Economic Modelling on Estimated Effect of Copyright Term Extension on New Zealand Economy

In 2009 the Ministry of Economic Development (now the Ministry of Business, Innovation and Employment, MBIE) commissioned an external study by Concept Economics, led by Henry Ergas, to estimate the costs and benefits of copyright proposals that New Zealand anticipated would be tabled as part of the TPP negotiations on the IP Chapter.

Based on this research, the Government estimated that the average cost to New Zealand from the obligation under TPP to extend New Zealand’s copyright period from 50 to 70 years would average around $55 million per year.

Copyright term extension

The study considered the economic impact for New Zealand of changing the copyright period from 50 to 70 years. It looked separately at books and recorded music, and incorporated a number of data sources to build a picture of the proportion of works under copyright; sales, exports and imports of works; and royalties. Based on this data, Concept Economics estimated the total cost to New Zealand of extending the copyright on existing and all future works, based on estimated future sales. The study found that New Zealand was a net importer of copyright-protected works, and the costs of extending copyright for New Zealand consumers would outweigh the benefits for New Zealand creators who sold their works offshore.

The study estimated the total cost for New Zealand of copyright term extension for books and recorded music in terms net present value (i.e. the equivalent amount of money that, if invested today, would cover all future costs for every year). The study considered a time period of 70 years for recorded music (the extended copyright term, which is generally calculated from time of production) and 110 years for books.\(^1\) The study estimated a net present value of $208-239 million for recorded music and $263-300 million for books.

Based on these net present value results, the Government has estimated the equivalent average annual cost of copyright term extension, over the total period that the extension would take to come into effect. (A discount rate of 7.5% was used to generate this average real value from the report’s net present value results.) This included an additional estimate for the cost of extending copyright on film and television, which Concept Economics did not model, by assuming film and television would incur the same net cost as recorded music. The average cost to New Zealand per year from copyright period changes under TPP was estimated as $55 million. This was the mid-point of the range of results reported by the study, which was equivalent to $51-59 million per year.

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\(^1\) The study used 110 years for books based on assumptions that the average life of an author over the last 90 years was 70 years, and the average age of an author when they create a new work is 30 (i.e. an average of 40 years before their death). An extended copyright term of 70 years from the death of the author would mean that on average a book would be protected by copyright for 110 years after the year it was produced.
Concept Economics analysis of the impact on New Zealand of extending copyright term.

EXTENSION OF THE COPYRIGHT TERM

Current Policy
The term of copyright protection in New Zealand varies by type of work. Under current copyright laws, the terms of protection are: ²

- For literary, dramatic, musical or artistic works: Life of author plus 50 years;
- For artistic works industrially applied: 16 years after the work is industrially applied;
- For works of artistic craftsmanship industrially applied: 25 years after the work is industrially applied;
- For sound recordings and films: 50 years after the work was made or made available to the public, whichever is the latter;
- For communication works (which includes web casts, broadcasts and cable programmes): 50 years after the broadcast is made, or the cable programme is included in a cable programme service; and
- For typographical arrangement of published editions ³: 25 years after the edition was first published.

The main exceptions to copyright protection in New Zealand (known as 'permitted uses'), take the following forms:

- "fair dealing" for the purposes of criticism, review, news reporting, research or private study; ⁴
- "transient reproduction" - i.e. where reproduction is transient or incidental and is an integral and essential part of a technological process; ⁵

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² Sections 22-25, 75 and 193 of the Copyright Act 1994.
³ The typeset or image of the published edition of the whole or part of a literary, dramatic or published work is subject to copyright protection in its own right, i.e. independent of whether the original work itself is protected by copyright.
⁴ Section 42 and 43.
⁵ Section 43A.
• limited copying or dealing in the work for particular educational purposes;\(^6\)

• limited copying or dealing in the work by librarians or archivists in specific circumstances;\(^7\)

• exceptions in respect of certain activities by the Crown;\(^8\)

• copying for the purposes of making copies that are in Braille;\(^9\)

• subject to certain conditions, the making of a back-up copy of a computer program;\(^10\) and

• recording a television programme for the purpose of making a complaint or for “time shifting” purposes so that a programme can be watched at a more convenient time.\(^11\)

Potential Policy Change

In light of copyright term provisions in the Peru-US Trade Promotion Agreement and the Australia-US FTA, it is anticipated that on conclusion of New Zealand-US FTA negotiations New Zealand may be required to extend the copyright term for literary, dramatic, musical or artistic works, performances and phonograms by 20 years as follows:

- In cases where the protection is expressed in terms of the natural life of the creator, the copyright term increases to life of the creator plus 70 years; and

- In cases where the protection is expressed on a basis other than the life of the creator, the copyright term increases to not less than 70 years after the work, performance or phonogram was made or made available to the public (whichever is the latter).

Consistent with the way that this policy change has been applied in other bilateral FTAs negotiated by the United States (e.g. Australia-US FTA), any copyright term extensions negotiated in the course of New Zealand-US FTA negotiations can be expected to apply to all future copyright protected works and current copyright-protected works with a term of protection that has not yet expired at the time of introduction of these extensions. In other words, the term extension will also apply retrospectively to copyrighted works which were created before the implementation of

\(^{6}\) Section 44 to 49.
\(^{7}\) Sections 50 to 57.
\(^{8}\) Sections 58 to 66.
\(^{9}\) Section 69.
\(^{10}\) Section 80.
\(^{11}\) Section 84.
the extension, as long as they are not yet in the public domain, as well as to future copyright protected works.

Note, the copyright term for communication works and typographical arrangements is not expected to change as these do not fall within the definition of a literary, dramatic, musical or artistic ‘work’. Similarly, the term of copyright protection applicable to artistic works industrially applied and works of artistic craftsmanship industrially applied are not expected to change as bilateral FTAs negotiated by the United States appear to permit a reduced term for industrial applications.

At this point in time there is no clear expectation of policy change to exceptions to copyright protection (i.e. ‘permitted uses’). In this regard, we note that both New Zealand and United States copyright statutes incorporate exceptions for ‘permitted uses’ (as they are known in New Zealand) or ‘fair use’ (as they are known in the United States). However, it is not possible to appreciate differences in the effective coverage of exception provisions by simply comparing the copyright laws in the two jurisdictions. This is because in the United States, copyright exceptions are legislated and enforced under antitrust laws and subject to a great deal of judicial guidance. While exceptions are set forth in the US Copyright Act, they are illustrative, not exhaustive. For example, the fair use provision in Section 107 of the US Copyright Act states that the fair use of a copyrighted work is not an infringement of copyright. The Act then lists certain purposes for which fair uses may be made (e.g. criticism, comment, news reporting, teaching and classroom use, scholarship and research). However, it does not preclude other purposes from qualifying as fair uses. In contrast, in New Zealand (as in Australia) copyright exceptions tend to be legislated and enforced under copyright laws rather than competition laws. The list of permitted uses in New Zealand Copyright Act are exhaustive.

Economic benefits of copyright term extension

Higher incomes to local producers of copyright-protected works in export markets

Copyright term extension increases the incomes of future producers of copyright-protected works by increasing the number of years over which they are entitled to receive a flow of royalty payments.

Not all future creators stand to benefit equally due to differences in the economic life of works. For example, software has a short economic life that probably expires long before the expiration of copyright protection. In the case of books and films, even those works that enjoy best seller or blockbuster status may be consigned to cultural irrelevancy by the time of the author’s/screen writer’s death, with the exception of a
very small number of perennial classics. For example, Landes and Posner found that only 1.7% of the 10,027 books published in the United States in 1930 were still in print in 2001.¹²

Since it is implemented retrospectively, copyright term extension also confers a windfall income gain on producers of works that are ‘in rights’ and created before the extension comes into effect. In other words, the potential policy change delays by 20 years the lapse of copyright protection for creators and, hence, delays by a similar period the pass through of price reductions to consumers that generally occurs when works fall out of rights (since the price of rights-protected works is generally marked-up to allow for royalty payments to the creator).

However, with one possible exception (considered below), the income gain to producers of copyright protected works as a result of copyright term extension is not a source of economic benefit to New Zealand. Firstly, this is because a significant portion of the income gain will accrue to foreign rights holders since New Zealand is a significant net importer of copyright-protected works – see Appendix A. Secondly, the portion of income gain that does accrue to New Zealand producers is entirely offset by a loss borne by users of such works in New Zealand (i.e. consumers, business, libraries, universities, government and creators of derivative works) in the form of higher prices paid for in rights works for a longer period.

The exception is a situation where copyright term extension results in transfers of income from foreign consumers to New Zealand producers of copyright-protected works. However, there is uncertainty about the extent to which copyright term extension in New Zealand will impact on income earned by New Zealand producers of copyright-protected works in export markets. According to Article 5 of the Berne Convention for the Protection of Literary and Artistic Works, the applicable copyright laws for literary and artistic works¹³ are those of the country of sale. This suggests that the returns that New Zealand exports of copyright works receive are independent of any decision that the New Zealand Government takes with respect to extension of copyright term. However, under Article 7 of the Berne Convention, there is scope for countries to apply reciprocal arrangements so that the term of protection

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¹³ In the Berne Convention, the expression “literary and artistic works” is defined to include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.
that applies to a New Zealand copyrighted work in the country of sale is the same as
the term that rights holders in the country of sale enjoy when New Zealanders
purchase their copyrighted works.\textsuperscript{14} Perhaps more pertinently, New Zealand would in
any case require as a condition of a Free Trade Agreement that any FTA partner
would have reciprocal obligations with respect to copyright law. This suggests that an
increase in copyright term in New Zealand may lead to higher export revenues
(transferred from foreign consumers) as a result of term extension.

For example, if all New Zealand exports of books were sold on terms consistent with
Article 5 of the Berne Convention, then copyright term extension would confer zero
economic benefit to New Zealand via the transfer of income from foreign consumers.
However, if reciprocity of treatment were required, then we conservatively estimate
that copyright term extension would confer an economic benefit to New Zealand via
the transfer of income from foreigners of the order of $36 million in present value
terms over a 2009 to 2118 timeframe. Appendix B explains the methodology used to
derive this estimate.

If all New Zealand exports of recorded music were sold on terms consistent with
Article 5 of the Berne Convention, then copyright term extension would confer zero
economic benefit to New Zealand via the transfer of income from foreign consumers.
However, if reciprocity of treatment were required, then we conservatively estimate
that copyright term extension would confer an economic benefit to New Zealand via
the transfer of income from foreigners of approximately $31.4 million in present value
terms over a 2009 to 2078 timeframe. Appendix C explains the methodology used to
derive this estimate.

\textbf{Stimulation of future production of copyright-protected works}

It is sometimes argued that term extension can yield economic benefits by stimulating
an increase in future production of copyright-protected works. In practice, however, the
size of any such benefit to New Zealand is likely to be negligible.

Firstly, this is because the incremental reward to creators of new works due to term
extension occurs decades into the future (6 or 7 decades at the earliest) and so, on a
net present value basis, is unlikely to provide any significant additional inducement to
creators to invest in the creation of new works that they otherwise were not prepared to
invest in.

Akerlof et al estimated that at best the additional compensation from a term
extension of 20 years would lead to a 0.33\% increase in present value payments to

\textsuperscript{14} On the other hand, Article 7(8) of Berne allows the country with a longer term of
protection to limit the duration of copyright it grants to foreign works.
an author assuming a work was created 30 years prior to the author’s death.\footnote{Akerlof, G. A., K. J. Arrow, T. F. Bresnahan, J. M. Buchanan, R. H. Coase, L. R. Cohen, M. Friedman, J. R. Green, R. W. Han, T. W. Hazlett, C. S. Hemphill, R. E. Litan, R. G. Noll, R. Schmalensee, S. Shavell, H. R. Varian and R. J Zeckhauser 2002, Amici Curiae Brief in support of petitioners, Eldred v Ashcroft, US Supreme Court, 20 May, also publicly available on the Brookings Institute website as an AEI-Brookings Joint Centre for Regulatory Studies paper at http://www.brookings.edu/~/media/Files/rc/reports/2002/05_copyright_litan/05_copyright_litan.pdf.} The assumptions used to arrive at this figure were relatively optimistic and favourable to a conclusion of there being a benefit from term extension. For example, it was assumed that the creator would enjoy a constant stream of revenues for the full copyright term, when the economic life of a work often is less than the copyright term (as noted above). Additionally, the authors used an interest rate of 7\% to discount future payments back to present value terms. Given the high degree of uncertainty of revenues from copyright and the fact that investors require higher compensation for riskier investments, the appropriate interest rate arguably should be higher than 7\%, which would further reduce the present value of additional compensation.

Secondly, there is no evidence that the income elasticity of the supply of creative works – i.e. the responsiveness of the supply of creative works to an increase in the income of the producers of such works – is high. Very few studies have attempted to measure the responsiveness of the supply of creative works to increases in the income of producers. One exception is a 2002 study by Hui and Png, which found no significant output effects from a copyright term extension of 20 years for films.\footnote{Hui, K-L, and I. P. L. Png 2002, ‘On the Supply of Creative Work: Evidence from the Movies’, American Economic Review, Vol. 92, Issue 2, May.}

Thirdly, in a small economy that is a significant net importer of copyright-protected works such as New Zealand, it is highly unlikely that copyright term extension in New Zealand would make a material difference in returns to foreign rights holders and therefore influence their production decisions. It is more likely that they would continue to base their production decisions on market conditions and policy environments in much larger markets (e.g. the United States or Europe).

Finally, it is worthwhile noting that there can be no output-inducing effect from the retrospective application of copyright term extension to works that were produced before the policy change but yet to fall into the public domain (i.e. are still in rights). Retrospective application confers a windfall gain to creators of past works but does not change the stock of such works.
Potential for increased foreign investment

It may be suggested that copyright term extension, by creating the perception of a stronger environment for IP protection and by harmonising New Zealand’s copyright term with that of major trading partners such as the United States, could induce greater foreign investment in New Zealand’s copyright-related industries and boost local production of copyright-protected goods and services. This in turn could stimulate economic growth and possibly raise productivity in New Zealand.

While these effects are theoretically possible, in practice any increase in foreign investment that New Zealand would attract as a result of policy change is likely to be trivial, as there is no evidence of foreign investment in New Zealand currently being held back due to insufficiently strong IP protection.

Moreover, because domestic copyright-related industries make a relatively small contribution to New Zealand’s GDP, implausibly large foreign investment would be required to make a non-trivial contribution to New Zealand’s economic growth.

Economic costs of copyright term extension

Increased transfers from New Zealand consumers to foreign rights holders

As previously noted, copyright term extension means that New Zealand consumers\textsuperscript{17} pay copyright prices for 20 years longer relative to the current arrangement. This is the source of the increased income to rights holders that was discussed as a potential economic benefit above. However, the portion of increased income that is sourced from New Zealand consumers and transferred to foreign rights holders represents an economic cost to the New Zealand economy.

The size of this transfer is likely to be substantial across all copyright industries. For example, we conservatively estimate that the economic cost associated with the transfer of income to foreign rights holders for books is of the order of $300 million in present value terms and for recorded music is of the order of $240 million in present value terms over a 2009 to 2118 timeframe. Appendices 1 and 2 set out the methodology used to derive these estimates.

\textsuperscript{17} In this report, the term ‘consumer’ is defined broadly to refer to any purchaser of an IP protected work, including final consumers (who may be individuals or businesses), intermediaries (e.g. libraries and universities) and producers of derivative works.
Foregone consumption of copyright-protected works

Copyright laws seek to resolve the problem of ensuring efficient investment in creative works by allowing producers of such works to set prices above the marginal cost of producing them. This price mark-up above marginal cost is intended to compensate creators for the especially high risk involved in investment in creative activity, for which they may not otherwise be appropriately compensated due to special problems relating to:

- non-excludability – i.e. the owners of creative works have difficulty preventing others from appropriating benefits generated by the use of their outputs without compensation;

- jointness in consumption – i.e. consumption of a creative work (e.g. reading of a poem) by one person does not diminish supply available for future consumption, which implies that prices for the second and subsequent purchases of a creative work should be set at or close to zero to encourage efficient consumption. This conflicts with the condition for efficient investment which requires a mark-up above marginal cost;

- cumulativeness - i.e. all creative works are potentially inputs into the production of future works. Future creators benefit from access to the existing stock of creative works, even if they play no part in their creation and do not contribute to their cost; and

- network effects – i.e. situation where the benefits derived from an activity increases with the number of participants that activity attracts. Network effects may be particularly relevant in areas such as creation of computer software.

When creative works fall out of rights, the creator is regarded as being appropriately compensated for the high risk involved in producing creative works and a mark-up above marginal cost is no longer warranted – i.e. it is efficient for prices to decline to reflect the marginal cost of production. It follows then that the longer the term of copyright, the longer particular works remain outside the public domain and the more likely that a consumer will find that the work they prefer to use will be ‘in rights’ and therefore sold at marked-up ‘copyright prices’.

The immediate effect of a 20 year copyright term extension is therefore to lengthen the period of time in which producers of creative works exercise control over the use of their works and are able to charge ‘copyright prices’, which may be substantially above marginal cost. Payments by consumers who continue to purchase the product at the copyright price are transferred to rights holders.

However, some consumers – in particular, consumers who value the works at or above marginal cost, but at less than the copyright price – will choose to forego consumption of the rights-extended work that they were otherwise willing to
purchase (in the absence of term extension) and possibly choose an alternative consumption option that they do not value as highly. In economics these foregone consumption opportunities are a form of economic cost (i.e. deadweight loss). These deadweight losses are also incurred under the current copyright term. Extension of the copyright term means that they are incurred for a further 20 years.

These costs are mitigated to some extent by permitted use provisions. Insofar as a particular use of a copyright-protected work falls within the permitted exceptions, then the relevant work can effectively be used as if they were substantially in the public domain.

In the case of books, we conservatively estimate that copyright term extension would confer an economic cost to New Zealand in the form of foregone consumption of the order of $0.155 million in present value terms over a 2009 to 2118 timeframe. Appendix B explains the methodology used to derive this estimate.

In the case of recorded music, we conservatively estimate that copyright term extension would confer an economic cost to New Zealand in the form of foregone consumption of the order of $0.08 million in present value terms over a 2009 to 2078 timeframe. Appendix C explains the methodology used to derive this estimate.

**Reduced local production of derivative works**

Producers of derivative works frequently want to collate or coordinate a set of works together to produce their own work. An extension of the copyright term would impose additional administrative costs on these producers. In particular, when creative works are still 'in rights', producers who wish to use these works to create derivative works must seek out the relevant rights holder and bargain with them about possible terms and conditions of use. If these works were in the public domain, not only would royalties not need to be paid, but bargaining costs and costs to seek permission would also be avoided. The longer the term of copyright protection, the longer that works will remain out of the public domain and the higher the likelihood that producers of derivative works will need to incur costs to trade and negotiate with rights holders. Consequently, extension of the copyright term can reasonably be expected to result in an increase these transaction costs.

The tracing cost component of these transaction costs is not homogeneous across works. The longer the copyright term, the longer works will remain outside the public domain and therefore the greater the associated tracing costs of a particular stock of works at any point in time. Producers who are interested in producing a derivative work by synthesising a number of old works (e.g. a multimedia project employing footage from old films) may find it significantly more costly and difficult to trade rights holders for some of the oldest works that remain in rights due to copyright term
extension. As a result, some producers of derivative works may forego use of the oldest works even though the value of those works at above the marginal cost of production because the effective price of using the work, taking into account all transaction costs, exceeds their valuation.

In this way, additional transaction costs associated with extension of the copyright term can lead to a deadweight loss associated with foregone production of derivative works. Even if the production of such works goes ahead, but at a higher cost and hence higher price to end users than would be the case absent term extensions, there is likely to be deadweight losses in the market for derivative works as some consumers substitute away from the higher priced derivative work in favour of a less preferred alternative.

Landes and Posner point out that it is not the term of copyright but the absence of a copyright registration system that may create prohibitive tracing costs. However, in the absence of any proposals to introduce and maintain a copyright registration office, the costs associated with term extension must be assessed on the basis of the prevailing operating environment.

Overall, term extension is expected to increase the cost of producing derivative works and consequently is likely to result in lower local production of derivative works in the future than would occur absent term extension.

**Additional administrative costs for intermediaries**

Intermediaries (e.g. libraries and universities) will face higher costs to comply with copyright term extension and manage their collections, including higher tracing costs. In addition to paying copyright prices when purchasing in rights works for their collections, intermediaries pay licence fees to rights holders for use of in rights works. These fees may be paid as part of a licence negotiated with the rights holder or with the collecting society that represents them. They may be paid to a rights holder or particularly in the case of educational institutions, to a collecting society. Intermediaries also incur resource costs to negotiate licences for use of in rights works. These costs can be significant in the case of, for example, scientific and medical journals.

These additional costs may be recouped through their subscription charges to relatively price insensitive users (e.g. researchers, bureaucrats, consultants and academics) or by transferring tax revenues or private funding that otherwise would have been allocated elsewhere in the economy. These are transfer effects and do not

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represent an economic cost to New Zealand, except to the extent that they are funded via an increase in taxes, in which case it is relevant to consider the deadweight costs associated with taxation.\textsuperscript{19}

However, to the extent that intermediaries are unable to recoup additional compliance costs to comply with term extension, they may be forced to shed some existing stocks of copyright-protected works and/or reduce new acquisitions of copyright-protected works, which would reduce public access to copyright-protected works. This translates to foregone opportunities for users to access copyright-protected works, which represents an economic cost to New Zealand.

Likely net impact on the New Zealand economy of copyright term extension

On balance, the economic benefits from term extension are dubious, weak and mostly can be expected to accrue to foreigners. In contrast, the likely costs of term extension are more certain, likely to be non-trivial and are likely to mostly be borne by the local users of copyright-protected works (i.e. New Zealand consumers, businesses, libraries, universities, government and local producers of derivative works).

On this basis, a 20 year extension of the copyright term can reasonably be expected to impose a significant net cost on the New Zealand economy.

We estimated the net impact of term extension (i.e. economic benefits less economic costs) for books and recorded music (see Appendices 1 and 2).

On the cost side we took into account transfers by New Zealand consumers to foreign rights holders plus the deadweight loss associated with New Zealand consumers’ foregone consumption of imported works and the deadweight loss associated with New Zealand consumers’ foregone consumption of works produced by New Zealand rights holders.

Due to lack of data, we ignore the two remaining (and likely relatively less important in terms of magnitude) types of costs attributable to term extension – i.e. additional administration costs for intermediaries and deadweight losses in the market for derivative works. This leads to under-estimation of the total economic cost of copyright term extension in the analysis.

\textsuperscript{19} Taxes impose economic costs because they induce individuals to make decisions that they would not have made in their absence. The deadweight loss associated with a tax is given by the difference between the amount individuals/firms would be willing to pay to avoid having a tax imposed and the amount of tax collected.
On the benefit side we took into account the increase in transfers to New Zealand rights holders in export markets (depending on whether reciprocity is granted thus facilitating export market benefits for New Zealand copyright holders).

We are able to safely assume that term extension has no output-inducing effect or foreign investment stimulation effect by focusing the cost benefit analysis on works produced prior to 2009. For consistency, on the cost side of the ledger we also exclude all transfers from New Zealand consumers to foreign rights holders that relate to new works produced after 2008 as well as all deadweight losses associated with New Zealand consumers’ foregone consumption of imported works created after 2008. For a substantial net importer of copyright goods like New Zealand, it is reasonable to expect that the sum of these two costs would substantially exceed any benefits (due to an output-inducing or foreign investment stimulation effect) realised on works created after 2008. Thus, on balance, the exclusion of works created after 2008 from the analysis leads to understatement of the economic cost of copyright term extension to New Zealand.

On this basis, the present value of the net impact of copyright term extension on the New Zealand economy is conservatively estimated to range:

- for books, between negative $263 million and negative $300 million over the period to 2118 (i.e. economic loss of between $263 million and $300 million) in present value terms, depending on whether export market trade is on terms consistent with Article 5 or Article 7 of the Berne Convention; and

- for recorded music, between negative $208 million and negative $239 million over the period to 2078 (i.e. economic loss of between $208 million and $239 million) in present value terms, depending on whether export market trade is on terms consistent with Article 7 or Article 5 of the Berne Convention.

Appendices 1 and 2 set out the methodology used to derive these estimates.

These results may be broadly indicative of the costs and benefits of term extension in other copyright industries. For a small economy such as New Zealand, a substantial part of the overall impact is driven by trade effects. As a substantial net importer of copyright-protected works, it is reasonable to expect that the transfer from domestic consumers to foreign rights holders (which count as an economic cost to New Zealand) plus deadweight losses due to foregone consumption will overwhelmingly dominate any potential benefits in export markets even under the optimistic assumption of reciprocal term extension in the US for New Zealand copyright holders.
APPENDIX A: NEW ZEALAND AS A NET IMPORTER OF IP-PROTECTED WORKS

New Zealand is a significant net importer of IP protected goods and services, as evidenced by the data presented in Sections A.1 to A.3 below.

This has important implications for the welfare consequences of the contemplated policy changes. Insofar as the benefits from policy change predominantly accrue to rights holders (who are mostly foreign), while the costs are predominantly borne by various users of IP protected goods and services in New Zealand (who are mostly local), the net impact of the policy changes is to exacerbate New Zealand’s trade imbalance with respect to IP protected goods and services.

VALUE OF IP PROTECTED IMPORTS SUBSTANTIALLY OUTWEIGHS VALUE OF IP PROTECTED EXPORTS

Most of New Zealand’s top 20 exports by value (which account for 83 percent of total value of exports in the year to June 2008 on a fob basis) are agriculture, mineral or energy commodities (see Table A1). Most of these final products are not directly subject to copyright or patent protection. Two exceptions are machinery (New Zealand’s 5th largest export by value in 2008) and Electrical machinery (New Zealand’s 11th largest export by value in 2008), where there may be some patent protection for products originally designed in New Zealand.

By contrast, a substantial proportion of New Zealand’s top 20 imports by value (which account for 77 percent of total value of imports in the year to June 2007 on a cif basis) are elaborately transformed manufactured products and are likely to be subject to copyright or patent protection (see Table A1). Some of these are used as inputs to the production of agriculture, mineral and energy exports and/or production for domestic markets.
## Table A1: Top 20 New Zealand Exports and Imports by value

<table>
<thead>
<tr>
<th>Rank</th>
<th>Exports (year to June 2008)</th>
<th>Value (NZ$000 fob)</th>
<th>Imports (year to June 2007a)</th>
<th>Value (NZ$000 cif)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified</td>
<td>8,827,697</td>
<td>Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes</td>
<td>7,119,719</td>
</tr>
<tr>
<td>2</td>
<td>Meat and edible meat offal</td>
<td>4,680,754</td>
<td>Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof</td>
<td>5,884,671</td>
</tr>
<tr>
<td>3</td>
<td>Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes</td>
<td>2,666,864</td>
<td>Vehicles; other than railway or tramway rolling stock, and parts and accessories thereof</td>
<td>6,328,370</td>
</tr>
<tr>
<td>4</td>
<td>Wood and articles of wood; wood charcoal</td>
<td>1,999,126</td>
<td>Electrical machinery and equipment and parts thereof, sound recorders and reproducers, televisions</td>
<td>3,776,835</td>
</tr>
<tr>
<td>5</td>
<td>Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof</td>
<td>1,906,486</td>
<td>Plastics and articles thereof</td>
<td>1,592,965</td>
</tr>
<tr>
<td>6</td>
<td>Aluminium and articles thereof</td>
<td>1,458,797</td>
<td>Optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and appliances</td>
<td>1,194,439</td>
</tr>
<tr>
<td>7</td>
<td>Fruit and nuts, edible; peel of citrus fruit or melons</td>
<td>1,376,897</td>
<td>Pharmaceutical products</td>
<td>1,048,398</td>
</tr>
<tr>
<td>8</td>
<td>New Zealand miscellaneous provisions</td>
<td>1,213,773</td>
<td>Paper and paperboard; articles of paper pulp, of paper or paperboard</td>
<td>1,003,699</td>
</tr>
<tr>
<td>9</td>
<td>Fish and crustaceans, molluscs and other aquatic invertebrates</td>
<td>1,125,816</td>
<td>Iron or steel articles</td>
<td>868,275</td>
</tr>
<tr>
<td>10</td>
<td>Albuminoidal substances; modified starches; glues; enzymes</td>
<td>1,099,901</td>
<td>Aircraft, spacecraft and parts thereof</td>
<td>788,952</td>
</tr>
<tr>
<td>11</td>
<td>Electrical machinery and equipment and parts thereof, sound recorders and reproducers, televisions</td>
<td>1,023,314</td>
<td>Iron and steel</td>
<td>655,908</td>
</tr>
<tr>
<td>12</td>
<td>Beverages, spirits and vinegar</td>
<td>972,771</td>
<td>Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps</td>
<td>637,294</td>
</tr>
<tr>
<td>13</td>
<td>Wool, fine or coarse animal hair; horsehair yarn and woven fabric</td>
<td>774,229</td>
<td>Ships, boats and floating structures</td>
<td>636,303</td>
</tr>
<tr>
<td>14</td>
<td>Preparations of cereals, flour, starch or milk; pastrycooks' products</td>
<td>713,479</td>
<td>Apparel and clothing accessories; knitted or crocheted</td>
<td>569,672</td>
</tr>
<tr>
<td>Rank</td>
<td>Exports (year to June 2008)</td>
<td>Value (NZ$000 fob)</td>
<td>Imports (year to June 2007a)</td>
<td>Value (NZ$000 cif)</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>--------------------</td>
<td>-----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>15</td>
<td>Pulp of wood or other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard</td>
<td>670,002</td>
<td>Apparel and clothing accessories; not knitted or crocheted</td>
<td>550,136</td>
</tr>
<tr>
<td>16</td>
<td>Iron and steel</td>
<td>649,060</td>
<td>Inorganic chemicals; organic and inorganic compounds of precious metals; of rare earth metals; etc</td>
<td>528,410</td>
</tr>
<tr>
<td>17</td>
<td>Miscellaneous edible preparations</td>
<td>633,965</td>
<td>Fertilizers</td>
<td>504,750</td>
</tr>
<tr>
<td>18</td>
<td>Optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and app</td>
<td>538,445</td>
<td>Rubber and articles thereof</td>
<td>500,719</td>
</tr>
<tr>
<td>19</td>
<td>Paper and paperboard; articles of paper pulp, of paper or paperboard</td>
<td>525,289</td>
<td>Food wastes and prepared animal fodder</td>
<td>483,646</td>
</tr>
<tr>
<td>20</td>
<td>Natural, cultured pearls; precious, semi-precious stones; precious metals, metals clad with precious</td>
<td>507,100</td>
<td>Miscellaneous edible vegetable preparations</td>
<td>480,281</td>
</tr>
</tbody>
</table>

NEW ZEALAND AS A NET IMPORTER OF PHARMACEUTICALS AND BOOKS

Two markets that are likely to be significantly impacted by stronger IP protection measures are pharmaceuticals and books.

New Zealand is a significant net importer of pharmaceuticals (see ). Pharmaceuticals represent New Zealand’s 7th largest import and 26th largest export by value in 2007. New Zealand’s trade deficit for pharmaceuticals has steadily increased in recent years and reached nearly NZ$850 million in 2008.

**Table A2: Pharmaceutical exports and imports of New Zealand (calendar years)**

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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceuticals exports (NZ $'000)</td>
<td>263,425</td>
<td>231,455</td>
<td>207,712</td>
<td>192,826</td>
<td>182,091</td>
<td>180,712</td>
</tr>
<tr>
<td>Pharmaceuticals imports (NZ $'000)</td>
<td>1,110,325</td>
<td>1,026,472</td>
<td>956,606</td>
<td>952,779</td>
<td>800,000</td>
<td>757,860</td>
</tr>
<tr>
<td>Trade balance (NZ$'000)</td>
<td>-846,895</td>
<td>-795,013</td>
<td>-748,894</td>
<td>-759,953</td>
<td>-617,909</td>
<td>-577,148</td>
</tr>
</tbody>
</table>

Note: Includes human and animal blood, glands and other organs for therapeutic or prophylactic uses; modified immunological products; vaccines; toxoids; micro-organism cultures; medications; bandages, wadding or gauze impregnated or coated with pharmaceutical substances or in packings for retail sale for medical, surgical or veterinary use; pharmaceutical, goods such as sterile surgical calut, suture materials pharmaceutical goods, tissue adhesives, laminates, laminated tents, absorbable surgical and dental haemostatics, and surgical or dental adhesion barriers.

Source: Statistics New Zealand, New Zealand External Trade Statistics.

New Zealand is also a significant net importer of books (see ). Books, newspapers and printed matter represent New Zealand’s 21st largest import and 51st largest export by value in 2007. New Zealand’s trade deficit for books, newspapers and printed matter has steadily increased since 2004 and reached nearly $390 million in 2007 and nearly $380 million in 2008.

**Table A3: Book exports and imports of New Zealand (calendar years)**

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Book exports (fbp) (NZ $'000)</td>
<td>65,006</td>
<td>49,046</td>
<td>63,047</td>
<td>60,376</td>
<td>63,930</td>
<td>66,996</td>
</tr>
<tr>
<td>Book imports (drp) (NZ $'000)</td>
<td>436,59</td>
<td>436,293</td>
<td>422,519</td>
<td>383,229</td>
<td>381,315</td>
<td>383,301</td>
</tr>
<tr>
<td>Trade balance (NZ$'000)</td>
<td>-377,583</td>
<td>-387,248</td>
<td>-369,472</td>
<td>-332,864</td>
<td>-317,386</td>
<td>-324,305</td>
</tr>
</tbody>
</table>

Note: Includes newspapers and printed matter.

Source: Statistics New Zealand, New Zealand External Trade Statistics.

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New Zealand is a net payer of royalties and licence fees

Royalties and licence fees\textsuperscript{21} data confirm that New Zealand is a substantial net importer of IP protected goods and services (see Table A4).

Royalties and licence fees paid on imported goods and services in New Zealand are of the order of 4 to 6 times greater (average 4.7 times greater over 5 years to 2007) than royalties and licence fees received on exported goods and services.

Table A4: Royalties and licence fees trade of New Zealand (calendar years)

\begin{center}
\begin{tabular}{|l|c|c|c|c|c|}
\hline
\hline
Royalties and licence fees exports (NZ $'000) & 100,920 & 189,257 & 130,871 & 158,181 & 185,197 \\
Royalties and licence fees imports (NZ $'000) & 765,138 & 750,863 & 783,081 & 794,515 & 801,206 \\
Trade balance (NZ$'000) & -674,209 & -561,606 & -652,210 & -636,434 & -616,009 \\
\hline
\end{tabular}
\end{center}

In comparison, Australia is also a net payer of royalties and licence fees (see Table A5). However, royalties and licence fees paid on imports in Australia are of the order of three to five times greater (average 3.6 times greater over the five years to June 2008) than royalties and licence fees received on exported goods and services.

Table A5: Royalties and licence fees trade of Australia (year to 30 June)

\begin{center}
\begin{tabular}{|l|c|c|c|c|c|}
\hline
\hline
Royalties and licence fees exports (A$m) & 752 & 887 & 772 & 633 & 622 \\
Royalties and licence fees imports (A$m) & 3,533 & 3,185 & 2,734 & 2,007 & 1,978 \\
Trade balance (A$m) & -2,781 & -2,298 & -1,962 & -1,374 & -1,356 \\
\hline
\end{tabular}
\end{center}

\textsuperscript{21} i.e. payments to the owners of IP protected goods and services by users of such goods and services, patents and copyrights by users.
APPENDIX B: ESTIMATION OF THE COSTS AND BENEFITS OF COPYRIGHT TERM EXTENSION FOR BOOKS

This appendix sets out the method followed by the authors to quantify the economic costs, economic benefits and overall impact on the New Zealand economy of copyright term extension for books. The methodology involves three key steps:

1. Calculation of the proportion of works that are in-rights;
2. Deriving relevant ratios to allow the projection of in-rights book sales; and
3. Calculating of costs and benefits of term extension.

Comments on the validity and limitations of this methodology are made in the section titled "Comments on Methodology".

Calculating the Proportion of Works that are In-Rights

In order to quantify costs and benefits, we first derive for each year from 2009 to 2118 the percentage of books sold that are i) produced before 2009 and ii) in-rights according to the current copyright term and also under the (potential) 20 year extended term. The year 2118 was chosen to enable the analysis to capture the full impact of copyright term extension on works produced prior to 2009.

These percentages are used to proxy the proportion of total book sales that in-rights books account for each year. Note that the percentages actually only reflect sales of books produced before 2009 that are in-rights. This approach was adopted to simplify the analysis. It leads to an under-estimate of the proportion of in-rights books in the future, because it excludes sales of books produced in 2009 or in subsequent years, all of which will be in-rights during the period covered by this analysis.

One advantage of this approach is that we can safely assume supply elasticities from term extension are zero\textsuperscript{22}. This is because these works were produced before the term extension and therefore the only effects will be costs in terms of deadweight losses due to foregone consumption, costs in terms of transfers from New Zealand consumers to foreign rights.

\textsuperscript{22} This applies to producers for the domestic market as well as producers for the export market.
holders, and benefits in terms of windfall gains of exporters at the expense of foreign consumers in the event that trade is on terms consistent with Article 7 of the Berne Convention.\footnote{Article 7 of the Berne Convention makes room for countries to apply reciprocal arrangements so that the term of protection that applies to a New Zealand copyrighted work in the country of sale is the same as the term that rights holders in the country of sale enjoy when New Zealanders purchase their copyrighted works.}

To estimate and project in-rights book sales using this approach, we make a number of assumptions. Some assumptions lead to an under-estimate, while others will lead to an over-estimate of the proportion of annual sales that in-rights works account for. The net impact of these counteracting tendencies is difficult to judge. However, overall we believe that the assumptions are reasonable given data and time constraints.

The assumptions we have made to estimate and project in-rights book sales include:

1. The average life expectancy of authors over the last 90 years is 70 years.

2. The average age of an author when they create a new work is 30 years. To the extent that average age of authors is actually higher than 30 years, this assumption will bias our results downwards.

3. Together these first two assumptions imply that the effective copyright term under the current regime would be 90 years (that is, 70-30+50) whereas under term extension it would be 110 years (that is, 70-30+70).

4. We assume 15\% of sales each year relate to works published a year or more before they were sold. This figure is based on data provided by the New Zealand Book Publishers Association indicating that new titles (i.e. titles published in the year of purchase) on average comprised between 81\% and 88\% of sales over the period 2005 to 2008.

5. The vintage pattern of the population of books is identical to the vintage pattern of the National Library of New Zealand (NZNL) book stock, and this vintage pattern is constant through time (see Table B1 below). This is likely to understate the percentage of works that are in-rights for the population of books, because most other libraries and households do not have the same proportional holding of older books that an archive institution such as the NLNZ would have.

6. Where vintages data is only available for decade-long periods, we assume that there is an equal distribution of works over the decade.

7. Term extension is introduced after all the books sold in 2008 are produced, but before the books sold in 2009 are produced. This is consistent with a 1 January
2009 start date. We also assume, for simplicity, that all works were created on 1 January in each year.

Table B1: Vintages data for book collection of the National Library of New Zealand

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion of book stock in 2009</th>
<th>Year</th>
<th>Proportion of book stock in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1900</td>
<td>4.49%</td>
<td>1995</td>
<td>1.16%</td>
</tr>
<tr>
<td>1900–1909</td>
<td>1.20%</td>
<td>1996</td>
<td>1.15%</td>
</tr>
<tr>
<td>1910–1919</td>
<td>1.52%</td>
<td>1997</td>
<td>1.15%</td>
</tr>
<tr>
<td>1920–1929</td>
<td>1.99%</td>
<td>1998</td>
<td>1.13%</td>
</tr>
<tr>
<td>1930–1939</td>
<td>3.02%</td>
<td>1999</td>
<td>1.14%</td>
</tr>
<tr>
<td>1940–1949</td>
<td>5.44%</td>
<td>2000</td>
<td>1.08%</td>
</tr>
<tr>
<td>1950–1959</td>
<td>8.49%</td>
<td>2001</td>
<td>1.02%</td>
</tr>
<tr>
<td>1960–1969</td>
<td>13.97%</td>
<td>2002</td>
<td>1.10%</td>
</tr>
<tr>
<td>1970–1979</td>
<td>17.90%</td>
<td>2003</td>
<td>1.14%</td>
</tr>
<tr>
<td>1980–1989</td>
<td>19.24%</td>
<td>2004</td>
<td>1.18%</td>
</tr>
<tr>
<td>1990</td>
<td>1.59%</td>
<td>2005</td>
<td>1.11%</td>
</tr>
<tr>
<td>1991</td>
<td>1.51%</td>
<td>2006</td>
<td>1.05%</td>
</tr>
<tr>
<td>1992</td>
<td>1.66%</td>
<td>2007</td>
<td>1.02%</td>
</tr>
<tr>
<td>1993</td>
<td>1.55%</td>
<td>2008</td>
<td>0.82%</td>
</tr>
<tr>
<td>1994</td>
<td>1.21%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: National Library of New Zealand

Based on these assumptions, we extrapolate the impact of term extension on the percentage of works sold in each year from 2009 to 2118 that were published before 2009 and are in- rights under the current copyright term.

Deriving Projection Ratios and Projecting Future Sales

The next step in the quantification of costs and benefits involved the derivation of a number of ratios that are used to project the value of book imports, exports and domestic sales in the future, and the relevant mark-up to apply to the percentage of sales that are of in-rights works due to term extension.

**Book Sales to GDP**

The first ratio calculated is of book sales to GDP. Both data series were sourced from Statistics New Zealand. Statistics New Zealand publishes wholesale sales data for Books and Paper Products, which includes Book and Magazine Wholesaling (ANZSIC Class 3755) and Paper Product Wholesaling (ANZSIC Class 3736). Book and Magazine Wholesaling includes book, magazine, newspaper and periodical wholesaling. Paper Product Wholesaling includes greeting card, paper, paper board
container, paper stationery and paper wholesaling as well as paper product wholesaling not elsewhere classified.

Statistics New Zealand was unable to provide a breakdown of this data to isolate book or book and magazine wholesaling. However, the Australian Bureau of Statistics (ABS) has published data indicating that Book and Magazine wholesale sales of goods accounted for 17.9% of total Book and Paper Products wholesale sales of goods. This figure still includes magazine and newspaper wholesaling, which we would prefer to exclude for this study. Unfortunately, the ABS was unable to provide more disaggregated information. To reduce the risk of overestimation of the value of wholesale book sales we therefore assume that 60% of Book and Magazine wholesale sales of goods relate to books, which is equivalent to 10.7% of total Paper Product Wholesaling sales of goods.

We then calculated a representative ratio of wholesale book sales\textsuperscript{24} to nominal GDP, based on a weighted average of data for the period 2003 to 2008, inclusive.

**Proportion of Book Sales that are Imports, Exports and Locally Produced and Sold**

We used the total wholesale book sales data, calculated as described above, and Statistics New Zealand data on exports and imports of books to estimate the proportions of book sales that relate to imported, exported, and locally produced and sold books for the period 2004 to 2008, inclusive.

Using this data we estimated weighted average proportions such that:

- 23% of book sales relate to domestically produced and sold books;
- 68% of book sales relate to imported books; and
- 8% of book sales relate to exported books.

**Royalties as a Proportion of Sale Price**

We also estimated royalties paid as a mark-up over the (royalty exclusive) sale price. Lack of robust data prevented us from performing this calculation using New Zealand data. We therefore calculated a copyright royalty mark-up on the royalty exclusive sale price using Australian data and assume that this mark-up is also representative of the copyright royalty mark-up in New Zealand.

This first required estimation of the value of in-rights book sales in Australia, since only in- rights sales are affected by royalty payments (feeding back into final prices). We used Australian vintages data to calculate the percentages of works that fall out

\textsuperscript{24} This includes book publisher export sales, sales of imported books and domestic sales of locally produced books.
of rights each year. These results were used to derive a weighted average mark-up, calculated as: royalties/(sales with royalties minus royalties). The estimated mark-up is 9.3%.

**Projection of Total Book Sales**

We assume that the stock of in rights books matches the expected long term rate of growth of growth of the New Zealand economy. To project book sales into the future, we therefore first project real GDP into the future from 2008 assuming 3% annual growth. We further assume that the ratio of book sales to GDP calculated above is constant. This ratio is then multiplied by the projected GDPs for each year from 2009 to 2118.

Next we determine the value of in-rights works in each of the years that copyright term extension affects in-rights works. We only calculate the effects of copyright term extension on works produced before 2009, which we have assumed to form a constant 15% of book sales. In other words, we assume that 85% of book sales in each year from 2009 relate to books published in the same year.

This percentage is multiplied by the corresponding percentage from the NLNZ vintages table presented above for each year. These percentages multiplied by the projected sales figures give the value of works affected by copyright laws each year.

**Calculating Costs and Benefits of Term Extension**

The costs and benefits of term extension are determined through analysis of deadweight losses and relevant transfers (i.e. transfers from New Zealand consumers to foreign rights holders, which are treated as an economic cost to New Zealand, and transfers from foreign consumers to New Zealand rights holders, which are treated as an economic benefit to New Zealand).

**Stream of Deadweight Losses Associated with Term Extension**

Because the focus is on the effects of term extension on the market for in-rights works produced before 2009, there is no need to take account of supply elasticities (that is, additional output from term increased rewards conferred on authors from term extension) since there are none in this case. All authors of works produced before the term extension begins receive a windfall gain.

We assume a price elasticity of demand for books of -1.77, based on a 2006 study by Ringstad and Løyland of book demand by more than 18,000 Norwegian households
over the period 1986 to 1999. This figure falls within the –1.5 to –3 range of price elasticities for books calculated in a 1992 study by Bittlingmayer of the US market.

We note that business book users and personal book users are not likely to be similarly responsive to changes in the price of books. Generally, business users are likely to be less responsive to price changes than personal users, and therefore have a more inelastic demand (that is, lower elasticity). Unfortunately there are no studies that calculate elasticities for business and personal users separately. For expediency, we assume that the Ringstad and Løyland result, which is at the lower end of the plausible range of price elasticities calculated by Bittlingmayer, is indicative of the price elasticity of demand by all New Zealand book consumers, including businesses and intermediaries.

The deadweight loss for each year is then calculated as 1.77 (i.e. the absolute value of the price elasticity of demand) times 0.5 times the square of the assumed royalty mark-up on book prices attributable to copyright (that is, 0.093) times the value of works affected by the cost raising effects of the copyright laws. This gives deadweight losses to total sales of books (broken down by domestic sales of locally produced books, imports and export sales to foreigners) each year. However, not all of this deadweight loss represents a welfare cost to New Zealand since some of the total deadweight losses are borne by foreign consumers. The relevant proportion of the total deadweight loss each year to New Zealand is therefore be separated out.

**Costs of Term Extension Associated with Foregone Consumption (Deadweight Loss)**

We estimate that domestically sales of books (i.e. export sales and domestic sales of locally produced books) account for 32% of total book sales. The stream of deadweight losses is calculated as 32% of the total deadweight loss in each year. This is then converted into a net present value. We use a discount rate of 7%, consistent with the approach of Akerlof et al in the US Eldred brief.

This results in a deadweight loss relating to foregone consumption of books by New Zealand consumers of $0.155 million in present value terms.

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Costs of Term Extension Associated with Transfer of Income to Foreigners

To estimate the size of the income transfer from New Zealand consumers who purchase books that otherwise would have fallen out of rights and been cheaper, we first calculated the what book sales would be after excluding the foregone purchases associated with the deadweight loss. This was calculated as: the value of old demand times (1 + the proportional change in price + (the elasticity of demand times the proportional change in price)).

The new sales figures for each year are then multiplied by 68% (which is the proportion of book sales that relate to imported books) to obtain the new values of book imports for each year. This figure is then adjusted downwards to remove the value of royalties built into it. Since the royalty mark-up was 0.0932, it is multiplied by 1/1.0932. This adjusted figure is then multiplied by the royalty mark-up to obtain the transfer. Doing this for each year and calculating a present value figure gives an estimated transfer of around $300 million from local consumers to foreigners.

Benefits of Term Extension in the Export Market

The deadweight loss in the export market is not relevant for national welfare purposes because it is incurred by foreigners. However, the additional income transferred from foreign consumers to domestic producers of copyrighted works counts as an economic benefit to New Zealand.

The maximum value of this transfer is given by the additional income that New Zealand rights holders would receive in export markets where all transactions occur on terms consistent with Article 7 of the Berne Convention. To calculate the maximum value of the transfer we first take the demand for books derived above (adjusted for deadweight losses) for each year and multiply this by the share of total book sales that relate to exports (that is, 8%). This figure is adjusted to remove the value of royalties that is built into it. We do this using the same method as for imports (that is, by multiplying it by 1/1.0932). The transfer due to royalties is then 0.0932 times the revised ratio of exports to book sales. This produces a stream of benefits that are converted into a present value figure.

If all transactions occurred on terms consistent with Article 5 of the Berne Convention then the additional income that New Zealand rights holders would receive in export markets as a result of copyright term extension in New Zealand would be zero. Zero is therefore the minimum value of the additional income transferred from foreign consumers to domestic producers of copyrighted works.

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28 This is a negative number.
On this basis, the ‘export transfer’ benefit is calculated to be in the range of $0 to $36 million in present value terms. The likely value of the transfer will be somewhere between these maximum and minimum values, as some export transactions are likely to occur on terms consistent with Article 5, while others are likely to occur on terms consistent with Article 7, of the Berne Convention.

Comments on Methodology

Conservative Nature of Results

The quantification of costs and benefits is subject to a number of caveats that should be duly noted. We believe that these caveats on balance produce a conservative ‘lower bound’ estimate of the net cost of extended copyright protection to the New Zealand economy.

To begin with our assumption about the vintages of books sold persisting through time in constant proportions could lead to an over-estimate of the deadweight loss associated with term extension. This assumption was required because we have no information about how sales of books produced in a given year might change through time.

However, a number of other assumptions have the opposite effect. For example, the analysis only takes into account the dead weight losses incurred by consumers of books published before 2009.

We also are likely to have underestimated the total social cost of copyright term extension because it focuses solely on initial deadweight losses due to foregone consumption and does not take account of possible flow on effects in terms of reduced future output of books due to increased cost of inputs into the production of derivative works, the detrimental impact on employment and output elsewhere in the economy, and the impact of additional administrative costs imposed on intermediaries as a result of term extension.

Our analysis further underestimates the total social cost of copyright term extension because it focuses solely on initial deadweight losses due to foregone consumption and does not take account of possible flow on effects in terms of reduced future output of books due to increased input costs. To capture fully all these effects — for instance the effects of transaction and bargaining costs in leading to the anti-commons problems discussed previously — would demand a sector by sector analysis of effects because of different conditions in different industries. Different and intricate assumptions would have to be made about each and if one wanted to capture the resulting deadweight loss because of these higher costs of production dissuading
some investments or shifting production techniques, then assumptions would have to be made about, for instance, the elasticity of supply with respect to input costs of these different producers.

**Uncertainties**

The analysis is built around an estimate of the book sales in New Zealand which depends on an assumption that books account for around 10% of total wholesale sales of Book and Paper products. Australian data suggests that the true figure is probably substantially less than 17.9%, as this figure includes magazine and newspaper wholesaling in addition to books. We undertook sensitivity testing and found that overall results are highly insensitive to values ranging from 9% to 14% of total wholesale sales of Book and Paper Products.

Projecting costs and benefits 100 years out is always complicated by uncertainties. The analysis assumes that book sales as a proportion of nominal GDP will remain constant over the next century. Future technological developments and changes in consumer preferences may result in a structural shift that renders this fixed relationship invalid.

There are other fixed ratios used in our projections which could be similarly affected by future changes in technology and tastes. Notwithstanding these uncertainties, a long projection time frame is called for in this case to capture the full impact of term extension on the current circulating stock of copyrighted works in New Zealand.
APPENDIX C: ESTIMATION OF THE COSTS AND BENEFITS OF COPYRIGHT TERM EXTENSION FOR RECORDED MUSIC

This appendix sets out the method followed by the authors to quantify the economic costs, benefits and overall impact on the New Zealand economy of copyright term extension for recorded music. The analysis excludes consideration of copyright in the musical work (that is, composition) and literary work (that is, lyrics).

Currently, recorded music is copyright-protected for 50 years from ‘publication’. Under the potential policy amendment the copyright term would be extended by 20 years so that sound recordings would receive protection for 70 years from publication.

The methodology used to estimate the costs and benefits of copyright term extension for recorded music is consistent with that described in Appendix B for books. It involves three key steps:

1. Calculation of the proportion of works that are in-rights;
2. Deriving relevant ratios to allow the projection of in-rights book sales; and
3. Calculating the costs and benefits of term extension.

Comments on the validity and limitations of this methodology are made in the section “Comments on Methodology”.

Calculating the Proportion of Works that are In-Rights

To simplify the analysis of vintages of works, we assume copyright term extension commenced on 1 January 2009 and that all works are created on 1 January in each year. These assumptions imply that, absent term extension, works that were produced in 1959 would have expired in 2009 (because 2008 would have been the 50th year after production). This means that works produced before 1959 need not be considered in the analysis because their copyright term expires too early to be ‘revived’ by term extension.

The timeframe for the analysis extends to 2078, as this is the final year in which works enjoy windfall gains from any decision in 2009 to extend the copyright term by 20 years and apply this policy change retrospectively. By 2078 works produced in 2008 or any year prior to 2008 will have fallen out-of-rights, either with or without term extension.
We focus on works produced before 2009 (i.e. the year in which copyright term extension is assumed to commence), which means that we can safely assume the relevant supply elasticities from term extension are zero\textsuperscript{29}. This is because the in-right works we have analysed were produced before the term extension. Consequently, the only relevant effects will be costs in terms of deadweight losses due to foregone consumption, costs in terms of transfers from New Zealand consumers to foreign rights holders and benefits in terms of windfall gains to exporters at the expense of foreign consumers in the event that trade is on terms consistent with Article 7 of the Berne Convention (which allows countries to apply reciprocal arrangements).

New works produced from 2009 onwards are excluded to simplify the analysis. The analysis of such works is more complicated because there is potential for economic benefits via an output effect or a productivity effect, which effects do not arise in relation to past works (although we do not anticipate that these effects would be significant in New Zealand’s case). It also requires complex forecasting of recorded music sales and vintage profiles for works that do not yet exist.

This approach leads to an underestimate of the proportion of in-rights books in the future, because it excludes sales of works produced in 2009 or later, all of which will be in rights during the period covered by the analysis. It is therefore likely to somewhat understate the net economic cost to New Zealand associated with copyright term extension for recorded music in the sense that it is unlikely that any increased incentive effects on later producers will exceed ongoing deadweight losses suffered by consumers of later works. The conservative nature of results is discussed further below.

To quantify costs and benefits we first derive, for each year from 2009 to 2078, the percentage of sound recordings sold that are: (i) produced before 2009; and (ii) in-rights according to the current copyright term and also under the proposed extended term.

The resulting annual percentages are used to proxy the proportion of total sound recording sales that relate to in-rights sound recordings each year. We obtained vintages data from the National Library of New Zealand (see Table below).

\textsuperscript{29} This applies to producers for the domestic market as well as producers for the export market.
Using this vintage data, we projected out to 2078 the likely consequences of term extension for the percentage of works produced prior to 2009 that will be in rights. Essentially, term extension results in a slightly higher percentage of works being in-rights for a longer period of time (i.e. an additional 20 years) than under the current policy arrangement:

**Table C1: Vintages data for recorded music collection of the National Library of New Zealand**

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion of total recorded music collection in 2009</th>
<th>Year</th>
<th>Proportion of total recorded music collection in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1900</td>
<td>0.12%</td>
<td>1995</td>
<td>2.54%</td>
</tr>
<tr>
<td>1900–1909</td>
<td>0.05%</td>
<td>1996</td>
<td>2.71%</td>
</tr>
<tr>
<td>1910–1919</td>
<td>0.17%</td>
<td>1997</td>
<td>2.80%</td>
</tr>
<tr>
<td>1920–1929</td>
<td>0.51%</td>
<td>1998</td>
<td>2.00%</td>
</tr>
<tr>
<td>1930–1939</td>
<td>0.52%</td>
<td>1999</td>
<td>2.72%</td>
</tr>
<tr>
<td>1940–1949</td>
<td>0.63%</td>
<td>2000</td>
<td>2.97%</td>
</tr>
<tr>
<td>1950–1959</td>
<td>2.47%</td>
<td>2001</td>
<td>2.87%</td>
</tr>
<tr>
<td>1960–1969</td>
<td>7.18%</td>
<td>2002</td>
<td>3.41%</td>
</tr>
<tr>
<td>1970–1979</td>
<td>7.28%</td>
<td>2003</td>
<td>3.33%</td>
</tr>
<tr>
<td>1980–1989</td>
<td>28.63%</td>
<td>2004</td>
<td>3.09%</td>
</tr>
<tr>
<td>1990</td>
<td>5.02%</td>
<td>2005</td>
<td>2.60%</td>
</tr>
<tr>
<td>1991</td>
<td>3.40%</td>
<td>2006</td>
<td>1.89%</td>
</tr>
<tr>
<td>1992</td>
<td>3.10%</td>
<td>2007</td>
<td>1.31%</td>
</tr>
<tr>
<td>1993</td>
<td>2.89%</td>
<td>2008</td>
<td>0.80%</td>
</tr>
<tr>
<td>1994</td>
<td>2.20%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: National Library of New Zealand

Deriving Relevant Ratios and Future Sales

The next step in the quantification of costs and benefits is to derive a series of ratios that are used to project the value of sound recording imports, exports and domestic sales in the future, and the relevant mark-up to apply to the percentage of sales that are of in-rights works due to term extension.

**Ratio of Retails Music Sales to GDP**

We obtained data on the total value of retail recorded music sales from the RIANZ website and data on nominal GDP from Statistics New Zealand for period 2003 to 2007. This data was used to calculate a weighted average ratio of retail sales of recorded music to GDP of 0.00107.
Exports and Imports of Recorded Music as Ratio of Total

We draw on RIANZ data on the total value of retail recorded music sales and data from Statistics New Zealand on the value of recorded music imports and exports from Statistics New Zealand for period 2003 to 2007.

This data was used to derive weighted average estimates of:

- Recorded music imports as a proportion of total recorded music sales (25%);
- Recorded music exports as a proportion of total recorded music sales (3%); and
- Share of total recorded music sales that is not exported (97%).

Royalties Mark-Up

We could not obtain a plausible value for a royalty mark-up using New Zealand data. To estimate the mark-up on copyright royalties caused by copyright term extension, we therefore rely on data from the ABS Business of music publication\(^\text{30}\), which separates sound recording royalties from publishing royalties. The royalty mark-up associated with copyright term extension was obtained by estimating the mark-up of sound recording royalty expenses incurred by record companies and distributors over sales by record companies and distributors. This mark-up was 26%.

Price Elasticity of Demand

We obtained an estimate of the price elasticity of demand for recorded music from an article published by Stevans and Sessions in 2005, which indicates that the price elasticity of demand for recorded music is -1.40 (i.e. demand is relatively price elastic).\(^\text{31}\)

Proportion of Total Sales that Related to Pre-2009 Vintages

We assume that 25% of recorded music works are either singles or classical music sales. This figure is based on Australian Record Industry Association data that suggests that singles accounted for 19% of purchases in 1998 and 199 and International Federation of the Phonographic Industry (IFPI) data suggesting that roughly 5% of purchases are of classical

\(^{30}\) ABS 1995-96, Business of Music, 4143.0

music.\footnote{International Federation of the Phonographic Industry (IFPI) 1999, The recording industry in numbers, Recording Industry Yearbook, IFPI.}

Singles and classical music sales were then excluded from the analysis. Singles were excluded because they are only released for a very limited period of time, usually less than a year. Classical music was excluded because we assume they are always out of rights. This assumption is not necessarily correct. It would hold for composition but not necessarily sound recordings. Nonetheless it is plausible that a higher percentage of classical music purchases may be out of rights works than contemporary music. By assuming all sales of classical works are out of rights, the analysis is likely to understate the proportion of sound recordings that are in rights during the period 2009 to 2078.

We assume 36% of recorded music sold in a given year were produced prior to that year of sale. This figure is based on Australian data for 1998.

The constant 36% figure is applied to the remaining 76% of sales analysed, to give a constant proportion of total sales of in rights works produced prior to 2009 of 27%.

**Projecting Sales**

We assume that the ratio of recorded music sales to GDP (discussed above) are constant over the study period.

We then assume that the value of in rights music grows at 3% per annum, consistent with New Zealand Treasury’s long term economic growth forecast for New Zealand.

**Calculating the Costs and Benefits of Term Extension**

The costs and benefits of term extension are determined through analysis of deadweight losses and relevant transfers - i.e. transfers from foreign consumers to New Zealand rights holders and transfers from New Zealand consumers to foreign rights holders.

**Stream of Deadweight Losses Associated with Term Extension**

As noted previously, because the focus is on the effects of term extension on the market for in-rights works produced before 2009, there is no need to take account of
output effects (that is, additional works produced as artists’ incentives are affected as a result of term extension) since there is none in the case of existing works. Artists of works that produced before 2009 but still in rights when the policy change takes affect receive a windfall gain with no incentive effect.

The price elasticity of demand was applied to calculate the deadweight loss associated with term extension.

As a first step, the additional value of works that are in-rights because of term extension was estimated using vintages data. As noted previously, we discount the additional percentages of works in rights by 27% after 2009. This involved multiplying the additional percentages of in-rights works for each year calculated using the vintage data by projected sales for each year.

However before doing this, the export component of the wholesale sales base for each year was removed since the focus is on domestic deadweight loss — this was achieved by multiplying the projected sales by 97% (since 3% of sales relate to exports).

The deadweight losses were calculated using the same procedure outlined in our analysis of books. That is, the deadweight loss for each year is then calculated as 1.41 (i.e. the absolute value of the price elasticity of demand) times 0.5 times the square of the mark-up on prices times the value of works affected by the cost raising effects of the copyright laws, as derived in the paragraph above. This gives deadweight losses to total domestic sales of sound recordings each year.

The total deadweight loss to domestic consumers in net present value terms was estimated to be $81,214. The estimate was based on a 7% discount rate and a discount period of 70 years. The discount rate of 7% was chosen because it is similar to the one used by the US Eldred brief which provided the most recent quantification of the effects of copyright term extension by eminent economists. The discount rate refers to the rate at which future benefits are discounted because a future benefit is worth less than a current benefit because it cannot be enjoyed in the current period. Generally, the longer that the beneficiary has to wait to enjoy a benefit, the lower is its value.

**Trade Effects in the Market for Imported Sound Recordings**

This section describes how we calculated transfers from New Zealand consumers to foreign rights holders (economic cost to New Zealand) and transfers from foreign consumers to New Zealand rights holders (economic benefit to New Zealand).
First we estimate the new projected total sales taking into account the reduction in demand from higher prices (i.e. foregone consumption indicated by deadweight loss calculated in the previous section). The formula for working out the new sales after deadweight losses is: the value of old demand multiplied by \((1 + \text{the proportional change in price} + (\text{the elasticity of demand} \times \text{the proportional change in price}))\).

**Trade Effects in the Import Market**

We calculate the sales attributable to imports using the imports ratio derived previously (i.e. 25%). This figure is then adjusted to remove the value of royalties built into it. It is then multiplied by the royalty mark-up to obtain the transfer.

Doing this for each year over the period 2009 to 2078 gives a transfer of around $239 million from local consumers to foreigners in present value terms.

**Trade Effects in the Export Market**

The deadweight loss in the export market is not relevant for national welfare purposes because it is incurred by foreigners. However, the transfer from foreigner consumers to domestic producers is relevant because it counts as a benefit. This is because it leads to a transfer of income from foreign purchasers to Australian producers.

The transfer is first calculated as if it applied to all of New Zealand’s trading partners (i.e. consistent with Article 7 of the Berne Convention). This is compared to the situation where there is no transfer because exported copyright works are subject to the copyright laws of the country of sale (i.e. consistent with Article 5 of the Berne Convention).

In reality only a proportion of New Zealand’s trading partners will be affected by the ‘export transfer’ effect. For this reason the export effect is presented as a range rather than as a point estimate.

To calculate the upper bound of the transfer, we first take the new demand for recorded music derived above (i.e. after adjustment for demand responses to higher prices) for each year and adjust accordingly by the export ratio to derive the sales value attributable to exports. This new figure then has to be adjusted to remove the value of royalties built into it, just as it was in the case for imports above.

Finally, it is multiplied by the royalty mark-up to obtain the transfer.

\[33 \text{ This is a negative number.}\]
This produces a stream of benefits, which are converted into a present value figure. The results indicate a transfer of between $0 and $31.4 million in present value terms, depending on the extent to which exports are subject to the copyright term in the country of sale or the New Zealand copyright term.

**Net Welfare Effect and Trade Effects**

The net welfare effect of term extension is calculated as benefits less costs. The benefit in this case is the export transfer, while the cost is the import transfer plus deadweight losses. This produces a net welfare cost of $208 million to $239 million in present value terms.

**Comments on Methodology**

**Conservative Nature of Results**

The quantification of costs and benefits discussed above is subject to a number of caveats that are similar to the caveats we noted in our analysis of books in Appendix B. We believe that these caveats on balance produce a conservative 'lower bound' estimate of the net costs of extended copyright protection.

To begin, our assumption about the vintages of sound recordings produced before 2009 and sold persisting through time in constant proportions could lead to an over-estimate of the deadweight loss associated with term extension. This assumption was required because we have no information about how sales of sound recordings produced in a given year might change through time.

However, a number of other assumptions have the opposite effect. For example, the analysis only takes into account the deadweight losses incurred by consumers of sound recordings published before 2009.

We also are likely to have underestimated the total social cost of copyright term extension because we focus solely on initial deadweight losses due to foregone consumption of recorded music, but do not take account of possible flow on effects in terms of reduced future output of derivative works due to an increase in the cost of recorded music.

**Uncertainties**

Projecting costs and benefits far into the future is always complicated by uncertainties. The analysis assumes that the rate of growth of sales of sound recordings will remain constant into 2073.
Future technological developments and changes in consumer preferences may result in a structural shift that renders this fixed relationship invalid. There are other fixed ratios used in our projections which could be similarly affected by future changes in technology and tastes such as those for proportion of sales exported and proportion of sales sourced from overseas.

Notwithstanding these uncertainties, a long projection time frame is called for in this case to capture the full impact of term extension.