Review of The Treasury’s usage of its Tax and Welfare Analysis model to provide advice on numbers of children in low income households

Report prepared for the New Zealand Treasury by Gillian Beer, Principal Adviser, the Department of the Treasury, Australia

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1. Introduction
The New Zealand Treasury (‘The Treasury’) has commissioned a review of the usage of its Tax and Welfare Analysis (TAWA) model following the discovery of coding errors and subsequent errors in the projected numbers of children in low income households under the Government’s Families Package, the previous government’s Family Incomes Package and the policy settings prior to the introduction of the Family Incomes Package.

This review reports on the degree to which, in undertaking the TAWA modelling work to support the advice requested, The Treasury followed modelling and quality assurance (QA) practices that would be considered generally reasonable according to the standards and requirements of policy maker users of outputs from tax-transfer microsimulation models such as TAWA. The full Terms of Reference for the review is at Attachment A.

Section 2 of this report describes the approach that I have taken for this review and Section 3 provides a summary of my investigations. In Section 4 I present my findings in relation to whether or not in providing the advice requested The Treasury followed modelling and quality assurance (QA) practices that would be considered generally reasonable. Finally, in Section 5 I provide some recommendations for The Treasury’s consideration.

2. Approach to the review
In forming my findings and recommendations I have interviewed all members of the Analytics and Insights Team who are responsible for the development and use of the TAWA model. I have also held discussions with key stakeholders from the Office of the Minister of Finance, The Treasury, the Ministry for Social Development (MSD), the Inland Revenue Department (IRD), Statistics New Zealand and microsimulation modelling experts from Victoria University. For a full list of the agencies and areas within them that were consulted, see Attachment B.

In addition to these interviews and discussions, I have reviewed relevant documents including Treasury Reports, internal research papers, emails and documentation associated with the TAWA model.

Factual statements in this report have been checked for accuracy by The Treasury. It is based on these facts, my discussions and readings and my more than 20 years of experience in maintaining, developing and using tax-transfer microsimulation models in government policy making, that I have drawn my conclusions and recommendations.

3. Summary of investigations
This section presents my understanding of each of the considerations specified in the Terms of Reference, based on the discussions that I have had and the reading that I have undertaken. All factual information has been checked by The Treasury.

The investigations centre around The Treasury’s Tax and Welfare Analysis (TAWA) model. The TAWA model is a static microsimulation model of the tax and transfer policy settings in New Zealand. It is
designed to provide comparative analysis of the impact of changes to tax and transfer policy settings on the whole of the New Zealand population. It can provide high level distributional analysis and can also be used to provide aggregate fiscal costs when agencies do not have the required administrative data.

1. The nature of the dataset limitations and the options for handling them in the circumstances

The TAWA model is based on the Household Economics Survey (HES) collected by Statistics New Zealand. The HES is an annual survey with a sample size of between 3,500 and 5,000 households. Amongst other things, the HES is collected to provide, at a relatively aggregate level, an understanding of the economic situation of New Zealanders.

The HES provides a representative sample of the whole (private dwelling) population in New Zealand. The Treasury is aware that, for the purposes of the TAWA model, the HES has some limitations. The main ones can be summarised as follows:

- The small sample size means that isolating particular subgroups of the population (such as particular household types, the elderly, people living in geographic regions, beneficiaries) is likely to lack statistical robustness. For instance, in a sample of 3,500 only around 1,200 households have children.

- The HES does not always collect all of the information needed for the TAWA model to accurately calculate entitlement to benefits.

- The HES underestimates the total number of beneficiaries.

Due to the limitations of the underlying data, the calculations of AS in the TAWA model result in the number of non-beneficiaries and non-superannuitants who receive AS being significantly overestimated unless a specific adjustment is made. This has been a known issue in the model but prior to the 2017 Budget, it was not addressed because its impact was considered to be immaterial for comparative policy analysis that did not comprise a change to the AS.

However, the previous government’s Family Incomes Package and the current Government’s Families Package comprise changes to the AS. For this reason, the TAWA team felt that an adjustment to the model’s overestimate of the AS was required. In addition, the requirement to provide disaggregated output from the model (including the number of children in low income households) meant that it was necessary to apply an adjustment that retained the model’s inherent internal consistency and enabled micro level results to be summed to sub-totals.

The methodology applied to adjust for the overestimate of the AS was the result of a research project undertaken following the Budget in May 2017. The approach identified three distinct groups of the population receiving the AS (beneficiaries, superannuitants and a residual group) and applied an approach that involved adding in additional administrative benchmarks, using multivariate adaptive regression splines to model take-up based on income types, income bands and AS amounts and assigning random take-up in accordance with the calculated take-up rates.

Before undertaking the 2017 research project the TAWA team considered other options around improving the modelling of the AS by supplementing the HES data with administrative data. This
approach was viewed by the team as being likely to give a more accurate outcome but it would not be achievable in the time that they felt they had. The approach adopted in the research project offered an improvement in statistical robustness that would serve as a reasonable solution until significant enhancements could be made to the model’s base data. On this basis, the research project was commenced and a prototype was developed and tested.

2. Urgency of the request for advice and the feasibility of the various modelling and QA options within the time available to respond.

Urgency of the request
On Friday 24 November 2017 a discussion took place between staff from the Minister of Finance’s office and officials from The Treasury regarding a request to recalculate the estimates of the number of children in low income households. This piece of work required the TAWA team to shift the TAWA model’s point of comparison from the Budget 2017 legislated settings to the pre-Budget legislated settings (referred to as the ‘status quo’) to estimate the number of children in low income households under the Government’s Families Package and the previous government’s Family Incomes Package. The outcomes of this discussion or any subsequent discussions in relation to this specific request were not documented. Different recollections on what was entailed in the discussions mean that it is not possible to draw a firm conclusion about how the timeline for the request was agreed. The only documented evidence that I have seen on the timeline for the request is that the request for revised estimates of the number of children in low income households was discussed on 24 November 2017 and provided to the Minister’s Office via a Treasury Report on Monday 4 and Tuesday 5 December 2017.

Modelling options
Following the discussion around the request to re-estimate the number of children in low income households, the TAWA team considered their options to be as follows:

- Do not provide the requested output. However, a precedent had been set by the fact that an estimate of the number of children in poverty had been provided in the May 2017 Budget. Further, The Treasury was trying to assist the new government to implement their 100 Day Plan and build rapport with the Minister’s Office. The team were strongly encouraged by The Treasury’s executive leadership team to provide the requested output as best they could.

- Use the methodology that is used in the core TAWA model, without any adjustments. This results in the model substantially overestimating the number of people receiving the AS. This overestimation was expected to materially impact the estimates of the number of children in low income households.

- Use the same methodology that was used in the Budget 2017 to adjust the AS. This was a top-down adjustment to weights to ensure that the TAWA model’s estimates of the total cost of the AS in the base year agreed with administrative totals. This approach had some undesirable flow-on implications for the distribution of the underlying population and was only ever considered to be a very temporary solution. The request also required the team to produce disaggregated output (such as the number of children in low income households) and this is not a defensible methodology for producing disaggregated results.
• Implement the existing draft prototype of a new methodology produced as part of a post-2017 Budget research project (referred to in (1) above) to adjust the take-up of the AS in the status quo and reform settings. Although this prototype had not formally been signed off for implementation by the TAWA Governance Group, a research paper had been drafted and it had been methodologically reviewed by a statistician outside of the team. Further, this methodology allowed the model to retain its inherent internal consistency so that it was possible to isolate sub-populations in the data and hence, provide estimates of the number of children in low income households.

A decision was taken by the TAWA team manager that the option to implement the existing draft prototype was the preferred option and that it could be implemented in the time that they had, provided that some of their usual coding and QA processes were adjusted.

Quality assurance options
The regular QA process for requests requiring the use of the TAWA model is for the changes to be independently produced by two team members (referred to as independent co-production). Output from their changes is compared and iterative changes are made until the numbers produced by each person match exactly.

Full independent co-production was not possible with the request to re-estimate the number of children in low income households because it required implementation of a complex methodological change (contained in the prototype). Instead, the QA process adopted attempted to balance responsiveness to the Minister’s Office with robustness of output and entailed a cut-down QA process that the team felt was appropriate in the circumstances.

The QA process for this request involved independent co-production in every part of the process except for the prototype code. That is, two people used the same piece of prototype code independently. This ensured that there were no errors in the parameter setting process and that the data being input into the prototype was independently produced and agreed. Given that independent co-production was not possible for the prototype, the prototype code was reviewed by three other members of the team (although two of these people had been in the team for less than three months and were relatively inexperienced). This review entailed each person reading through the code to check for logic and coding errors. The coding error, which was present in the prototype version, was not picked up in this process and thus, was translated into the version that was implemented into the TAWA model to fulfil the request.

One key element of QA that was not undertaken either when the prototype was initially developed nor when it was implemented as part of the request for the numbers of children in low income households was a systematic review of the prototype module. Ideally, this would have been done when the prototype was originally developed but the finalisation of the prototype had been interrupted by urgent policy work. It was not done as part of the work on the request due to time constraints.

3. The nature of the modelling uncertainties involved in using TAWA to respond to requests of this nature.

The TAWA model takes the survey data from a given year and projects it forward three or four years based on forecast changes in populations and economic conditions. The numbers that are
calculated by the model will always be estimates and subject to survey sampling errors and errors in economic forecasts.

A member of the TAWA team was usually present at meetings with the Minister’s Office relating to the requested work. The Treasury asserts that the risks associated with the tight timeframe, using the TAWA model to estimate the number of children in low income households and the fact that the estimates could change substantially due to fluctuations in the data, data quality and sample size issues were communicated to political advisers at these meetings. There is no documented evidence of these risks being conveyed.

The results of the TAWA modelling were provided to the Minister for Finance in early December 2017 via written Treasury Reports. In these reports, point estimates are provided. The numbers of families impacted are rounded to the nearest thousand. The dollar impacts are reported as unrounded average amounts. The language used in the Reports to refer to the numbers does not give a sense of their inherent uncertainty.

The Treasury Reports also contain a couple of high level caveats referring to the fact that the numbers are subject to change because they are dependent on survey data, modelling assumptions and economic forecasts and that they are projections, not forecasts. There is also a caveat warning that the TAWA numbers cannot be compared to values used in the Ministry for Social Development’s Household Incomes Report. There is no mention of the risks in using the numbers or the fact that estimating the number of children in poverty requires sub-setting the data to a level that is likely to lack statistical robustness.

4. The scale and complexity of the TAWA model.

The predecessor to the TAWA model was the TAXWELL model. TAXWELL had become overly complex, lacked transparency and was not on a sustainable footing. In 2016 a project was started to redevelop TAXWELL into the TAWA model. The TAWA model is generally viewed by internal and external sources as being more robust, transparent and sustainable than TAXWELL. This is a strength of the TAWA model.

The TAWA model is the only tool in New Zealand that covers the whole of the private dwelling population. It captures the main elements of the personal tax and transfers systems, including superannuation, AS, Working for Families and the Independent Earner Tax Credit. Importantly, it captures the interactions between payments and/or the personal tax system to give the overall net impact of policies.

The TAWA model is able to produce distributional outcomes, although subsetting outcomes to particular groups of the population can lack statistical reliability due to the small sample size of the underlying HES data. It can also produce distributional EMTRs and aggregate fiscal costs. It does not currently have a cameo capability.

The TAWA model calculates entitlement to payments either from first principles or by using a flag for eligibility and the income information on the survey. It models most of the first tier assistance payments (some first tier payments made to relatively small numbers of people, such as Youth Payment and Young Parent Payment, are not explicitly modelled but are included in disposable income calculations) and some second tier payments, such as the Accommodation Supplement (but
not Disability Allowance or Child Care Assistance due to insufficient information in the base data). For payments not modelled in TAWA, the amount recorded in the survey is used to calculate disposable income but any changes to other payments that would flow on to these payments are not captured.

The calculations in the core TAWA model require close to 3,500 lines of code. The code to prepare the TAWA model’s base file is comprised of 3,300 lines of code. There is some in-code commenting but limited other documentation.

The setting of development priorities for the TAWA model is decided by a broader cross-government Governance Group comprised of representatives from Statistics New Zealand, MSD, IRD, Treasury policy teams. The model also has a Technical Advisory Group comprising analysts from across government (IRD, MSD, The Treasury) and academia. Both of these groups are intended to meet monthly but this has not been achieved due to the sensitive nature of the work on TAWA and urgent work crowding out these meetings.

5. The Treasury's capacity and capability to undertake modelling work of this sort to the required standard.

**Capability**

The TAWA modelling team currently comprises five people. Two of these team members have been in the team since September/October 2017. Two other team members started in the second half of 2016. The longest serving team member has been in the TAWA team for around 3.5 years (on a full-time equivalent basis).

Each of the team members has come into the team with relevant coding and applied statistical skills but with minimal understanding of the personal tax and transfers systems. Their policy knowledge has developed through working on the TAWA model.

Due to the high workload of the TAWA team, training a new person in TAWA has mostly centred around one-on-one on-the-job training. Very limited model documentation or training material exists for the TAWA model because this work has been crowded out by other urgent work.

Over the course of 2017, the resources of the team have been very stretched and the team has worked long hours to cope with the workload.

Over the years there has been a regular turnover of staff in the TAWA team. From talking to both internal and external stakeholders there is a sense that building deep expertise in microsimulation modelling does not benefit an analyst’s career in The Treasury. As a result, most people do not tend to stay longer than about two years.

**Capacity**

Following the 2017 Budget, a program of improvements to the model was developed. One of the improvements was to implement a more statistically robust approach to the modelling of the AS to improve the methodology that was applied as a ‘quick fix’ in the 2017 Budget. The team also wanted to undertake improvements to the model’s base data by supplementing it with administrative information from the Integrated Data Infrastructure (IDI).
The work to implement a more statistically robust approach to modelling the AS began post-Budget and a prototype was developed in late-October/early-November. But before it was finalised and approved by the model’s Governance Group, the request for this particular piece of analysis was received.

In the process of forming the Coalition Government the TAWA team faced a heavy additional workload to analyse a range of policies. Once the Coalition was formed, the heavy workload continued with the new Government’s 100 Day Plan. This work required the resources of the vast majority of the team and meant that model maintenance and development work had to be sidelined. This included the finalisation of the prototype to improve the modelling of AS in TAWA.

The crowding out of important model maintenance and development work by urgent policy work meant that the model was not in the best possible state when it was required.

4. Findings
This section draws conclusions based on the facts presented above, discussions with stakeholders and my professional judgement.

In the context of estimating the number of children in low income households under the Families Package and the Family Incomes Package, I believe that it was necessary for The Treasury to implement a bespoke adjustment to the TAWA model to correct for deficiencies in the underlying data and account for a known issue in the model that significantly overestimates the number of AS recipients. This is because the Families Package and the Families Income Package comprised significant changes to the AS and because the AS is likely to disproportionately impact low income households.

Further, I believe that in the circumstances, the methodology and QA processes that The Treasury adopted to make the adjustments to the modelling of the AS were reasonable and met the standards and requirements of policy maker users of outputs from tax-transfer microsimulation models.

- Other methodological options were considered by The Treasury, but were appropriately ruled out in the context in which the request was received.

- I believe that the level of QA that was undertaken in the time provided was of a high standard despite the fact that the team’s usual independent co-production approach was not feasible.

In order to assess the net impact of the Families Package and the Family Incomes Package, I believe that the TAWA model is the most appropriate tool currently available. This is because it captures both the tax and transfers changes and their interactions and because the model captures the whole New Zealand population.

The TAWA model is a redevelopment of its predecessor, TAXWELL, and represents a substantial improvement in transparency, complexity and sustainability of the model. However, the nature of tax-transfer static microsimulation models is that they are large and complex and as such, it is never possible to say that the model is error-free. In the case of the coding error relating to estimating the number of children in low income households, the nature of the error was that it referred to an
incorrect variable. These errors are not as readily apparent as some other errors, such as syntax errors that may cause warnings to be generated or render the model unable to complete its calculations. The error was introduced as part of the 2017 post-Budget development of the prototype and was translated into the implemented version used to estimate the number of children in low income households. Despite the fact that a considerable QA process was undertaken on both the prototype version and the version used in the request for analysis, the nature of the error and the size and complexity of the model and the prototype contributed to the fact that the error was undetected.

The complexities and uncertainties implicit in the TAWA model mean that it is important to clearly convey this to users of TAWA output, along with the risks associated with using the numbers provided in certain ways. In the instance of using the TAWA model to provide advice on numbers of children in low income households, I believe that the uncertainties and risks were not conveyed as clearly as they could have been to the Minister. This finding based on three main areas as follows:

- The written Treasury Reports providing the TAWA output to the Minister for Finance do not clearly convey the risks and uncertainties associated with the numbers.
  - The Treasury Reports provided some high level caveats around the uncertainty and variability of the numbers provided. Nothing was written on the risks associated with sub-setting the data to estimate the number of children in low income households.
  - The estimated numbers of children in low income households and families impacted by the packages are point estimates that have been rounded to the nearest thousand. Given the level of uncertainty and likely variability in the numbers, I believe that rounding the numbers to the nearest 10,000 would be more appropriate. In addition, providing an indication of the level of variability would have been desirable.
  - The estimated average weekly dollar gains are not rounded and imply a false level of accuracy. I believe that these numbers should have been rounded to the nearest dollar.
  - The general tone of the language used in the Treasury Reports does not reinforce the uncertainty of the numbers.

- The Treasury asserts that the risks associated with producing the required output in a compressed time period and using the TAWA model to estimate the number of children in low income households were conveyed verbally to the Minister’s Office staff on several occasions by members of the TAWA team. This advice should have been followed up in writing.

- At the same time that the work on estimating the number of children in low income households was being discussed with the Minister’s Office, emails relating to other related requests for work using the TAWA model were being exchanged between The Treasury and the Minister’s Office. These emails give a sense that the numbers being produced would be robust and quality-assured. It is possible that the distinction between different requests had been blurred.

I am impressed by the technical skills of the team of people at The Treasury working on maintaining, developing and using the TAWA model. They have achieved an impressive amount with the
resources and time that they have had. However, the fact that the longest serving member of the team has been working on the TAWA model for around three years (on a full-time equivalent basis) means that there is an absence of deep technical expertise and policy understanding in the team.

I believe that the TAWA team were not sufficiently resourced to cope with the level of work required for important model maintenance and development as well as the extensive policy work required at the same time. This contributed to the fact that the model was not in the best possible state when the requests for work were received.

5. Recommendations
In order to minimise the risk of similar errors happening in the future, I believe that there a number of changes that The Treasury should consider implementing. This section details these changes.

Recommendation 1
Increase the size of the TAWA team by 2 – 3 FTE on an ongoing basis. This will provide a critical mass of people to improve the sustainability of the modelling capability within The Treasury, help to minimise key person risk and enable resources to be ring-fenced for important model development work.

Recommendation 2
In periods where there is less demand for TAWA output, consider providing diverse experiences to team members to expand their modelling experience. For example, a TAWA team member could move temporarily into the macro modelling team, or be seconded to a relevant agency such as Statistics New Zealand or MSD to learn new but related skills.

Recommendation 3
Provide a clear career pathway for technical specialists to aid in building deep modelling expertise within The Treasury. This should include specialist recruitment and promotion opportunities, secondments to other relevant areas, opportunities for recognition from senior leadership and investment in broadening their skill set.

Specialist recruitment panels must include technical experts who can identify the required skills.

Recommendation 4
Ring-fence the model development function within The Treasury, particularly during periods of significant development. Investing in model development helps to build deep expertise and understanding in the model, as well as ensuring that the model is fit for purpose when it is required for policy work. In order to ensure that this important work does not get crowded out by day-to-day demands, resources should be quarantined but should involve the wider TAWA team/users whenever possible to ensure knowledge is devolved.

Recommendation 5
Prioritise a project to improve the base data of TAWA. All stakeholders that I have talked with have identified the limitations of the HES as a significant limitation for the TAWA model. Improving the quality of the base data is vital to improving the accuracy of the output from the TAWA model. A multi-faceted approach should be considered as follows:
• Collaborate with Statistics New Zealand to:
  – investigate possibilities around increasing the sample size of the HES, collecting additional data items to enable more accurate calculations in TAWA, increasing sampling on groups of interest and coming to a joint understanding of key population groups.
  – come to a joint understanding about the best practice for deriving weights for the TAWA basefile. Currently, the process for creating a basefile for the TAWA model involves adjustments to the HES weights. This results in two sets of weights that can be used—the HES weights and the TAWA weights. In situations where agencies and analysts have access to both sets of weights, this leads to a choice needing to be made regarding which set of weights to use. Statistics New Zealand has expressed concerns with this because it can result in inconsistent advice on the basis of different weights being chosen. Statistics New Zealand expressed a desire to have only one set of weights, and I think that this would be highly desirable.
  – address concerns raised by Statistics New Zealand about the approach to weighting used in TAWA, including possible distortions to groups that are not in the benchmarks.

• Investigate alternative data sources to the HES, to either replace the HES or supplement it to improve accuracy. This includes other survey data, as well as using the IDI.

**Recommendation 6**
Make some changes to the QA process as follows:

• Consider adopting a less resource-intensive and more policy-focussed approach to QA. While independent co-production is likely to give high quality QA, it is very resource intensive and may not be the most efficient allocation of resources. Less resource-intensive tools for QA could be developed, such as ‘standard output’ to track changes for individuals and families between the status quo and proposed policy scenarios.

• Develop a cameo (hypothetical family) capability for the TAWA model to assist with QA.

• Make more use of the administrative data held by agencies to do ‘sense checks’. The MSD expressed a desire to assist with this approach. It would also help to build MSD’s understanding of the model.

**Recommendation 7**
Change the language used in verbal and written advice to the Government to better indicate the level of uncertainty and risk associated with modelling output. Using phrases such as ‘Our best estimate of...’ to refer to the numbers would provide a sense of their uncertainty. Further, there should be a focus on providing clear, succinct advice on what the numbers can be used for and the caution that should be taken in using them.
**Recommendation 8**
Develop a protocol for documenting and explaining risks associated with modelling output, including risks arising from compressed timeframes.

Develop a protocol for rounding of numbers in modelling output. This should be devised to ensure that the numbers convey the appropriate level of certainty. Consider providing numbers in terms of a point estimate, plus or minus an amount. A protocol for rounding of dollar amounts should also be developed.

**Recommendation 9**
Build the understanding of the TAWA model, its capabilities and limitations, amongst policy makers, senior management at The Treasury and external agencies. This could be done by providing seminars on the model at a high level, demonstrations of the model’s user interface and providing other practical demonstrations of model applications. Building an understanding of the TAWA model will help people to better understand how the output of TAWA can be used, timeframes and risks, and will lead to closer collaboration between The Treasury and external agencies.

**Recommendation 10**
Prioritise work to complete the documentation of the TAWA model. The team is acutely aware that this important part of model development has been crowded out by urgent policy work. Model documentation is important to help manage key person risk and increase the sustainability of the model.

**Recommendation 11**
Develop a community of practice for microsimulation modelling and data analytics, linking in MSD, Statistics New Zealand, IRD, other relevant agencies and academics. The community of practice should be used to help to build understanding of the TAWA model, which is something that Statistics New Zealand and MSD have expressed their interest in. This may provide an easier transition to The Treasury devolving the use of the model to relevant policy departments if it chooses to.

Increasing The Treasury’s links with existing microsimulation networks in Australia is also highly recommended in order to increase the team’s exposure to ideas and methods beyond what is a relatively small community in New Zealand.

**Recommendation 12**
Once the TAWA model is on a sustainable footing, consider releasing it to other agencies and/or releasing it publicly. The more users a model has, the better the model is likely to be because it benefits from people using it in different ways and picking up bugs. It also avoids duplication of effort between agencies. Releasing the model should only be considered when the model can be supported by documentation and The Treasury has the capacity to provide limited user support and training.

**Recommendation 13**
Once the TAWA model is ready to be released (either within government or more broadly), consider approaching MSD, IRD and/or Statistics New Zealand to second an officer to work in the TAWA team with the idea of skilling them up and taking the capability to use TAWA back to their agency.
**Recommendation 14**
When providing numbers that are likely to be contested once publically released consider contracting appropriate experts to either provide advice on The Treasury’s approach or to produce their own estimates in parallel. This has proven to be a successful approach used at the Australian Treasury.

**Recommendation 15**
Maintain and build the tax-transfer microsimulation capability within The Treasury for at least the short- to medium-term. ‘Contracting out’ model maintenance and development is not recommended as this makes it harder for users develop a deep understanding of the model that they are using. It also risks proliferation of versions as adjustments and improvements are made to the model between official versions being released by the contractors.

Longer term, establishing a Centre of Excellence may be worth investigating, but many of the recommendations above would be an important first step towards this.
TERMS OF REFERENCE

Review of The Treasury’s usage of its Tax and Welfare Analysis model to provide advice on numbers of children in low income households

Background

On 5 December 2017 the Minister of Finance received advice from The Treasury on the projected numbers of children in low income households and the impact on those numbers of the Government’s Families Package, compared to the projected numbers under (1) policy settings as modified by the Family Incomes Package and (2) policy settings prior to the introduction of the Family Incomes Package. To support the production of this advice The Treasury undertook work using its Tax and Welfare Analysis (TAWA) modelling system. This work included writing code for a new supplementary program to correct known limitations of the household incomes dataset used for the TAWA modelling (the dataset). The supplementary program was required to respond to the specific policy questions to be addressed. The Treasury subsequently discovered coding errors in the supplementary program and communicated to the Minister the errors and their impact on the results.

Matters on which reporting is required

The reviewer shall report on the degree to which, in undertaking the TAWA modelling work to support the advice requested, The Treasury followed modelling and quality assurance (QA) practices that would be considered generally reasonable according to the standards and requirements of policymaker users of outputs from tax/transfer microsimulation models such as TAWA. In making the judgement about reasonableness, the reviewer shall have regard to the following considerations:

1. the nature of the dataset limitations and the options for handling them in the circumstances;
2. the urgency of the request for advice and the feasibility of the various modelling and QA options within the time available to respond;
3. the nature of the modelling uncertainties involved in using the TAWA system to respond to requests of this nature;
4. the scale and complexity of the TAWA system; and
5. The Treasury’s capacity and capability to undertake modelling work of this sort to the required standard.

The reviewer shall report to the Secretary to the Treasury by 16 March 2018. The Treasury shall make available to the reviewer for consultation all staff and documentation relevant to the review.

The Treasury

January 2018
List of organisations and areas consulted

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