701A Crude oil (incl. condensate)  
0701B Gas Extraction  
0801Z Iron Ore Mining  
0802A Gold Ore Mining  
0802B Other Metal Ore Mining  
0901A Construction Material Mining  
0901B Other Non-Metallic Mineral Mining and Quarrying  
1001A Exploration  
1001B Other Mining Support Services  
1101A Meat Processing  
1101B Poultry Processing  
1101C Bacon and Ham  
1101D Other Smallgoods  
1102Z Processed Seafood Manufacturing  
1103A Milk  
1103B Cheese  
1103C Ice cream and other dairy products  
1104A Jams  
1104B Other Fruit Processing  
1104C Vegetables, frozen  
1104D Vegetables, prepared or preserved  
1104E Tomato pulp, puree and paste  
1104F Other processed vegetables  
1105Z Oils and Fats Manufacturing  
1106A Grain Mill Product Manufacturing  
1106B Cereal, Pasta and Baking Mix Manufacturing  
1107A Bread Manufacturing  
1107B Other Bakery Product Manufacturing  
1108A Sugar Manufacturing  
1108B Confectionery Manufacturing  
1109A Potato, Corn and Other Crisp Manufacturing  
1109B Prepared Animal and Bird Feed Manufacturing  
1109C Coffee and tea, including substitutes  
1109D Other Food Product Manufacturing n.e.c.  
1201Z Soft Drinks, Cordials and Syrup Manufacturing  
1202Z Beer Manufacturing  
1205A Spirit Manufacturing  
1205B Wine and Other Alcoholic Beverage Manufacturing  
1205C Cigarette and Tobacco Product Manufacturing  
1301Z Textile Manufacturing  
1302Z Tanned Leather, Dressed Fur and Leather Product Manufacturing  
1303A Textile Floor Covering Manufacturing  
1303B Rope, Cordage and Twine Manufacturing  
1303C Cut and Sewn Textile Product Manufacturing  
1303D Textile Finishing and Other Textile Product Manufacturing  
1304Z Knitted Product Manufacturing  
1305Z Clothing Manufacturing  
1306Z Footwear Manufacturing

1401Z Sawmill Product Manufacturing  
1402Z Other Wood Product Manufacturing  
1501Z Pulp, Paper and Paperboard Manufacturing  
1502A Paper Stationery Manufacturing  
1502B Sanitary Paper Product Manufacturing  
1502C Other Converted Paper Product Manufacturing  
1601A Printing and Printing Support Services  
1601B Reproduction of Recorded Media  
1701A Automotive petrol; gasoline refining or blending; motor spirit (incl aviation spirit)  
1701B Kerosene (incl kerosene type jet fuel)  
1701C Petrodiesel  
1701D Other Petroleum Refining and Petroleum Fuel Manufacturing  
1701E Other Petroleum and Coal Product Manufacturing  
1801Z Human Pharmaceutical and Medicinal Product Manufacturing  
1802Z Veterinary Pharmaceutical and Medicinal Product Manufacturing  
1803A Basic Chemical Manufacturing  
1803B Basic Polymer Manufacturing  
1803C Fertiliser and Pesticide Manufacturing  
1803D Other Basic Chemical Product Manufacturing  
1804A Soap and Toothpaste Manufacturing  
1804B Other Cleaning Compound Manufacturing  
1804C Cosmetic and Toiletry Preparation Manufacturing  
1901A Tyre Manufacturing  
1901B Other Polymer Product Manufacturing  
1902Z Natural Rubber Product Manufacturing  
2001Z Glass and Glass Product Manufacturing  
2002Z Ceramic Product Manufacturing  
2003Z Cement, Lime and Ready-Mixed Concrete Manufacturing  
2004Z Plaster and Concrete Product Manufacturing  
2005Z Other Non-Metallic Mineral Product Manufacturing  
2101A Basic Ferrous Metal Manufacturing  
2101B Basic Ferrous Metal Product Manufacturing  
2102A Alumina Production  
2102B Aluminium Smelting  
2102C Copper, Silver, Lead and Zinc Smelting and Refining  
2102D Gold - primary and secondary (excl from purchased scrap)  
2102E Other Basic Non-Ferrous Metal Manufacturing  
2102F Basic Non-Ferrous Metal Product Manufacturing  
2201Z Forged Iron and Steel Product Manufacturing  
2202Z Structural Metal Product Manufacturing  
2203A Metal Container Manufacturing  
2203B Sheet Metal Product Manufacturing (except Metal Structural and Container Products)  
2204Z Other Fabricated Metal Product manufacturing  
2301A Motor Vehicle Manufacturing  
2301B Motor Vehicle Body and Trailer Manufacturing  
2301C Automotive Electrical Component Manufacturing  
2301D Other Motor Vehicle Parts Manufacturing  
2301E Other Transport Equipment Manufacturing n.e.c.  
2302A Shipbuilding and Repair Services  
2302B Boatbuilding and Repair Services  
2303Z Railway Rolling Stock Manufacturing and Repair Services  
2304Z Aircraft Manufacturing and Repair Services

2401A Photographic, Optical and Ophthalmic Equipment Manufacturing  
2401B Medical and Surgical Equipment Manufacturing  
2401C Other Professional and Scientific Equipment Manufacturing  
2401D Computer and Electronic Office Equipment Manufacturing  
2401E Communication Equipment Manufacturing  
2401F Other Electronic Equipment Manufacturing  
2403Z Electrical Equipment Manufacturing  
2404Z Domestic Appliance Manufacturing  
2405A Pump, Compressor, Heating and Ventilation Equipment Manufacturing  
2405B Specialised Machinery and Equipment Manufacturing  
2405C Other Machinery and Equipment Manufacturing  
2501Z Furniture Manufacturing  
2502A Jewellery and Silverware Manufacturing  
2502B Toy Manufacturing  
2502C Sporting Product Manufacturing  
2502D Other Manufacturing n.e.c.  
2601A Fossil Fuel Electricity Generation  
2601B Hydro-Electricity Generation  
2601C Other Electricity Generation  
2605A Other electricity service income  
2605M Margin - Electricity transmission, distribution and on selling (2620-2640)  
2701A Other gas service income  
2701M Margin - gas distribution  
2801Z Water Supply, Sewerage and Drainage Services  
2901Z Waste Collection, Treatment and Disposal Services  
3001Z Residential Building Construction  
3002Z Non-Residential Building Construction  
3101A Road and Bridge Construction  
3101B Other Heavy and Civil Engineering Construction  
3201Z Construction Services  
3301A Non-margin - wholesaling services  
3301B Commission-Based Wholesaling  
3301M Margin - wholesaling services  
3901A Non-margin - retailing services  
3901B Retail commission on sales  
3901M Margin - retailing services  
4401Z Accommodation  
4501A Meal preparation and presentation  
4501B Beverage serving service  
4501C Takeaway food  
4501D Catering services  
4501E Net losses from gambling - Clubs, pubs, taverns and bars (Hospitality)  
4501M Margin - food and beverage services (4511-4530)  
4601A Non-margin - Road Freight Transport  
4601B Road Passenger Transport  
4601M Margin - Road Freight Transport  
4701A Non-margin - Rail Freight Transport  
4701B Rail Passenger Transport  
4701M Margin - Rail Freight Transport  
4801A Non-margin - Water Freight Transport  
4801B Water Passenger Transport  
4801M Margin - Water Freight Transport

4901A Non-margin - Air and Space Freight Transport  
4901B Air and Space Passenger Transport  
4901M Margin - Air and Space Freight Transport  
4801C Scenic and Sightseeing Transport  
4801D Non-margin - Pipeline and Other Transport  
4801N Margin - Pipeline and Other Transport  
5101Z Postal and Courier Pick-up and Delivery Service  
5201A Water Transport Support Services  
5201B Airport Operations and Other Air Transport Support Services  
5201C Other Transport Support Services  
5201D Warehousing and Storage Services  
5201M Margin - Water Transport Support Services  
5401A Newspaper and Magazine publishing  
5401B Book publishing  
5401C Other Publishing  
5401D Software Publishing  
5501A Motion Picture and Video Activities  
5501B Sound Recording and Music Publishing  
5601A Radio Broadcasting  
5601B Television Broadcasting  
5701A Internet Publishing and Broadcasting  
5701B Internet Service Providers and Web Search Portals  
5701C Data Processing, Web Hosting and Electronic Information Storage Services  
5801A Wired Telecommunications Network Operation  
5801B Other Telecommunications Network Operation  
5801C Other Telecommunications Services  
6001A Libraries and Archives  
6001B Other Information Services  
6201A Banks, building societies, credit unions  
6201B Other Depository Financial Intermediation  
6201C Non-Depository Financing  
6201D Financial Asset Investing  
6301A Life Insurance  
6301B Health Insurance  
6301C General Insurance  
6301D Superannuation Funds  
6301M Marine insurance provision (Margin)  
6401A Financial Asset Broking Services  
6401B Other Auxiliary Finance and Investment Services  
6401C Auxiliary Insurance Services  
6601A Goods and Equipment Rental and Hiring  
6601B Non-Financial Intangible Assets (Except Copyrights) Leasing  
6701A Residential Property Operators: owner-occupied  
6701B Residential Property Operators: rented  
6702A Non-Residential Property Operators  
6702B Real Estate Services  
6901A Scientific Research Services  
6901B Architectural Services  
6901C Surveying and Mapping Services  
6901D Engineering Design and Engineering Consulting Services  
6901E Other Specialised Design Services  
6901F Scientific Testing and Analysis Services

6901G Legal Services  
6901H Accounting Services  
6901I Advertising Services  
6901J Market Research and Statistical Services  
6901K Corporate Head Office Management Services  
6901L Management Advice and Related Consulting Services  
6901O Veterinary Services  
6901P Professional Photographic Services  
6901Q Other Professional, Scientific and Technical Services n.e.c.  
7001Z Computer Systems Design and Related Services  
7210A Employment Placement and Recruitment Services  
7210B Labour Supply Services  
7210C Travel Agency and Tour Arrangement Services  
7210D Other Administrative Services  
7310A Building Cleaning, Pest Control and Gardening Services  
7310B Packaging Services  
7501Z Public Administration and Regulatory Services  
7601Z Defence  
7701Z Public Order and Safety  
8010A Preschool Education  
8010B Primary Education  
8010C Secondary Education  
8010D Special School Education  
8110A Technical and Vocational Education and Training  
8110B Higher Education  
8210A Adult, Community and Other Education  
8210B Educational Support Services  
8401A Hospitals  
8401B Medical Services  
8401C Pathology and Diagnostic Imaging Services  
8401D Dental Services  
8401E Optometry and optical dispensing  
8401F Other Allied Health Services  
8401G Other Health Care Services  
8601A Aged Care Residential Services  
8601B Other Residential Care Services  
8601C Child Care Services  
8601D Other Social Assistance Services  
8901A Museum Operation  
8901B Parks and Gardens Operations  
8901C Creative and Performing Arts Activities  
9101A Sports and Physical Recreation Activities  
9101B Horse and Dog Racing Activities  
9101C Amusement and Other Recreation Activities  
9201A Casino Operation  
9201B Lottery Operation  
9201C Other Gambling Activities  
9401Z Automotive Repair and Maintenance  
9402A Machinery and Equipment Repair and Maintenance  
9402B Other Repair and Maintenance  
9501A Personal Care Services  
9501B Funeral, Crematorium and Cemetery Services

- 9501C Laundry and Dry-Cleaning Services
- 9501D Photographic Film Processing
- 9501E Parking Services
- 9501F Other Personal Services n.e.c.  
Private Households Employing Staff and Undifferentiated Goods- and Service-Producing
- 9501G Activities of Households for Own Use
- 9502A Religious Services
- 9502B Civic, Professional and Other Interest Group Services

## A.5 Baseline scenario and validation

The model uses a variety of recent data, but the main source is the detailed Input-Output (IO) tables from the ABS, giving the model a detailed picture of the Australian economy. Specifically, the 2009/10 IO tables released in late 2013 are used, which means that the model also uses the contemporary ABS industry classification, ANZSIC 2006. The model is calibrated so that it exactly reproduces this 2009/10 data.

The next step is to simulate a baseline scenario for use as a point of reference. This involves two aspects, uprating the economy from 2009/10 to 2012/13 and normalising the economy to a sustainable position. That is, the baseline scenario provides a normalised, or sustainable, version of the 2012/13 economy.

Uprating the economy from 2009/10 to 2012/13 involves simulating the model after adjusting the model's inputs for the effects of economic developments from 2009/10 to 2012/13. This includes allowing for growth in wages, import prices, productivity and employment from 2009/10 to 2012/13.

Normalising the economy involves taking into account the differences between the structure of the economy in 2009/10, compared to an economy in a long-run sustainable equilibrium. This involves normalising the trade balance, rates of business investment, and the level of the terms-of-trade.

The model has been tested to ensure that it observes a number of widely-accepted balance and neutrality properties for CGE models.

- GDP by expenditure always equals GDP by income. This is true for both nominal and real GDP in all simulations, which is a useful check on the consistency of the model's coding.
- Walras' Law states that if all but one market is in equilibrium, then the last market must also be in equilibrium. In the Independent Extended CGE Model, equilibrium is not imposed in one of the 51 labour markets, but is nevertheless always achieved in that market in model simulations as a consequence of Walras' Law.
- The Independent CGE Model observes price neutrality. When the average nominal wage or numeraire is increased by one per cent, all prices in the model increase by exactly one per cent, and all real variables are unaffected, in accordance with the expected price neutrality property.
- The Independent CGE Model also observes real neutrality. This means that when all of the exogenous real variables are one per cent higher, all of the endogenous real variables are also one per cent higher. The exogenous real variables in the Independent CGE Model are: total labour supply; real general government final demand by industry; the supplies of industry-specific fixed factors; the supplies of land; the real assets owned by the household sector; and the size of the world economy.

## A.6 Business tax

Analysis of the business tax system is important. High or poorly designed business taxes have the potential to cause major economic distortions because of the open economy assumption that the after-tax required rate of return on capital is determined overseas. This assumption implies that an increase in taxation of foreign investment into Australia may need to be offset by higher pre-tax returns on capital to maintain the after-tax returns received by foreign investors. Higher pre-tax returns are achieved by reducing investment and capital, which leads to lower labour productivity.

In light of this, the model has a highly detailed treatment of business taxation, with a focus on important features of the current Australian system as well as tax designs that have been proposed around the world. This takes into account factors such as: the different tax treatments of debt and equity financing; the complex system of depreciation allowances and tax concessions which differ by industry; franking credits; foreign tax credits; and the potential for international profit shifting.

### Treatment of debt and equity financing

Four alternative business income tax systems that have been proposed around the world are provided for in the Independent CGE model. These systems differ in the deductions available for the costs of debt and equity financing, and are modelled as follows.

- Standard corporate income tax (CIT), such as the current Australian system, allows deductions for the interest costs of debt financing, but no deduction with respect to equity financing costs.
- Comprehensive business income tax (CBIT), allows no deductions for financing costs, giving the widest possible tax base.
- Allowance for corporate equity tax (ACE), gives deductions for the interest costs of debt financing, along with an imputed cost for equity financing.
- Allowance for corporate capital tax (ACC), allows a single deduction for an imputed cost for the full capital base, so both equity and debt financing costs are covered by the one deduction.

Both ACE and ACC aim to provide deductions that cover all capital financing costs. With the full cost of capital deductible, the tax base is intended to only include economic rents. In principle, this means that a business tax system based on ACE or ACC would be more efficient than the existing CIT system.

In modelling deductions for the cost of debt financing (under the CIT and ACE), the debt-to-equity ratio of each industry has been estimated using ATO Taxation Statistics data. This allows the model to take into account that the current company income tax system provides higher tax deductions for industries which tend to have higher debt-to-equity ratios.

### Depreciation allowances and tax concessions

Company income tax in Australia allows for a number of depreciation allowances and tax concessions, which differ by industry and asset type. The model takes into account the following aspects of the system of depreciation allowances.

- The tax system allows for depreciation at historic cost which is less generous than economic depreciation which would be calculated at replacement cost.

- Tax and economic depreciation rates differ for each of the nine types of produced assets in the model. Where tax depreciation rates are more concessional for some types of capital than for others, the choice of the mix of capital may be distorted.
- Tax depreciation rates can differ for each industry. This allows modelling of industry tax concessions which allow some industries to depreciate assets at concessionally high rates.
- Immediate expensing is allowed for investment in some assets, sometimes with a loading. This includes certain R&D expenditure, which can be immediately expensed, with loadings that differ by industry.

### Franking credits

Some corporate tax revenue is refunded when franking credits are used, reducing the overall contribution to the budget from company tax. However, some franking credits are “lost” because companies may choose to retain profits rather than distribute them as franked dividends, or because the franking credits accrue to overseas investors who are not able to use them.

### Foreign tax credits

In some circumstances, foreign entities may be able to use corporate income tax paid in Australia as a tax credit against tax payable in their own jurisdiction. These foreign tax credits, which are taken into account in the modelling, mainly relate to US direct investment in Australia. The model assumes that, at the margin, foreign investors in Australia receive tax credits in their home countries to offset around 10 per cent of any change in their tax liabilities in Australia.

Tax credits do not affect Australian tax collections. However, they do affect the cost of capital for foreign investors. Specifically, the potential benefits to foreign investors from reductions in Australian company tax are diluted by an associated reduction in their ability to claim tax credits.

### Choice of firm location

Multinational firms can generate rents through access to intangible assets such as brand names, patents and market power. Company income tax can have an important effect on the locational choice of multinational firms and their rents, which is taken into account in the model. It assumes that multinational firms have access to a firm-specific fixed factor that represents their intangible assets. They allocate the factor between countries to maximise their profit.

The response of firm-specific capital to an increase in the Australian company tax rate is not dissimilar to the response of variable capital. In both cases, capital is likely to be withdrawn, until pre-tax returns rise sufficiently to restore after-tax returns to the levels available in other jurisdictions.

### Profit shifting

The model takes into account that companies may seek to reduce their business tax liability by shifting profits from Australia to countries with lower rates of business tax. It does this by modelling the use of tax havens, including the costs incurred in using tax havens. The model takes into account the overall effect that this behaviour has on both revenue collections and the user cost of capital.

## A.7 Applications

The Independent Extended CGE model is a powerful tool for simulating the economic impacts of changes in government economic policies. This section discusses the applications of the model, including a number of recent projects.

The long-term time horizon in the model is fitting for analysing the effects of economic policies, because government policies should be judged against their lasting effects on the economy, not just their effects in the first one or two years.

The most important metric for judging the merits of any policy is its effect on household living standards, or welfare. As discussed above, the model provides a valid measure of household welfare, which means that policies can be judged according to the public interest. The model also shows the effects of policies on economic activity, employment, trade and investment at the level of individual industries, impacts on households and impacts on the economy as a whole.

### Industry Policy

The detailed modelling of industry production makes the Independent CGE model uniquely well-suited to modelling industry policies. One aspect of this detail is the large number of industries that are distinguished at 284, compared to around 110 industries in comparable models. Another aspect is the detailed modelling of production within each industry, involving nine types of produced capital, 51 types of labour, both location-specific and mobile fixed factors that are industry specific, and land, which goes well beyond the level of detail in comparable models.

### Labour market policy

The detailed treatment of labour markets explicitly models supply and demand for 51 different occupations, as discussed in Section 3.2.2. This means that the Independent CGE model is well suited to estimating the effects of labour market policies. This includes policies related to education, workplace relations and immigration.

### Regional policies

The Independent CGE model includes a regional module which can be used to estimate effects of various economic developments on small regions. The regional module has been designed to allow maximum flexibility in regional disaggregation. The standard version contains the eight States and Territories, and this can readily be extended to include sub-state detail.

### Tax policy

- The Independent CGE model has detailed modelling of the **business tax** system, as discussed section A.6. It takes into account a wide range of features of the current company income tax and can also be used to model alternative business tax systems.
- The model is ideally suited modelling the effects of **personal income tax**. Household labour supply is sensitive to the after-tax real wage, and a higher personal income tax discourages households from working.

- Taxes on the **mining industry**, such as state royalties and resource rent taxes, are also appropriately modelled in the Independent CGE model. For example, it takes into account that royalties and rent taxes have different designs and so have different effects on mining incentives.
- **Indirect taxes**, such as GST and excise taxes, can also be modelled in the Independent CGE model. The 2-tier modelling of consumer demand provides a richer framework for analysing the distortions to spending decisions from the various taxes that consumers face.

### International developments

The Independent CGE model has a sophisticated treatment of Australia's interactions with the global economy, as described in section A.6. This means that it is well suited to modelling government policies relating to trade, including tariffs and free trade agreements. It is also well suited to simulating international developments that occur independently of government policy, such as changes in international prices and rates of return required by world capital markets.

#### A.7.1 Recent projects

Since its development in 2012, the original Independent CGE model has been used for a number of applications. These include:

- analysing the effect of a reduction in the company tax rate with the Australian Treasury, as part of work for the Business Tax Working Group;
- estimating the economic impacts of reducing company tax and reforming mining tax in a paper published in the Tax Policy Journal;
- estimating the effects of improved workplace practices on productivity in the building and construction industry, and the flow-on effects to the wider economy for Master Builders Australia;
- estimating the economic impacts of capital expenditure and plant operation by the oil and gas industry in Gippsland, Victoria and Australia for ExxonMobil; and
- estimating the effects of additional Vocational Education and Training (VET) funding on the labour force and the economy for TAFE Directors Australia.

The Independent Extended CGE model was completed recently and is already in use in three separate client projects.

## A.8 References

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## Appendix B: Detailed results

Tables B1 to B5 provide detailed economic impacts for the five scenarios.

Table B.1 Effects of changes to FCS policy on household living standards

	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
Real wage	-0.01%	-0.01%	-0.02%	-0.03%	-0.27%	-0.02%
Real after-tax wage	0.10%	0.14%	0.15%	0.21%	0.02%	0.31%
Real consumption (national accounts)	0.05%	0.08%	0.08%	0.11%	-0.07%	0.17%
consumption	0.05%	0.08%	0.08%	0.11%	-0.07%	0.17%
leisure	-0.04%	-0.07%	-0.07%	-0.10%	-0.09%	-0.15%
full consumption	0.03%	0.04%	0.04%	0.06%	-0.07%	0.10%
full nominal consumption	0.06%	0.09%	0.10%	0.14%	0.20%	0.19%
Household welfare \$m 2012/13 terms	325	485	473	683	-800	1,061

Source: Independent Economics

Table B.2 Effects of changes to FCS policy on real GDP by expenditure

	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
Households Final Consumption Expenditure	0.05%	0.08%	0.08%	0.11%	-0.07%	0.17%
General Government Final Demand	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Investment	0.04%	0.06%	0.06%	0.09%	-0.06%	0.13%
Exports	0.04%	0.06%	0.06%	0.09%	0.01%	0.13%
less Imports	0.05%	0.07%	0.07%	0.10%	0.01%	0.15%
<b>GDP</b>	<b>0.04%</b>	<b>0.05%</b>	<b>0.05%</b>	<b>0.08%</b>	<b>-0.05%</b>	<b>0.12%</b>

Source: Independent Economics

Table B.3 Effects of changes to FCS policy on real GDP by broad (1-digit) industry

	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
A Agriculture, forestry and fishing	0.05%	0.07%	0.07%	0.10%	0.03%	0.15%
B Mining	0.03%	0.04%	0.04%	0.06%	0.01%	0.08%
C Manufacturing	0.04%	0.06%	0.07%	0.10%	0.02%	0.14%
D Electricity, gas, water and waste services	0.05%	0.08%	0.08%	0.12%	0.02%	0.17%
E Construction	0.03%	0.05%	0.05%	0.07%	-0.05%	0.10%
F Wholesale trade	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
G Retail trade	0.06%	0.09%	0.09%	0.14%	0.06%	0.20%
H Accommodation and food services	0.05%	0.08%	0.08%	0.12%	0.06%	0.17%
I Transport, postal and warehousing	0.04%	0.06%	0.07%	0.10%	0.03%	0.14%
J Information media and telecommunications	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
K Financial and insurance services	0.02%	0.03%	0.01%	0.02%	-0.59%	0.07%
L Rental, hiring and real estate services	0.04%	0.06%	0.06%	0.08%	-0.01%	0.12%
M Professional, scientific and technical services	0.04%	0.06%	0.06%	0.09%	0.00%	0.13%
N Administrative and support services	0.04%	0.06%	0.07%	0.10%	0.01%	0.14%
O Public administration and safety	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%
P Education and training	0.03%	0.04%	0.04%	0.06%	0.04%	0.09%
Q Health care and social assistance	0.02%	0.03%	0.03%	0.05%	0.03%	0.07%
R Arts and recreation services	0.05%	0.08%	0.08%	0.12%	0.04%	0.17%
S Other services	0.05%	0.08%	0.08%	0.12%	0.04%	0.17%
T Ownership of dwellings	0.03%	0.04%	0.03%	0.05%	-0.14%	0.08%
Indirect taxes	0.05%	0.08%	0.08%	0.12%	0.02%	0.18%
<b>GDP</b>	<b>0.04%</b>	<b>0.05%</b>	<b>0.05%</b>	<b>0.08%</b>	<b>-0.05%</b>	<b>0.12%</b>

Source: Independent Economics

Table B.4 Effects of changes to FCS policy on real household consumption by broad category

	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
Food	0.07%	0.10%	0.10%	0.15%	0.06%	0.22%
Alcoholic beverages	0.06%	0.10%	0.10%	0.15%	0.06%	0.21%
Cigarettes and tobacco	0.06%	0.10%	0.10%	0.14%	0.06%	0.21%
Clothing and footwear	0.07%	0.10%	0.10%	0.15%	0.06%	0.22%
Housing services	0.04%	0.06%	0.06%	0.08%	-0.15%	0.13%
Water and sewerage services	0.08%	0.12%	0.12%	0.18%	0.05%	0.26%
Electricity, gas and other fuel	0.07%	0.10%	0.11%	0.16%	0.06%	0.23%
Furnishings and household equipment	0.07%	0.10%	0.10%	0.15%	0.06%	0.22%
Health	0.07%	0.10%	0.11%	0.15%	0.06%	0.22%
Vehicle purchase and operation	0.07%	0.10%	0.11%	0.15%	0.06%	0.22%
Transport services	0.07%	0.11%	0.11%	0.16%	0.05%	0.23%
Communication	0.07%	0.10%	0.10%	0.15%	0.06%	0.22%
Goods for recreation and culture	0.07%	0.10%	0.11%	0.15%	0.06%	0.22%
Recreational and cultural services	0.07%	0.10%	0.11%	0.16%	0.06%	0.23%
Education services	0.07%	0.10%	0.11%	0.16%	0.07%	0.23%
Catering	0.07%	0.10%	0.10%	0.15%	0.06%	0.21%
Accommodation services	0.06%	0.09%	0.10%	0.14%	0.07%	0.21%
Other goods and services	0.07%	0.10%	0.11%	0.15%	0.06%	0.22%
Financial services	-0.04%	-0.06%	-0.10%	-0.14%	-0.98%	-0.14%
<b>Total</b>	<b>0.05%</b>	<b>0.08%</b>	<b>0.08%</b>	<b>0.11%</b>	<b>-0.07%</b>	<b>0.17%</b>

Source: Independent Economics

Table B.5 Effects of changes to FCS policy on real GDP by detailed (model) industry

	\$100k limit	\$50k limit	apply premium	limit + premium	abolish FCS	costless scheme
0101A Sheep Farming	0.04%	0.05%	0.06%	0.08%	0.03%	0.12%
0101B Beef Cattle Farming	0.04%	0.07%	0.07%	0.10%	0.05%	0.14%
0101C Grain Growing	0.04%	0.06%	0.06%	0.09%	0.02%	0.13%
0101D Dairy Cattle Farming	0.05%	0.08%	0.08%	0.12%	0.05%	0.18%
0102A Poultry Farming	0.05%	0.07%	0.07%	0.11%	0.05%	0.15%
0102B Deer Farming	0.04%	0.06%	0.06%	0.09%	0.05%	0.13%
0102C Other Livestock Farming	0.05%	0.07%	0.07%	0.11%	0.04%	0.15%
0103A Nursery and Floriculture Production	0.05%	0.07%	0.08%	0.11%	0.01%	0.16%
0103B Mushroom Growing	0.06%	0.08%	0.09%	0.13%	0.05%	0.19%
0103C Vegetable Growing (Under Cover)	0.05%	0.08%	0.08%	0.12%	0.04%	0.18%
0103D Potatoes	0.06%	0.08%	0.09%	0.13%	0.05%	0.18%
0103E Other Vegetables	0.06%	0.09%	0.09%	0.13%	0.05%	0.19%
0103F Fruit and Tree Nut Growing	0.05%	0.08%	0.08%	0.12%	0.05%	0.17%
0103G Other Crop Growing	0.05%	0.07%	0.07%	0.11%	0.04%	0.16%
0201Z Aquaculture	0.05%	0.08%	0.09%	0.12%	0.05%	0.18%
0301Z Forestry and Logging	0.03%	0.05%	0.05%	0.07%	-0.03%	0.11%
0401A Fishing	0.05%	0.08%	0.08%	0.12%	0.06%	0.17%
0401B Hunting and Trapping	0.02%	0.03%	0.04%	0.05%	0.04%	0.07%
0501A Forestry Support Services	0.04%	0.05%	0.06%	0.08%	0.01%	0.12%
0501B Agriculture and Fishing Support Services	0.05%	0.07%	0.07%	0.10%	0.03%	0.15%
0601Z Coal mining	0.03%	0.04%	0.04%	0.06%	0.02%	0.09%
0701A Crude oil (incl. condensate)	0.01%	0.02%	0.02%	0.03%	0.01%	0.04%
0701B Gas Extraction	0.02%	0.03%	0.04%	0.05%	0.01%	0.07%
0801Z Iron Ore Mining	0.03%	0.04%	0.05%	0.07%	0.01%	0.10%
0802A Gold Ore Mining	0.03%	0.04%	0.04%	0.06%	0.02%	0.08%
0802B Other Metal Ore Mining	0.02%	0.03%	0.04%	0.05%	0.02%	0.07%
0901A Construction Material Mining	0.03%	0.05%	0.05%	0.07%	-0.04%	0.11%

0901B Other Non-Metallic Mineral Mining and Quarrying	0.06%	0.08%	0.09%	0.13%	0.03%	0.18%
1001A Exploration	0.04%	0.06%	0.06%	0.09%	0.01%	0.13%
1001B Other Mining Support Services	0.03%	0.04%	0.05%	0.07%	0.02%	0.10%
1101A Meat Processing	0.04%	0.06%	0.06%	0.09%	0.05%	0.13%
1101B Poultry Processing	0.06%	0.09%	0.10%	0.14%	0.05%	0.20%
1101C Bacon and Ham	0.06%	0.09%	0.09%	0.13%	0.05%	0.19%
1101D Other Smallgoods	0.06%	0.09%	0.09%	0.14%	0.05%	0.20%
1102Z Processed Seafood Manufacturing	0.06%	0.09%	0.10%	0.14%	0.05%	0.21%
1103A Milk	0.06%	0.09%	0.09%	0.13%	0.06%	0.19%
1103B Cheese	0.06%	0.08%	0.09%	0.13%	0.05%	0.18%
1103C Ice cream and other dairy products	0.06%	0.08%	0.09%	0.13%	0.06%	0.18%
1104A Jams	0.06%	0.09%	0.10%	0.14%	0.07%	0.21%
1104B Other Fruit Processing	0.06%	0.09%	0.10%	0.14%	0.07%	0.20%
1104C Vegetables, frozen	0.06%	0.09%	0.10%	0.14%	0.06%	0.20%
1104D Vegetables, prepared or preserved	0.05%	0.07%	0.08%	0.11%	0.06%	0.16%
1104E Tomato pulp, puree and paste	0.06%	0.09%	0.10%	0.14%	0.07%	0.20%
1104F Other processed vegetables	0.06%	0.09%	0.09%	0.14%	0.06%	0.19%
1105Z Oils and Fats Manufacturing	0.06%	0.08%	0.09%	0.13%	0.05%	0.19%
1106A Grain Mill Product Manufacturing	0.06%	0.09%	0.09%	0.13%	0.05%	0.19%
1106B Cereal, Pasta and Baking Mix Manufacturing	0.06%	0.09%	0.10%	0.14%	0.05%	0.20%
1107A Bread Manufacturing	0.06%	0.09%	0.09%	0.13%	0.07%	0.19%
1107B Other Bakery Product Manufacturing	0.06%	0.08%	0.09%	0.13%	0.07%	0.18%
1108A Sugar Manufacturing	0.04%	0.06%	0.07%	0.10%	0.06%	0.14%
1108B Confectionery Manufacturing	0.06%	0.09%	0.09%	0.13%	0.07%	0.19%
1109A Potato, Corn and Other Crisp Manufacturing	0.06%	0.09%	0.10%	0.14%	0.07%	0.21%
1109B Prepared Animal and Bird Feed Manufacturing	0.06%	0.08%	0.09%	0.13%	0.05%	0.18%
1109C Coffee and tea, including substitutes	0.06%	0.09%	0.10%	0.14%	0.06%	0.20%
1109D Other Food Product Manufacturing n.e.c.	0.06%	0.09%	0.09%	0.13%	0.06%	0.19%
1201Z Soft Drinks, Cordials and Syrup Manufacturing	0.04%	0.07%	0.07%	0.10%	0.05%	0.15%
1202Z Beer Manufacturing	0.05%	0.07%	0.07%	0.11%	0.04%	0.15%

1205A Spirit Manufacturing	0.05%	0.07%	0.07%	0.11%	0.05%	0.15%
1205B Wine and Other Alcoholic Beverage Manufacturing	0.04%	0.06%	0.06%	0.09%	0.04%	0.13%
1205C Cigarette and Tobacco Product Manufacturing	0.04%	0.05%	0.06%	0.08%	0.05%	0.12%
1301Z Textile Manufacturing	0.04%	0.06%	0.06%	0.09%	0.05%	0.13%
1302Z Tanned Leather, Dressed Fur and Leather Product Manufacturing	0.03%	0.05%	0.05%	0.08%	0.05%	0.11%
1303A Textile Floor Covering Manufacturing	0.04%	0.06%	0.07%	0.10%	0.04%	0.14%
1303B Rope, Cordage and Twine Manufacturing	0.04%	0.06%	0.07%	0.10%	0.04%	0.14%
1303C Cut and Sewn Textile Product Manufacturing	0.05%	0.07%	0.08%	0.11%	0.05%	0.16%
1303D Textile Finishing and Other Textile Product Manufacturing	0.04%	0.07%	0.07%	0.10%	0.05%	0.14%
1304Z Knitted Product Manufacturing	0.04%	0.05%	0.06%	0.09%	0.13%	0.12%
1305Z Clothing Manufacturing	0.05%	0.07%	0.07%	0.11%	0.08%	0.15%
1306Z Footwear Manufacturing	0.06%	0.08%	0.09%	0.13%	0.07%	0.18%
1401Z Sawmill Product Manufacturing	0.03%	0.05%	0.05%	0.07%	-0.05%	0.10%
1402Z Other Wood Product Manufacturing	0.03%	0.05%	0.05%	0.07%	-0.07%	0.11%
1501Z Pulp, Paper and Paperboard Manufacturing	0.05%	0.07%	0.07%	0.11%	0.04%	0.16%
1502A Paper Stationery Manufacturing	0.04%	0.07%	0.07%	0.10%	0.03%	0.14%
1502B Sanitary Paper Product Manufacturing	0.05%	0.08%	0.08%	0.12%	0.05%	0.18%
1502C Other Converted Paper Product Manufacturing	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
1601A Printing and Printing Support Services	0.04%	0.06%	0.07%	0.09%	0.01%	0.14%
1601B Reproduction of Recorded Media	0.05%	0.07%	0.07%	0.11%	0.02%	0.16%
1701A Automotive petrol; gasoline refining or blending; motor spirit (incl aviation spirit)	0.06%	0.08%	0.09%	0.13%	0.03%	0.18%
1701B Kerosene (incl kerosene type jet fuel)	0.05%	0.08%	0.08%	0.11%	0.04%	0.17%
1701C Petrodiesel	0.05%	0.07%	0.07%	0.10%	0.01%	0.15%
1701D Other Petroleum Refining and Petroleum Fuel Manufacturing	0.05%	0.07%	0.07%	0.10%	0.01%	0.15%
1701E Other Petroleum and Coal Product Manufacturing	0.04%	0.06%	0.07%	0.10%	0.01%	0.14%

1801Z Human Pharmaceutical and Medicinal Product Manufacturing	0.03%	0.05%	0.05%	0.07%	0.04%	0.11%
1802Z Veterinary Pharmaceutical and Medicinal Product Manufacturing	0.06%	0.08%	0.09%	0.13%	0.03%	0.18%
1803A Basic Chemical Manufacturing	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
1803B Basic Polymer Manufacturing	0.05%	0.07%	0.07%	0.11%	0.01%	0.15%
1803C Fertiliser and Pesticide Manufacturing	0.06%	0.08%	0.09%	0.13%	0.03%	0.18%
1803D Other Basic Chemical Product Manufacturing	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
1804A Soap and Toothpaste Manufacturing	0.06%	0.09%	0.09%	0.13%	0.06%	0.19%
1804B Other Cleaning Compound Manufacturing	0.06%	0.08%	0.09%	0.13%	0.05%	0.19%
1804C Cosmetic and Toiletry Preparation Manufacturing	0.06%	0.09%	0.10%	0.14%	0.07%	0.20%
1901A Tyre Manufacturing	0.05%	0.08%	0.09%	0.12%	0.07%	0.18%
1901B Other Polymer Product Manufacturing	0.05%	0.07%	0.07%	0.10%	0.00%	0.15%
1902Z Natural Rubber Product Manufacturing	0.03%	0.04%	0.04%	0.06%	0.03%	0.09%
2001Z Glass and Glass Product Manufacturing	0.05%	0.08%	0.08%	0.12%	0.05%	0.17%
2002Z Ceramic Product Manufacturing	0.04%	0.06%	0.06%	0.09%	-0.04%	0.13%
2003Z Cement, Lime and Ready-Mixed Concrete Manufacturing	0.03%	0.05%	0.05%	0.07%	-0.06%	0.10%
2004Z Plaster and Concrete Product Manufacturing	0.03%	0.05%	0.04%	0.06%	-0.08%	0.10%
2005Z Other Non-Metallic Mineral Product Manufacturing	0.04%	0.05%	0.05%	0.08%	-0.02%	0.12%
2101A Basic Ferrous Metal Manufacturing	0.04%	0.06%	0.06%	0.09%	0.00%	0.13%
2101B Basic Ferrous Metal Product Manufacturing	0.04%	0.06%	0.06%	0.09%	0.02%	0.13%
2102A Alumina Production	0.03%	0.04%	0.05%	0.07%	0.03%	0.10%
2102B Aluminium Smelting	0.04%	0.05%	0.06%	0.08%	0.02%	0.12%
2102C Copper, Silver, Lead and Zinc Smelting and Refining	0.03%	0.05%	0.05%	0.07%	0.03%	0.10%
2102D Gold - primary and secondary (excl from purchased scrap)	0.03%	0.04%	0.04%	0.06%	0.03%	0.09%
2102E Other Basic Non-Ferrous Metal Manufacturing	0.03%	0.05%	0.05%	0.07%	0.03%	0.11%

2102F Basic Non-Ferrous Metal Product Manufacturing	0.04%	0.06%	0.06%	0.08%	0.01%	0.12%
2201Z Forged Iron and Steel Product Manufacturing	0.04%	0.06%	0.07%	0.10%	0.02%	0.14%
2202Z Structural Metal Product Manufacturing	0.03%	0.05%	0.05%	0.07%	-0.04%	0.11%
2203A Metal Container Manufacturing	0.04%	0.06%	0.07%	0.10%	0.00%	0.14%
2203B Sheet Metal Product Manufacturing (except Metal Structural and Container Products)	0.04%	0.06%	0.06%	0.09%	0.00%	0.14%
2204Z Other Fabricated Metal Product manufacturing	0.03%	0.05%	0.05%	0.08%	0.02%	0.11%
2301A Motor Vehicle Manufacturing	0.06%	0.08%	0.09%	0.13%	0.04%	0.18%
2301B Motor Vehicle Body and Trailer Manufacturing	0.05%	0.08%	0.08%	0.12%	0.03%	0.18%
2301C Automotive Electrical Component Manufacturing	0.05%	0.08%	0.08%	0.12%	0.03%	0.18%
2301D Other Motor Vehicle Parts Manufacturing	0.06%	0.09%	0.09%	0.13%	0.04%	0.19%
2301E Other Transport Equipment Manufacturing n.e.c.	0.05%	0.08%	0.08%	0.12%	0.05%	0.17%
2302A Shipbuilding and Repair Services	0.00%	0.01%	0.01%	0.01%	0.02%	0.01%
2302B Boatbuilding and Repair Services	0.05%	0.07%	0.07%	0.10%	0.04%	0.15%
2303Z Railway Rolling Stock Manufacturing and Repair Services	0.04%	0.06%	0.06%	0.09%	0.06%	0.12%
2304Z Aircraft Manufacturing and Repair Services	0.03%	0.05%	0.05%	0.07%	0.06%	0.10%
2401A Photographic, Optical and Ophthalmic Equipment Manufacturing	0.05%	0.08%	0.09%	0.12%	0.05%	0.18%
2401B Medical and Surgical Equipment Manufacturing	0.04%	0.06%	0.07%	0.10%	0.03%	0.14%
2401C Other Professional and Scientific Equipment Manufacturing	0.05%	0.07%	0.07%	0.10%	0.03%	0.15%
2401D Computer and Electronic Office Equipment Manufacturing	0.05%	0.07%	0.07%	0.11%	0.03%	0.16%
2401E Communication Equipment Manufacturing	0.05%	0.08%	0.08%	0.12%	0.03%	0.17%
2401F Other Electronic Equipment Manufacturing	0.05%	0.08%	0.08%	0.12%	0.04%	0.17%
2403Z Electrical Equipment Manufacturing	0.04%	0.06%	0.07%	0.10%	0.03%	0.14%
2404Z Domestic Appliance Manufacturing	0.05%	0.08%	0.09%	0.12%	0.06%	0.18%

2405A Pump, Compressor, Heating and Ventilation Equipment Manufacturing	0.04%	0.06%	0.06%	0.09%	0.03%	0.13%
2405B Specialised Machinery and Equipment Manufacturing	0.04%	0.06%	0.07%	0.10%	0.03%	0.14%
2405C Other Machinery and Equipment Manufacturing	0.04%	0.06%	0.06%	0.09%	0.04%	0.13%
2501Z Furniture Manufacturing	0.04%	0.06%	0.07%	0.10%	0.05%	0.14%
2502A Jewellery and Silverware Manufacturing	0.05%	0.07%	0.07%	0.11%	0.07%	0.15%
2502B Toy Manufacturing	0.06%	0.08%	0.09%	0.13%	0.09%	0.18%
2502C Sporting Product Manufacturing	0.06%	0.09%	0.09%	0.13%	0.09%	0.19%
2502D Other Manufacturing n.e.c.	0.04%	0.06%	0.07%	0.10%	0.04%	0.14%
2601A Fossil Fuel Electricity Generation	0.05%	0.08%	0.08%	0.12%	0.03%	0.17%
2601B Hydro-Electricity Generation	0.05%	0.08%	0.08%	0.12%	0.03%	0.17%
2601C Other Electricity Generation	0.05%	0.08%	0.09%	0.12%	0.03%	0.18%
2605A Other electricity service income	0.06%	0.08%	0.09%	0.12%	0.03%	0.18%
2605M Margin - Electricity transmission, distribution and on selling (2620-2640)	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
2701A Other gas service income	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
2701M Margin - gas distribution	0.04%	0.06%	0.06%	0.09%	0.03%	0.14%
2801Z Water Supply, Sewerage and Drainage Services	0.06%	0.09%	0.09%	0.13%	0.02%	0.19%
2901Z Waste Collection, Treatment and Disposal Services	0.03%	0.05%	0.05%	0.07%	-0.02%	0.11%
3001Z Residential Building Construction	0.03%	0.04%	0.04%	0.05%	-0.17%	0.09%
3002Z Non-Residential Building Construction	0.02%	0.03%	0.03%	0.04%	0.02%	0.06%
3101A Road and Bridge Construction	0.01%	0.01%	0.01%	0.02%	0.01%	0.03%
3101B Other Heavy and Civil Engineering Construction	0.03%	0.05%	0.05%	0.07%	0.02%	0.10%
3201Z Construction Services	0.04%	0.05%	0.05%	0.08%	-0.06%	0.12%
3301A Non-margin - wholesaling services	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
3301B Commission-Based Wholesaling	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
3301M Margin - wholesaling services	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
3901A Non-margin - retailing services	0.05%	0.07%	0.08%	0.11%	0.01%	0.16%

3901B Retail commission on sales	0.06%	0.09%	0.09%	0.13%	0.03%	0.19%
3901M Margin - retailing services	0.06%	0.09%	0.09%	0.14%	0.06%	0.20%
4401Z Accommodation	0.04%	0.06%	0.07%	0.10%	0.07%	0.14%
4501A Meal preparation and presentation	0.05%	0.08%	0.08%	0.12%	0.05%	0.17%
4501B Beverage serving service	0.06%	0.08%	0.09%	0.13%	0.05%	0.18%
4501C Takeaway food	0.06%	0.09%	0.09%	0.13%	0.06%	0.19%
4501D Catering services	0.04%	0.06%	0.06%	0.09%	0.02%	0.14%
4501E Net losses from gambling - Clubs, pubs, taverns and bars (Hospitality)	0.06%	0.08%	0.09%	0.13%	0.06%	0.19%
4501M Margin - food and beverage services (4511-4530)	0.06%	0.09%	0.10%	0.14%	0.06%	0.20%
4601A Non-margin - Road Freight Transport	0.05%	0.07%	0.07%	0.11%	0.02%	0.15%
4601B Road Passenger Transport	0.04%	0.07%	0.07%	0.10%	0.05%	0.14%
4601M Margin - Road Freight Transport	0.05%	0.07%	0.07%	0.11%	0.03%	0.15%
4701A Non-margin - Rail Freight Transport	0.04%	0.06%	0.06%	0.09%	0.02%	0.13%
4701B Rail Passenger Transport	0.05%	0.08%	0.08%	0.12%	0.08%	0.17%
4701M Margin - Rail Freight Transport	0.02%	0.03%	0.04%	0.06%	0.14%	0.07%
4801A Non-margin - Water Freight Transport	0.10%	0.16%	0.16%	0.23%	-0.01%	0.34%
4801B Water Passenger Transport	0.06%	0.09%	0.10%	0.14%	0.02%	0.21%
4801M Margin - Water Freight Transport	0.07%	0.10%	0.10%	0.15%	0.01%	0.22%
4901A Non-margin - Air and Space Freight Transport	0.04%	0.06%	0.06%	0.09%	0.03%	0.13%
4901B Air and Space Passenger Transport	0.05%	0.08%	0.09%	0.12%	0.05%	0.18%
4901M Margin - Air and Space Freight Transport	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
4801C Scenic and Sightseeing Transport	0.08%	0.11%	0.12%	0.17%	0.03%	0.25%
4801D Non-margin - Pipeline and Other Transport	0.04%	0.07%	0.07%	0.10%	0.01%	0.14%
4801N Margin - Pipeline and Other Transport	0.04%	0.06%	0.07%	0.10%	0.03%	0.14%
5101Z Postal and Courier Pick-up and Delivery Service	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
5201A Water Transport Support Services	0.05%	0.08%	0.08%	0.12%	0.02%	0.17%
5201B Airport Operations and Other Air Transport Support Services	0.06%	0.08%	0.09%	0.13%	0.03%	0.19%
5201C Other Transport Support Services	0.02%	0.04%	0.04%	0.06%	0.01%	0.08%

5201D Warehousing and Storage Services	0.04%	0.06%	0.07%	0.09%	0.01%	0.14%
5201M Margin - Water Transport Support Services	0.06%	0.08%	0.09%	0.13%	0.04%	0.18%
5401A Newspaper and Magazine publishing	0.05%	0.08%	0.08%	0.12%	0.02%	0.17%
5401B Book publishing	0.06%	0.10%	0.10%	0.15%	0.06%	0.21%
5401C Other Publishing	0.05%	0.07%	0.07%	0.11%	0.01%	0.16%
5401D Software Publishing	0.04%	0.07%	0.07%	0.10%	0.03%	0.14%
5501A Motion Picture and Video Activities	0.05%	0.07%	0.07%	0.11%	0.04%	0.15%
5501B Sound Recording and Music Publishing	0.05%	0.07%	0.07%	0.10%	0.07%	0.15%
5601A Radio Broadcasting	0.05%	0.08%	0.08%	0.11%	-0.01%	0.17%
5601B Television Broadcasting	0.06%	0.09%	0.09%	0.13%	0.01%	0.19%
5701A Internet Publishing and Broadcasting	0.06%	0.08%	0.09%	0.13%	0.02%	0.19%
5701B Internet Service Providers and Web Search Portals	0.06%	0.10%	0.10%	0.15%	0.04%	0.21%
5701C Data Processing, Web Hosting and Electronic Information Storage Services	0.05%	0.07%	0.07%	0.11%	0.02%	0.16%
5801A Wired Telecommunications Network Operation	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
5801B Other Telecommunications Network Operation	0.05%	0.07%	0.08%	0.11%	0.03%	0.16%
5801C Other Telecommunications Services	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
6001A Libraries and Archives	0.02%	0.04%	0.04%	0.06%	0.03%	0.08%
6001B Other Information Services	0.01%	0.01%	0.01%	0.02%	0.00%	0.03%
6201A Banks, building societies, credit unions	-0.05%	-0.08%	-0.14%	-0.20%	-1.61%	-0.17%
6201B Other Depository Financial Intermediation	0.08%	0.11%	0.13%	0.19%	0.38%	0.25%
6201C Non-Depository Financing	0.05%	0.07%	0.08%	0.11%	0.04%	0.16%
6201D Financial Asset Investing	0.13%	0.20%	0.23%	0.33%	0.80%	0.43%
6301A Life Insurance	0.26%	0.38%	0.45%	0.65%	1.53%	0.84%
6301B Health Insurance	0.26%	0.38%	0.45%	0.65%	1.53%	0.84%
6301C General Insurance	0.12%	0.18%	0.21%	0.30%	0.60%	0.40%
6301D Superannuation Funds	0.26%	0.38%	0.45%	0.65%	1.53%	0.84%
6301M Marine insurance provision (Margin)	0.03%	0.05%	0.04%	0.06%	-0.28%	0.11%
6401A Financial Asset Broking Services	0.04%	0.06%	0.07%	0.10%	0.22%	0.14%

6401B Other Auxiliary Finance and Investment Services	0.07%	0.10%	0.12%	0.18%	0.45%	0.23%
6401C Auxiliary Insurance Services	0.03%	0.05%	0.05%	0.08%	0.00%	0.11%
6601A Goods and Equipment Rental and Hiring	0.05%	0.07%	0.07%	0.10%	0.00%	0.15%
6601B Non-Financial Intangible Assets (Except Copyrights) Leasing	0.05%	0.08%	0.08%	0.12%	0.00%	0.18%
6701A Residential Property Operators: owner-occupied	0.03%	0.04%	0.03%	0.05%	-0.14%	0.08%
6701B Residential Property Operators: rented	0.03%	0.04%	0.04%	0.05%	-0.14%	0.08%
6702A Non-Residential Property Operators	0.03%	0.05%	0.05%	0.07%	0.01%	0.10%
6702B Real Estate Services	0.04%	0.06%	0.06%	0.09%	-0.06%	0.13%
6901A Scientific Research Services	0.04%	0.05%	0.05%	0.08%	-0.01%	0.12%
6901B Architectural Services	0.04%	0.06%	0.06%	0.09%	-0.04%	0.13%
6901C Surveying and Mapping Services	0.04%	0.05%	0.05%	0.08%	-0.03%	0.12%
6901D Engineering Design and Engineering Consulting Services	0.04%	0.06%	0.06%	0.09%	-0.01%	0.13%
6901E Other Specialised Design Services	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
6901F Scientific Testing and Analysis Services	0.05%	0.07%	0.07%	0.10%	-0.02%	0.15%
6901G Legal Services	0.04%	0.06%	0.06%	0.09%	0.00%	0.14%
6901H Accounting Services	0.05%	0.08%	0.08%	0.11%	0.01%	0.17%
6901I Advertising Services	0.04%	0.07%	0.07%	0.10%	0.01%	0.15%
6901J Market Research and Statistical Services	0.04%	0.06%	0.06%	0.09%	0.02%	0.12%
6901K Corporate Head Office Management Services	0.07%	0.10%	0.10%	0.15%	-0.02%	0.22%
6901L Management Advice and Related Consulting Services	0.04%	0.06%	0.07%	0.10%	0.00%	0.14%
6901O Veterinary Services	0.08%	0.11%	0.12%	0.17%	0.03%	0.25%
6901P Professional Photographic Services	0.06%	0.09%	0.09%	0.13%	0.02%	0.19%
6901Q Other Professional, Scientific and Technical Services n.e.c.	0.04%	0.06%	0.06%	0.09%	0.01%	0.14%
7001Z Computer Systems Design and Related Services	0.03%	0.04%	0.04%	0.06%	-0.01%	0.09%
7210A Employment Placement and Recruitment Services	0.03%	0.04%	0.04%	0.06%	0.01%	0.09%

7210B Labour Supply Services	0.04%	0.06%	0.06%	0.09%	0.01%	0.13%
7210C Travel Agency and Tour Arrangement Services	0.05%	0.08%	0.08%	0.12%	0.04%	0.17%
7210D Other Administrative Services	0.04%	0.07%	0.07%	0.10%	0.01%	0.15%
7310A Building Cleaning, Pest Control and Gardening Services	0.05%	0.07%	0.07%	0.11%	0.00%	0.16%
7310B Packaging Services	0.05%	0.07%	0.07%	0.10%	0.02%	0.15%
7501Z Public Administration and Regulatory Services	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%
7601Z Defence	0.00%	0.00%	0.00%	0.00%	0.00%	-0.01%
7701Z Public Order and Safety	0.01%	0.02%	0.02%	0.03%	0.01%	0.04%
8010A Preschool Education	0.04%	0.06%	0.06%	0.09%	0.05%	0.13%
8010B Primary Education	0.02%	0.03%	0.03%	0.05%	0.03%	0.06%
8010C Secondary Education	0.03%	0.04%	0.05%	0.07%	0.04%	0.09%
8010D Special School Education	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%
8110A Technical and Vocational Education and Training	0.03%	0.04%	0.04%	0.06%	0.05%	0.09%
8110B Higher Education	0.03%	0.04%	0.04%	0.06%	0.05%	0.09%
8210A Adult, Community and Other Education	0.05%	0.07%	0.07%	0.11%	0.07%	0.15%
8210B Educational Support Services	0.05%	0.08%	0.08%	0.12%	0.03%	0.17%
8401A Hospitals	0.02%	0.02%	0.02%	0.04%	0.02%	0.05%
8401B Medical Services	0.02%	0.03%	0.04%	0.05%	0.05%	0.07%
8401C Pathology and Diagnostic Imaging Services	0.02%	0.03%	0.03%	0.05%	0.03%	0.07%
8401D Dental Services	0.05%	0.08%	0.08%	0.12%	0.06%	0.16%
8401E Optometry and optical dispensing	0.05%	0.08%	0.08%	0.12%	0.06%	0.17%
8401F Other Allied Health Services	0.05%	0.07%	0.07%	0.10%	0.05%	0.15%
8401G Other Health Care Services	0.01%	0.02%	0.02%	0.02%	0.02%	0.03%
8601A Aged Care Residential Services	0.01%	0.02%	0.02%	0.03%	0.02%	0.04%
8601B Other Residential Care Services	0.03%	0.04%	0.04%	0.06%	0.04%	0.09%
8601C Child Care Services	0.04%	0.05%	0.06%	0.08%	0.06%	0.12%
8601D Other Social Assistance Services	0.02%	0.03%	0.03%	0.04%	0.03%	0.06%
8901A Museum Operation	0.01%	0.02%	0.02%	0.03%	0.02%	0.04%
8901B Parks and Gardens Operations	0.01%	0.02%	0.02%	0.03%	0.02%	0.04%

8901C Creative and Performing Arts Activities	0.05%	0.07%	0.07%	0.10%	0.03%	0.15%
9101A Sports and Physical Recreation Activities	0.05%	0.07%	0.07%	0.11%	0.04%	0.15%
9101B Horse and Dog Racing Activities	0.06%	0.10%	0.10%	0.15%	0.06%	0.21%
9101C Amusement and Other Recreation Activities	0.06%	0.09%	0.09%	0.13%	0.05%	0.19%
9201A Casino Operation	0.08%	0.12%	0.12%	0.18%	0.06%	0.26%
9201B Lottery Operation	0.08%	0.12%	0.13%	0.18%	0.06%	0.27%
9201C Other Gambling Activities	0.08%	0.11%	0.12%	0.17%	0.06%	0.25%
9401Z Automotive Repair and Maintenance	0.05%	0.07%	0.08%	0.11%	0.02%	0.16%
9402A Machinery and Equipment Repair and Maintenance	0.04%	0.06%	0.06%	0.09%	0.00%	0.13%
9402B Other Repair and Maintenance	0.06%	0.08%	0.09%	0.13%	0.03%	0.18%
9501A Personal Care Services	0.06%	0.08%	0.09%	0.13%	0.07%	0.18%
9501B Funeral, Crematorium and Cemetery Services	0.03%	0.05%	0.05%	0.08%	0.05%	0.11%
9501C Laundry and Dry-Cleaning Services	0.04%	0.06%	0.07%	0.10%	0.05%	0.14%
9501D Photographic Film Processing	0.04%	0.07%	0.07%	0.10%	0.02%	0.14%
9501E Parking Services	0.05%	0.08%	0.08%	0.12%	0.05%	0.17%
9501F Other Personal Services n.e.c.	0.05%	0.08%	0.09%	0.12%	0.07%	0.18%
9501G Private Households Employing Staff and Undifferentiated Goods- and Service-Producing Activities of Households for Own Use	0.06%	0.09%	0.09%	0.13%	0.07%	0.19%
9502A Religious Services	0.07%	0.10%	0.10%	0.15%	0.06%	0.22%
9502B Civic, Professional and Other Interest Group Services	0.06%	0.10%	0.10%	0.15%	0.04%	0.21%
Indirect taxes	0.05%	0.08%	0.08%	0.12%	0.02%	0.18%
<b>GDP</b>	<b>0.04%</b>	<b>0.05%</b>	<b>0.05%</b>	<b>0.08%</b>	<b>-0.05%</b>	<b>0.12%</b>

Source: Independent Economics