



KPMG Econtech

Economic Impacts of the Austrade Export Market Development Grant

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ADVISORY



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The findings in this report have been formed on the above basis.

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1 Introduction

The Export Marketing Development Grants (EMDG) Scheme effectively redistributes productive resources from Australian taxpayers (including firms) to new and emerging exporters. To the extent that this transfer of resources results in an increase in community welfare than would otherwise be the case, the Scheme can be judged to be efficient.

Modelling results reported here suggest that this is the case when account is taken of the improved efficiency of EMDG exporters and their competitors (positive 'spillover' effects). In particular, it is estimated that for every \$1 cost to the taxpayer, they receive \$5.38 in benefits from the scheme.

The Export Market Development Grants (EMDG) Scheme is an Australian Government program aiming to boost Australian exports of goods and services. This Scheme provides financial assistance to help exporters to access foreign markets.

In 2008, KPMG Econtech modelled the economy-wide impacts of export marketing grants and included an estimate of any additional “flow-on” impacts of export activity. This modelling was presented in a report for the Australian Trade Commission (Austrade) by Lateral Economics. Austrade used the results of this analysis to inform the 2008 Mortimer Review of Export Policies and Programs.

Austrade has now commissioned KPMG Econtech to update and refine the 2008 modelling. The modelling incorporates data from the latest Austrade survey of EMDG recipients in 2009. Similar to the analysis undertaken for the 2008 report, KPMG Econtech has again used its MM600+ to model the impact of the EMDG as a direct subsidy of exports and an increase in export demand. Further to the 2008 study, KPMG Econtech has also used new information from the survey data to estimate some of the additional economic impacts of the EMDG Scheme (which were discussed, but not quantified in the 2008 report).

In particular, KPMG Econtech has used the following new survey data provided by Austrade:

- changes in the EMDG recipients' productivity;
- the number of EMDG recipient's competitors who also indirectly benefited from the EMDG recipient's activity; and
- the resulting change in these competitors' activity.

Thus, the refined modelling in this update extends the 2008 analysis. Similar to the 2008 analysis, this update captures the impact of the direct export subsidy. It then extends the analysis in two important ways.

- First, other firms outside of the EMDG scheme are learning from EMDG recipients' experience – as evidenced in the new survey data.
- Second, studies show that there is currently a gap between Australian manufacturing productivity and world best practice – indicating there is likely to be room for productivity improvements in Australia. As export firms (such as EMDG firms) compete on the world market, they often find ways to become more competitive/productive – and, again, there is evidence of improved productivity from the new survey data.



The report also compares the impacts of the EMDG Scheme with other government programs and benchmarks.

This report is structured as follows.

- Section 2 outlines the modelling approach used in this analysis.
- Section 3 presents the results of the modelling in terms of both the national impacts and the industry effects of the EMDG Scheme.
- Section 4 summarises the net benefits of the EMDG Scheme and compares the results with other government programs.



2 Modelling approach

This section provides details of the modelling approach used to estimate some of the economic impacts of the EMDG Scheme on the national economy of Australia. This section starts by outlining the features of the model used for this analysis. This is followed by a description of the scenarios that were modelled.

2.1 Computable generated equilibrium (CGE) model

The economic modelling of the impact of the EMDG Scheme was conducted using KPMG Econtech's CGE model - Murphy Model 600 plus (MM600+). MM600+ is a long-term CGE model of the Australian economy that models a long-run equilibrium (approximately 5 to 10 years). It distinguishes 108 industries that produce 672 products, making it six times more detailed than any comparable model. The industry and production classification used in MM600+ is based on Australian and New Zealand Standard Industry Classifications (ANZSIC) used by the Australian Bureau of Statistics (ABS).

The high level of product disaggregation available in MM600+ is important when simulating the EMDG scenarios using the model. This detailed representation in MM600+ means that the impact of the EMDG Scheme can be better simulated in a more sophisticated manner.

MM600+ has the following important features that make it well suited for this analysis.

- Export markets in MM600+ are highly responsive to changes in Australian export prices, reflecting the fact that Australia is a small player in the global market. This level of realism is possible due to the model's unique treatment of the choice of Australian firms to supply the local market or the export market.
- It allows for the substitution effects triggered by changes in the prices of goods and services. Specifically, MM600+ allows substitution between:
 - labour and capital;
 - different types of capital inputs such as motor vehicles, computers, buildings etc;
 - different forms of primary energy, including black coal, brown coal, LPG and natural gas; and
 - road and rail freight transport.
- MM600+ contains more realistic export supply responses to EMD grants than alternative models. For example, in comparable Australian CGE models such as ORANI, it is assumed that there is frictionless switching of supply from domestic to export market. In comparison, MM600+ allows for frictions in switching (elasticity of transformation of 2.5).
- It estimates the effects of industry changes on key macroeconomic aggregates such as GDP, trade balance and Australian consumer living standards.
- MM600+ provides valid measures of changes in consumer welfare or living standards based on compensating and equivalent variations, so that government programs can be correctly evaluated in terms of the public interest.

Further, the use of a CGE model has the following key advantages over the simpler approach of using an input-output model:

- it takes account of how the structure of the economy is likely to respond to changes in relative prices and hence is not rigid; and



- it also takes into account important long-run, national constraints on the economy - such as labour supply constraints, budget balance, external balance and private savings.

This leads to results that are more conservative, but more credible, compared with input-output modelling. Notably, input-output models are often criticised for providing overly-optimistic economic impact assessments of projects in a way that CGE models are not.

Key assumptions

The scenarios modelled in this report are based on the standard long-run closure of the MM600+ model. This long-run closure shows the long-term effects of industry changes, after the economy has fully responded. This is fitting because industry changes should be judged against their lasting effects on the economy, not just their effects in the first one or two years. Some of the assumptions underlying the long-term closure of MM600+ are as follows.

Labour market equilibrium: local employment in MM600+ is fixed, which means that in the long run the labour market is assumed to attain equilibrium, so that an economic shock has no lasting effect on total employment. This assumption is implemented by fixing the level of total employment.

External balance: in MM600+, the balance of trade is at a sustainable level. Specifically, a trade surplus is run equal to the amount required to service foreign-owned capital. The real exchange rate needed to achieve this trade surplus is determined by MM600+. Thus shocks to international trade affect the real exchange rate, not the trade surplus.

Budget balance: the government budget is also assumed to be at a sustainable level. Specifically, it is assumed to be in balance. A lump sum tax/transfer is used as the fiscal policy instrument to balance out the effects on the government budget of increase taxation revenue. Thus any change in revenue is associated with a balancing cut/increase in labour income tax.

Private saving: the level of private sector saving and associated asset accumulation is sustainable in the long run. Private saving is held constant in MM600+ by fixing the quantity of capital that is owned locally, and changes in capital are only in the foreign-owned portion.

More detailed information about MM600+ is presented in Attachment A.

2.2 Model Scenarios

To examine the economic impacts of the EMDG Scheme, four scenarios were modelled in MM600+, as follows.

- **Baseline Scenario:** No EMDG Scheme.
- **Scenario 1:** EMDG Scheme – EMDG Scheme modelled as export subsidies varying rates by product.
- **Scenario 2:** EMDG Scheme plus spillovers – EMDG Scheme as export subsidies and 64 per cent spillover effects of the private rate of return (modelled as higher export demand).
- **Scenario 3:** EMDG Scheme, spillovers plus increased productivity – EMDG Scheme as export subsidies, 64 per cent spillovers of the private rate of return and an increase in labour efficiency.

The differences in economic outcomes between Scenarios 1 to 3 and the Baseline Scenario are calculated to estimate the likely economic benefits of the EMDG Scheme. The main inputs for the scenarios are discussed below.

2.3 Model Inputs

Austrade provided KPMG Econtech with data on the grants provided under the EMDG Scheme by 4-digit ANZSIC code. These grants were allocated by Austrade across ANZSIC codes according to the industry that received the grant. KPMG used these grants to estimate an equivalent export subsidy (discussed further in Scenario 1 below).

Austrade also provided KPMG Econtech with data on the impact of the EMDG Scheme on EMDG recipient's productivity, the number of competitors benefiting from the EMDG recipients activity and the associated increase in competitors exports.

This grant and survey data is shown in the table below.

Table 2.1 EMDG Survey and Grants Data

Average Industry Grant (as a share of total exports)	0.1%
Competitor firms benefiting from each EMDG recipient firm's exporting experience	2.4
The extent of such benefits in the competitor firm's export	10%
Size of labour productivity improvements across EMDG recipient firms	13.2%

Source: Austrade EMDG survey and KPMG Econtech estimates

Based on the survey results provided by Austrade, the table above shows the estimated productivity and spillover benefits attributed to the EMDG scheme.

- When asked if competitor firms learnt or benefited from their activities, the middle response¹ (or the median) indicated that around 4 other firms benefited from each EMDG firm who believed they had been an influence. This equates to, on average, 2.4 other firms benefiting per EMDG surveyed firm.

¹ As the structure of the survey responses precluded discounting outliers, the median was used as the most appropriate response to account for spillover effects.



- When asked to what extent these competitor firms benefited from these spillovers, both the middle (the median) and the most frequent response (the mode) was 10 per cent.
- The survey productivity response also is shown in Table 2.1, where the middle response by those who indicated that they had achieved improved labour productivity, was to estimate an improvement of 15 per cent. Discounting this estimate so that it applies to all EMDG recipients surveyed gives an average labour productivity improvement across all EMDG recipients of approximately 13.2 per cent.

This data was then used to design a number of different modelling scenarios. These scenarios are used to estimate the impact of the EMDG scheme on the Australian economy.

Scenario 1: EMDG Grants

As discussed above, the amount of grants distributed in 2006/07 was used to as an input into the modelling, to estimate the direct impact on exports and the broader economy as a result of awarding these grants.

To model these impacts, the grants first needed to be reallocated, as necessary, to the industry responsible for the related exports. For example, if the grant was provided to a milk wholesaler, the initial 4-digit classification would have allocated this grant to the wholesale trade industry. For modelling purposes such a grant was redirected to the milk manufacturing industry. Thus, as a first step in the analysis, KPMG Econtech reallocated export grants, where necessary, across 4-digit ANZSIC industries.

The grants were then used to estimate a rate of export subsidy by MM600+ product. These export subsidies were fed into KPMG Econtech's MM600+ model (Scenario 1).

The base case scenario assumes perfect information and perfect capital markets. However, it is important to note that this is unlikely to be the case. In particular, the survey results indicate that there are additional benefits to both participants and competitors from the scheme. This indicates that, without the scheme, recipients and their competitors do not have access to full information to assist them in accessing export markets. Further, recipients also do not have access to perfect information to allow them to be as productive as they could be – this information is likely to be more accessible as recipients compete on the world market.

Thus, the EMDG scheme benefits the Australian economy by breaking down some of the barriers to information - opening up the export market and increasing the productivity of recipients.

Scenario 2: EMDG Grants and Spillover Impacts

The next step was to estimate the impacts of the EMDG scheme on firms outside of the EMDG recipients' group. For this, competitor data was used by KPMG Econtech to estimate the spillover effects across competitor firms in the economy. Spillovers include the benefits attributable to non-grant recipients also accessing what has effectively become a more open export market as a result of the Scheme. That is, as other companies gain access to export markets, this flows through to further export activity - induced in the modelling via higher export prices.

In the 2008 report, the modelling included the impacts of a 50 per cent to 100 per cent spillover effect. This was based on studies into the likely impacts of other R&D programs. This update uses new survey data to fine-tune the estimate of the likely spillover impacts of the EMDG scheme.

The Table 2.2 shows how this data was used to estimate a 64 per cent spillover impact associated with the EMDG Scheme.

Table 2.2 EMDG Spillover Impact

Average Industry Grant (A)	0.1%
EMDG share of exports (B)	3.1%
potential EMDG export price impact (A / B)	3.7%
export demand elasticity (D)	10.3
potential export volume gain attributed to EMDG (E = C x D)	38%
productivity gain to competitors (F)	24%
spillover effect (G = F / E)	64%

Source: Austrade EMDG survey and KPMG Econtech estimates

The first step was to estimate the potential increase in EMDG recipients' exports due to the EMDG scheme. This was done by estimating the potential price impact due to the average subsidy across EMDG recipients (0.1% / 3.1%) and applying a factor representative of the likely export demand response (export demand elasticity of 10.3). This gave a potential increase in EMDG recipients' exports of 38 per cent attributed to the EMDG scheme.

The second step compares the estimated benefits across other firms (2.4 firms benefiting x 10% increase in exports = 24%) with the estimated impact on EMDG recipients exports (38%). This gives a 1:0.64 relationship. That is, for every \$1 benefit to EMDG recipients there is an additional \$0.64 benefit to the rest of the economy. Thus, to capture the spillover impacts of EMDG Schemes, KPMG Econtech has modelled EMDG spillovers of 64 per cent of the private rate of return (Scenario 2). Through the spillover effects, Scenario 2 captures the imperfect information for competitors in the export market.

Scenario 3: EMDG Grants, Spillover Impacts and Productivity Improvements

The final impact modelled in this 2009 update is the potential efficiency benefits of moving resources from non-traded sectors to traded sectors. This benefit was discussed in the 2008 report, but at that stage there were no data available to measure the likely impact of this benefit. Austrade have since extended their survey to capture an estimate of these benefits in terms of labour productivity improvements experienced by EMDG recipients.

The table below shows how this data was used to estimate a 0.06 per cent average increase in industry labour productivity associated with the EMDG Scheme.

Table 2.3 EMDG Productivity Impact

EMDG production (\$ million)	13,040
labour cost saving	13.2%
EMDG share of economy-wide labour costs	0.5%
labour productivity saving	0.06%

Source: Austrade EMDG survey and KPMG Econtech estimates

EMDG production data from Austrade was used to estimate that the EMDG firms contribute to approximately 0.5 per cent of economy-wide labour costs. This estimate was combined with the survey result of a 13.2 per cent EMDG productivity saving. This gave an estimated 0.06 per cent improvement in labour productivity across the whole economy, equating to a labour cost savings of \$307 million (in 2006/07 dollars).

While the table above shows the impact across all industries, for the modelling exercise, a separate calculation was done for each industry. This meant that a different labour productivity improvement



was applied to each industry based on the level of EMDG firms operating in that industry. Through the increased labour efficiency, Scenario 3 captures the imperfect information for recipients relating to potential production efficiencies.

Modelling considerations

Important considerations for analysing the likely effects of the EMDG Scheme are summarised in the tables below. The first table shows the considerations that are captured in the modelling. The second table shows the considerations that are not captured in the modelling.

Table 2.4: EMDG Considerations – Captured in the modelling

Allocative Efficiency	Allocative efficiency losses arise when assistance is provided to some industries – meaning that resources are artificially reallocated from other industries towards the assisted industries.
The Base Case	Scenario 1 - the base case scenario, assumes perfect information and perfect capital markets. However this is not likely to be the case (see page 6).
Spillover Effects - competitors	The survey results indicate that competitors do not have access to full information to assist them in accessing export markets – and this is captured in Scenario 2. The additional export activity of grant recipients (as a result of these grants) open up more export opportunities to companies who are not receiving any grants.
Efficiency of traded vs. not traded industries	The survey also indicates that recipients achieve productivity improvements with greater access to information from world markets – and this is captured in Scenario 3.
Extra taxation to fund EMDG Scheme	This is the cost of the grants to taxpayers (= \$152 million in 2006/07)

Table 2.5: EMDG Considerations – Not Captured in the modelling

Spillover Effects - recipients	Just as competitors do not have access to full information to assist them in accessing export markets, neither do recipients. The learning achieved through access to more export markets is likely to translate into further benefits to the recipient and the economy as a whole. However, it is difficult to distinguish the additional activity due to additional learning by EMDG recipients from the additional activity due to the grant and increased productivity. Thus, the results in this report are likely to be somewhat understated.
Deadweight Loss	This is the deadweight loss from extra taxation to fund the EMDG Scheme.
Capital Constraints	Capital constraints facing SMEs (emphasised by the Centre for International Economics (CIE) in its 2005 study of the Scheme).

The remaining sections of this report present and discuss the modelling results.

3 Results

This section reports the results of modelling the main long-term economic impacts of the EMDG Scheme. Importantly, when analysing the impacts of a policy, the most appropriate impacts to consider are the long-term effects of the policy, after the economy has fully adjusted. This is fitting because policies should be judged against their lasting effects on the economy, not just their projected effects in the first one or two years.

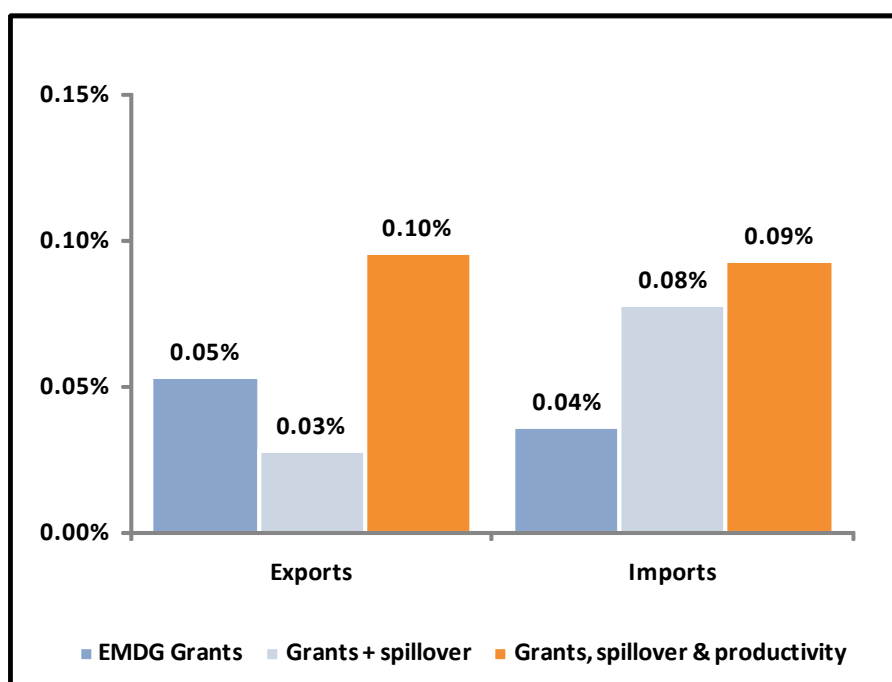
This section is structured as follows.

- The first part describes the estimated long-term effects of the Scheme on the level of imports and exports (compared to what they would have been without the Scheme).
- The second part sets out the estimated long-term economy-wide effects of the Scheme (compared to economy-wide activity without the Scheme).
- The third part presents the long-term impacts on industries within the economy attributable to the Scheme (compared to the industry activity without the Scheme).
- The fourth part reports the estimated long-term impacts of the Scheme on consumer welfare (compared to the industry activity without the Scheme).
- Finally, the fifth part compares the estimated long-term benefits of the scheme with the costs.

3.1 Trade effects

Chart 3.1 shows the estimated trade effects of the EMDG scheme. In particular, this chart shows the projected annual contribution of the scheme to aggregate exports and imports.

Chart 3.1 Trade Effects (% deviation from baseline)



Source: KPMG Econtech MM600+ simulations



The EMDG Scheme provides support to recipients to assist in the development of export markets. This assistance takes the form of subsidies (grants) that lower the cost of export marketing activities, which, in turn, leads to higher exporting activity by grant recipients than would have occurred without the program. Higher demand for Australian exports will lead to an improvement in Australia's terms-of-trade which leads to a higher exchange rate. This effect on the exchange rate will have two key impacts.

- First, the resulting appreciation of Australian dollar means that prices of imported goods and services would be lower than would otherwise be the case. Lower prices lead to an increase in the demand for imports, making consumers better off.
- Second, the change in the real value of the Australian dollar means that prices of exported goods and services would be higher than would otherwise be the case. Higher prices lead to a fall in the demand for Australian exports.

This will mean that the initial rise in exports will be partly offset by lower exports in other areas of the economy. The higher export activity by grant recipients will lead to some reallocation of resources away from other production and export activity. This will further offset the initial rise in exports.

Spillover effects include the flow-on benefits of a more open export market. These effects arise as the additional export activity of grant recipients opens up more export opportunities to companies who are not receiving any grants (Scenario 2). This has the effect of further increasing the first round boost to exports. These effects lead to a further improvement in Australia's terms-of-trade – driving up the exchange rate further. This, in turn, further stimulates imports, while again dampening exports in other areas of the economy.

With a more efficient economy (arising from labour efficiency benefits of moving resources from non-traded sectors to traded sectors in Scenario 3), Australian products are more competitive and can be offered at a lower price. This leads to increased production and exports, again further improving Australia's terms-of-trade – and driving the exchange rate up even further and stimulating imports. With lower export prices, export volumes need to rise more than import volumes to maintain external balance. Indeed, Chart 3.1 shows the incremental increase in exports under Scenario 3 is more than the incremental increase in imports. Specifically, export volumes are 0.07 percentage points higher (0.10% - 0.03%) while import volumes are 0.01 percentage points higher (0.09% - 0.08%) than under Scenario 2.

3.2 Economy-wide effects

The key economy-wide contributions of the EMDG scheme are now considered. As previously discussed, these modelling results refer to outcomes over the long run (5 to 10 years).

Chart 3.2 below shows the average annual contribution of the EMDG scenarios to key economic aggregates in the Australian economy. Specifically, the chart shows the average annual contribution of the EMDG Scheme to private consumption and investment, and the effect on the exchange rate when compared to the Baseline Scenario.

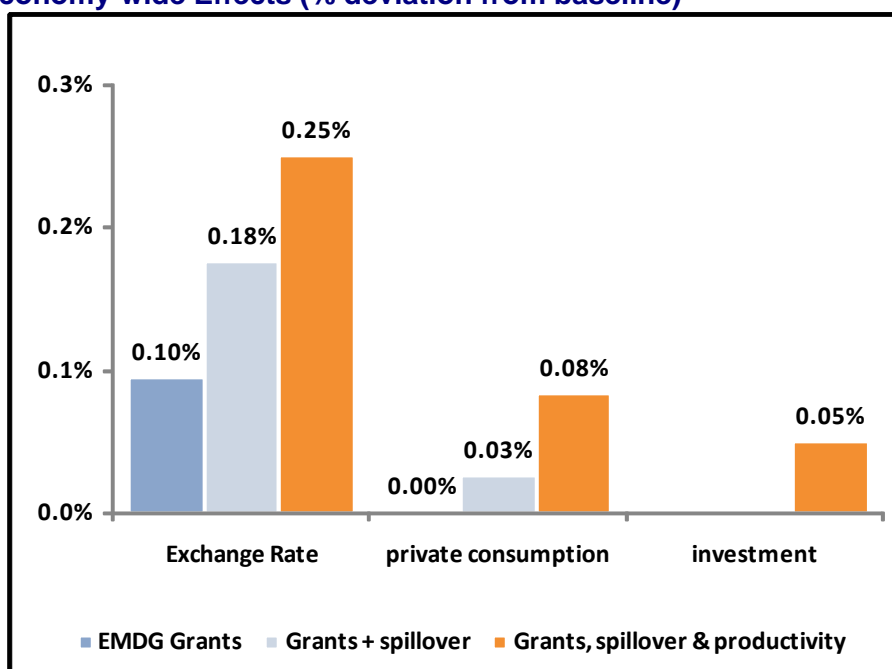
As discussed in the trade effects section, the first round effect of the Scheme is to stimulate exports when compared to the Baseline Scenario. The higher level of exports improves Australia's terms-of-trade leading to a higher expected exchange rate (compared to the Baseline Scenario). The stronger Australian dollar will make imports cheaper. Access to cheaper imports will lead to higher consumption levels.

However, there is also a direct cost involved in providing the EMD grants, which is ultimately borne by taxpayers². As such, the cost of the scheme is projected to almost completely offset the direct benefits to consumers of the EMDG Scheme alone (Scenario 1).

Additional to these direct effects, there are also expected to be flow-on benefits or spillover effects to the economy as a whole. For example, other companies that are not EMDG recipients are also expected to benefit from greater access to export markets. Further, by becoming more trade-exposed, EMDG firms are expected to show signs of increased productivity as they improve production processes to remain competitive and also through learning from their overseas competitors. In the Austrade survey, EMDG recipients reported increased productivity due to participation in the Scheme.

These additional benefits mean that there will be higher economic activity under the grants + spillover and productivity scenarios (Scenarios 2 and 3) compared to the Baseline Scenario. This increase in economic activity will flow through to further support higher private consumption, meaning that the EMDG Scheme + spillovers provide a net benefit to the economy.

Chart 3.2 Economy-wide Effects (% deviation from baseline)



Source: KPMG Econtech MM600+ simulations

3.3 Industry Effects

The impact of the export marketing grants will vary across industries in Australia. Chart 3 illustrates the projected variation in the industrial structure of the Australian economy.

Chart 3.3 shows that the grants will assist with sales and productivity in the industries responsible for exporting related goods and services. For example, the Manufacturing industry receives a significant proportion of the grants under the EMDG Scheme. Thus, this sector expands relative to others sectors including, Agriculture and Mining.

² Incidence across taxpayers is unknown



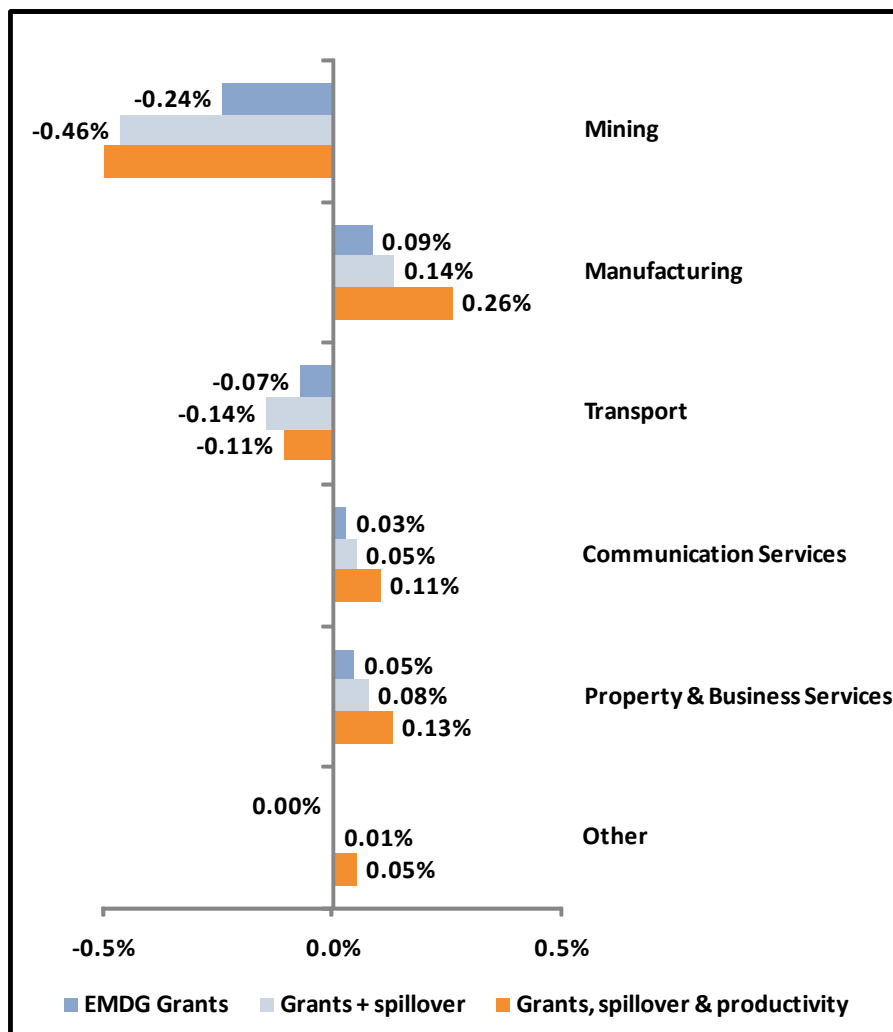
The additional activity in the EMDG export industries will also stimulate extra activities in industries that supply services to the export industries. As can be seen in Chart 3, sectors supplying services to the export industries, including communications sector and property and business services sector benefit due to increased economic activity under the EMDG Scenarios.

As a result of increased export activity by EMDG firms, the additional industry outputs in Australia generates more revenues to the community when compared to the Baseline Scenario. This boosts demand for consumption goods and services, including those provided by the cultural and recreational services industry. As such these sectors also benefit from increased economic activity under the EMDG Scenarios.

The exchange rate plays a critical role in determining growth in trade-exposed industries. As previously mentioned, the increased export activity leads to a higher value of the Australian dollar which lowers demand for other Australian exports.

Therefore, the production gains in the consumer-oriented industries and the industries upstream/downstream to the EMDG export industries would be somewhat offset by losses in production in other trade-exposed industries.

Chart 3.3 Average Annual Industry Production Effects (% change, deviations from baseline)



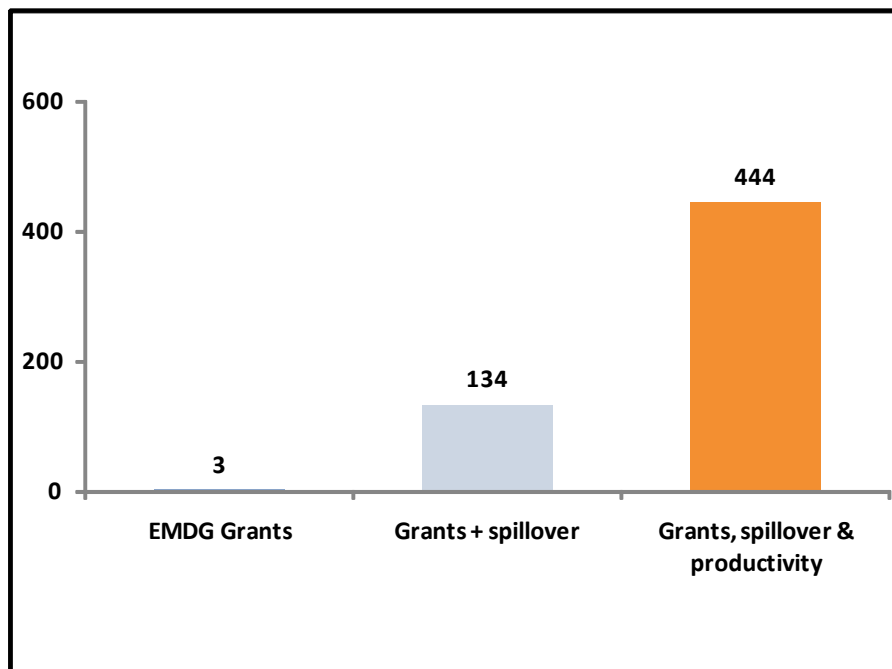
Source: KPMG Econtech MM600+ simulations

3.4 Consumer welfare effects

Rather than changes in production, the overall benefit of the implementation of the EMDG Scheme on Australian living standards is most appropriately captured using consumption measures. This is because living standards derive from consumption. Therefore, this report includes a measure of the changes in Annual Consumer Welfare resulting from the EMDG Scheme. In broad terms, Annual Consumer Welfare is determined by the average annual real consumption per head of the population.

Chart 3.4 presents the expected change in consumer welfare resulting from the EMDG scheme

Chart 3.4 Annual Consumer Living Standard Effects (\$ million, 2006/07 prices, deviations from the baseline)



Source: KPMG Econtech MM600+ simulations

Chart 3.4 shows that the increase in consumption that is due to EMDG alone (as modelled in Scenario 1) is predominantly offset by the cost of the scheme.

Further, the chart shows that including the flow-on impacts from increased access to export markets and increased productivity in the economy, more than offsets the cost of the Scheme. That is, it leads to an overall increase in consumer living standards. This increase in living standards is the result of a number of factors.

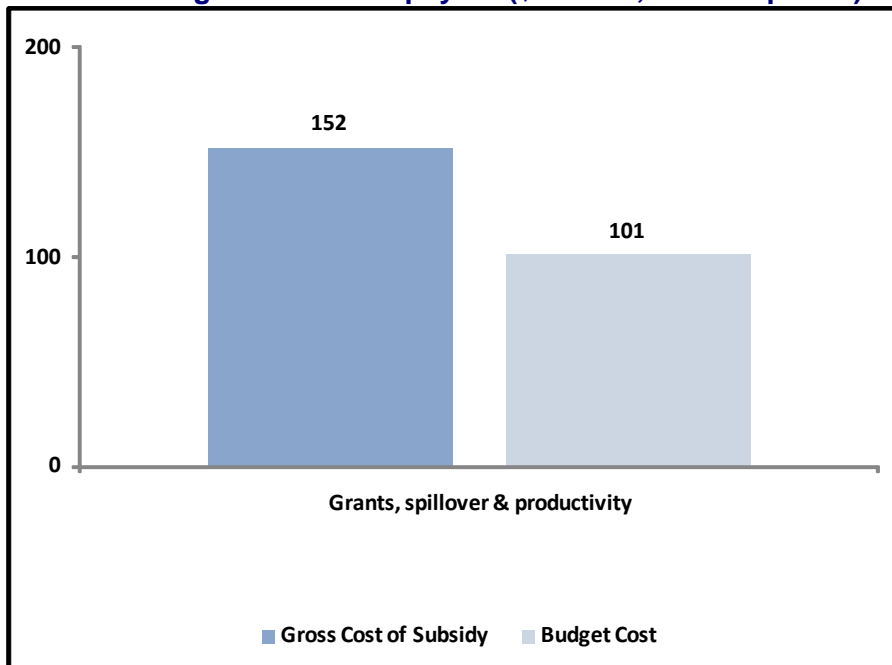
- Firstly, Scenario's 2 and 3 of the EMDG Scheme stimulate exports, driving higher levels of production in the economy. This will push higher annual national income. This, in turn, leads to a higher level of private consumption when compared to the Baseline Scenario.
- Secondly, additional demand for Australian exports leads to an initial improvement in Australia's terms of trade. This will mean that the exchange rate will adjust (ensuring the long-run condition of sustainable trade balance). A higher Australian dollar will make imports cheaper, further benefiting consumers.

- Thirdly, the enhanced labour efficiency of Scenario 3 takes account of the \$307 million labour cost savings expected from the EMDG Scheme. This enhances the overall welfare in the Australian economy by \$310 million³. This occurs as the labour cost saving in industries receiving EMDG benefits frees up some labour resources, allowing them to move into other sectors and contribute to production there.

3.5 Net impacts of the EMDG Scheme on the government budget

The chart below estimates the impact of the scheme on the government budget. In particular, it estimates the labour income tax adjustments that are required to fund the scheme. As can be seen, after taking into account the increase in other tax collected from additional economic activity stemming from the grants, more open export markets and increased productivity – additional funding will not need to cover the full cost of the grants, as the additional activity and income across the economy leads to increased tax collections, which will offset some of the cost of the scheme.

Chart 3.5: Estimated Budget Cost to Taxpayers (\$ million, 2006/07 prices)



Source: KPMG Econtech MM600+ simulations

Chart 3.5 only takes into account the government budget side of the program. Table 3.6 summarises the estimated overall net benefits of the EMDG Scheme to the whole Australian economy.

³ This is the difference between the annual consumer living standards of Scenario 3 and Scenario 2 (\$444 million – 134 million)



Table 3.6: Estimated net benefit of EMDG Scheme (\$ million, 2006/07 prices)

	EMDG Grants	Grants + spillover	Grants, spillover & productivity
Gross Benefit	171	301	546
Budget Cost	168	167	101
Net Benefit	3	134	444

Source: KPMG Econtech MM600+ simulations

As can be seen in the table above, the direct benefits of the EMDG scheme are almost completely offset by the budget cost of the grants (as discussed above). However, the Scheme also opens up export markets to other domestic producers and leads to increased productivity in trade-exposed companies, there is a clear net benefit to the economy and the Australian community (Scenarios 2 and 3).

4 Comparison with other government programs and benchmarks

When assessing programs it is important to assess them on a comparable basis. The most appropriate basis is in terms of the benefits compared to the cost associated with each program.

The table below uses this basis to compare the impacts of the EMDG Scheme with other government programs and benchmarks. It is important to note that this is not an exhaustive list of government programs and benchmarks. The benefit to cost ratio shows the amount of benefits per \$1 spent on each program. For example, the table below shows that for every \$1 cost to the taxpayer, they receive around \$5.38 in benefits (when the scheme's impacts on productivity and other exporters are taken into account).

As can be seen from the table below, the impacts of the EMDG scenarios compare favourably with estimated benefits of other government programs. That is, the benefits of the EMDG scheme are in line with, or higher than the programs identified in the table below. Further, the EMDG Scheme has a benefit cost ratio of greater than 1:1, indicating that the benefits of this scheme outweigh the cost of the scheme.

Table 4.1: Comparison with other government programs and benchmarks

Programs	benefit : cost
EMDG	1.02 : 1
EMDG plus spillovers and productivity	5.38 : 1
Backing Australia's Activity	1.12 : 1
Strategic Investment Program	0.98 : 1
E-Government Programs	0.61-0.92 : 1
R&D Tax Concession	0.70-1.98 : 1

The following provides a brief description of some comparable programs and the benefits they provide.

Backing Australia's Ability

Backing Australia's Ability (BAA)⁴ is a \$3 billion package to encourage and support science and innovation to enhance Australia's economic prosperity, international competitiveness and social well-being. The BAA pursues excellence in research, science and technology, through three key areas: research and development; commercialization; and skills development. Backing Australia's Ability – Building Our Future through Science and Innovation is a package totalling \$5.3 billion over seven years from 2004-05. Together, these packages constitute a ten year, \$8.3 billion commitment to science and innovation stretching from 2001-02 to 2010-11. BAA programs include: National Competitive Grants Program (NCGP); Research infrastructure block grants (RIBG); Systemic Infrastructure Initiative (SII); Commercial Ready Program; and the Commercialising Emerging Technologies (COMET) Program.

The BAA scheme is recognised as beneficial to the Australian economy, with a benefit to cost ratio greater than 1:1. That is, the BAA program is expected to provide \$1.21 in benefits for each \$1 spent on the program. The EMDG Scheme (when productivity and spillover impacts are recognised) compares favourably to this program, with almost three times the benefits expected for each \$1 spent on the grants (\$5.38 benefit : \$1 cost).

⁴ A report prepared by Econtech for the Department of Education, Science and Training (2006) *Economic Impact Of Public R&D Activity In Australia*.



Textile Clothing & Footwear Strategic Investment Program (SIP) Scheme

The Textile Clothing & Footwear Strategic Investment Program⁵ (SIP) Scheme was an entitlement program that provided incentives in the form of reimbursement grants. The aim of the scheme was to promote investment, innovation and value adding in Australia's textiles, clothing, footwear and leather industries. It is estimated that the SIP scheme provided \$0.98 in benefits for every \$1 spent on the scheme. Thus the benefits of the EMDG scheme compare favourably to the SIP Scheme.

E-Government

The Commonwealth's E-Government strategies include the Government Online Strategy and Better Services, Better Government. E-government is the transformation of public sector internal and external relationships through Internet enabled operations and information and communication technologies. A report on the benefits of E-Governments considered the economic, financial and social benefit/cost ratio for 38 e-government programs⁶.

Of the 38 programs surveyed, 24 programs expected a financial benefit. Across the agencies expecting a financial benefit the aggregate benefit/cost ratio was 92.5 per cent from an investment of \$108 million (or a 0.925:1 benefit to cost ratio). The report also found that the aggregate benefit/cost ratio across all 38 programs was 61% (or a 0.61:1 benefit to cost ratio). Thus the EMDG scheme has a greater return than E-government programs.

R&D Tax Concession

The R&D Tax Concession is a Commonwealth Government initiative to increase the level of research and development (R&D) in Australia. The aim of the concession is to encourage innovative, competitive and export-oriented Australian industries. This is achieved by allowing companies to deduct up to 125 per cent of R&D expenses that qualify for the tax concession when lodging their corporate tax return.

The Government has recently announced intentions to implement extensive changes to the R&D Tax program from July 2010. These changes include: changing from a tax deduction to a tax credit system; increasing the level of benefits, narrowing the scope of expenditures that can be claimed; and definitions of eligible R&D activities.

A 2003⁷ report that reviewed the 125% R&D Tax Concession program by the Centre for International Economics (2003) found that the benefits generated by the 125% Concession are between \$0.70 and \$1.98 for each dollar of tax revenue forgone. This does not include the spillover benefits that arise from the research and skills flowing to other firms, nor the behavioural gains by the firms. In 2007, an evaluation of the two new elements of the program⁸ the R&D Tax Offset and the 175% Premium R&D Tax Concession; found that the R&D expenditure by firms registering for the Concession grew by \$1.226 billion (to \$6.936 billion) in 2003–04 from 2001–02 when the changes were introduced.

When compared to the 125% R&D Tax Concession, the benefit cost ratio of Scenario 1 of the EMDG Scheme falls within the range of benefit cost ratios of the tax scheme.

⁵ A report prepared by Econtech for the Productivity Commission (2003) *Economic Modelling Of The Post-2005 Textile, Clothing And Footwear Assistance Arrangements*

⁶ Information on the E-Government programs is sourced primarily from NOIE-DMR Consulting report, *The E-Government Benefits Study*.

⁷ Centre for International Economics (2003) Review of the R&D Tax Concession Program

⁸ The Australian Government (2007) New Elements of the R&D Tax Concession Evaluation Report



Attachment A - KPMG Econtech's MM600+ Model

MM600+ is a long-term CGE model of the Australian economy. MM600+ covers industry costs and prices as well as industry production and employment, and models market-clearing, long-term outcomes under optimising behaviour.

MM600+ is used in some of KPMG Econtech's policy consulting projects. KPMG Econtech undertakes any required simulations in-house and provides the client with the results of the modelling and commentary of these results in a written report.

Development

In 1997 KPMG Econtech developed the Murphy Model 303 (MM303) under contract to a state government to estimate the effects of indirect tax reform on industries and businesses. MM303 modelled the production of over 300 product groups by 107 industries.

In 2000, the more detailed MM600+ model was developed from our original MM303 model under contract to the ACCC. That is MM600+ is a direct descendant of MM303. MM600+ has significantly more product detail than MM303. Specifically, MM600+ has 108 industries that produce 672 products, making it six times more detailed than any comparable model. It also has greater tax detail for each of product, which is discussed in more detail below.

The high level of product detail has many advantages, which was recognised by the ACCC. In commissioning MM600+, the ACCC requested the high level of product detail so that estimates of the model could serve as a more useful point of comparison in its price monitoring work. This high level of detail is crucial for pinpointing the effects of the NTS on business costs, consumer prices and economic activity.

This level of product detail also means that policy changes that are not related to the NTS can be analysed. For example, the product detail means that the gains from some micro-economic reforms can be more fully captured. For example, a finer level of disaggregation better reveals the diversity in rates of customs duty, leading to more reliable estimates of the gains from tariff reforms that produce benefits by reducing this diversity.

Features

MM600+ distinguishes 672 products, making it six times more detailed than any other model. It achieves this high level of detail using unpublished input-output data obtained in an electronic format from the Australian Bureau of Statistics (ABS).

MM600+ is well suited for use in a wide range of projects. Its main features are as follows:

- it fully incorporates the New Tax System (NTS), making it unique among Australian CGE models. It models the GST treatment of each of its 672 products, and 24 other indirect taxes, including excises on petrol and diesel;
- within the 672 products, it has high level of detail of petroleum products. MM600+ distinguishes between petrol, diesel, aviation gasoline, aviation turbine fuel and kerosene, while some other models treat petroleum products as one category;



- it incorporates all changes to the NTS since 1 July 2000 that affect business costs, including the changes to petrol and beer excises;
- it allows for the substitution effects triggered by changes in the prices of goods and services. Specifically, MM600+ allows substitution between:
 - labour and capital;
 - different types of capital inputs such as motor vehicles, computers, buildings etc;
 - different forms of primary energy, including black coal, brown coal, LPG and natural gas; and
 - road and rail freight transport.
- it allows for CO2 emissions from all sources of energy, including black coal, brown coal, natural gas, LPG, petrol, diesel, aviation gasoline and aviation turbine fuel;
- it incorporates the relative energy content of each type of fuel;
- it is set up to achieve budget neutrality in alternative ways. The default swing fiscal instrument is income tax and the alternative swing fiscal instrument is GST;
- it generates results for specific regions within Australia. Specifically, MM600+ produces estimates of changes in production and employment across 32 regions; and
- it provides valid measures of changes in consumer welfare based on compensating variations so that policy reforms can be correctly evaluated in terms of being in the public interest.

These features make MM600+ well suited to projects that require an economy-wide analysis of policy changes. For example, MM600+ has been used extensively in analysing the impact of the NTS on costs and prices throughout the economy. It can also be used to consider the impact of other policy changes such as introducing a CO2 tax on the economy or increasing competition in a particular industry.

Not all of the above features are standard in detailed economy-wide models because of the modelling complexities involved. Unlike MM600+, which has all of these features, no other Australian CGE model has even a majority of these features.

Key Assumptions

MM600+ models a long-run equilibrium. In the long run, economic agents optimise, all markets are in equilibrium, and assets and liabilities follow sustainable paths. Some of the key assumptions involved are as follows.

Labour market equilibrium: local employment in MM600+ is fixed, which means that in the long run the labour market is assumed to attain equilibrium, so that an economic shock has no lasting effect on total employment. This assumption is implemented by fixing the level of total employment. This means that direct job losses in a particular industry or region from each emissions tax will be exactly balanced by job gains in other industries or regions.



External balance: in MM600+, the balance of trade is at a sustainable level. Specifically, a trade surplus is run equal to the amount required to service foreign-owned capital. The real exchange rate needed to achieve this trade surplus is determined by MM600+. Thus shocks to international trade affect the real exchange rate, not the trade surplus.

Budget balance: the government budget is also assumed to be at a sustainable level. Specifically, it is assumed to be in balance. A lump sum tax/transfer is used as the swing fiscal instrument to balance out the effects on the government budget of increase taxation revenue. Thus a tax increase is associated with a balancing cut in labour income tax.

Private saving: the level of private sector saving and associated asset accumulation is sustainable in the long run. Private saving is held constant in MM600+ by fixing the quantity of capital that is owned locally, and changes in capital are only in the foreign-owned portion.

Documentation

Further details for MM600+ are available from the MM600+ documentation on our web-site (www.econtech.com.au).

MM600+ Model Outputs

MM600+ produces results at three different levels. Specifically results are provided at the product, industry and national level.

Results are produced for the following measures for each of the 672 products and 18 industries in the economy.

- production volume, production value and employment;
- value added;
- export volumes and prices; and
- imports volumes and prices.

At the national level, MM600+ produces results for the following broad economic aggregates.

- gross domestic product (GDP);
- investment;
- the exchange rate;
- the consumer price index (CPI); and
- valid measures of changes in consumer welfare based on compensating variations.

MM600+ Regional module

MM600+ includes a regional module, which provides results at the regional level. Results can be provided for the following 32 regions, which match the 32 ABS statistical regions.

- | | |
|-------------------------------------|---------------------------------------|
| 1. Sydney | 2. North Western Sydney |
| 3. Hunter | 4. Illawarra |
| 5. South Eastern NSW | 6. Richmond-Tweed and Mid-North Coast |
| 7. Northern-Central-Far Western NSW | 8. Murray-Murrumbidgee |
| 9. Melbourne | 10. Barwon-Western District |
| 11. Central Highlands-Wimmera | 12. Loddon-Mallee |
| 13. Goulburn-Ovens-Murray | 14. All Gippsland |
| 15. Brisbane | 16. South and East Moreton |
| 17. North and West Moreton | 18. Wide Bay-Burnett |
| 19. Darling Downs-South West | 20. Mackay-Fitzroy-Central Qld |
| 21. Northern-North West | 22. Far North |
| 23. Adelaide | 24. North and West SA |
| 25. South and East SA | 26. Perth |



27. Higher Western WA
29. Greater Hobart-Southern
31. Mersey-Lyell
33. Australian Capital Territory

28. Remainder WA
30. Northern Tasmania
32. Northern Territory