Assessing Economic Damages in Wrongful Termination Cases

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This paper presents a method for measuring economic damages in wrongful termination cases. Such cases present the damages expert with a problem since the available studies of earnings recovery after a job loss are based on a limited time period after a job loss and many workers never catch-up to the previous earnings level. A two-step approach is offered. First, the expert uses appropriate available empirical evidence to develop a typical earnings catch-up period. Second, the expert gathers information about case factors affecting the duration of the period to earnings catch-up. Using these factors, the expert modifies the base time period to develop a reasonable range of years for earnings catch-up. The ultimate choice of lost earnings is left for the court to decide, given the range presented by the expert. Cases directly or indirectly supporting this method are presented.

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I. Introduction

Forensic economists who assess economic damages in civil litigation usually build a damages model based on economic theory, empirical studies, and prior cases. What is a forensic economist to do, however, when prior studies generally find earnings losses persist (i.e., earnings do not "catch-up" to the pre-job loss earnings level) after an involuntary job loss, yet the courts say the wronged party should be made "whole"? We begin with a basic framework in which:

- The role of the expert is to assist the trier of fact.

- The plaintiff has a duty to mitigate his loss after termination.

- If liability is established, an accepted remedy is to make the plaintiff "whole." This means damages are what earnings would have been had the termination not happened, less mitigation earnings.

- The expert should use existing theoretical and empirical studies, make reasonable assumptions, and avoid speculation in assessing economic damages.

To this framework of analysis, we add the observation that it is preferable to be approximately correct than precisely wrong when assessing economic damages.

To make the injured party whole in a wrongful termination case, the end point in measuring earnings loss is not when the dismissed person gets another job, but when the dismissed person gets a job that pays what they would have gotten had they not been dismissed. Finding another job fits with the need to mitigate losses. If the individual immediately finds a new job that meets or exceeds the old job in pay, then there are no damages. If the new job fails to match the prior job's pay level then there are at the very least transitional losses to be compensated, assuming the search for new employment has been dutiful toward mitigating loss.

Fulfilling the duty to mitigate damages is a thorny issue. Accepting a low-paying job offer immediately might lead to a loss in bargaining power regarding a future job, so refusal of a

job offer is not necessarily a sign of malingering. Taking a job in a much different occupation may cause erosion of job skills, as would occur when a highly trained technician becomes employed for long duration performing tasks commonly associated with unskilled labor. Jobs sited far from one's family residence have associated with them extraordinary costs, so rejection of such an employment opportunity is not tantamount to shirking. Such factors as have been mentioned warrant consideration by judge and jury, even if the forensic economist does not present expert opinion on the issue of mitigation of damages.

The next section reviews the literature most relevant to determining the duration of job loss after wrongful termination and estimating the time frame to obtaining earnings at the pre-termination level. An approach to calculating damages is proposed and then illustrated in successive sections. Crucial to the analysis is the choice of the number of years to full mitigation, addressed specifically in its own section. The paper concludes with a brief summary.

II. Prior Studies

While a considerable empirical body of work has been developed on job search and/or unemployment duration, relatively few articles compare pre- and post-termination pay. Roney (2012) surveys the literature on duration and magnitude of earnings losses from a job loss. The article highlights the importance of the data set studied on the measured outcome and concludes that there is a consensus that involuntary job loss has a long lasting and serious adverse effect on earnings. An article by Couch and Placzek (2010) also provides a detailed list of displaced worker studies by type of data used, economic conditions, age, and whether the worker switched industry after job loss.

Displaced workers who are 50 years of age or older face special challenges in obtaining employment. Chan and Stevens (2001a) presents an empirical study of job loss and reemployment based on data from the Health and Retirement Study (HRS) following an

involuntary job loss by workers 50 and over. For displaced workers who do return to work, as opposed to retiring or dropping out of the labor force, the authors considered the earnings on post-displacement jobs and, like others, found earnings reductions for older workers were large and persistent. Specifically, six years or more after a job loss, displaced men face earnings reductions of 23 percent (Chan and Stevens 2001a, p. 200). While Roney (2012) does not include mention of the Chan and Stevens (2001a) article, the results in the two articles are consistent. Couch (1998) also uses the 1992 HRS and finds an earnings decline of 39 percent for older displaced workers aged 51-60, but the focus is on reemployed workers and does not consider how long it takes to make up pre-displacement earnings loss.

The studies cited here and others explicitly cited in Roney (2012) indicate that some workers, especially older workers, may never catch-up to pre-displacement earnings for a mix of possible reasons: not enough time between layoff and retirement, employer preferences for younger workers, out-of-date job skills, etc. Faced with uncertainty as to how long it takes a worker to catch-up in earnings, if at all, in the next section we propose a method that nevertheless effectively estimates the pecuniary loss associated with involuntary employment termination.

III. A Proposed Method for Determining Damages

It appears to us that there are two broad possible ways to assess damages in a wrongful termination case for those forensic economists who take up the challenge. The first of the two, although conceptually simple, is riddled with problems. In the first approach one would consider the literature on unemployment duration and then multiply pre-layoff pay times the expected length of unemployment to infer damages. Again, this is relatively simple to compute, but measuring a completed spell of unemployment turns out to be difficult because not all spells of unemployment end with a job: some unemployment spells are followed by time out of the labor

force. Published U.S. Bureau of Labor Statistics (BLS) unemployment duration measures are based on those still unemployed. For such persons, the measured spell of unemployment is thus shorter than the true length of unemployment. Also, this option offers no comparison between the earnings of pre- and post-layoff jobs. Moreover, as the literature shows, the earnings at the first position taken after job loss are generally well below the pre-layoff pay level; even if one had an accurate measure of unemployment duration (which is in fact unavailable), measuring the pre- to post-pay gap as observed generally means underestimating earnings loss.

A second option is to consider that the displaced worker has a duty to mitigate damages and incorporate a measure of mitigation in the damages estimate. At first blush it may seem that this approach would be beset with as much difficulty as the first approach, as it would appear that the forensic economist would need to tackle the shirking/malingering issue head on. In fact, the second approach is our preferred approach. And rather than address the issue of mitigation head on, we in fact turn it on its head, as we now explain.

In our preferred method, faced with uncertainty as to how long it takes a worker to catch-up in earnings, if at all, we present three alternative periods (of say 6, 8, and 10 years each) to achieve 'catch-up' in earnings, where wage catch-up is imposed at the end of each time period. The method involves consideration of annual damages as the difference between but-for and 'actual' wages for each year until catch-up, but we construct a series of 'hypothetical' mitigation pay levels and impose these constructs as the 'actual' in the loss calculation. If an individual has a real mitigation job, we would take as an offset to 'but-for' pay the greater of (a) pay level of the real mitigation job or (b) our hypothetical mitigation pay.

Our method imposes 100 percent mitigation at various different time lengths, after which there would be no damages. We then ask the court to select from an array of damages, each associated with a different hypothetical length of earnings catch-up. The key choice for the court

is to select the appropriate damages needed for a case-specific remedy. To the extent that earnings losses may persist beyond the upper limit of a range suggested for catch-up, the method we suggest is conservative and underestimates economic loss. And the choice of usable, specific time frames can be addressed based on published empirical studies. The method is non-speculative inasmuch as a similar, empirically based weighting scheme has been accepted in the courts when applied to commercial damages, as we describe in the section addressing the number of years to earnings catch-up.

IV. Illustrating the Method

Consider a hypothetical example. Assume one is asked to assess economic damages in a wrongful termination case, and that liability has been established. The dismissed individual is a single male. Before his termination, his employer provided earnings and fringe benefits. The individual had held his position with the company for seven years, and at the time of his termination he was 52 years old; his pre-termination pay was $20.00 per hour and he was working 40 hours per week for 52 weeks per year. What are his economic damages?

We begin with a layoff date and earnings. We then grow those earnings for the three different time periods using a measure of annual earnings growth such as the Employment Cost Index. This is the 'but-for' earnings profile. So-called 'actual wages' are really derived mitigation pay and computed indirectly. The key issue is that given we have 6 (or 8 or 10) years of wage growth, we ask: what would 'mitigation pay' need to be in each year going forward to exactly match 'but-for' pay in the terminal year, be it 6 (or 8 or 10) years? As usual, the differences between but-for and mitigation pay measures lost 'pay.' Standard adjustments need to be made for fringe benefits, partial years, and discounting future loss to present value. These adjustments are omitted here as they are generally well known, and here we wish to focus on the suggested method. Special attention may also need to be given to the treatment of taxes as noted

below. All these adjustments, however, are secondary. Our main concern is our reliance on sensitivity analysis as a way of dealing with uncertainty and balancing the twin goals of requiring mitigation (job-taking) and making the plaintiff whole.

Table 1a presents 6-year, 8-year, and 10-year earnings catch-up scenarios with a trial date in year 11. As a result, there is no discounting of losses (an assumption dropped in Table 1b). Consider the 6-year catch-up model for the older worker. If we assume annual termination earnings of $41,600 (i.e., $20/hour x 2,080 annual hours) and wage growth of 2.5 percent per year after the first year, then 'but-for' pay in year 6 is $47,067. The question then becomes, what 'mitigation pay' is needed in years 1, 2, 3, 4, and 5 to match $47,067 in year 6? We say 1/6th of $47,067 in year 1, or $7,844; 1/3rd in year 2, or $15,689; 1/2 in year 3, or $23,533; and so forth until pay levels match in year 6. "Taking a job" is an assumed requirement, but following the 'make-whole' principle cited in *Franks v. Bowman* (1976) and elsewhere, if the terminated worker lands a new job paying $7,844 that does not mean 'catch-up' since, as we can see in Table 1, "lost earnings" are over $33,000 if the mitigation pay level is $7,844.

Also shown in Table 1a are 8- and 10-year catch-up scenarios. Earnings growth rates are the same in each situation as are but-for earnings levels, but the mitigation pay level depends on how long it takes to catch-up to but-for pay; if less catch-up time, then higher initial pay and vice versa for a longer catch-up duration.

Table 1b presents the 6-year earnings catch-up scenario with a trial date at the end of the third year. The calculation of the but-for and "actual" earnings is the same as in Table 1a. In contrast to Table 1a, however, some of the losses occur after the trial date. As a result, the future earnings losses are discounted with an assumed interest rate of 1% and mid-year discounting. The present value of past losses is $80,879 and the present value of future of losses is $19,952. The total present value of losses is $100,831. These losses are $166 less than the losses that for the 6-

year earnings catch-up period in Table 1a, which involved no discounting. The same approach would be applied to the 8- and 10-year earnings catch-up period scenarios.

The 'make-whole' principle, which appeared in *Franks v. Bowman* (1976), was cited in *Brinkley-Obu v. Hughes Training* (1994); namely, as part of its equitable powers under Title VII, a district court has broad equitable discretion to fashion remedies to make the plaintiff whole for injuries resulting from a violation of the statute. Section 706(g) of Title VII, 42 U.S.C. § 2000e-5(g), vests broad equitable discretion in the federal courts to order such affirmative action as may be appropriate to remedy a violation including back pay and such other equitable relief as the court deems appropriate. Further support for the 'make-whole' principal comes from Posner (2003, p.187). He notes the *eggshell skull principle*, which is the idea in torts that the victim in a tort can recover total tort damages equal to the tort victim's total harm even though the extent of damages of the injury was unforeseeable by the defendant at the time of the injury.

To be clear, in a personal injury or wrongful death case, we would take 'pre-event' earnings, grow pre-event pay at an appropriate rate for a certain time such as work life expected, then discount the difference between future mitigation and projected future pay to present value as of the trial date. At any point, if mitigation pay equals or exceeds expected earnings then losses cease. In our situation, we do not have a certain date when mitigation pay will meet projected but-for pay because empirical studies are unclear. So we build a model beginning with what but-for earnings will be in 6, 8, or 10 years and ask what rate of pay is needed now and in each intervening year to catch-up with but-for earnings in each of those time periods. As usual, past losses are not discounted and future losses are discounted after a specified point, *viz.* the trial date.

Damages are tax-free in personal injury and related cases, but federal law for wrongful termination dictates that income taxes will be paid on damages awards. This problem may need

to be addressed and how to solve it is discussed in several forensic economic articles in refereed journals, including important articles by Ben-Zion (2000) and Ireland (2010). The issue is generally called the need to 'gross up' the damages award to offset the tax consequences and make the plaintiff whole.

We have illustrated the method above by using three earnings catch-up periods, 6, 8, and 10 years. While we present a procedure below for choosing years to catch-up, it may be useful to consider explicitly how one computes the losses shown in Table 1.

The estimation of economic damages in the model calls for three steps. First, compute the future value of base earnings (FVBE):

(1) $FVBE_t = BE \cdot (1 + g)^{t-1}$

where BE is the base earnings pre-termination, g is the earnings growth rate, and t is the number of years post termination from t=1 to n, until a worker is assumed to be caught up. The earnings growth rate for the first year after termination is assumed to be 0 since in most cases it is a partial year of earnings.

Second, compute the 'actual' or mitigation earnings, where

(2) $AE_t = \dfrac{FVBE_n}{\cdot t}^n$

The mitigation earnings can be assumed to have a non-linear catch-up rate to FVBE. For example, it could be a logarithmic catch-up rate:

(2)′ $AE_t = FVBE_t \cdot (1 - y) \cdot \dfrac{ln(n) - ln(t)}{ln(n)}$

where γ is the percentage reduction in earnings relative to FVBE in the first year after termination. Some evidence in Couch and Placzek (2010) suggests such a logarithmic catch-up rate is appropriate, as we explain and illustrate in Section V.

Third, the lost earnings in year t is computed as

(3) $LostEarnings_t = FVBE_t - AE_t$

V. Choosing the Number of Years to Earnings Catch-up

While selecting various time periods for earnings catch-up is needed to make operational our suggestion, the available empirical evidence provides only inexact clues. For instance, Bureau of Labor Statistics (BLS) published unemployment duration for men aged 45-54 years as 40.1 weeks in January 2011, but this average rose by 1.3 weeks only by changing the top code to 5 years from 2 years. Also BLS measures the unemployment duration of those still unemployed, not an average for a completed spell of unemployment. See http://www.bls.gov/cps/avgdur.2011.01.pdf. An additional problem is that most existing longitudinal empirical studies only follow workers for up to six years, thus truncating the possibility of measuring catch-up after six years.

Still, some readers may object to the proposed method, believing an expert should always rely on empirical results and eschew a subjective method. Yet, if no clear empirical or theoretical guidance is available, then we believe the forensic expert nonetheless has a role, an obligation, to analyze the case facts and select the best evidence possible, even if minimal. In a wrongful termination case, a central issue is determining years to earnings catch-up, at which point the plaintiff is made whole, if not before. As for the use of qualitative factors and checklists in litigation to reasonably approximate economic damages, reliance upon such methods is already established.

- In patent infringement litigation it is common to use a qualitative valuation method first presented in the seminal case of *Georgia-Pacific Corp. v. United States Plywood Corp.* (1971); the district court's method to computing economic damages was to list 15 qualitative factors, which were some of the key issues in determining damages in other

cases. Use of the *Georgia-Pacific* factors is widespread today in litigation involving patent valuation. Use does not involve an exact numeric calculation but a systematic analysis of most, if not all, of the 15 factors to determine a percentage based on a 'reasonable royalty' rate, which is then multiplied by the dollar amount of infringing sales to determine the dollar amount of damages.

- In valuing a business, measuring the company-specific risk is often a key step in determining an equity cost of capital using a build-up method. Yet, as Hitchner and Vogt (2005) observe, one way to determine this factor is through a subjective analysis of the company. The valuation expert first lists component risk factors such as management depth, supplier concentration, access to capital, potential new competitors, etc., then may (a) assign each factor a numeric weight, (b) assign each factor a 'sign' (e.g., '+', '-', 'no change [nc]'), or (c) merely list each factor and assign an overall company-specific risk number. Each method is acceptable and used in many business valuations, as part of determining a discount factor, in spite of being subjective.

- The use of multifactor tests to determine economic damages in litigation appears in a review of *Divergent Paths: The Academy and the Judiciary* by Richard A. Posner, Harvard University (2016), as reviewed by Kermit Roosevelt in the *New York Times*, January 2016:

    Legal analysis often features multifactor tests, 'lists of considerations for the judge to weigh and compare,' in deciding some issue, like the amount of damages to award in a patent infringement case. Posner . . . thinks . . . in some circumstances. . . a multifactor test would improve matters: It would structure intuition by telling judges which factors to consider and which to ignore.

- Lloyd (2000) in writing about damages to a new business notes virtually every damage calculation will have some uncertainty underlying it. Key questions are whether the damage claim basis is reasonable and has support in the record, and whether appropriate steps been taken to avoid speculation. Lloyd (2008, p. 8, citing Cashman v. Allied Products Corp.[1985] and Computer Systems Engineering v. Qantel Corp. [1984]) explains:

> One approach for explicitly recognizing the range of possible amounts in a calculation relying on variables and estimates is to present a range of possible outcomes (losses) and let the trier of fact decide which single point within this range is appropriate. Several cases have shown this method to be acceptable.

The expert needs to consider the facts of the case and determine what, if any, relevant empirical studies of catch-up earnings exist and, if so, after what time period. Our study of the literature on time to catch-up earnings leads us to suggest that the forensic expert use a two-step process to derive a range of economic damages.

As a first step we consider a base time period for earnings catch-up. To establish the baseline estimate, we use the results of Couch and Placzek (2010) since the authors use a large and recent longitudinal data set covering a 6-year time period. It is important to note that Couch and Placzek (2010) excludes the 15 percent of individuals who do not get reemployed within one year after displacement. Including these individuals in the analysis as zero earnings would increase the earnings loss by 15 to 18 percentage points.

Couch and Placzek (2010) includes four different methods for measuring the earnings: for individual fixed effects, individual fixed effects with an individual time trend, propensity score matching with average treatment of the treated, and propensity score matching with differenced average treatment of the treated. We calculate the average earnings loss by year

across the four methods and present the results in Figure 1. The figure shows that the average

earnings loss falls 24.3 percent in the first year after displacement to 9.9 percent in the sixth year.

These average earnings losses were fitted using a regression model with the log of years since

displacement as a control. The regression model results in terms of equation 3 are:

Earnings Loss = .2297 - 0.078 log (Years Since Displacement)

The R-squared for the model is 0.95.

To estimate the number of years to earnings catch-up, we use equation 3 and set earnings

loss to 0 and solve for years since displacement. The implied number of years to earnings catch-

up is 19.3 years. Table 2 presents the estimated earnings loss by years since displacement based

on equation 3. The results show that about two-thirds of the total losses occur within 6 years and

over 80 percent in 9 years.

As a second step, we suggest a multifactor test for the forensic expert to use in adjusting

the average earnings catch-up with multiple catch-up end points to reflect the uncertainty with

regards to an end point for damages. As a reminder, at the catch-up point, damages cease. Table

3 presents the factors affecting catch-up time, the direction of the impact, and the relevant

studies.

The methodology is not unlike use of the 15 *Georgia-Pacific* factors in a patent

infringement case or consideration of firm-specific risk factors in determining a discount factor

using the build-up method in business valuation. Namely, the forensic expert begins with a range

of loss, using the best evidence available, then considers a possible adjustment to this range

based on a multifactor test, again by noting specific factors from prior studies or economic

theory. As with other multifactor tests used in litigation, not all of the factors need apply. For

example, if there is no recession, the plaintiff was not an UI claimant, not disabled, or has a

previous termination history, or last worked in the manufacturing sector, then only six factors are

relevant. The multifactor test can take various forms. We suggest one might simply count and add the various 'signs' for the specific case. For example, if among the six relevant factors we note the former employee was 52 years old (+), a high school graduate (?), white (-), female (+), with above average family income (+), and unknown prior job tenure (?), the forensic economist could say there is some evidence to support a loss estimate with nine or more earnings years of catch-up range because the test shows three '+' signs, two '?' signs, and only a single '-' sign. We might refer to this adjusted loss range and the 'final range' for assessing economic damages. Again, this method is similar to that used in many patent infringement cases to adjust an assessment of economic damages using a multifactor test once a base level of loss is presented.

This paper has suggested that forensic experts consider the use of a reasonable way to estimate damages in a wrongful termination case, avoiding speculation, while relying on both recent economic literature and guidance from court decisions on the 'make-whole' principle; but it turns out that in spite of our best efforts, there remain problems. Namely, a catch-up projection, based on a recent and large empirical study (Couch and Placzek, 2010) is 19 years, and this duration may be too long for courts to accept in order to satisfy a 'make-whole' principle. An alternative may be for forensic experts to consider the range of entries in the last column of Table 2 and note that a range of catch-up years, 6-8-10, are associated respectively with 66% of total loss, 77% of total, and 86% of total, then apply a multifactor test suggested by the entries in Table 3.

VI. Summary

Computing economic damages in a wrongful dismissal case is a challenge because the empirical literature has varying results even if there is a consensus that earnings losses after job loss are significant, moderate over time, but appear to be long lasting. The position taken here is to note that the plaintiff has a duty to mitigate losses, so we impose catch-up in a hypothetical

range, which is determined by applying a multifactor test to a base range of catch-up years where the forensic expert using that test and range makes a reasonable effort to use the best evidence available and avoid speculation. The jury makes the final damages choice within the final range presented. The role of the expert is to assess damages in this range and point out that job-finding success may differ by age, education, race, economic conditions, and tenure of last job, but lacking empirical evidence as to how these factors exactly impact the timing of earnings catch-up (if at all), the role of the expert is limited in these types of cases to suggesting a reasonable range of damages (compared to other cases where clearer guidance is available to enable a point estimate). We also stress that the forensic expert has an obligation to follow generally accepted methods with respect to handling issues like partial-year adjustments, income taxes, discounting, and other case-specific facts, like fringe benefits.

As might be expected, our suggested method is not without controversy. In *Alvarado, et al. v. FedEx Corp.*, N.D. Cal., Case No. 3:04-CV-00098-SI (2007), we provided trial testimony on damages for plaintiff Charlotte Boswell, but only after defense counsel had filed a *motion in limine* to prevent this testimony. The jury verdict was for the plaintiff with compensatory damages based on the mid-point in our estimate of lost pay range.

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Table 1a
6, 8, and 10 Year Earnings Catch-up Scenarios With a Year 11 Trial Date

		6-Year Earnings Catch-up			8-Year Earnings Catch-up			10-Year Earnings Catch-up		
Year	Earnings Growth	But-For Earnings	"Actual Earnings"	"Lost Earnings"	But-For Earnings	"Actual Earnings"	"Lost Earnings"	But-For Earnings	"Actual Earnings"	"Lost Earnings"
1	0.0%	$41,600	$7,844	$33,756	$41,600	$6,181	$35,419	$41,600	$5,195	$36,405
2	2.5%	$42,640	$15,689	$26,951	$42,640	$12,362	$30,278	$42,640	$10,391	$32,249
3	2.5%	$43,706	$23,533	$20,173	$43,706	$18,543	$25,163	$43,706	$15,586	$28,120
4	2.5%	$44,799	$31,378	$13,421	$44,799	$24,725	$20,074	$44,799	$20,781	$24,018
5	2.5%	$45,919	$39,222	$6,696	$45,919	$30,906	$15,013	$45,919	$25,976	$19,942
6	2.5%	$47,067	$47,067	$0	$47,067	$37,087	$9,980	$47,067	$31,172	$15,895
7	2.5%				$48,243	$43,268	$4,975	$48,243	$36,367	$11,876
8	2.5%				$49,449	$49,449	$0	$49,449	$41,562	$7,887
9	2.5%							$50,686	$46,757	$3,928
10	2.5%							$51,953	$51,953	$0
Total				$100,997			$135,925			$156,629

Table 1b
6 Year Earnings Catch-up Scenario With An End of Year 3 Trial Date

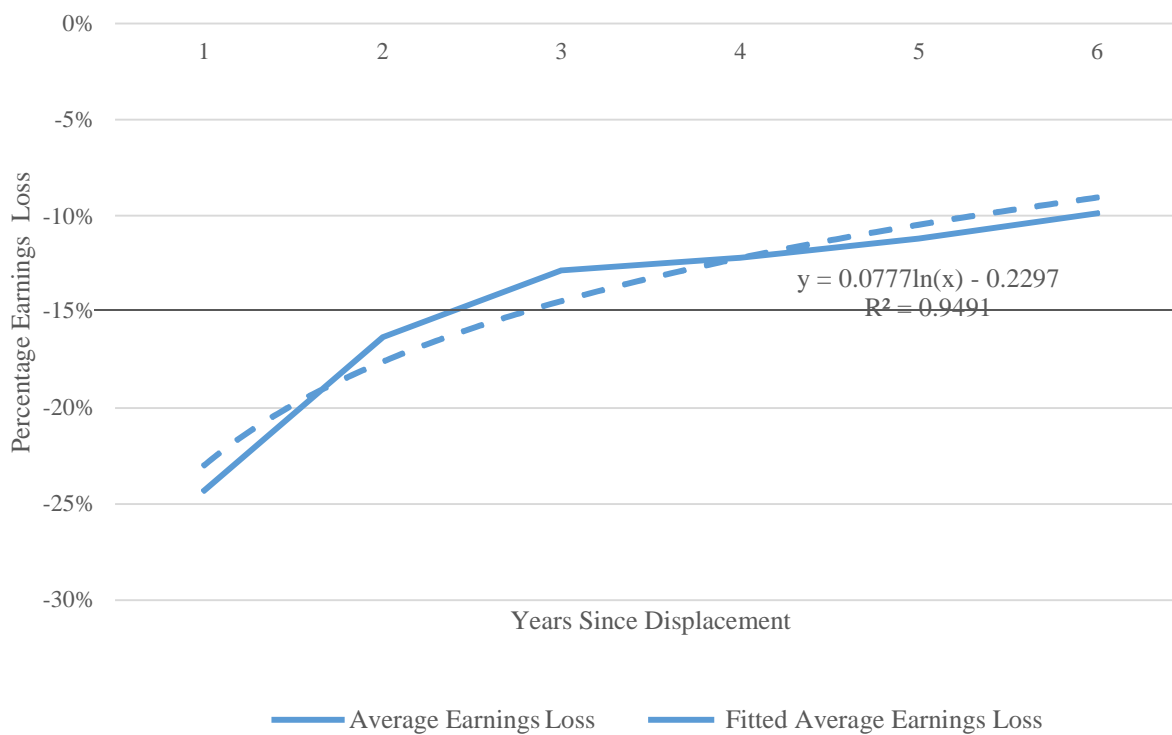| Year	Earnings Growth	Interest Rate	But-For Earnings	"Actual Earnings"	"Lost Earnings"	Discount Factor	Present Value
1	0.0%	0.0%	$41,600	$7,844	$33,756	1.0000	$33,756
2	2.5%	0.0%	$42,640	$15,689	$26,951	1.0000	$26,951
3	2.5%	0.0%	$43,706	$23,533	$20,173	1.0000	$20,173
4	2.5%	1.0%	$44,799	$31,378	$13,421	0.9950	$13,354
5	2.5%	1.0%	$45,919	$39,222	$6,696	0.9852	$6,597
6	2.5%	1.0%	$47,067	$47,067	$0	0.9754	$0
							$100,831

Table 2

Estimated Losses by Years Since Displacement Based on Couch and Placzek (2010)

Years Since Displacement	Annual Earnings Loss	Cumulative Earnings Loss	Percent of Total Loss
1	-23.0%	-23.0%	17.6%
2	-17.6%	-40.6%	31.0%
3	-14.4%	-55.0%	42.1%
4	-12.2%	-67.2%	51.4%
5	-10.5%	-77.7%	59.4%
6	-9.0%	-86.7%	66.3%
7	-7.9%	-94.5%	72.3%
8	-6.8%	-101.4%	77.5%
9	-5.9%	-107.3%	82.0%
10	-5.1%	-112.3%	85.9%
11	-4.3%	-116.7%	89.2%
12	-3.7%	-120.3%	92.0%
13	-3.0%	-123.4%	94.4%
14	-2.5%	-125.8%	96.2%
15	-1.9%	-127.8%	97.7%
16	-1.4%	-129.2%	98.8%
17	-1.0%	-130.2%	99.5%
18	-0.5%	-130.7%	99.9%
19	-0.1%	-130.8%	100.0%

Table 3: Factors Affecting Catch-up Time

Factor	Impact on Catch-up Time	Study or Theory
Adverse labor market conditions when job loss	+	Jacobson et al. (1993) and Davis and von Wachter (2011). Adverse labor market conditions likely prolong catch-up.
Deferred compensation	+	Lazear (1999). Workers later in their career will suffer a permanent earnings loss.
Unemployment insurance claimant	+	Couch and Placzek (2010)
Switch industry	+	Couch and Placzek (2010)
Age, if older worker (50+)	+	Chan and Stevens (2001a). Six years after job loss, men and women had reduced earnings of 23 and 29 percent; Baum (2013); Macpherson and Piette (2003); Couch (1998); Couch and Placzek (2010)
Education	?	Mixed evidence. Heckman, et al. (2006) implied greater wage loss if more educated, perhaps more selective; yet, Chan and Stevens (2001a) find some college is associated with faster return to work than those with more or less education.
Disability	+	Chan and Stevens (2001b)
If terminated previously	+	Ruhm (1991)
Race, (if white)	+	A priori, expect faster catch-up if white vs. non-white
Gender, (if female)	?	While results are mixed in Couch and Placzek (Table 1, 2010), most find females have greater wage loss, so expect longer time to catch-up
Family income	+	Greater family income may enable extended job search
Tenure of prior job	+	Workers more tenured pre-job loss are more unlikely to catch-up quickly to prior pay due to human capital loss.
If in manufacturing sector in prior job	+	Jacobson et al. (1993); Schoeni and Dardia (2003); Kodrzycki (2007)

Figure 1
Average Earnings Losses from Couch & Placzek (2010)

Note: The average earnings loss is an average of the Couch and Placzek (2010) results for individual fixed effects, individual fixed effects with an individual time trend, propensity score matching with average treatment of the treated, and propensity score matching with differenced treatment of the treated.