"Neutralizing the Adverse Effect of State and Federal Income Taxes on Lump Sum Awards in Employment Cases"

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Abstract

This paper provides a methodology to "gross-up" an award when estimated losses are taxable such as in employment (e.g., wrongful termination or discrimination) and non-physical injury cases. This solves a simultaneity problem wherein the award amount is a function of the income taxes paid and these taxes are a function of the award plus other income in the year the award is received. This paper makes two contributions. First, it provides "gross-up" calculations in the context of several factors impacting income tax: investment income, Social Security and Medicare taxes, and Net Investment Income Taxes (NIIT) in the context of the Tax Cuts & Jobs Act of 2017. Second, it uses spreadsheet functions to iterate a user-friendly solution using an example calculating state and federal income taxes, Social Security/Medicare taxes, and NIIT to determine the award. We also compare the accuracy of an approximation "gross-up" formula to the correct solution.

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I. Introduction

The adverse effect of federal income taxes in employment cases has received considerable attention in the forensic economics literature (Goodwill and Paul 1988; Benich, 1991, 1996; Markowski and Cross 1991a, 1991b; Bowles and Lewis 1996; Lewis and Bowles 1996; Ben-Zion 2000; Rodgers 2003; Ireland (2010; 2012); Roney 2012, 2016; Macpherson and Stephenson 2016; Schap 2016). The ambiguity existing prior to 1996 in the treatment of taxes in litigation involving employment law was clarified by the Small Business Job Protection Act of 1996 (Public Law No. 104-88, Sec. 1605 (REPEAL OF EXCLUSION FOR PUNITIVE DAMAGES AND FOR DAMAGES NOT ATTRIBUTABLE TO PHYSICAL INJURIES OR SICKNESS); 26 U.S.C. §104(a)(2)). This law codified that damages not resulting from a personal physical injury are subject to federal income taxes.[1] This means taxes are levied on awards for back pay and front pay in employment cases. An award lacking an accounting for these tax consequences will undercompensate a plaintiff for the presumed tort. Rodgers (2003) addressed this issue in two respects. First, he noted that if the award is presented in after tax dollars, the taxation of the award causes the income to be taxed twice. Second, he noted that because federal tax rates are progressive, taxing the award of back pay and front pay when received as a lump sum in one tax year causes the plaintiff to pay higher taxes on the lost income than they would have paid if the plaintiff had received the income yearly. Ben-Zion (2000) termed this increase in federal tax liability an "adverse tax consequence."

Besides the usual loss estimation issues[2] involved in personal injury cases, employment cases require the expert to address any adverse tax consequence. This means calculating an award amount such that after deducting federal and state income taxes and payroll taxes the resultant difference is the estimated loss amount. This calculation has been referred to as an award "gross-up" to account for, or neutralize, an adverse tax consequence of an award in employment cases or other non-physical injury cases (Ben-Zion 2000; Ireland 2010).

A "gross-up" calculation is not straightforward. The calculation must consider both federal and state (if applicable) income taxes and their progressive rate structure; the deductibility of state income taxes in some state jurisdictions; payroll taxes; and investment income. The "gross-up" calculation becomes more cumbersome when the forensic economist estimates alternative loss scenarios.

This paper provides an innovative method to perform "gross-up" calculations to determine an award amount when estimated losses are taxable income and extends the literature in two ways. First, it incorporates several real-world tax calculation issues (using the Tax Cuts & Jobs Act of 2017) when addressing adverse tax consequences of an award including investment income, Social Security and Medicare taxes and NIIT. Second, the paper presents a tax "gross-up" using readily available spreadsheet functions[3] to iterate a user-friendly "gross-up" tax calculation.

Section II outlines the conceptual framework for the "gross-up" calculation. Section III uses an example to demonstrate the use of spreadsheet internal routines to solve for a tax-adjusted award amount for back pay. Section IV demonstrates the use of the model for gross-up calculations for varying years of possible future lost earnings. Section V compares the accuracy

of an approximation “gross-up” formula to the correct results for a range of annual earnings and years of losses. Section VI provides our conclusions.

II. Conceptual Framework

The following provides the conceptual framework for our gross-up model.

GUA = ATL + SITGU + FITGU + PTGU

Where:

GUA = the “grossed-up” award amount

ATL = the estimated after-tax loss amount

SITGU= the incremental state income tax on the "grossed-up" award amount (if applicable)

FITGU= the incremental federal income tax on the "grossed-up" award

PTGU= the incremental payroll (i.e., Social Security and Medicare) tax on the "grossed-up" award amount.

All tax amounts are determined by the “gross-up” award amount, which in turn is determined by the tax amounts. We overcome this simultaneity problem as follows.

ATL’ = GUA - (SITGU + FITGU + PTGU)

Where:

ATL’ = calculated after-tax award amount

GUA = a “gross-up” value solved via a Goal Seek process.

For this calculation, GUA is a value and all taxes are variables so that after their deduction from GUA, what results is: ATL' = ATL. We demonstrate the calculation of all values in Section III.

State Income Taxes

The SITGU variable is the incremental state income tax on the grossed-up award, equaling the state income tax after the award (SITA) minus the state income tax before the award (SITB). The calculations of SITB and SITA are as follows.

State Income Taxes Before the Award (SITB): Conceptually, SITB is a function of state taxable income before the award (STIB) (received during the year of the award). The calculation of STIB, however, depends on the jurisdiction. We use Hawaii as an example, where

STIB = II - SPE - SSID

Where:

STIB = state taxable income before the award in the year of the award

II = investment income (e.g., interest, dividends) in the year of the award

SPE = the state personal exemption deduction[4]

SSID = the state standard or estimated itemized deduction, generally different than the Federal deduction

Once STIB is determined, it is a straightforward spreadsheet calculation to determine the SITB.

State Income Taxes After the Award (SITA): Conceptually, SITA is a function of state taxable income after the award (STIA) received during the year of the award, where

STIA = GUA + II - SPE - SSID

Where:

STIA = state taxable income after the award in the year of the award

GUA = the "grossed-up" award amount

II = investment income (e.g., interest, dividends) in the year of the award

SPE = the state personal exemption deduction

SSID = the state standard or estimated itemized deduction, generally different than the Federal

SITA is a straightforward spreadsheet calculation once STIA is determined.

Federal Income Taxes

FITGU is the incremental federal tax on the grossed-up award, equaling the Federal Income Tax After the Award (FITA) minus the Federal Income Tax Before the Award (FITB). The calculations of FITB and FITA are as follows.

Federal Income Taxes Before the Award (FITB): Conceptually, federal income taxes are a function of federal taxable income before the award (FTIB) received during the year of the award. FTIB is calculated as follows.

FTIB = II - FSID - SITB

Where:

FTIB = federal taxable income before the award as if the award had not been received during the year of the award

II = investment income (e.g., interest, dividends) (in the year of the award)

FSID = the federal standard ($12,000 for a single filer[5]) or itemized deduction

SITB = any state income taxes before the award, capped at $10,000[6]

FITB is a straightforward spreadsheet calculation once FTIB is determined.

Federal Income Taxes After the Award (FITA): Conceptually, FITA is also a function of federal taxable income after the award (FTIA) received during the year of the award.

FTIA = GUA + II - FSID - SITA

Where:

FTIA = federal taxable income after the award in the year of the award

GUA = the "grossed-up" award amount

II = investment income (e.g., interest, dividends) in the year of the award

FSID = the federal standard or itemized deduction

SITA = any state income taxes after the award, capped at $10,000

FITA is a straightforward spreadsheet calculation once FTIA is determined.

Payroll Taxes

PTGU is the incremental payroll tax on the gross-up award, equaling the Payroll Tax After the Award (PTA) minus the Payroll Tax Before the Award (PTB), calculated as follows.

Payroll Taxes Before the Award (PTB): Payroll taxes before the award (PTB) derives from three sources: 1) Social Security and Medicare tax (PTSSB), plus 2) the Additional Medicare Tax (PTAMB), plus 3) the Net Investment Income Tax (PTNIITB). Since it will be assumed that the plaintiff has no mitigating income, there are no payroll taxes before the award.

Payroll Taxes After the Award (PTA): PTA derives from three sources: 1) Social Security and Medicare Tax (PTSSA), plus 2) the Additional Medicare Tax (PTAMA), plus 3) the Net Investment Income Tax (PTNIITA) as shown below.

1) PTSSA = (GUA, up to maximum taxable earnings) x (SS + M) + (GUA, earnings above maximum taxable earnings) x M

Where:

SS = the Social Security tax rate (6.2%) subject to the earnings maximum

M = the Medicare tax rate (1.45%)

2) PTAMA = payroll tax for the Additional Medicare Tax rate of 0.9% (a provision of the Affordable Care Act) for the amount of single filer income after the award which is over $200,000

= (GUA - $200,000)*0.9%, only if (GUA) >$200,000; $0 otherwise

3) PTNIITA = payroll tax for the Net Investment Income Tax (NIIT) rate of 3.8% (a provision of the Affordable Care Act sometimes called the Medicare Contribution Tax) on investment income (e.g., $20,000 in our example) if the single filer's modified adjusted gross income after the award is over $200,000

III. Using Spreadsheet Routines for Back Pay Gross-Up in an Example Case

A. Plaintiff Characteristics

This section provides an example case to estimate the gross-up on back pay using our model and appropriate spreadsheet functions.

We specify the following example plaintiff.

- A single, college graduate, 55 year old male (DOB 1/1/1963) who lost his job on January 1, 2016 in Hawaii at age 53 due to age discrimination;
- Plaintiff consistently earned $75,000 per year from 2013 to 2015 and is projected to have earned $75,000 per year in the future. For simplification, no economy-wide wage growth and no age-earnings wage growth for this college degreed male are assumed.
- On January 1, 2016, the plaintiff lost his job and has been unable to find employment.
- No fringe benefits are assumed to exist, for simplification.
- The plaintiff has $20,000 in investment income (e.g., interest and dividends) in 2018.
- The single filer will use the federal standard deduction of $12,000 in 2018.
- The single filer will use the $2,200 standard deduction for Hawaii.
- The tax jurisdiction requires the calculation of lost income after subtracting state[7] and federal income taxes, and Social Security and Medicare taxes. We assume effective income tax rates (in real 2018 dollars) remain the same in future years.[8]
- It is assumed that the plaintiff does not have to pay attorney fees.[9]

B. Grossed-up Award Amount (GUA) Determination

We calculate after-tax losses (ATL) for back pay, which are cumulative past losses in our example. No mitigating income is assumed in the year (2018) the award is received. The after-tax lost earnings are used to calculate the grossed-up award.

In Table 1, we calculate the gross-up for past-lost earnings of $162,609.[10] The grossed-up award (GUA) equals $276,173.[11] In Table 1's spreadsheet, the "gross-up" amount links from the earnings award (GUA) calculation in Table 3.[12]

We determine State and Federal taxable incomes before and after the awards, in order to calculate their respective income tax amounts.

1. Before the Award Calculations

In Table 3, we calculate taxable income before the award for our example as follows.

STIB and FTIB	=	$17,800 and $8,000, respectively =
II (both state & federal)	=	$20,000 investment income (e.g., interest and dividends in 2018) -
SSID and FSID	=	$2,200 and $12,000, Hawaii standard and federal standard deductions.

The SITB is calculated as follows:

SITB	=	$913 per the 2018 Hawaii income tax schedule[13]

The FITB is calculated as follows:

FITB	=	$800 per the 2018 Federal income tax schedule.[14]

Payroll Taxes Before the Award (PTB): The PTB calculation uses the maximum Social Security taxable earnings ($128,400) and payroll taxes paid on earned income for the 2018 tax year. We also include the 0.9% Additional Medicare Tax on wages above $200,000 (for single

filers); and the 3.8% Net Investment Income Tax (NIIT, sometimes called the Medicare Contribution Tax) on investment income (e.g., $20,000 in our example) if the single filer's modified adjusted gross income is over $200,000. The PTB equals $0.[15]

2. After the Award Calculations

In Table 3, we calculate taxable income after the award for our example as follows.

STIA and FTIA	=	$293,973 and $284,173 respectively =
GUA	=	$276,173 for both Federal and State +
II (both state & federal)	=	$20,000 investment income (e.g., interest and dividends in 2018) -
SSID and FSID	=	$2,200 and $12,000, respectively Hawaii standard and federal standard deductions

The SITA is calculated as follows:

SITA = $26,716 per the 2018 Hawaii income tax schedule[16]

The FITA is calculated as follows:

FITA = $75,150 per the 2018 Federal income tax schedule[17]

Payroll Taxes After the Award (PTA): The PTA calculation uses the maximum Social Security taxable earnings for 2018 ($128,400) and payroll taxes paid on earned income for the tax year. We include the 0.9% Additional Medicare Tax on the single filer's wages above $200,000[18] and the 3.8% Net Investment Income Tax (NIIT, sometimes called the Medicare

Contribution Tax)[19] on investment income (e.g., $20,000 in our example) if the single filer's modified adjusted gross income after the award is over $200,000. The PTA equals $13,411.[20]

3. The Grossed-up Amount (GUA) Goal Seek Iteration

The GUA is the value determined via a Goal Seek such that ATL = ATL'. [21],[22] For our example the GUA = $276,173. Once calculated, one can calculate the incremental federal income tax on the GUA (FITGU = -$74,350), the incremental state income tax on the GUA (SITGU = -$25,803), and the incremental payroll (PTGU = -$13,411) tax on the GUA amount for a total of $113,564 in incremental taxes. When this $113,564 in taxes is subtracted from the GUA, the result causes the ATL to equal ATL' which equals $276,173,[23] the estimated loss amount for our example. These values and calculations are shown in Table 3 for back pay.

IV. Gross-Up Calculations for Varying Years of Front Pay Loss: A Macro for Repeated Use of Goal Seek

The number of years that a court may allow for an earnings loss in an employment case can vary. The forensic economist can provide a range of front pay losses (say from one to ten years) from which the court can choose (Macpherson and Stephenson, 2016; Roney, 2012; Roney and Lanning, 2016). In Table 2, we show the cumulative past plus present value (for simplification, we assume an interest rate of zero) of future net losses and the tax-adjusted amounts.[24] The economist can also provide the tax adjusted cumulative award for each year using the same calculation process outlined in Section III. It may be automated using a spreadsheet Macro[25] in Table 4 (for back pay plus front pay for 2019) to facilitate multiple calculations.[26] Table 5 shows the tax adjustment for back pay plus front pay for 2019 and 2020.

Additional front pay calculations (not shown) can be done. The resulting cumulative (including past losses) gross-up amounts for ages 56 to 65 are shown in cells K297 to K306 in Column 10 of Table 2.

V. Approximation "Gross-Up" Formula Accuracy

Sometimes a forensic economist may want to quickly approximate the gross-up amount. One possible approximation formula is to sum up the pre-tax annual lost earnings and then add an additional amount using the prevailing average tax rate at the pre-tax lost earnings.[27] For example, the past lost pre-tax earnings in Column 3 of Table 2 sum to $225,000. From Appendix A, it can be seen that at an income of $75,000 the average effective tax rate is 7.01% for Hawaii and 13.07% for the U.S. If we gross-up the $225,000 by these tax rates ($225,000*(1+.0701+.1307)), we get a figure of $270,180. If we increase this for the Social Security tax in the 2018 tax year (=($270,180-$128,400)*0.0145 + 0.0765*$128,400), we get another $11,878 gross-up. The total approximate gross-up amount equals $282,058 which is 2.13% larger than the correct gross-up amount of $276,173. To determine how accurate this approximation formula is over a range of annual earnings and future years of losses, similar calculations have been done and are shown in Appendix B. The results indicate that the approximation formula is quite close for a range of annual earnings (except at high earnings, e.g. above $100,000) and for a range of front pay years of loss (except for a very large number of years). The error rate decreases arithmetically (not in absolute value) as the number of future years increases. For the smaller income levels, the errors are generally negative and the absolute

value of the error increases with a larger number of years. For earnings around $25,000 the formula has some significant errors. For earnings between $50,000 and $100,000, the back pay losses (for 3 years) are less than 5% in absolute value, while the errors can get large for future years, particularly at $50,000 annual earnings. With respect to changes in income levels, the error rate grows arithmetically (not absolute value) as the income levels increase. Overall, this approximation gross-up formula is a good first approximation for a range of annual earnings and years, and can assist the forensic economist in making a quick assessment. Of course the iterative calculations described in this paper need to be performed to ultimately determine the correct amounts.

VI. Conclusions

If a plaintiff is to be made economically whole, a forensic economist needs to calculate a tax adjusted (gross-up) award to offset adverse tax consequences from receiving a lump sum award in cases where an award is taxable income. This calculation becomes complicated because an additional payment, which is made to the plaintiff to handle the adverse tax consequences of receiving the award, causes an additional tax liability, which then requires an additional payment, and so on.

We present a method that facilitates making the tax "gross-up" calculation for a range of possible back pay and future loss amounts. The method calculates all tax amounts including Federal (according to the Tax Cuts & Jobs Acts of 2017) and State income taxes and payroll taxes to make a plaintiff economically whole in the sense of receiving an FE estimated loss amount after deducting gross-up taxes. The method uses common spreadsheet functions and

formulas and thus its use is readily available and usable by the typical FE. We also present an approximation gross-up formula that can be useful for some ranges of annual earnings and years of losses as a first order approximation.

Our method accounts for both federal income taxes, state income taxes, and payroll taxes in the tax gross-up process. Note that the plaintiff will pay less Social Security taxes if a lump sum award is received in one year (and is larger than Social Security maximum taxable wage) rather than spread out over several years. This is referred to as a "gross-down" calculation by Ireland (2010). We subtract Social Security taxes when we calculate the lost past and future earnings each year, so there is no need for a "gross-down" calculation using our model. We do subtract Social Security taxes in our "gross-up" calculations as described in the paper, so the plaintiff ultimately receives the amount that makes the plaintiff whole. We do not consider the possible loss of some years of credited Social Security earnings.

Note that the economist may need to adjust the gross-up calculation to fit the award amount. For example, if the Court awarded 75 percent of the amount calculated by the economist, the gross-up amount is not a simple 75% of the original gross-up calculation. The Court may need to hear testimony of the newly calculated tax neutralization in a post-trial hearing.

The federal circuits are not in agreement on whether "gross-up" tax adjustments should be allowed (See Schap (2016) for a discussion.). A forensic economist should consult the retaining attorney on the permissibility of the tax adjustment calculation in a particular state and, if so, whether it can be presented in court or in a post-trial hearing before a judge.

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[1] The law clearly relates to employment cases since it states "For purposes of paragraph (2), emotional distress shall not be treated as a physical injury or physical sickness."

[2] This includes: base earnings, mitigating earnings, wage growth rates, discount rates (Tucek 2016), and worklife expectancy (Foster & Skoog 2004; Skoog et al. 2011).

[3] As will be seen these include: Goal Seek, VLOOKUP, and macros to facilitate alternative scenario calculations.

[4] The federal personal exemption was eliminated by the Tax Cuts and Jobs Acts. See Sec. 11041. **SUSPENSION OF DEDUCTION FOR PERSONAL EXEMPTIONS.**

[5] The Tax Cuts & Jobs Act raised the standard deduction for a single filer to $12,000 in 2018. Part III – Tax Benefits for Families and Individuals, Sec. 11021. Increase in Standard Deduction, (1)(7)(A) increased the standard deduction from $3,000 to $12,000.

[6] The Tax Cuts & Jobs Act limits state and local income, sales and property tax (SALT) deductions to $10,000 annually. See Sec. 11042 LIMITATION ON DEDUCTION FOR STATE AND LOCAL, ETC. TAXES. Note in Table 3, the formula for determining federal taxable income in O365 is "=O356+O359+O364". Since the standard deduction of $12,000 is greater than the maximum SALT deduction of $10,000, it will be assumed that the standard deduction of $12,000 will be used. If the filer has other deductions (such as mortgage interest or charitable contributions), the filer may itemize deductions but still the maximum deduction for SALT is $10,000.

[7] The average effective tax rates for a single filer in 2018 for the U.S. and Hawaii which are used to determine the after tax lost past and future income, are shown in Appendix A. All numbers are in constant 2018 dollars. It is assumed the tax schedule remains the same in 2018 dollars. The average effective tax rates are calculated in $1,000 increments, but for the sake of brevity we show selected income levels. We are assuming the jurisdiction requires that the damages be presented in after tax amounts, but this may not be required in all jurisdictions. Federal courts require that the damages be expressed in after tax amounts. For the year 2018 (in which the award will be received), we use the 2018 federal income tax rate schedule and Hawaii's 2018 income tax rate schedule. Hawaii reinstated the three highest tax brackets beginning after December 31, 2017. See Hawaii Department of Taxation Announcement No. 2017-08.

[8] For the 2018 income tax calculations, it is assumed that the single filer takes the standard deduction of $2,200 for Hawaii. In only a few cases will it be beneficial for the single filer to itemize. Itemization faces limitations for single filers earning over $83,400. It is assumed that the single filer uses $12,000 in standard deductions for the U.S. tax returns and the Hawaii state income taxes are not deductible on the federal tax return because the federal standard deduction of $12,000 is used. Federal personal exemptions were eliminated with Tax Cuts and Jobs Act.

[9] Sometimes the plaintiff may not pay attorney fees. Title VII (Section 706 (k)) of the Civil Rights Act of 1964 states that "the court, in its discretion, may allow the prevailing party … a reasonable attorney's fee."

[10] Shown in our spreadsheet in cell J272 in Table 1.

[11] Shown in our spreadsheet in cell J273 in Table 1.

[12] The link is to G350 in our Table 3 spreadsheet (the GUA calculation table).

[13] Once STIB is determined, the state income tax amount is calculated from the rate schedule using a VLOOKUP command structured as follows:
Lookup the "Tax amount at min. of bracket" corresponding to the lower bound of the "Taxable Income Amount" bracket which contains STIB amount + (STIB - the lookup value of lower bound of the "Taxable Income Amount" bracket corresponding to STIB) times the VLOOKUP marginal tax rate corresponding to the STIB amount.
In our example spreadsheet, the Table 3 SITB in cell E346 refers to cell O363, which is the VLOOKUP value per the VLOOKUP structure described from the State Income Tax rate schedule in cells N343 to Q354. In Table 3, the formula in cell O363 is =-(VLOOKUP(O362,$N$343:$Q$354,3)+(O362-VLOOKUP(O362,$N$343:$Q$354,1))*VLOOKUP(O362,$N$343:$Q$354,4)). The first part of the VLOOKUP formula yields $682 and the second part of the VLOOKUP formula yields $231 (=$17,800 - $14,400)*0.068). The two parts sum to $913.

[14] Once FTIB is determined, FITB is calculated from the rate schedule using a VLOOKUP command structured similarly to the one used for the state income tax amount as follows:
In our example spreadsheet, the Table 3 FITB in cell E345 refers to cell O366, which is the VLOOKUP value per the VLOOKUP structure described from the Federal Income Tax rate schedule in cells I345 to L351.

In Table 3, the formula in cell O366 is
=VLOOKUP(O365,$I$345:$L$351,3)+(O365-
VLOOKUP(O365,$I$345:$L$351,1))*VLOOKUP(O365,$I$345:$L$351,4). The first part of the VLOOKUP formula yields $0 and the second part of the VLOOKUP formula yields $800 = ($8,000 - $0)*0.10. The two parts sum to $800.

[15] Structurally this is as follows using an IF command:
-IF(2018 plaintiff's earned income<=128400,(2018 plaintiff's earned income)*0.0765,0.0765*(128400) + 0.0145*(2018 plaintiff's earned income - 128400)) - IF(2018 plaintiff's earned income income>200000,0.009*(2018 plaintiff's earned income - 200000),0) - IF(2018 plaintiff's earned income income + investment income >200000, 0.038*(min(investment income, 2018 plaintiff's earned income + investment income - 200000),0) In our spreadsheet in Table 3 in cell E347, this formula is:

=-IF(O357<=128400,(O357)*0.0765,0.0765*(128400)+0.0145*(O357-128400))-IF(O357>200000,0.009*(O357-200000),0) -IF(O357+O359>200000,0.038*MIN(O359,O357+O359-200000),0)
The result is = $0 since it is assumed that no earned income occurs in 2018. Note that the Additional Medicare Tax and NIIT do not apply in this example because the before award income was not above the respective thresholds.

[16] Once STIA is determined, the SITA is calculated from the rate schedule using a VLOOKUP command structured as follows:
Lookup the "Tax amount at min. of bracket" corresponding to the lower bound of the "Taxable Income Amount" bracket which contains STIA amount + (STIA - the lookup value of lower bound of the "Taxable Income Amount" bracket corresponding to STIA) times the VLOOKUP marginal tax rate corresponding to the STIA amount.
In our example spreadsheet, the Table 3 SITA in cell F346 refers to cell K363, which is the VLOOKUP value per the VLOOKUP structure described from the State Income Tax rate schedule in cells N343 to Q354. In Table 3, the formula in cell K363 is =-(VLOOKUP(K362,$N$343:$Q$354,3)+(K362-
VLOOKUP(K362,$N$343:$Q$354,1))*VLOOKUP(K362,$N$343:$Q$354,4)). The first part of the VLOOKUP formula yields $16,379 and the second part of the VLOOKUP formula yields $10,366 (=$293,973 - $200,000)*0.11. The two parts sum to $26,716.

[17] Once FTIA is determined, FITA is calculated from the rate schedule using a VLOOKUP command structured similarly to the one used for the state income tax amount as follows:
In our example spreadsheet, the Table 3 FITA in cell F345 refers to cell K366, which is the VLOOKUP value per the VLOOKUP structure described from the Federal Income Tax rate schedule in cells I345 to L351.
In Table 3, the formula in cell K366 is =VLOOKUP(K365,$I$345:$L$351,3)+(K365-
VLOOKUP(K365,$I$345:$L$351,1))*VLOOKUP(K365,$I$345:$L$351,4). The first part of the VLOOKUP formula yields $45,690 and the second part of the VLOOKUP formula yields $29,460 = ($284,173 - $200,000)*0.35. The two parts sum to $75,150.

[18] The additional Medicare Tax remains the same in the Tax Cuts and Jobs Act of 2017. See I. Compensation 1. Modification of limitation on excessive employee remuneration (sec. 3801 of the House bill, sec. 13601 of the Senate amendment, and sec. 162(m) of the Code) Employment taxes and reporting, footnote 1047. It is not indexed for inflation.

[19] The NIIT remains the same in the Tax Cuts and Jobs Act of 2017 D. Reform of Business Related Exclusion, Deduction, etc., See 15. Recharacterization of certain gains in the case of partnership profits interests held in connection with performance of investment services (sec. 3314 of the House bill, sec. 13310 of the Senate amendment, and secs. 1061 and 83 of the Code) Net long term capital gains, footnote 830. It is not indexed for inflation.

[20] Structurally this is as follows using an IF command:
-IF(GUA + 2018 plaintiff's earned income<=128400,(GUA + 2018 plaintiff's earned income) *0.0765,0.0765*(128400) + 0.0145*(GUA + 2018 plaintiff's earned income - 128400)) - IF(GUA + 2018 plaintiff's earned income>200000,0.009*(GUA + 2018 plaintiff's earned income - 200000),0) - IF(GUA + 2018 plaintiff's earned income + investment income>200000,0.038*(min(investment income, GUA + 2018 plaintiff's earned income + investment income - 200000),0)
In our spreadsheet in Table 3 in cell F347, this formula is:

=-IF(K356+K357<=128400,(K356+K357)*0.0765,0.0765*(128400)+0.0145*(K356+K357-128400))-
IF(K356+K357>200000,0.009*(K356+K357-200000),0) -
IF(K356+K357+K359>200000,0.038*MIN(K359,K356+K357+K359-200000),0)
The result is =0.0765*(128,400) + 0.0145*(276,173-128,400) .009*($276,173-$200,000) +.038*($20,000)= $9,823 +$2,143 + $686 +$760= $13,411. Note that the Additional Medicare Tax (PTAMA) and NIIT (PTNIITA) apply in this example because the after award income is above the respective thresholds. Receiving the lump sum award triggered payment of the Additional Medicare Tax and the NIIT on the $20,000 of investment income.

[21] Using our example, the GOALSEEK command is specified as follows:
Set cell G354 (=E352-G351) to 0, by changing cell K356 (GUA) until G351 (ATL') equals cell E352 (ATL). The final result is GUA = $276,173. Goal Seek streamlines the iterative calculation, which could be manually iterated.

[22]In Tables 1 and 2, we calculate the effective tax rates on past and future earnings for the plaintiff (but for the alleged tort) using the state and federal tax schedules as shown in Appendix A). We calculate the average tax rate at each increment of $1,000 in income and assume the standard deductions are taken. The effective tax rates are shown only for every $25,000 in incremental income up to $200,000 and then in increments of $100,000 up to $1,000,000 in annual income in order to condense the table. We use these effective tax rates to estimate what the future effective tax rates will be for the single filer as their real adjusted gross income changes over time. For the year in which the award is received, we assume that the forensic economist can determine the investment income and the deductions (standard or itemized) that will be taken that year and thus we use the current marginal tax tables shown in Table 3 (2018 for federal taxes and 2018 for Hawaiian taxes).

[23] This is cell E352 in Table 3 of our example spreadsheet, which is the after-tax loss (ATL) for the past loss period shown in Table 1.

[24] In our spreadsheet in Table 2 these are in cells J297 to J306 and K297 to K306, respectively.

[25] A Macro is a small program in Excel that can be used to perform repetitive steps. Macros are written in Visual Basic for Applications (VBA), but the user does not need to be a VBA programmer to create a Macro. A Macro can be created by asking Excel to "Record" mouse and keypad strokes. The Macro feature can be found under the "View" tab. Once the Macro has been recorded and named with a "Shortcut," such as "Ctrl L", it can easily be repeated by hitting "Ctrl L".

[26] Table 4 is constructed to look for the total loss for each age in Table 2 and place the loss amount three columns to the right (and two rows down) of the age in Table 4. For example, the formula in cell E382 is =VLOOKUP(B380,$B$297:$K$306,9,FALSE). It looks for age 56 (the content of cell B380 which finds age 56 in cell B297 in Table 2), and finds the estimated loss value 9 columns over, in J297. The total cumulative of back pay plus 2019 front pay loss is $216,812. The correct tax adjusted amount is $381,656 shown in cell K297, which links from G380. To expedite the process of calculating the cumulative tax adjusted amount for back pay plus front pay from 56 to 65 years old, a Macro that repeats this Goal Seek command at each future age is used, by starting at G384 and use the Macro as follows:

```
Sub Macro1()
' Macro1 Macro
' repeat goal seek
' Keyboard Shortcut: Ctrl+l
   ActiveCell.GoalSeek Goal:=0, ChangingCell:=ActiveCell.Offset(2,4).Range( _
      "A1")
   ActiveCell.Offset(30, 0).Range("A1").Select
End Sub
```

[27] We thank an anonymous reviewer for this suggestion.

Appendix A: U.S. & Hawaii Average Tax Rates as a Percent of Adjusted Gross Income for Single Persons, 2018

Adjusted Gross Income	Hawaii Average Tax Rate	U.S. Average Tax Rate	Total Average Tax Rate
$25,000	5.1%	5.5%	10.5%
$50,000	6.4%	8.7%	15.1%
$75,000	7.0%	13.1%	20.1%
$100,000	7.3%	15.4%	22.7%
$125,000	7.5%	17.1%	24.6%
$150,000	7.6%	18.3%	25.9%
$175,000	7.8%	19.3%	27.2%
$200,000	8.1%	20.9%	29.0%
$300,000	9.0%	25.5%	34.5%
$400,000	9.5%	27.9%	37.4%
$500,000	9.8%	29.3%	39.1%
$600,000	10.0%	30.5%	40.6%
$700,000	10.2%	31.5%	41.6%
$800,000	10.3%	32.2%	42.4%
$900,000	10.3%	32.7%	43.0%
$1,000,000	10.4%	33.1%	43.5%

Average tax rate calculations made by authors by dividing total tax liability by total adjusted gross income for single persons at each income level, using the 2018 federal and state income tax schedules. To conserve space, results are only shown at increments of $25,000 up to $200,000 in income, then in $100,000 increments up to $1,000,000 in annual income.

Appendix B: Approximation Gross-Up Formula Error Rates

Annual Income	$25,000	$50,000	$75,000	$100,000	$125,000	$150,000	$175,000	$200,000	$500,000
Past years	-5.18%	-1.1%	2.1%	4.3%	6.4%	5.6%	5.7%	8.1%	25.9%
Future years									
1	-7.1%	-7.3%	-2.1%	1.0%	2.9%	2.6%	3.1%	5.8%	24.7%
2	-8.0%	-10.5%	-4.4%	-1.7%	0.7%	0.9%	1.6%	4.4%	24.0%
3	-11.5%	-12.6%	-6.6%	-3.4%	-0.7%	-0.3%	0.7%	3.5%	23.5%
4	-14.5%	-14.0%	-8.1%	-4.6%	-1.7%	-1.1%	0.0%	2.9%	23.2%
5	-16.5%	-15.5%	-9.2%	-5.5%	-2.4%	-1.6%	-0.5%	2.4%	23.0%
6	-18.1%	-16.6%	-10.0%	-6.1%	-3.0%	-2.1%	-0.9%	2.1%	22.8%
7	-19.3%	-17.5%	-10.7%	-6.7%	-3.4%	-2.4%	-1.2%	1.8%	22.6%
8	-20.3%	-18.2%	-11.2%	-7.1%	-3.8%	-2.7%	-1.5%	1.6%	22.5%
9	-21.1%	-18.8%	-11.7%	-7.4%	-4.1%	-3.0%	-1.7%	1.4%	22.4%
10	-21.8%	-19.3%	-12.0%	-7.7%	-4.4%	-3.2%	-1.9%	1.2%	22.3%

Table 1
Expected Past Lost Earnings of John Doe

1	2	3	4	5	6	7	8
Age	Year	Potential Earnings	HI AGI Average Tax Rate	U.S. AGI Average Tax Rate	(3*(4+5)) Fed + HI Income Taxes	Social Security Tax	(3-6-7) After Tax Lost Income
53	12/31/16	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203
54	12/31/17	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203
55	12/31/18	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203
						Total	**$162,609**
						Tax adjusted	**$276,173**

TABLE 2

A VALUATION OF THE EXPECTED FUTURE LOST EARNINGS OF

John Doe

1	2	3	4	5	6	7	8	9	10
					(3*(4+5))		(3-6-7)		
Age	Year	Potential Taxable Inc.	HI AGI Average Tax Rate	U.S. AGI Average Tax Rate	Fed + HI Income Taxes	Social Security Tax	After Tax (Inc.+S.S.)	Cumulative Future After Tax Earnings	Tax adjusted award
56.00	12/31/19	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$216,812	$381,656
57.00	12/31/20	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$271,015	$486,598
58.00	12/31/21	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$325,218	$595,551
59.00	12/31/22	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$379,421	$704,721
60.00	12/31/23	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$433,624	$813,891
61.00	12/31/24	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$487,827	$923,062
62.00	12/31/25	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$542,030	$1,032,232
63.00	12/31/26	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$596,233	$1,141,402
64.00	12/31/27	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$650,436	$1,250,572
65.00	12/31/28	$75,000	7.01%	13.07%	$15,060	$5,738	$54,203	$704,639	$1,359,742

Table 3 Tax Adjustments for Back Pay for 2016-2018

Summary Loss Table

Item	Before award	After award	Increment
Federal Income Tax	($800)	($75,150)	($74,350)
State Income Tax	($913)	($26,716)	($25,803)
Soc. Sec./Medicare, NIIT Tax	($0)	($13,411)	($13,411)
Total taxes	($1,713)	($115,277)	($113,564)

Age 55

Pretax income	$20,000	$296,173	$276,173
After tax income	$18,287	$180,896	$162,609
After tax loss amt.	$162,609		
After tax (inc. + award)	$180,896		
Difference			$0

Estimated State and Federal Income Taxes on Award

2018 Federal Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$9,525	$0	10.0%
$9,525	$38,700	$953	12.0%
$38,700	$82,500	$4,454	22.0%
$82,500	$157,500	$14,090	24.0%
$157,500	$200,000	$32,090	32.0%
$200,000	$500,000	$45,690	35.0%
$500,000		$150,690	37.0%

2018 Hawaii State Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$2,400	$0	1.40%
$2,400	$4,800	$34	3.20%
$4,800	$9,600	$110	5.50%
$9,600	$14,400	$374	6.40%
$14,400	$19,200	$682	6.80%
$19,200	$24,000	$1,008	7.20%
$24,000	$36,000	$1,354	7.60%
$36,000	$48,000	$2,266	7.90%
$48,000	$150,000	$3,214	8.25%
$150,000	$175,000	$11,629	9.0%
$175,000	$200,000	$13,879	10.0%
$200,000		$16,379	11.0%

After award item	Tax Calculations
Award income	$276,173
Mitigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$293,973
HI Income Tax	($26,716)
Fed. standard deduction	($12,000
Fed. Taxable income	$284,173
Fed. Income Tax	$75,150

Before award item	Tax Calculations
Award income	
Mtigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$17,800
HI Income Tax	($913)
Fed. standard deduction	($12,000)
Fed. Taxable income	$8,000
Fed. Income Tax	$800

Table 4 Tax Adjustments for Back Pay plus Front Pay for 2019

Summary Loss Table

Item	Before award	After award	Increment
Federal Income Tax	($800)	($112,069)	($111,269)
State Income Tax	($913)	($38,319)	($37,406)
Soc. Sec./Medicare, NIIT Tax	($0)	($16,169)	($16,169)
Total taxes	($1,713)	($166,557)	($164,844)

Age 56

Pretax income	$20,000	$401,656	$381,656
After tax income	$18,287	$235,099	$216,812
After tax loss amt.	$216,812		
After tax (inc. + award)	$235,099		
Difference			$0

Estimated State and Federal Income Taxes on Award

2018 Federal Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$9,525	$0	10.0%
$9,525	$38,700	$953	12.0%
$38,700	$82,500	$4,454	22.0%
$82,500	$157,500	$14,090	24.0%
$157,500	$200,000	$32,090	32.0%
$200,000	$500,000	$45,690	35.0%
$500,000		$150,690	37.0%

After award item

	Tax Calculations
Award income	$381,656
Mitigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$399,456
HI Income Tax	($38,319)
Fed. standard deduction	($12,000
Fed. Taxable income	$389,656
Fed. Income Tax	$112,069

Before award item

	Tax Calculations
Award income	
Mtigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$17,800
HI Income Tax	($913)
Fed. standard deduction	($12,000)
Fed. Taxable income	$8,000
Fed. Income Tax	$800

2018 Hawaii State Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$2,400	$0	1.40%
$2,400	$4,800	$34	3.20%
$4,800	$9,600	$110	5.50%
$9,600	$14,400	$374	6.40%
$14,400	$19,200	$682	6.80%
$19,200	$24,000	$1,008	7.20%
$24,000	$36,000	$1,354	7.60%
$36,000	$48,000	$2,266	7.90%
$48,000	$150,000	$3,214	8.25%
$150,000	$175,000	$11,629	9.0%
$175,000	$200,000	$13,879	10.0%
$200,000		$16,379	11.0%

Table 5 Tax Adjustments for Back Pay plus Front Pay for 2019 and 2020

Summary Loss Table

Item	Before award	After award	Incre-Ment
Federal Income Tax	($800)	($148,799)	($147,999)
State Income Tax	($913)	($49,863)	($48,950)
Soc. Sec./Medicare, NIIT Tax	($0)	($18,635)	($18,635)
Total taxes	($1,713)	($217,297)	($215,583)

Age 57

Pretax income	$20,000	$506,598	$486,598
After tax income	$18,287	$289,302	$271,015
After tax loss amt.	$271,015		
After tax (inc. + award)	$289,302		
Difference			$0

Estimated State and Federal Income Taxes on Award

2018 Federal Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$9,525	$0	10.0%
$9,525	$38,700	$953	12.0%
$38,700	$82,500	$4,454	22.0%
$82,500	$157,500	$14,090	24.0%
$157,500	$200,000	$32,090	32.0%
$200,000	$500,000	$45,690	35.0%
$500,000		$150,690	37.0%

2018 Hawaii State Marginal Tax Rates for Single Filers

Taxable Income Amt. over	but not over	Tax amt. at min. of bracket	Marginal Rate
$0	$2,400	$0	1.40%
$2,400	$4,800	$34	3.20%
$4,800	$9,600	$110	5.50%
$9,600	$14,400	$374	6.40%
$14,400	$19,200	$682	6.80%
$19,200	$24,000	$1,008	7.20%
$24,000	$36,000	$1,354	7.60%
$36,000	$48,000	$2,266	7.90%
$48,000	$150,000	$3,214	8.25%
$150,000	$175,000	$11,629	9.0%
$175,000	$200,000	$13,879	10.0%
$200,000		$16,379	11.0%

After award item	Tax Calculations
Award income	$486,598
Mitigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$504,398
HI Income Tax	($49,863)
Fed. standard deduction	($12,000
Fed. Taxable income	$494,598
Fed. Income Tax	$148,799

Before award item	Tax Calculations
Award income	
Mtigating income	$0
Other (invest.) income	$20,000
HI standard deduction	($2,200)
HI Taxable Income	$17,800
HI Income Tax	($913)
Fed. standard deduction	($12,000)
Fed. Taxable income	$8,000
Fed. Income Tax	$800