An estimate of the cost of Executive branch actions on the costs of the Risk Corridors program

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- Testimony before the Subcommittee on Economic Growth, Job Creation and Regulatory Affairs, June 18, 2014

Introduction

I am Seth J. Chandler, a Foundation Professor of Law at the University of Houston Law Center where I have taught for the past 24 years. My areas of expertise include insurance law and the use of mathematics in the understanding of legal rules. I am also the principal of a blog http://acadeathspiral.org which has examined issues associated with the Affordable Care Act with significant emphasis on the so-called 3Rs of Transitional Reinsurance, Risk Corridors and Risk Adjustment.

I am here primarily to advise Congress on the effects of insurer profitability on Congressional expenditures under the Risk Corridors program contained in 42 U.S.C. § 18032 and to discuss the costs of recent executive branch decisions in the implementation of Risk Corridors. I am concerned that a combination of insurer losses and the recent Executive Branch changes to the Risk Corridors program will result in this provision costing the federal government more than budgeted or anticipated. I am equally concerned that the contrary predictions of the Congressional Budget Office are difficult to reconcile with mathematical reality. I also hope to be able to advise Congress on some areas of inquiry relating to the Risk Adjustment program contained in 42 U.S.C. § 18033.

Risk Corridors can best be thought of as a derivative, not unlike a synthetic collateralized debt obligation, issued by the government to insurers participating on the Exchanges. The program significantly shifts the risk of entering an insurance market whose characteristics are not well known from participating insurers to the federal government. Unlike the transitional reinsurance program (42 U.S.C. § 18031) and the permanent risk adjustment program (42 U.S.C. § 18033), there simply are no failsafe mechanisms in the Risk Corridor statute or the regulations enacted thereunder that induce it to be budget neutral. Although it is not impossible that, as the CBO has most recently asserted, Risk Corridors will be budget neutral or, as the CBO earlier asserted -- it could even be a source of net revenue for the

federal government, it is more likely, in my view, that it will add significantly to the cost of Title I of the Affordable Care Act over the three years in which it is projected to be in effect. Despite significant research, I have not been able to figure out how the CBO concluded, as it did in February of 2014, that Risk Corridors would be likely to earn the government $8 billion. Nor have I been able to figure out how the changes in implementation of the ACA -- in particular the changes in the profit margin floor and administrative cost allowance created by HHS in April of 2014 would, as the CBO now asserts (see CBO table below), wipe out that $8 billion gain and leave the program budget neutral.

Table 4.

Comparison of CBO and JCT's Current and Previous Estimates of the Effects of the Insurance Coverage Provisions of the Affordable Care Act

	February 2014 Baseline	April 2014 Baseline	Difference
	Change in Insurance Coverage Under the ACA in 2024 (Millions of nonelderly people, by calendar year)[a]		
Insurance Exchanges	24	25	*
Medicaid and CHIP	13	13	1
Employment-Based Coverage[b]	-7	-7	-1
Nongroup and Other Coverage[c]	-5	-5	*
Uninsured[d]	-25	-26	-1
	Effects on the Cumulative Federal Deficit, 2015 to 2024[e] (Billions of dollars)		
Exchange Subsidies and Related Spending[f]	1,197	1,032	-164
Medicaid and CHIP Outlays	792	792	**
Small-Employer Tax Credits[g]	15	15	**
Gross Cost of Coverage Provisions	2,004	1,839	-165
Penalty Payments by Uninsured People	-52	-46	6
Penalty Payments by Employers[g]	-151	-139	12
Excise Tax on High-Premium Insurance Plans[g]	-108	-120	-12
Other Effects on Revenues and Outlays[h]	-206	-152	54
Net Cost of Coverage Provisions	**1,487**	**1,383**	**-104**
Memorandum:			
Net Collections and Payments for Risk Adjustment, Reinsurance, and Risk Corridors[i]	-8	0	8

old estimate

new estimate

Source : http : // www.cbo.gov/sites/default/files/cbofiles/attachments/43900 - 2014 - 02 - ACAtables.pdf

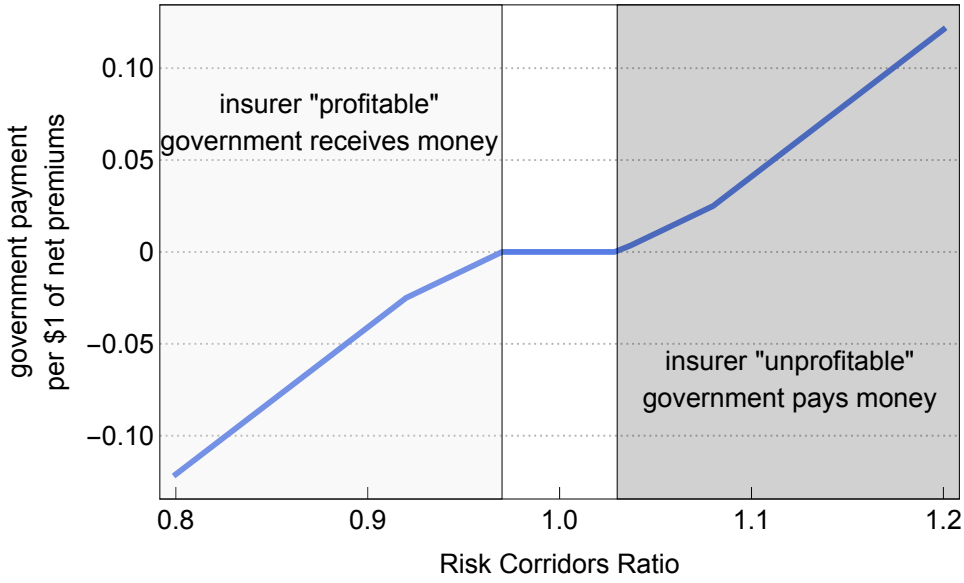
- Figure 1

The idea behind the Risk Corridors statute

Individual insurer level

The graphic below illustrates the idea behind Risk Corridors. It looks at the situation from the perspective of an individual insurer and the federal government. The line going from bottom left to top right shows the amount of money paid under the Risk Corridors program by the government per $1 of net premiums an insurer receives. The line shows this payment amount as this statutory creation called the Risk Corridor Ratio varies. As a first approximation, you can think of the Risk Corridors Ratio as a

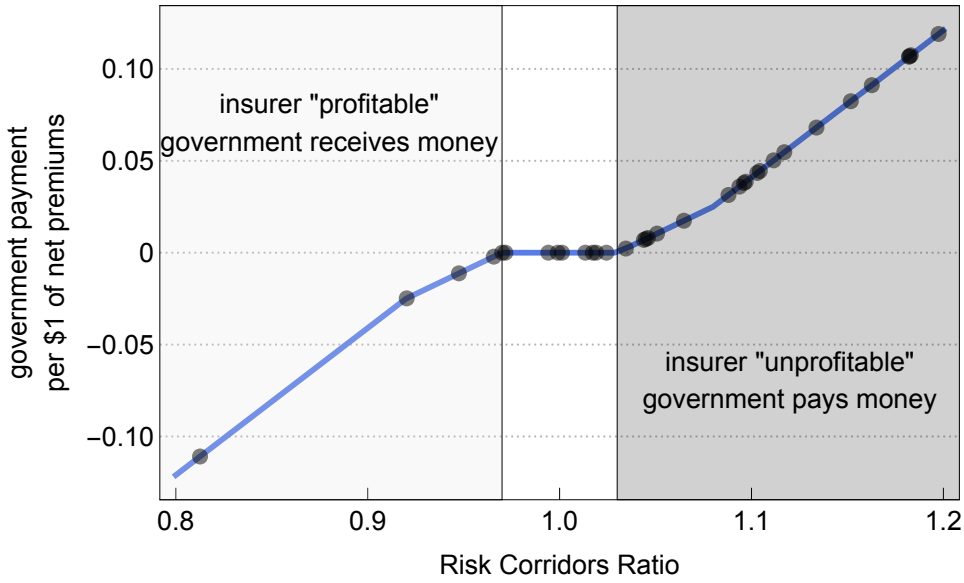
measure of insurer profitability. Roughly speaking, if the Risk Corridor Ratio is below 0.97, the government thinks of the insurer as it it were profitable and taxes the insurer on its ACA-based profits, potentially at a rate of up to 80%. If the Risk Corridor Ratio is above 1.03, the government thinks of the insurer as if it were unprofitable and covers up to 80% of the insurers losses. Between 0.97 and 1.03, the government does nothing.



■ Figure 2

Aggregate level

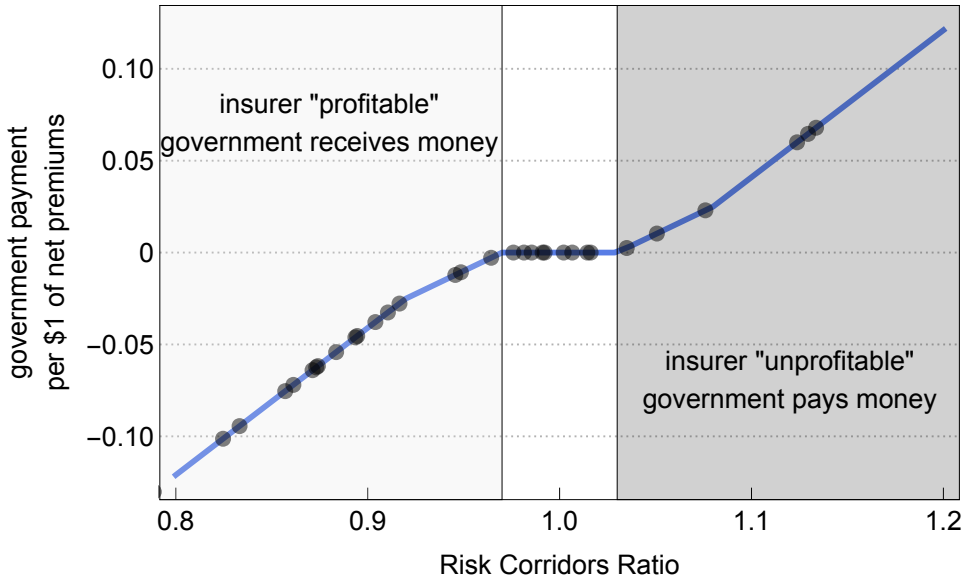
We now start looking at the situation in aggregate. If insurers are mostly in the gray zone on the right side, which is illustrated in the graphic below -- or, to oversimply a bit -- if insurers are "unprofitable" as computed by the government -- the government pays money to insurers.



■ Figure 3

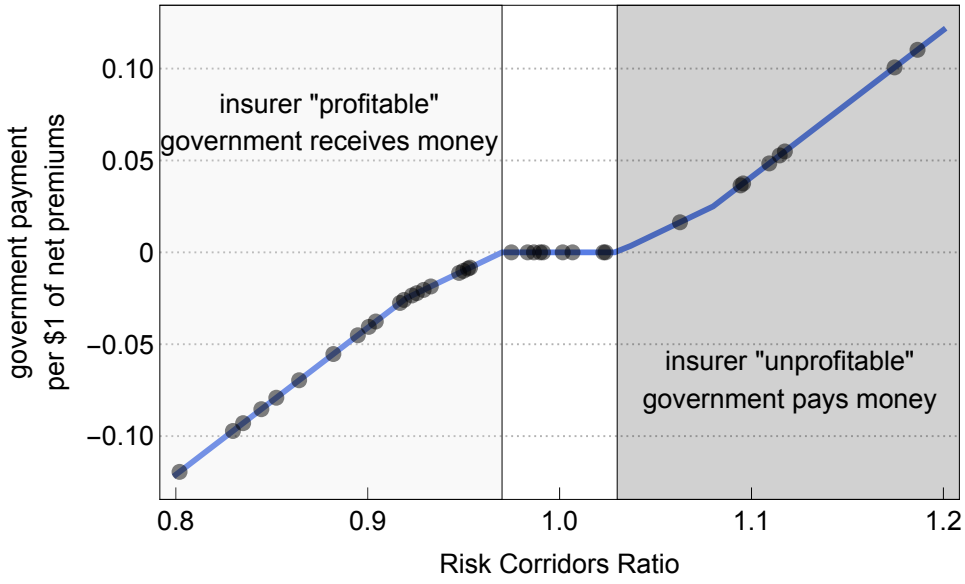
If insurers are mostly in the white zone, in which the Risk Corridors Ratio is less than 1 or -- again to

oversimplify a bit -- if insurers are "profitable" as computed by the government, the government receives money from insurers.



■ Figure 4

And if insurers are scattered pretty evenly throughout the gray and white zones, the government will break even.

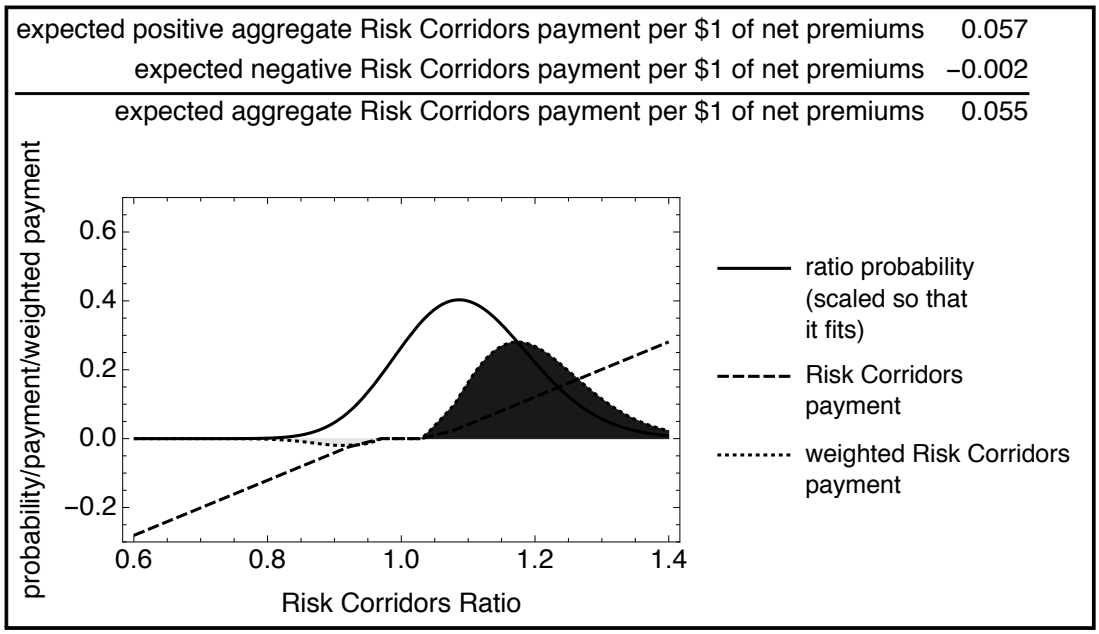


■ Figure 5

Now let’s look more closely at the situation in aggregate. What I hope you can see even before I get more elaborate is that the profitability of insureds selling in the Exchanges will affect the aggregate amount of money the government receives from insurers or -- more likely -- pays to insurers through the Risk Corridors program. You can see this in the graphics below. In each of the three graphics, the dashed line is the Risk Corridors payment as a function of the Risk Corridors Ratio. The dotted line is the probability of an insurer incurring that Ratio and the sold line shows what happens when I multiply each Risk Corridor payment by the probability of the government paying that sum. The dark gray area

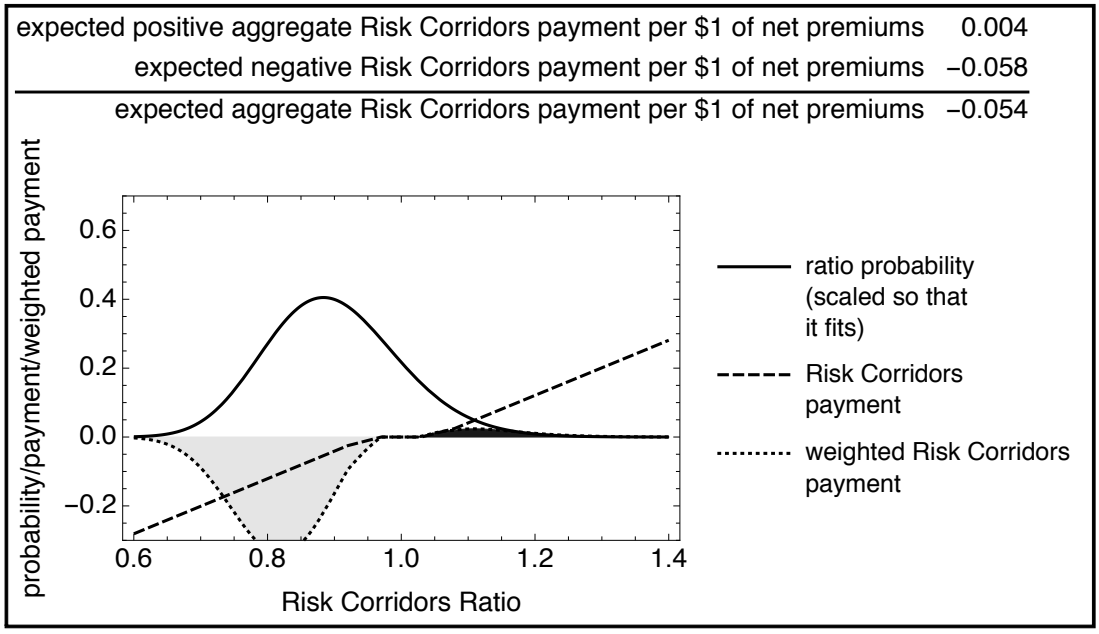
thus becomes a geometric representation of the amount of money the government pays to "unprofitable" insurers and the light gray area becomes a geometric representation of the amount of money the government receives from "profitable insurers." (In a color version of this testimony, the colors are red and green respectively). This means that the dark gray area minus the light gray here is a geometric representation of the amount the government owes. I've also included a little table at the top to summarize that arithmetic.

In the first example, insurers tend to be unprofitable and the government pays about 5.5 cents for every dollar of net premium insurers receive.



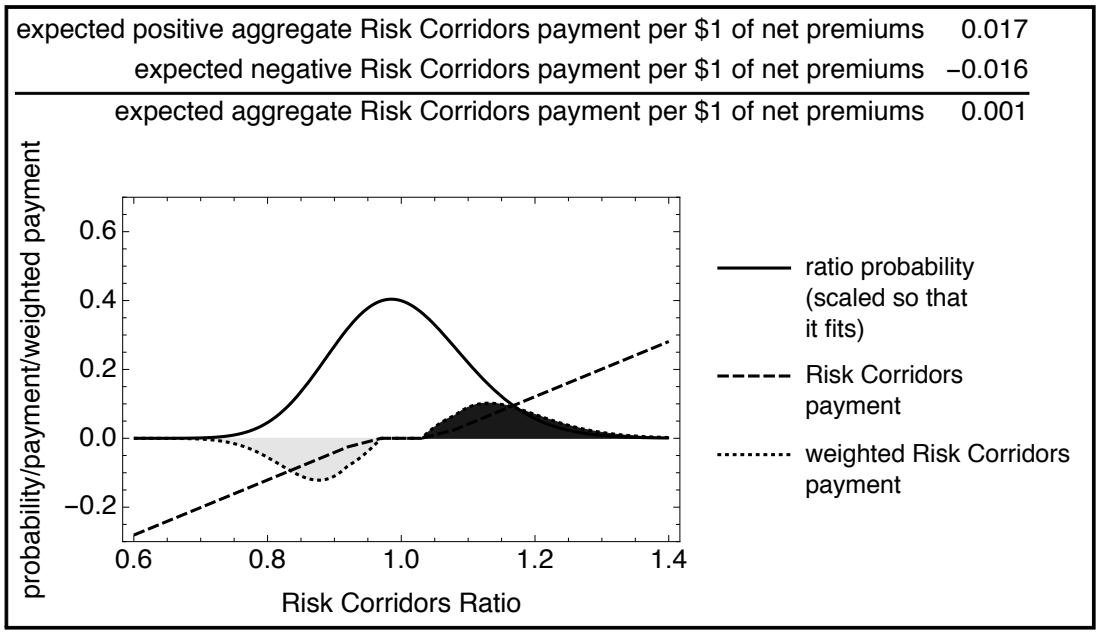
■ Figure 6

In the second example, insurers tend to be profitable and the government receives about 5.4 cents for every dollar of net premium insurers receive.



■ Figure 7

In the third and final example, insurers are equally likely to be profitable and unprofitable so Risk Corridors is essentially budget neutral.



■ Figure 8

Implementation of Risk Corridors by the Obama administration

The two relevant Executive branch actions

Thus far I have presented Risk Corridors as it was actually enacted by Congress. The Executive Branch, however, has implemented Risk Corridors and other ACA provisions, however, with definitions and various complications that push the Risk Corridors Ratio away from insurer profitability.

There are two Executive branch actions of which Congress needs to be mindful in evaluating the real costs of Risk Corridors. The first is the effect of the so - called "transitional policy" created by the Obama administration after the political firestorm created by the realization that people were not going to be able to keep their health plans, period, even if they liked them. Without statutory authorization, the Obama administration delegated to states the authority, now exercised by about 60%, to permit insurers to continue selling policies that violated numerous provisions of the ACA such as bars on more health-based underwriting and pricing and requirements to provide Essential Health Benefits. This action undermined the delicate mechanisms in the ACA intended to prevent an adverse selection death spiral. It meant that generally healthier insureds could leave the community rated pools of policies sold inside the Exchange, perhaps forgo benefits they did not want, and leave the pools inside the Exchange generally smaller, less healthy, and thus more likely to result in losses for insurers. The second step, taken to try to prevent the unraveling of the ACA mechanism created by the first executive action, and also without statutory authorization, was to modify 45 C.F.R. § 153.500 (shown below) essentially to permit certain insurers to count phantom costs in the computation of its Risk Corridor Ratios. It was and is a mechanism by which the Obama administration has, quite frankly, decided to make sure that insurers -- on whose voluntary participation in the Exchanges the whole ACA edifice depends -- are "taken care of." As I will discuss, CMS changed these parameters this past spring for 2014 in certain states not because there was anything wrong with the old formula -- indeed the only comments it published on the matter argued for the reverse of what it most recently did -- - but, as it admitted, to provide insurers selling in the Exchanges in those states more money.

§ 153.500 Definitions.

* * * * *

Adjustment percentage means, with respect to a QHP:

(1) For benefit year 2014, for a QHP offered by a health insurance issuer with allowable costs of at least 80 percent of after-tax premium in a transitional State, the percentage specified by HHS for such QHPs in the transitional State; and otherwise

(2) Zero percent.

* * * * *

Allowable administrative costs mean, with respect to a QHP, the sum of administrative costs of the QHP, other than taxes and regulatory fees, plus profits earned by the QHP, which sum is limited to the sum of 20 percent and the adjustment percentage of after-tax premiums earned with respect to the QHP (including any premium tax credit under any governmental program), plus taxes and regulatory fees.

* * * * *

Profits mean, with respect to a QHP, the greater of:

(1) The sum of three percent and the adjustment percentage of after-tax premiums earned; and

(2) Premiums earned of the QHP minus the sum of allowable costs and administrative costs of the QHP.

* * * * *

Transitional State means a State that does not enforce compliance with §§ 147.102, 147.104, 147.106, 147.150, 156.80, or subpart B of part 156 of this subchapter for individual market and small group health plans that renew for a policy year starting between January 1, 2014, and October 1, 2014, in accordance with the transitional policy outlined in the CMS letter dated November 14, 2013.

■ Figure 9

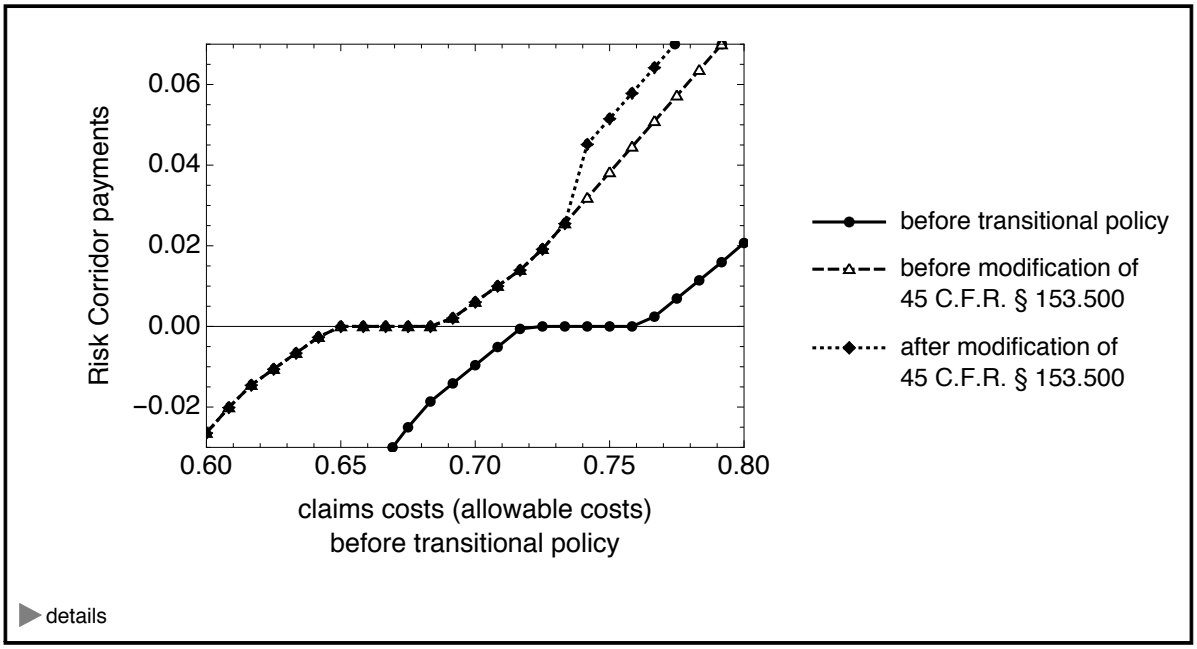
But how much money are we talking about? I have researched in some detail the likely costs of the Risk Corridors program using the methodologies described by CMS in its Notice of Benefit and Payment Parameters dated March 11, 2013 and the subsequent revisions of that methodology by CMS. (See Appendix 2). That research has permitted me to derive a mathematical formula for the Risk Corridor payments by the government per dollar of adjusted premiums. The formula, which is provided in the Appendix to my written testimony, is a function of such items as claims costs incurred and of regulatory parameters. These parameters include esoteric and non-statutory values such as the "profit margin floor" and the "allowable administrative costs cap. " I first consider the effect of the two Executive branch actions at the level of an individual insurer and the government. Then, as before, I consider the

effect of these two actions at an aggregate level.

Effects at an individual insurer level

Although the formula is gruesomely complex, we can use computer algebra systems to visualize the effects of both of these administrative actions. To do so, I am going to use the case of the hypothetical insurer created by CMS in its March 11, 2013, exposition of Risk Corridor mechanics. This insurer earns $200 in gross premiums and has claims costs of $140. I've attached a copy of the relevant pages of the CMS document as Appendix 2 to make it easier to follow along.

The graphic below shows the relationship between what the claims cost of the insurer would have been but for either of the administrative actions and the Risk Corridor payment by the government. The circle line (the lowest line) shows the situation before either of the executive branch actions. Notice that the government breaks even or makes money so long as the claims costs would have been below about 76% of the adjusted premiums. The triangle line (the one next above the circle line) shows the situation resulting from the transitional policy. Lower cost insureds disproportionately exit the exchanges resulting in higher per member mean claims costs and fewer insureds over which to spread non-claims costs of running the plan. As a result, insurers that would have been profitable now lose money and are entitled to Risk Corridor benefits. But, Risk Corridors never fully indemnifies an insurer for its losses. So, the diamond line (the highest line) shows the situation after the second executive action, tampering with section 153.500 by creating this "adjustment percentage" that modifies the minimum profits an insurer is permitted to claim and the maximum amount of non-claims expenses an insurer, most of whom sell all sorts of plans, can attribute to plans sold on an Exchange. Notice that the diamond line tracks the triangle line up until claims costs as a fraction of net premiums hits a certain threshhold. At that point, in the transitional states, the "adjustment percentage" kicks in, the Executive branch treats insurers as losing more money than before, and Risk Corridor payments can grow significantly.

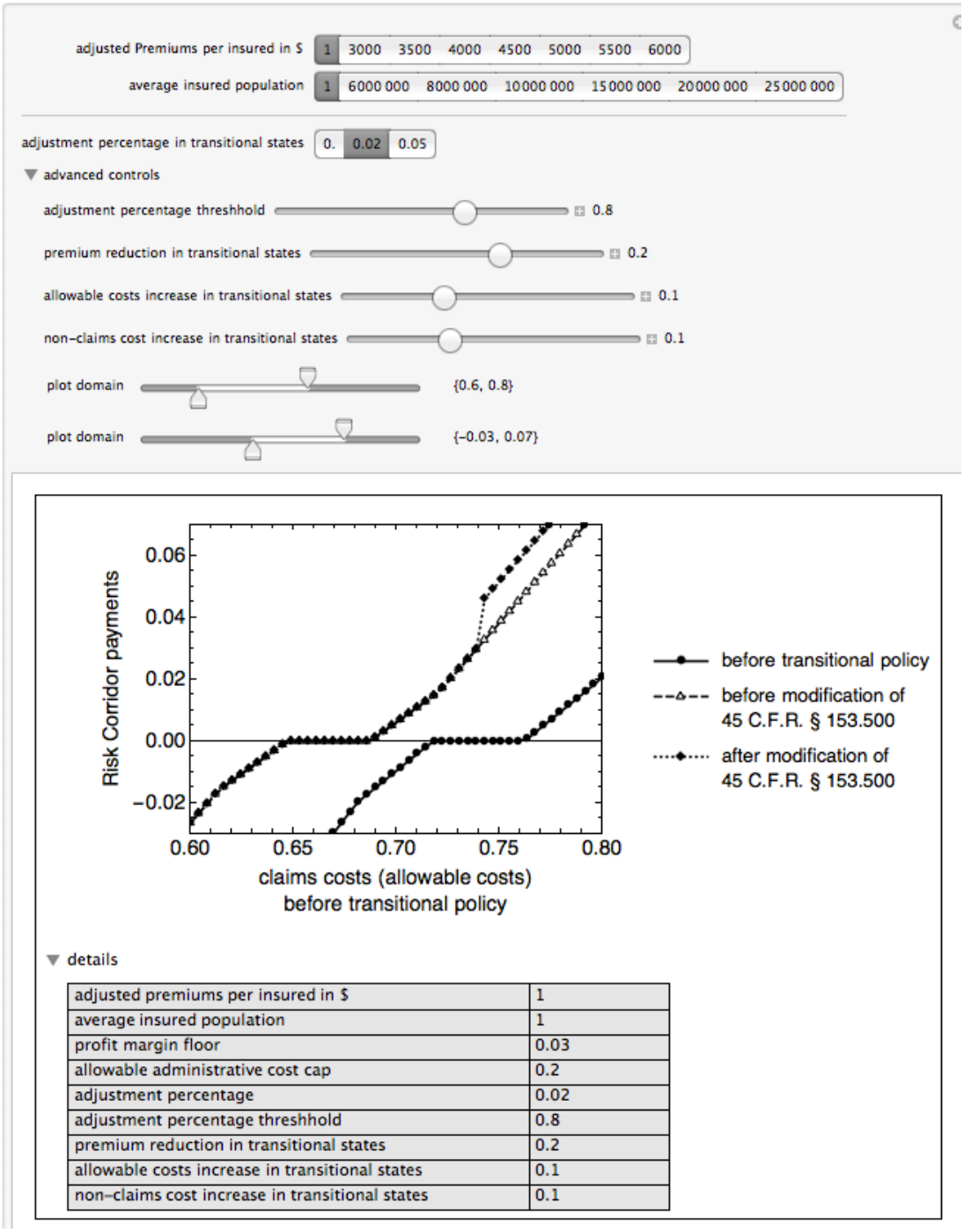


■ Figure 10

I want to be clear that the first Executive action -- the per se refusal to enforce provisions of the ACA in certain states -- indeed created a problem for the Obama administration, even if it was one of its own

making. If the Obama administration had not subsequently changed the way in which the internal computations of Risk Corridors worked, insurers selling on the Exchanges would have lost money relative to what would have happened had no “transitional policy” been developed. Some might have fled the Exchanges or decided not to reenlist for 2015. The Affordable Care Act is extraordinarily vulnerable to voluntary participation by private and often profit-driven insurance companies. But, instead of coming to Congress and asking that the Risk Corridor parameters be changed or that Transitional Reinsurance be made more generous to compensate for the shift in the likely distribution of claims costs induced by the Transitional Policy, or, for that matter, seeking a statutory change that would align campaign rhetoric with the realities of the ACA, the Obama administration added a conditional “adjustment percentage” to further complicate its Risk Corridor algorithm. (45 C.F.R. § 153.500) and move it farther away from what the statute specified. By regulation, CMS increased in certain states the minimum amount an insurer could claim as profit and it increased the amount an insurer could treat as an administrative expense. It did so in states that would permit insurers to continue to sell policies that violate various provisions of the Title I of the ACA. Doing so made insurers look less profitable than they had been under the prior regulations and thus increased the amount the government would owe them under Risk Corridors or, at least, decrease the amount the insurers would pay the government to help balance the Risk Corridor account. The upside, at least in some eyes, of having taken this latter action is that the entire ACA edifice retained a higher probability of stability. The downsides, however, is the expensive, heightened subsidization of the insurance industry by the federal government.

In the oral presentation of this testimony I hope to be able to show an interactive graphic that will demonstrate these effects yet more clearly and that will permit examination of different assumptions. Here is what it will look like.



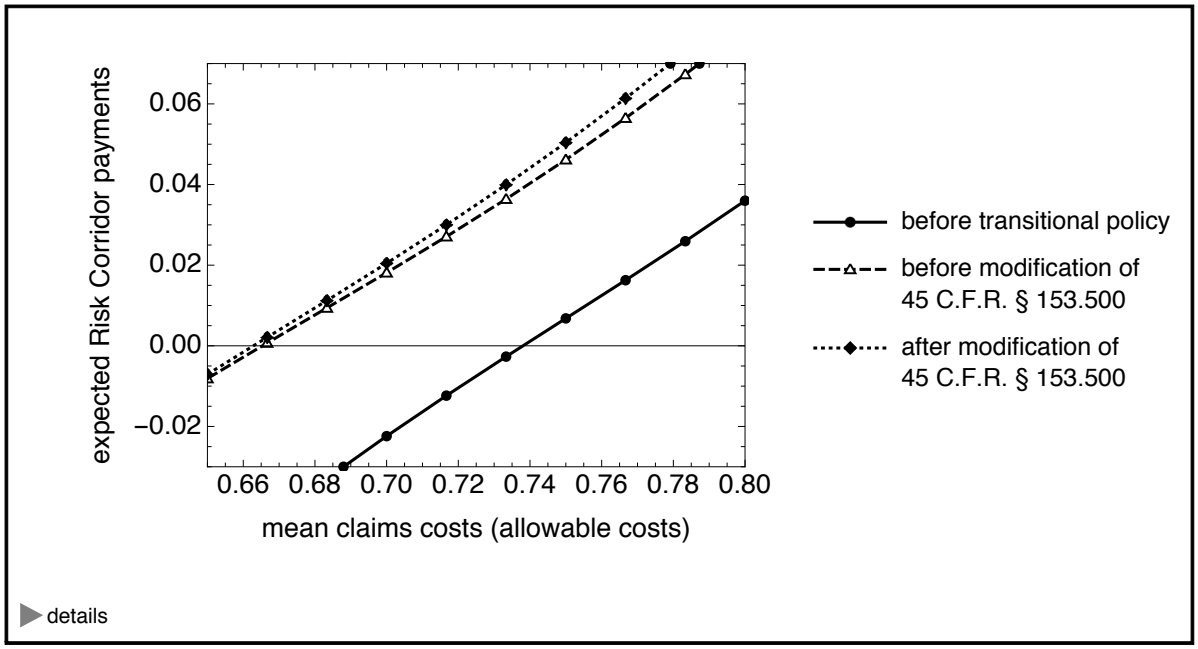
adjusted premiums per insured in $	1
average insured population	1
profit margin floor	0.03
allowable administrative cost cap	0.2
adjustment percentage	0.02
adjustment percentage threshhold	0.8
premium reduction in transitional states	0.2
allowable costs increase in transitional states	0.1
non-claims cost increase in transitional states	0.1

- Figure 11

Aggregate effects

The above graphic and analysis looks only at an individual insurer, however. What should matter more to Congress is the effect of these Executive branch changes on the overall cost of the Risk Corridors program. And this depends substantially on the distribution of claims costs relative to premiums. What I show in the graphic below is how various assumptions about overall premium revenue under the ACA and the distribution of claims costs relative to premiums for insurers selling on the Exchanges affect the expected costs of the Risk Corridors program. I do not pretend that this computation will be accurate to the penny -- there are far too many variables to do so -- but I do claim that it provides a pretty good estimate of what is likely to happen.

The graphic below illustrates the computation. It shows the cost to the government per dollar of net premium from running Risk Corridors as the mean of the distribution of claims costs varies. The y-axis shows the expected Risk Corridor payment as a fraction of the adjusted premiums collected by insurers. One can see that as the mean claims cost increases, the expected Risk Corridor payment increases in a fairly linear way. The circle line shows how matters might have stood had no transitional policy been announced. The triangle line shows the situation with just the transitional policy in effect but no attempt to further subsidize -- or "bailout" as some have termed it -- the insurance industry. And the diamond line shows matters given both the transitional policy and the changes to section 153.500 of the Code of Federal Regulations.

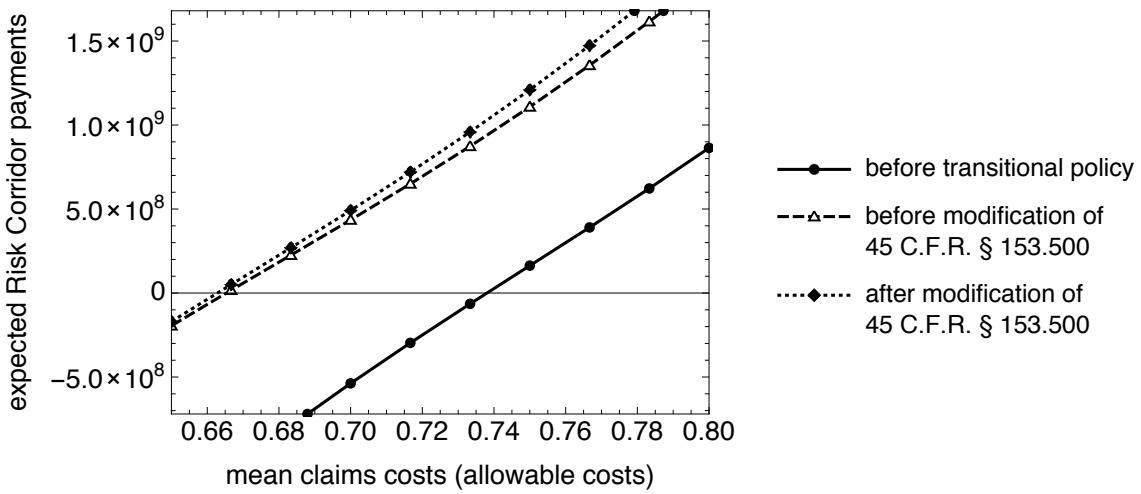


■ Figure 12

This is just the payment per dollar. How many dollars are involved? CMS says 153.500 is just modified for 2014, but it also says it reserves the right to rethink. It would be doing a disservice to the insurance industry to suggest that it would not urge continuation of the more liberal formula through 2015 and 2016 and substituting hope for realism to suggest that, if insurers indeed lose money, the Executive branch and some in Congress would not be sympathetic to such pleas. We also don't know what future enrollments and premiums will look like. Finally, we don't know how many states will continue to be "transitional states" assuming the Obama administration permits continued violation of the ACA by insurers in order to preserve its campaign promises. In the end, we have to make some reasonable assumptions.

The graphic below shows the situation for one set of assumptions. I accept CMS's hedged promise that the transition and the relief lasts just one year. In that setting, the transition probably increased the Risk

Corridors bill by about $1 billion and the modification to section 153.500 probably tagged on an extra $100 million to the price tag. These bills are on top of whatever the cost would be of running Risk Corridors in the first place in a setting in which insurers stand a good likelihood of losing money in the Exchanges.

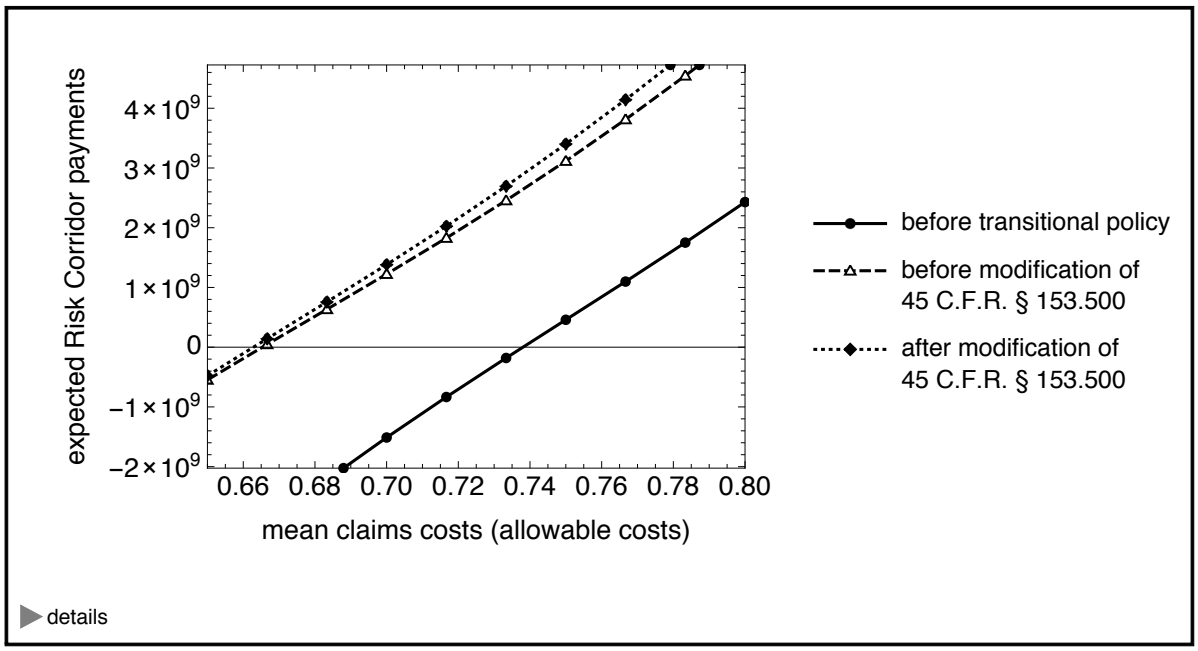


▼ details

adjusted premiums per insured in $	4000
average insured population	6 000 000
standard deviation of mean claims cost distribution	0.08
transitional state percentage	0.6
profit margin floor	0.03
allowable administrative cost cap	0.2
adjustment percentage	0.02
adjustment percentage threshhold	0.8
premium reduction in transitional states	0.2
allowable costs increase in transitional states	0.1
non−claims cost increase in transitional states	0.1

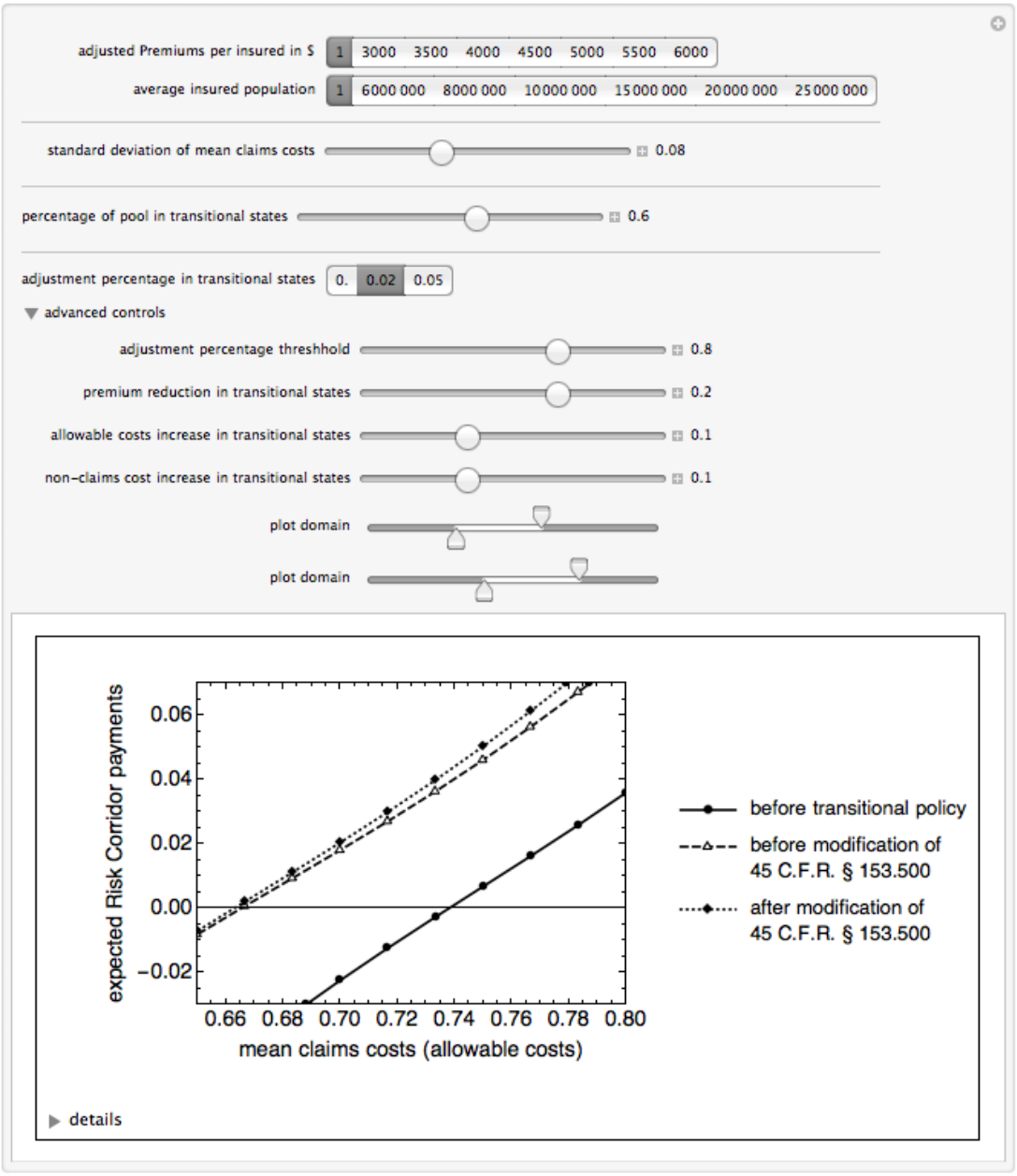
■ Figure 13

The second graphic shows the situation for an alternative scenario: the transition lasts for three years and so too does the modification to section 153.500. In that case, the incremental average cost for Risk Corridors could be $2.5 billion per year from the transition and perhaps $200 million from the modification to section 153.500. Of course, if more states become transitional states, the bill goes higher.



■ Figure 14

Again, in the oral presentation of this testimony I hope to be able to show an interactive version of this graphic that looks like this. It would permit different assumptions to be used.



■ Figure 15

In sum, Risk Corridors might possibly have been budget neutral had the Executive branch not sabotaged the ACA by creating incentives for healthier insureds to drop out of the Exchanges and then not compounded the situation by propping up insurers by inserting an "adjustment percentage" into the regulations that made insurers appear poorer than perhaps they were. Having taken both of these actions, however, the probability that Risk Corridors will, ultimately, cost the federal government and taxpayers money is high. The Executive branch has asserted that any such costs should not be a cause for concern since fact that the Obama administration will attempt to hide this imbalance by violating the statute and shorting insurers for a year, making up the deficit the following year using that year's collections. This is the position taken by CMS in its Fact Sheet of April 11, 2014. (http://www.cms.gov/CCIIO/Resources/Fact-Sheets-and-FAQs/Downloads/faq-risk-corri-

dors-04-11-2014.pdf). The problem, of course, in addition to the fact that the statute does not call for insurers to float the federal government a loan, is that there is an end game. In the final year or years of the program there may be no future receipts with which to make the statutorily required payments to insurers. CMS says it does not anticipate this problem occurring but says, “[W]e will establish in future guidance or rulemaking how we will calculate risk corridor payments if risk corridor collections ... do not match risk corridors payments as calculated under the risk corridors formula for the final year of the program.” I believe a pithier translation of this comment is that “We have no idea what to do if in the end there is not enough revenue.” Congress should monitor CMS's promised attempt to escape this predicament.

The Congressional Budget Office Scoring

The issue I must confront in saying all of this is that the Congressional Budget Office seems to disagree. It is worth noting that the CBO did not include Risk Corridors in any visible way in their scoring of the cost of the Affordable Care Act. Then, as shown in Figure 1 above, in February of 2014, after a bill was introduced by Senator Marco Rubio to repeal Risk Corridors, the CBO said it would actually net the government $8 billion ($16 billion in revenue from profitable insurers and $8 billion in payments to unprofitable insurers). (http://www.cbo.gov/sites/default/files/cbofiles/attachments/45010-breakout-AppendixB.pdf) The CBO purported to base its analysis on a comparison with Medicare Part D programs without perceptible consideration as to whether that program was fully relevant to the far more complex provisions of the Affordable Care Act and without apparent consideration of what then appeared to be the then-woefully low levels of enrollment (or the unknown level of actual purchases) in the Exchanges. No comparison was made with a more recent part of the ACA, the Pre-Existing Condition Insurance Program, in which claims expenses had proven to be about triple of what had been expected. Moreover, even if, as the CBO claimed, insurer premiums would exceed costs by “a few percent” such as the 2% or 3% levels it cited with respect to Medicare Part D, the mathematical analysis done here suggests that such modest insurer profits would not have raised the $8 billion in Risk Corridor revenues asserted by the CBO. Raising $8 billion it would have required insurers to have premiums 7% or higher of costs on average -- a level for which there was (and is) no factual support.

Then, in April of 2014, after the "transitional policy" was announced, the CBO said Risk Corridors would break even. Apparently it did so based on an April 11, 2014, “Fact Sheet” issued by CMS purporting to resolve the question of “What risk corridors payments will HHS make if risk corridors collections for a year are insufficient to fund risk corridors payments for the year, as \.08calculated under the risk corridors formula?” (http://www.cms.gov/CCIIO/Resources/Fact-Sheets-and-FAQs/Downloads/faq-risk-corridors-04-11-2014.pdf). CMS asserted that it would simply use the proceeds from the following year to pay off insurers from the preceding year. This, of course, would hurt insurer cashflow. More importantly, however, what would happen if, as we headed for the end of of the Risk Corridors program, because of all this borrowing against future receipts, there was no money to pay the 2016 or 2017 Risk Corridor obligations? As discussed above, CMS has presently not expressed any idea as to what it would do in such a scenario.

I doubt many accountants would accept that a program that depended on nebulous future revenues would be considered budget neutral. Rather than consider the actual likelihood, however, that there would be any money left to pay for the final years of Risk Corridors payments, the CBO apparently just accepted CMS’s vapor funding. Had CBO used critical thinking skills, I believe the picture would be less benign. Insurance policy sales in the Exchange are subject to “The Winner’s Curse” in which the policies most likely to be purchased are those most likely to be underpriced. While perhaps insurer pricing in the final year of the Risk Corridors program will be better informed than it is presently, the spectres of adverse selection and moral hazard create a substantial risk that losses in the first years of the program will be sufficiently large to make the entire program a loser for the government. What appears to have happened here is a CBO capitulation to the Executive Branch’s ipse dixit that the program would break even.

I would urge Congress to take a closer look at the CBO methodology here. If we are going to have government programs as complex as the ACA and with as long a time horizon as it envisions, it becomes even more critical that we have a strong, independent and technically adept agent to estimate their costs as well as possible. To be sure, it may well be that were Congress to take a closer look it would find that the CBO's methodology was plausible and that it is just a case of two experts disagreeing in good faith. It might even find that the CBO with superior resources and information was taking into

account facts and issues I have neglected. The world can live with this testimony being wrong. What it will not do well with, however, is a CBO that is not acutely aware of the need to separate as much as is possible politics and opinion from law and fact. Unfortunately, in my opinion there is enough smoke here to warrant a closer look by Congress.

The Risk Adjustment Program

Let me spend a few brief moments on the Risk Adjustment Program; it, unlike Risk Corridors, is a permanent feature of the ACA. In my opinion, Risk Adjustment contains incentives for insurer fraud and manipulation that need to be monitored carefully but whose very monitoring creates the potential for patient privacy invasions, not just among those who accept subsidies for policies purchased on the Exchanges but also for insureds in the small group market who are in plans protected by Risk Adjustment.

The idea of Risk Adjustment is again to detach insurer profitability from the relative riskiness of the pool it insures. But one needs to state the form of protection afforded by this program very carefully. Risk Adjustment will not protect insurers against the risk most likely to materialize -- the aggregate pool -- the one covered by all relevant insurers -- having higher medical expenses than expected. Risk Adjustment leaves that risk on the insurance industry. Instead, insurers are expected by 2017 to figure out how much it should cost to insure a pool if it is composed of average pool members and to do so without the protection currently afforded by Transitional Reinsurance or Risk Corridors. Risk Adjustment just protects the insurer who prices accurately on the basis of a standard pool but finds for some reason that its pool is populated by those government models say are likely to incur higher than average medical expenses.

The incentives for an insurer under Risk Adjustment are simple. First, seek out those insureds for whom the government estimated cost is most at variance with the actual projected costs. There is no current legal barrier against this behavior. Indeed, there is already a study by the Milliman Actuarial firm on how to undertake this coding arbitrage for fun and profit. (http://us.milliman.com/uploadedFiles/insight/2013/adverse-selection-aca.pdf) The government expense model, though complex, is not as complex either as reality or as insurers are able themselves to create. Second, give as many insureds as possible those diagnoses that the federal government, using Hierarchical Condition Codes, believes create high medical expenses.

Congress needs to be vigilant in making sure that opportunities for coding arbitrage are few and short lived. This will require oversight of administrative agencies to ensure that they are gathering the proper information on the actual costs of treatment for each condition code and to consider whether finer grained methods should be employed in determining the projected claims costs of individuals.

Congress also needs to be very concerned about enforcement of Risk Adjustment. Laxity will result in insurers getting away with upcoding: honest insurers will end up subsidizing the shady based on the latter's bogus projections of future claims costs. Overly vigilant enforcement is problematic as well, however. Insurers can not operate in an environment of terror in which a mistake in selecting from among closely competing diagnoses leaves them vulnerable to recapture or claims of fraud. Moreover, the opportunities for release of private, sensitive information abound in the validation process necessitated by Risk Adjustment. Auditors of Risk Adjustment coding by insurers will need to take a look at the complete medical histories of sexual assault victims, HIV patients, cancer patients, individuals suffering miscarriages, persons with various mental illnesses and other areas of medical sensitivity in order to determine whether the insurer coded correctly and whether any errors are the product of mistake or

fraud. Moreover, audits will need to be done of the auditors to ensure that any of their claims of error are in fact correct. The more people that poke around in these records, the greater the opportunity for inadvertent or advertent release.

Conclusion

I wish to make clear that the cost of Risk Corridors is not congruent to the wisdom of Title I of the ACA. There may be some who believe that, even if Risk Corridors costs billions, it is a necessary component of a system that manages to insulate insureds from most of the costs of their own medical characteristics but remains sufficiently attractive to insurers that they voluntarily participate in an insurance market notwithstanding the many prior failures and continuing hazards of community rating. There is also nothing automatically wrong with subsidizing insurers, even ones who have earlier achieved high profits in a fair market, to achieve government goals if they are worthy. Elimination of Risk Corridors could have serious consequences on the stability of the insurance Exchanges and, indeed, the complex web of Obamacare. But because the complexities of the ACA are by no means the only way of extending access to healthcare to more Americans or improving the health of Americans, the true aggregate cost of Title I of the ACA -- of which Risk Corridors is a component -- are highly relevant for Congress to examine. And because insurance companies would not usually be high on my list of those in need of government assistance, Congress should consider whether the implementation of Risk Corridors has been consistent with the statutory objectives. Congress should pay close attention to executive branch decisions regarding administration of Risk Corridors that significantly affect its ultimate price tag. It should be concerned about responses from the Executive branch such as that found in the April 11 Fact Sheet that induce the federal budget to be viewed as a discretionary fund rather than a set of appropriations and have the potential to reallocate taxpayer funds to large insurance corporations. Finally, Congress needs to make sure that its own budgeting office is engaged in independent, objective, and replicable research in determining the cost of large and complex government programs.

Disclaimer

The views expressed here are my own and do not necessarily represent those of the University of Hosuton.

Appendix 1 : Derivation of Relationship between mean and standard deviation of a lognormal distribution and the aggregate net payment under Risk Corridors

Government payment

The Risk Corridor payment of the government is equal to the following :

$$(\phi - \text{Min}[\delta, \epsilon + \text{Max}[\alpha, \beta]]) \left\{ \begin{array}{ll} -\left\{ \begin{array}{ll} \frac{1}{40} + \frac{4}{5}\left(\frac{23}{25} - \gamma\right) & \gamma < \frac{23}{25} \\ \frac{1}{2}\left(\frac{97}{100} - \gamma\right) & \frac{23}{25} \le \gamma < \frac{97}{100} \\ 0 & \text{True} \end{array} \right. & \gamma < 1 \\ \left\{ \begin{array}{ll} \frac{1}{2}\left(-\frac{103}{100} + \gamma\right) & \frac{103}{100} \le \gamma < \frac{27}{25} \\ \frac{1}{40} + \frac{4}{5}\left(-\frac{27}{25} + \gamma\right) & \gamma \ge \frac{27}{25} \\ 0 & \text{True} \end{array} \right. & \gamma \ge 1 \\ 0 & \text{True} \end{array} \right.$$

where

```
γ → (ac (1 + aci) (1 - pr)) /
   (pe (1 - pr) - (1 + nci) (1 - pr) t -
     Min[aacc (pe (1 - pr) - (1 + nci) (1 - pr) t),
      ncc (1 + nci) (1 - pr) - (1 + nci) (1 - pr) t +
       Max[-ac (1 + aci) (1 - pr) -
          ncc (1 + nci) (1 - pr) + pe (1 - pr),
        pmf (pe (1 - pr) - (1 + nci) (1 - pr) t)]])
α →
 -ac (1 + aci) (1 - pr) - ncc (1 + nci) (1 - pr) + pe (1 - pr)
β → pmf (pe (1 - pr) - (1 + nci) (1 - pr) t)
aacc (pe (1 - pr) - (1 + nci) (1 - pr) t) →
 aacc (pe (1 - pr) - (1 + nci) (1 - pr) t)
ϵ → ncc (1 + nci) (1 - pr) - (1 + nci) (1 - pr) t
ϕ → pe (1 - pr) - (1 + nci) (1 - pr) t
```

where aacc is the allowed administrative cost cap, ac is allowable costs (claims and related), aci is the percentage increase in per member allowable costs caused by the transitional policy, ncc is the non-claims cost, nci is the percentage increase in per member non-claims costs caused by the transitional policy, pe is the (gross) premiums earned, pmf is the profit margin floor, pr is the percentage reduction in (gross) premiums caused by the transitional policy, and t are the fees and taxes.

Expected government payment

If we assume that allowable costs (ac) follow a lognormal distribution (bounded below by zero) of which the mean is μ and the standard deviation is σ then we can find the expected Risk Corridor payment is equal to the following:

$$\int_0^\infty \frac{\text{payment(ac)} \exp\left(-\frac{\left(\log(\text{ac})+\frac{1}{2}\left(\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)-2\log(\mu)\right)\right)^2}{2\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)}\right)}{\sqrt{2\pi}\ \text{ac}\ \sqrt{\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)}}\, d\text{ac}$$

This is so in part because, as shown below, a conventionally parameterized lognormal distribution can be reparameterized directly using its mean and standard deviation. The *Mathematica* code below shows how this is done.

```
reparameterizationEquations = Reduce[{Mean[LogNormalDistribution[a, b]] == μ,
    StandardDeviation[LogNormalDistribution[a, b]] == σ, b > 0},
  {a, b}, Reals, Backsubstitution → True]
```

$$\mu \neq 0 \;\&\&\; \sigma \neq 0 \;\&\&\; \mu > 0 \;\&\&\; \sigma \geq 0 \;\&\&\; \text{a} == \frac{1}{2}\left(2\,\text{Log}[\mu] - \text{Log}\left[\frac{\mu^2+\sigma^2}{\mu^2}\right]\right) \;\&\&\; \text{b} == \sqrt{\text{Log}\left[\frac{\mu^2+\sigma^2}{\mu^2}\right]}$$

The probability density function of such a reparameterized lognormal distribution is computed using the following *Mathematica* code :

```
Refine[PDF[LogNormalDistribution[1/2 (2 Log[μ] - Log[(μ^2 + σ^2)/μ^2]),
    Sqrt[Log[(μ^2 + σ^2)/μ^2]]], ac], ac > 0] // TraditionalForm
```

$$\frac{\exp\left(-\frac{\left(\log(\text{ac})+\frac{1}{2}\left(\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)-2\log(\mu)\right)\right)^2}{2\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)}\right)}{\sqrt{2\pi}\ \text{ac}\ \sqrt{\log\left(\frac{\mu^2+\sigma^2}{\mu^2}\right)}}$$

Appendix 2 : The CMS Explanation of its computation

The preamble to our proposed rule contained an example that illustrated the proposed operation of the risk corridors calculation. We have included a minor correction to the calculation of profits in this example:

Premiums earned: Assume a QHP with premiums earned of $200.

Allowable costs: Assume allowable costs of $140, including expenses for health care quality and health information technology, and other applicable adjustments.

Non-claims costs: Assume that the QHP has non-claims costs of $50, of which $15 are properly allocable to licensing and regulatory fees and taxes and assessments described in Sec. 158.161(a), Sec. 158.162(a)(1), and Sec. 158.162(b)(1) (that is, ``taxes'').

The following calculations result:

``Taxes'': Under the proposed definition of taxes, the QHP's ``taxes'' will be $15.

Administrative costs are defined as non-claims costs. In this case, those costs would be $50. Administrative costs other than ``taxes'' would be $35.

After-tax premiums earned are defined as premiums earned minus ``taxes,'' or in this case $200 - $15 = $185.

Profits are proposed to be defined as the greater of: 3 percent of premiums earned, or 3 percent * $185 = $5.55; and premiums earned by the QHP minus the sum of allowable costs and administrative costs, or $200 - ($140 + $50) = $200 - $190 = $10. Therefore, profits for the QHP would be $10, which is greater than $5.55

Allowable administrative costs are defined as the sum of administrative costs, other than ``taxes,'' plus profits earned by the QHP, which sum is limited to 20 percent of after-tax premiums earned by the QHP (including any premium tax credit under any governmental program), plus ``taxes.''

= ($35 + $10), limited to 20 percent of $185, plus $15
= $45, limited to $37, plus $15
= $37, plus $15
= $52.

The target amount is defined as premiums earned reduced by allowable administrative costs, or $200 - $52 = $148.

The risk corridors ratio is the ratio of allowable costs to target amount, or the ratio of $140 to $148, or approximately 94.6 percent (rounded to the nearest one-tenth of one percent), meaning that the QHP issuer would be required to remit to HHS 50 percent of approximately (97 percent - 94.6 percent) = 50 percent of 2.4 percent, or approximately 1.2 percent of the target amount, or approximately

0.012 * $148, or approximately $1.78.

[Federal Register Volume 78, Number 47 (Monday, March 11, 2013)]
[Rules and Regulations]
[Pages 15409-15541]

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■ Summary

▫ Current Employment

Professor of Law,
University of Houston Law Center

▫ Former Employment

Munger Tolles & Olson (1986-90); Williams & Connolly (1984-86); Judge Edward R. Becker, Third Circuit Court of Appeals (1983-84)

▫ Education

Harvard Law School, J.D. 1983, magna cum laude; Princeton University (Woodrow Wilson School of Public and International Affairs), A.B. 1979, summa cum laude

▫ Representative Publications

Introduction to the Eighteenth Annual Frankel Lecture (on the Affordable Care Act), 51 Hous. L. Rev. 1017 (2014); *A Genetically Modified Liability Insurance Contract,* 13 Conn. Ins. L.J. 203 (2007)*; The Network Structure of Supreme Court Jurisprudence*, in Applied *Mathematica*: Proceedings of the 7th International Mathematica Symposium (August 2005) (ISBN 1-57955-050-9)*; Simpler Games: Using Cellular Automata to Model Social Interaction*, in Challenging the Boundaries of Symbolic Computation: Proceedings of the 5th International *Mathematica* Symposium (July 2003); *Visualizing Adverse Selection: An Economic Approach to the Law of Insurance Underwriting*, 8 Conn. Ins. L.J. 435 (2002); *Foggy Games and the Structure of Legal Rules*, in Symbolic Computation: New Horizons: Proceedings of the Fourth International Mathematica Symposium (2001); *Reconsidering The Duty to Settle*, 42 Drake L. Rev. 741 (1993); *Note, Removing Books From School Libraries,* 96 Harv. L. Rev. 151 (1983); author of 90 published interactive "Demonstrations" available at http://demonstrations.wolfram.crom

▫ Teaching

Typical Courses: Insurance Law, Law and Economics, Contracts, Constitutional Law, Health Law, Analytic Methods for Lawyers

1995 Enron Teaching Award, University of Houston Law Center

Education

Degrees

Harvard Law School, J.D., 1983, *magna cum laude*

Princeton University (Woodrow Wilson School of Public and International Affairs), A.B., 1979, *summa cum laude*

Certificates

Harvard Graduate School of Education, Management Development Program, 2003

Major Activities

Managing Editor, The Harvard Law Review, 1982-83

Editor, The Harvard Law Review, 1981-82

Managing Editor, The Daily Princetonian, 1978-79

Law School Employment

Law Foundation Professor of Law, University of Houston Law Center, January 1, 2006 - present

Director, Program on Law and Computation, 2011 - present

Co-Director, Health Law & Policy Institute, May 2004 - 2010

Vice Dean, University of Houston Law Center, June 2004 - Dec. 31, 2005

Associate Dean for Academic Affairs, University of Houston Law Center, May 2002 - June 2004

Professor of Law, University of Houston Law Center, 2002-present

Associate Professor of Law, University of Houston Law Center, 1990-2002

Major Publications

Introduction, 51 Hous. L. Rev. 1017 (2014) (Forward to an issue discussing the Affordable Care Act)

The Architecture of Contemporary Healthcare Reform and Effective Marginal Tax Rates, critical assessment of the effect on effective marginal tax rates of income-dependent subsidies under the Patient Protection and Affordable Care Act, 29 Miss. C. L. Rev. 335 (2010)

Long Term Care : The Next Healthcare Frontier, describing issues arising in regulating public and private long term care insurance in light of 19 Annals Health L. 19 (2010)

A Genetically Modified Liability Insurance Contract, uses "genetic programming" and other mathematical techniques to show how insurers and courts could construct a better liability insurance contract by paying greater attention to statistical characteristics of lawsuits that befall the insured and by constructing a somewhat more complex duty to settle. 13 Conn. Ins. L.J. 203 (2007)

The Insurance Industry, in the International Encyclopedia of Social Science (2d ed. 2007)

Children and Insurance, in The Child: An Encyclopedic Companion (University of Chicago Press, 2009)

Restricted Non - Cooperative Games, in 4488 Lecture Notes in Computer Science 170 (Yong Shi, et. al. eds., 2007) (7th International Conference in Computational Science, Beijing)

The Network Structure of Supreme Court Jurisprudence, in Applied *Mathematica*: Proceedings of the 7th International Mathematica Symposium (August 2005) (ISBN 1-57955-050-9) (discussed in *The Wisdom of Hercules*, The Economist, August 27, 2005, and available at http://www.economist.com/science/PrinterFriendly.cfm?Story_ID=4316174) (a revised version is available in 10 The *Mathematica* Journal 501 (2007))

GCANS:Global Cellular Automaton Networks, in Proceedings of the 6th International *Mathematica* Symposium (August 2004)

Simpler Games: Using Cellular Automata to Model Social Interaction, in Challenging the Boundaries of Symbolic Computation: Proceedings of the 5th International *Mathematica* Symposium (July 2003), (Peter Mitic et. al., eds., 2003) (ISBN 1-86094-363-2)

Visualizing Adverse Selection: An Economic Approach to the Law of Insurance Underwriting, 8 Conn. Ins. L.J. 435 (2002)

Foreword, Children's Health: A Time for Optimism?, 1 Hous. J. Health L. & Pol'y 1 (2001) (co-authored with Mary Anne Bobinski)

Foggy Games and the Structure of Legal Rules, in Symbolic Computation: New Horizons: Proceedings of the Fourth International Mathematica Symposium (Yoshihiko Tazawa, et. al., eds., 2001) (ISBN 4-501-73020-X C3041)

Behavior and Learning Under Law: Automata Containing Evolutionary Algorithms, 8 The Mathematica Journal 301 (2001) (co-authored with Christian J. Jacob and revising our *Automata Containing Evolutionary Algorithms: Behavior and Learning Under Law*, in Proceedings of the Third International *Mathematica* Symposium (1999), available at http://www.risc.uni-linz.ac.at/-conferences/summer99/ims99)

Insurance Regulation, in 3 The International Encyclopedia of Law and Economics 837 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000)

Automata Containing Evolutionary Algorithms: Behavior and Learning Under Law, in Proceedings of the Third International *Mathematica* Symposium (1999), available at http://www.risc.uni-linz.ac.at/conferences/summer99/ims99

Modeling Law: Using Cellular Automata to Study Legal Regulation of Conflicting Land Use, in Innovations in Mathematics: Proceedings of the Second International *Mathematica* Symposium (1997) (ISBN 9525153029)

The Interaction of the Tort System and Liability Insurance Regulation, 2 U. Conn. Ins. L.J. 91 (1996)

Visualizing Moral Hazard, 1 U. Conn. Ins. L.J. 97 (1995)

Reconsidering The Duty to Settle, 42 Drake L. Rev. 741 (1993)

Note, Removing Books From School Libraries, 96 Harv. L. Rev. 151 (1983)

■ Teaching

▫ Courses Taught in Past 10 Years

Course	Special Features	Years
Analytic Methods for Lawyers	New course (first year practical skills elective) teaching students basics of decision analysis, game theory, contract structure, accounting, finance, microeconomics, law and economics and statistics; large number of videos and other materials available at http : // www.law.uh.edu / polac / resources	2005, 2007, 2009, 2011, 2013, 2014

Computational Law	Developed course dealing with network theory, computational linguistics and machine learning; website at sites.google.com/site/computationallaw	2012, 2015
Constitutional Law	Created class blog learningconlaw.wordpress.org; created website sites : google.com/site/sjcconlaw	2009, 2010, 2012, 2014
Contracts	Extensive reliance on Case Files. Made drafting integral part of course.	1993 – 94, 2000 – 01, 2004, 2007, 2010, 2012, 2015
Health Law	Survey courses in health law, including bioethics, tort liability, licensure, financing, fraud and abuse, antitrust	1996, 1998, 2000 – 02, 2005, 2007, 2009
Insurance Law	Development of website containing extensive materials mostly on Texas insurance law.	1990 – 95, 1997 – 2004, 2007 2008, 2011, 2013
Law and Economics (Course and Seminar)	Extensive use of *Mathematica* in presenting materials in course. Course covers traditional law and economics as well as game theory and network/spatial models.	1993 – 1996, 1999, 2001, 2003
Life & Health Insurance	Prepared extensive materials for course as no law casebook exists; created class blog http : // mathlawguy.wordpress.com/	1999, 2002, 2008, 2011

Teaching Awards

Enron Teaching Excellence Award, University of Houston, 1995

Service

Law Center

Co-chair, Strategic Planning Committee (2013-14)

Chair, Promotion and Tenure Committee (2011 - 2013, 2014-15)

Faculty Appointments Committee (2005 - 2007)

Curriculum Committee (1999-2002)

Chair, Entry Level Hiring Committee (1999-2000)

Chair, Executive Committee (1998- 1999; Member 1991-94)

Chair, Legal Research and Writing Search Committee (Spring 1999)

Supervisor, Adjunct Teaching Improvement Project (1998- 1999)

Chair, Law Center Computer Committee (1994-1997)

Member, Planning Committee for Teaching Methods Workshops (1995-present)
Work on development of new teaching methods, with focus on use of new technology

Chair, Ad Hoc Computer Use Fee Committee (1994-present)

Faculty Advisor, Houston Law Review (1993-1997)

Faculty Advisor, Houston Business & Tax Law Journal (1999-present)

Dunkee, Asian Law Students Association, Family Day (1995)

Member, Ad Hoc Skills Training Committee (1993-94)

Member, Law Center Computer Committee (1990-93)

Faculty Sponsor, "Thursday Thoughts" Program (1993)

Member, Curriculum Committee (1991-93; 1996-97, 1998 - present)

Faculty Sponsor, Democratic Law Students Association (1992-93)

Judge of various moot courts (1990-2003)

University-Wide

University Grievance Committee (2011 - present)

Teaching Excellence Committee (2000-03)

Faculty Senate (1997 - 2000, 2008-2011) (including Legislative and Community Affairs Committee, Planning Committee and Faculty Affairs Committee)

Graduate and Professional Studies Council (1998 - 1999)

Chair, Academic Computing Advisory Committee (1995 - 1996)

Member, Academic Computing Advisory Committee (1993-present)

Member, Dissertation Committee for Daniel Carr, Ph.D. Candidate (Psychology, “Expert Systems in Jury Selection”) (1995-present)

Community & Miscellaneous

Testimony, House Insurance Committee (Austin, 2013)

Testimony, Senate Business and Commerce Committee (Austin 2013)

Testimony, Joint Interim Committee to Study Seacoast Territory Insurance (Austin, 2012)

Conference Organizer, 11th International Mathematica Symposium (London 2012)

Chair, ABA Site Team, University of Nebraska (2011)

Speaker, Health Insurance (The People' s Law School 2009 - present)

Testimony, House Insurance Committee (Austin, 2009)

Chair, ABA Site Team, University of Oklahoma (November 2008)

ABA Site Inspector, University of Dayton (March 2008)

Editorial Reviewer, Ninth International Mathematica Symposium (June 2008) (reviewed eight abstracts on finance and graphics)

ABA Site Inspector, University of Missouri Kansas City (2007)

Assistant Coach, West University Little League Baseball (2007-08, 2009, 2011)

Opening Speaker, Texas Legislature, State Affairs Committee Hearing on Stem Cell Advances (September 26, 2006, Houston, Texas)

Conference Organizer and Opening Speaker, Reforming the Law of Emergency Medical Care (Houston, April 6, 2006)

Member, Texas Health Care Policy Council (2006-2011) (statutory body within the office of the Governor)

Member, Steering Committee, Texas Department of Insurance State Planning Grant on Houston Small Employer Insurance

Instructor, New Kind of Science Summer School (Brown University 2005)

Chair, Association of American Law Schools Section on Insurance Law (2006-07)

Member, Thesis Review Committee for Michael Thompson, Master of Science Candidate, University of Western Sydney ("Use of Cellular Automata Models to Examine Complexity of Organizational Behavior") (2005)

Referee, Art Diggle, et. al., *Individual based models of spread of seeds, pollen, fungi, and insects* (paper for International Mathematica Symposium 2005)

Referee, Yves Papegay, *Exploring Board Games strategies* (paper for International Mathematica Symposium 2005)

Referee, Colin Rose & Murray Smith, *mathStatica: Symbolic Computational Statistics* (paper for International Mathematica Symposium 2005)

Program Committee Member, Seventh International Mathematica Symposium (2005)

Chair, ABA Site Inspection Committee, University of Missisippi (2004-05) (attended ABA meeting in September, 2004 in preparation)

Program Committee Member, Sixth International Mathematica Symposium (2004)

Speaker, Meeting of Center for Disease Control and Texas Department of Health on Community Public Health Legal Preparedness (2004)

ABA Site Inspector, La Verne College of Law (2003)

Program Committee Member, Fifth International Mathematica Symposium (2003)

ABA Site Inspector, University of Arkansas Little Rock (2003)

Pro Bono Attorney, In re Luis Alberto Ramirez Diaz (2002-present) (representation in political asylum proceeding, appeal to Bureau of Immigration Appeals, appeal to United States Court of Appeals for the Fifth Circuit)

Speaker, Health Law, University of Texas School of Public Health/ Texas Southern University Conference on Health and Social Justice (2002)

Volunteer Editor/Beta Tester for Stephen Wolfram's book, "A New Kind of Science." (2002)

Expert on Insurance Law and Health Law, for "Allexperts.com" (1999-2000) (number one rated national expert in insurance law)

Consultant, Texas Attorney General's Office (2000) (pro bono evaluation of settlement of major dispute between managed care entities and state)

Moderator, The Florida Election Debate (Houston, November 2000)

Contract Law for Fifth Graders (Klentzman Intermediate School, 2000)

Speaker, "Beyond Stowers" (Houston, Fall 1998)

Pro Bono Professional Work Relating to Health Insurance Needs of Persons with HIV/AIDS (Houston, Spring 1998)

Speaker, "The People's Law School," Health Insurance (Houston, Spring 1998, Fall 1998, Spring 2000, Spring 2001)

Panelist, "On the Spot": The Health Channel (broadcast in January 1998) Topic : "In Vitro Fertilization of Post Menopausal Women"

Speaker, "The People's Law School," Insurance Law (Houston, 1993, 1994, Spring 1995, Fall 1995, Fall 1996, 2002)

Speaker, "A Simulated Class on Contract Law," Family Day (Houston, Fall 1995)

Speaker, "Law Preview Day," (Houston 1994, Houston 1995)

Speaker, "Group Health Insurance and Cancer: Federal Regulation of Insurance Policies," American Cancer Society (Houston, 1994)

Speaker, “Law and Economics” (Houston, 1994)

Speaker, “Quasi-Contract for Kindergartners,” (Houston, 1993)

Speaker, "Health Insurance and Problems of Tourette's Syndrome: Current Law and Health Security Act," National Tourette Syndrome Society Convention (Houston, 1993)

Speaker, "Health Insurance,"American Cancer Society (Houston, 1993)

Speaker, "Health Insurance and Problems of Tourette's Syndrome" (Houston, 1992)

Docent, Houston Heights Historical Museum (1991-92)

Awards

LexisNexis award for use of computer technology in the classroom (2012)

Wolfram Innovator Award (2011) (award to honor individuals who have made significant contributions to their fields through the innovative use of Wolfram technologies).

President's Medal, Loyola University (2006) (highest honor given by Loyola University; awarded for spearheading and implementing efforts to host Loyola (New Orleans) Law School at the University of Houston Law Center for fall 2005 following Hurricane Katrina).

Ethel M. Baker Faculty Award (2004) (Law Center's highest award for community service)

Blogs

acadeathspiral.org (established November 2013)

This blog, which has been picked up by leading aggregators such as thehealthcareblog and realclearpolicy.com and has become a leding source of information on the topic, chronicles the potential implosion of the Affordable Care Act. It explores whether the Exchange based system of providing health insurance without medical underwriting is likely to work or that, if it does, whether it will need far more massive propping up from federal taxes than is conventionally recognized. It looks at current events, the history of the Act, important court cases, and regulatory developments. Its tools include careful review of primary documents such as statutes, regulation and statistical materials, some graphical and mathematical analyses, and references to important and insightful articles written by others. As of April 2014, the blog had over 25,000 views.

catrisk.net (established June, 2012)

A blend of legal analysis, actuarial research, visualization and opinion that has become the leading source of information on catastrophic risk insurance in Texas. Contains 91 posts and has had over 6,800 views since being established, averaging about 1,000 per month for the 2013. Contains numerous interactive visualizations, static visualizations addressing hte 83rd Legislature in Texas, accounting, assessments, climate and weather, finance, insurance law, meetings and hearings, catastrophe modeling, receivership law and reinsurance.

mathlaw.org (established January 2013)

Using static and interactive visualization technology to address the opportunities for mathematical analysis and computer programming to assist with legal anaysis. Posts to date focus on the Affordable Care Act (statistics, taxation, network theory), Game Theory (iterated games), taxation and climate studies.

■ Other Publications And Speaking Engagements

▫ Legal Publications

Small Business and Obamacare, published in the National Review Online *(*available at http://www.nationalreview.com/article/368241/small-businesses-and-obamacare-seth-j-chandler*)*(-January 13, 2014)

The Effect of Premium Subsidies and Cost Sharing Reductions Under the Affordable Care Act on Effective Marginal Tax Rates, Harvard Law School (panel on the future of healthcare) (talk cancelled due to Boston Marathon bombing manhunt) (version of talk available at http://math-law.org/2013/04/09/exploring-the-effective-marginal-tax-created-by-the-affordable-care-act/)

Machine Learning The Supreme Court, Reinvent Law conference at the Dubai International Financial Center in a conference sponsored by Michigan State University.

JLink Without Java : Mathematica with .Class, Wolfram Technical Conference (Champaign, IL, October 2012) (interfacing *Mathematica* with Clojure, Scala and xTend)

"To fix the TWIA mess, focus on the fundamentals," Houston Chronicle, July 27, 2012

"Let' s do the math before deciding on Medicaid expansion, " Houston Chronicle, July 12, 2012

"Leaving denser coastal counties out to dry if major windstorms strike," Austin American Statesman, July 10, 2012

Machine Learning Judicial Behavior Using a Mathematica to Weka Interface, 11th International Mathematica Symposium (University College, London, June 2012) (draft available on request)

Insurance Justice with Two Dimensional Underwriting, Wolfram Technology Conference (Champaign, IL, Oct. 2011) (available at http://library.wolfram.com/infocenter/Conferences/8017)

The Case for Evolutionary Computing, Inaugural Workshop of the Program on Law and Computation (Houston, Texas, April 2011) (available at http://www.law.uh.edu/polac/resources/home-page.php)

Health reform plan flawed but has potential benefits: Letting states opt out invites experimentation, *Houston Chronicle*, March 1, 2011

Health care plan could dampen economic growth, Houston Chronicle, Nov. 26, 2009

Reformulated coastal insurance plan a catastrophe, Houston Chronicle, June 6, 2009

Windstorm reform trims subsidies, *Houston Chronicle*, May 11, 2009

Chandler on Hartford Accident & Indem. Co. v. Argonaut Ins. Co. : Following the Fortunes, 2008 Emerging Issues 2767 (August, 2008)

Title I of the Genetic Information Nondiscrimination Act of 2008, 2008 Emerging Issues 471 (July 2008)

Professor Seth J. Chandler on Fair Credit Reporting Act, 15 USCS Section 1681 b : Congressional Bill Would Outlaw Use of Credit Scores in Personal Lines insurance, available at http://law.lexisnexis.com/practiceareas/Insurance/Regulatory-Issues-and-Compliance/Professor-Seth-J-Chandler-on-Fair-Credit-Reporting-Act-15-USCS-Section-1681b-Congressional-Bill-Would-Outlaw-Use-of-Credit-Scores-in-Personal-Lines-Insurance (posted July 2008)

Professor Seth J. Chandler on Florida Stat. §627.0628, available at http : // law.lexisnexis.-com/practiceareas/Insurance/Climate - Change/Professor - Seth - J - Chandler - on - Florida - Stat-- - 6270628 (posted June 2008)

The CISG Text, proceedings of the 9 th International Mathematica Symposium (July 2008, Maastricht, Holland)

Demonstrating Insurance (Poster talk presented to the American Association of Law Schools, January 2008, New York)

A Category 5 Mistake if We Expand Windstorm Coverage, Houston Chronicle, August 28, 2006

Court Finds ERISA Bar To Maryland Effort To Force Large Employers to Provide Limited Health Insurance (August 2006)

<http://www.law.uh.edu/healthlawperspectives/(SC)MDERISA.pdf>

Texas Medical Malpractice Reform: Introduction, Health Law News (November 2005)

The Network Structure of Supreme Court Jurisprudence (June 2005) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=742065>

High Deductible Health Plans: The Limits of Analytic Economics (June 2005) (Poster presented to the American Society of Law, Medicine & Ethics Health Law Teachers' Conference)

Game Theory Looks at Florida's Three Strikes Laws (December 2004) <http://www.law.uh.edu/healthlawperspectives/(SC)ThreeStrikesRev2.pdf>

Court: Insurers Must Be Even Clearer In Explaining Retroactive Dates in Group Medical Malpractice Policies (August 2004) <http://www.law.uh.edu/healthlawperspectives/(SC)PresidentvJenkins2.pdf>

New Jersey Supreme Court Restricts Use of Contract in Determining Disposition of Frozen Preembryos (August 2001) <http:www.law.uh.edu/healthlawperspectives/reproductive/010827NewJersey.html>

Book Review: Gostin's Public Health Law: A Masterful Restatement, 14 Health Law Perspectives 10 (March 2001)

The Genetic Information Nondiscrimination in Health Insurance Act of 1999: Too Fast and Too Federal?, Health Law Perspectives (August 2000) <http://www.law.uh.edu/healthlawperspectives/Genetics/000803Nondiscrimination.html >

The Texas-Aetna Settlement: A Significant Experiment in Managed Care Reform, Health Law Perspectives (May 2000) <http://www.law.uh.edu/healthlawperspectives/Managed/000503TexasAetna.html>

Massachusetts Court Diminished Role for Contract in Reproductive Decision, Health Law Perspectives (April 2000)< http://www.law.uh.edu/healthlawperspectives/Reproductive/20000412-Massachusetts.html>

Book Review, Undue Risk: Secret State Experiments on Humans, 13 Health Law News 11 (March 2000)

Fifth Circuit Joins Seventh in Rejecting ADA Attacks on AIDS Benefit Caps, Health Law Perspectives (Feb. 2000)< http://www.law.uh.edu/healthlawperspectives/Disabilities/20000229M-cNeil.html>

RICO Unleashed: Humana Case Gives Federal Government More Power to Police Health Insurers, 13 Health Law News 7 (Sept. 1999)

Policing the Insurance Industry: Did Congress Give Away Its Power in 1945?, 3 Supreme Court Preview 156 (Nov. 20, 1998)

Eleventh Circuit Finds No Antitrust Violation in "Preferred Provider" Arrangement by Hospitals, Health Law Perspectives (March 1998)< http://www.law.uh.edu/healthlawperspectives/Managed/980325Antitrust.html>

Insurance Insolvency Issues in Professional Malpractice Actions, in 6th Annual Medical Malpractice Conference, Texas Trial Lawyers Association (1995)

The New Technology in Legal Education: Computer Generated Heresy, 14 The Briefcase No. 2 (1994)

Comment, Faculty Roundtable, 11 The Briefcase No. 3 (1992)

Maryland Court Rejects Insured Versus Insured Exclusion, ABA Class Actions & Derivative Suits (1990)

▫ Science/Economics Publications and Presentations

Interactive Economic Models from the Wolfram Demonstrations Project, Journal of Economics Education (Winter, 2008) (with Fiona Maclachlan and W.J. Bolte).

Exploring Computational Irreducibility and the Predictability of Complex Systems using Mathematica, Proceedings of 2004 New Kind of Science Conference (June 2004) (available as *Mathe-*

matica notebook at http://www.wolframscience.com/conference/2004/presentations)

Demonstrations

The list below constitutes peer reviewed interactive demonstrations of various ideas and data in the fields of law, economics, statistics, linguistics and other miscellaneous areas of interest. These "Demonstrations," produced using *Mathematica*, have been viewed over one half million times and downloaded for serious examination over 50,000 times. They may be downloaded and examined using the Wolfram CDF Player, a product conceptually similar to Adobe Acrobat, and freely available at http://www.wolfram.com/cdf/. There are also plug-ins available for most web browsers that let you interact with these documents within the web browser.

Legal/Economic

Academic Admissions, available at http://demonstrations.wolfram.com/AcademicAdmissions/

A Conceptual Model of Lapse Financed Life Insurance, available at http://demonstrations.wolfram.com/AConceptualModelOfLapseFinancedLifeInsurance/

A Health Stories Model of Long - Term Care Insurance, available at http://demonstratios.wolfram.com/AHealthStoriesModelOfLongTermCareInsurance/

A Minimal Circumcircle Measure of District Compactness, available at http://demonstrations.wolfram.com/AMinimalCircumcircleMeasureOfDistrictCompactness/

A Parameterized Multistate Life Table, available at http : // demonstrations.wolfram.com/AParameterizedMultistateLifeTable/

A Spatial Dynamic Jury Model, available at http://demonstrations.wolfram.com/ASpatialDynamicJuryModel/ (featured on the television show *Numb3rs* (see http://numb3rs.wolfram.com/515/))

Adverse Selection, available at http://demonstrations.wolfram.com/AdverseSelection/

Akrasia, available at http ://demonstrations.wolfram.com/Akrasia/

Asylum in the United States, available at http://demonstrations.wolfram.com/AsylumInTheUnitedStates/ (with Anne Chandler)

Banzhaf Power Index, available at http://demonstrations.wolfram.com/BanzhafPowerIndex/

Beat Chebyshev, available at http://demonstrations.wolfram.com/BeatChebyshev/

Bilateral Accident Model, available at http://demonstrations.wolfram.com/BilateralAccidentModel/

Binary Election Sequences, available at http://demonstrations.wolfram.com/BinaryElectionSequences/

Certainty Equivalent Wealth, available at http://demonstrations.wolfram.com/CertaintyEquivalentWealth/

Constant Elasticity of Substitution Production, available at http://demonstrations.wolfram.com/ConstantElasticityOfSubstitutionProduction/ (with Kevin Balch)

Cobb - Douglas Production Functions, available at http://demonstrations.wolfram.com/CobbDouglasProductionFunctions/

Collocation By Chi Square, available at http://demonstrations.wolfram.com/CollocationByChiSquare/

Collocation By Symmetric Conditional Probability, available at http://demonstrations.wolfram.com/CollocationBySymmetricConditionalProbability/

Congressional Apportionment Using General Divisor Methods, available at http://demonstrations.wolfram.com/CongressionalApportionmentUsingGeneralDivisorMethods/

Constant Risk Aversion Utility Functions, available at http://demonstrations.wolfram.com/ConstantRiskAversionUtilityFunctions/

Coordination of Insurance Policies, available at http://demonstrations.wolfram.com/CoordinationOfInsurancePolicies/

Current v. Cohort Life Tables and The Regulation of Life Insurance, available at http://demonstrations.wolfram.com/CurrentVersusCohortLifeTablesAndTheRegulationOfLifeInsurance/

Death Penalty Regressions, available at http://demonstrations.wolfram.com/DeathPenaltyRegressions/

Efficient Single Limit Liability Insurance, available at http://demonstrations.wolfram.com/EfficientSingleLimitLiabilityInsurance/

Employer Health Insurance Choices Under H.R. 3590 and H.R. 3962, available at http://demonstrations.wolfram.com/Employer HealthInsuranceChoicesUnderHR3590AndHR3962/

Estimating Insurance Premiums Using Exceedance Data and the Method of Moments, available at http://demonstrations.wolfram.com/EstimatingInsurancePremiumsUsingExceedanceDataAndTheMethodOf/

*Estimating Loss Functions Using Exceedance Data And The Method Of Moment*s, available at http://demonstrations.wolfram.com/EstimatingLossFunctionsUsingExceedanceDataAndTheMethodOfMome/

Evidentiary Uncertainty, available at http://demonstrations.wolfram.com/EvidentiaryUncertainty/

General Assembly Resolution Viewer, available at http://demonstrations.wolfram.com/GeneralAssemblyResolutionViewer/

General Divisor Methods, available at http://demonstrations.wolfram.com/GeneralDivisorMethods/

Healthcare Reform and Effective Marginal Tax Rates, available at http : // demonstrations.wolfram.com/HealthcareReformAndEffectiveMarginalTaxRates/

Health - Wealth Tradeoffs, available at http://demonstrations.wolfram.com/HealthWealthTradeoffs/

Hurricane Risk by State, available at http ://demonstratons.wolfram.com/HurricaneRiskByState/

Individual Insurance Decisions under HR 3560 and HR 3962, available at http://demonstratons.-wolfram.com/IndividualInsuranceDecisionsUnderHR3560AndHR3962/

Insurer Assessments with Tax Credits, available at http://demonstrations.wolfram.com/InsurerAssessmentsWithTaxCredits/

Insolvency Setoff, available at http : // demonstrations.wolfram.com/InsolvencySetoff/

Insurance And Precautions, available at http : // demonstrations.wolfram.com/InsuranceAndPrecautions/

Insurance Disclosures, available at http ://demonstrations.wolfram.com/InsuranceDisclosures/

Insurer Ruin, available at http://demonstrations.wolfram.com/InsurerRuin/

Iterated Games, available at http://demonstrations.wolfram.com/IteratedGames/

Land Use with Contract, available at http://demonstrations.wolfram.com/LandUseWithContract/

Lawsuit Settlement Calculator, available at http : // demonstrations.wolfram.com/LawsuitSettlementCalculator/

Legal Incoherence, available at http : // demonstrations.wolfram.com/LegalIncoherence/

Liability Insurance Desirability under LogNormal Loss Distributions, available at http://demonstrations.wolfram.com/LiabilityInsuranceDesirabilityUnderLognormalLossDistribution/

Liability Insurance Desirability When ' Diminution' is Unlawful, available at http://demonstrations.wolfram.com/LiabilityInsuranceDesirabilityWhenDiminutionIsUnlawful/

Life Insurance Pricing, available at http://demonstrations.wolfram.com/LifeInsurancePricing/

Life Transitions, available at http : // demonstrations.wolfram.com/LifeTransitions/

Lorenz Curves and the Gini Coefficient, available at http://demonstrations.wolfram.com/LorenzCurvesAndTheGiniCoefficient/

Magic Number Bidding, available at http : // demonstrations.wolfram.com/MagicNumberBidding/

Measures of Node Prominence on a Network, available at http://demonstrations.wolfram.com/MeasuresOfNodeProminenceOnANetwork/

Merger Guidelines, available at http://demonstrations.wolfram.com/MergerGuidelines/

Monopoly and Natural Monopoly, available at http://demonstrations.wolfram.com/MonopolyAndNaturalMonopoly/

Moral Hazard, available at http://demonstrations.wolfram.com/MoralHazard/

Nash Equilibria in 3 x3 Games, available at http://demonstrations.wolfram.com/NashEquilibriaIn33Games/

Nash Equilibria with Continuous Strategies, available at http://demonstrations.wolfram.com/NashEquilibriaWithContinuousStrategies/

Neighborhood Graphs With HITS and SALSA, available at http : // demonstrations.wolfram.com/NeighborhoodGraphsWithHITSAndSALSA/

Occurrence versus Claims - Made Insurance Policies, available at http://demonstrations.wolfram.com/OccurrenceVersusClaimsMadeInsurancePolicies/

Optimal Consumption Paths, available at http://demonstrations.wolfram.com/OptimalConsumptionPaths/

Parameterizing Mathews v. Eldridge, available at http://demonstrations.wolfram.com/ParameterizingMathewsVersusEldridge/

Pay the Points?, available at http://demonstrations.wolfram.com/PayThePoints/

Payoff Gradients in Two - Player Games, available at http://demonstrations.wolfram.com/PayoffGradientsInTwoPlayerGames/

Post Event Bonding, available at http://demonstrations.wolfram.com/PostEventBonding/

Predictive Scores and Ultimate Test Passage, available at http : // demonstrations.wolfram.com/PredictiveScoresAndUltimateTestPassage/

Premium Assistance Calculator for H.R. 3590 and H.R. 3962, available at http://demonstrations.wolfram.com/PremiumAssistanceCalculatorForHR3590AndHR3962/

Premium Ratios with Capital Costs Included, available at http://demonstrations.wolfram.com/PremiumRatiosWithCapitalCostsIncluded/

Probit and Logit Models with Normal Errors, available at http://demonstrations.wolfram.com/ProbitAndLogitModelsWithNormalErrors/

Property Coinsurance, available at http://demonstrations.wolfram.com/PropertyCoinsurance/

Reinsurance Cut - Through, available at http://demonstrations.wolfram.com/ReinsuranceCutThrough/

Restricted Non-Cooperative Game Theory, available at http://demonstrations.wolfram.com/RestrictedNonCooperativeGameTheory/

Retiree Stop-Loss Reinsurance, available at http://demonstrations.wolfram.com/RetireeStopLossReinsurance/

Saving for Retirement, available at http://demonstrations.wolfram.com/SavingForRetirement/

Sensitivity, Specificity, and Incidence, available at http://demonstrations.wolfram.com/SensitivitySpecificityAndIncidence/

Subrogation, available at http : // demonstrations.wolfram.com/Subrogation/ (after work by Alan Sykes)

Supplemental Jurisdiction, available at http://demonstrations.wolfram.com/SupplementalJurisdiction/ (co-authored with Aaron Bruhl)

Synthetic Legal Precedent Structures : Feature Distance,"available at http://demonstrations.wolfram.com/SyntheticLegalPrecedentStructuresFeatureDistance/

Synthetic Legal Precedent Structures : Lévy Flight, available at http://demonstrations.wolfram.-com/SyntheticLegalPrecedentStructuresLevyFlight/

Tail Conditional Expectations, available at http://demonstrations.wolfram.com/TailConditionalExpectations/

Tax Rates and Tax Revenue, available at http://demonstrations.wolfram.com/TaxRatesAndTaxRevenue/

The 2001 CSO Mortality Tables, available at http://demonstrations.wolfram.com/The2001CSOMortalityTables/

The Duty to Settle, available at http://demonstrations.wolfram.com/TheDutyToSettle/

The Edgeworth Box, available at http://demonstrations.wolfram.com/TheEdgeworthBox/

The effects of coinsurance and deductibles on optimal precautions for Weibull distributed loss, available at

The Efficient Dual Limit Liability Insurance Contract, available at http://demonstrations.wolfram.-com/TheEfficientDualLimitLiabilityInsuranceContract/"

The Equivalent Mileage of an Electric Vehicle with Backup Gasoline Propulsion, available at http://demonstrations.wolfram.com/The EquivalentMileageOfAnElectricVehicleWithBackupGasolinePro/

The Persuasion Effect : A Traditional Two Stage Jury Model, available at http://demonstrations.-wolfram.com/ThePersuasionEffectATraditionalTwoStageJuryModel/

The Present Value of Future Gas Use, available at http : // demonstrations.wolfram.com/ThePresentValueOfFutureGasUse/

The Purpose of the Law, available at http://demonstrations.wolfram.com/ThePurposeOfTheLaw/

*Travel With Waiting Time and Distance Distribution*s, available at http:// demonstrations.wolfram.-com/TravelWithWaitingTimeAndDistanceDistributions/

Tries, available at http : // demonstrations.wolfram.com/Tries/

Unilateral Accident Model, available at http://demonstrations.wolfram.com/UnilateralAccidentModel/

Visualizing Legal Rules : A Homicide Case, available at http://demonstrations.wolfram.com/VisualizingLegalRulesAHomicideCase/"

Visualizing Legal Rules : Battle of the Forms, available at http://demonstrations.wolfram.com/VisualizingLegalRulesBattleOfTheForms/

Other

A Cycle Index Spreadsheet, available at http://demonstrations.wolfram.com/ACycleIndexSpreadsheet/

Baseball Without Swings, available at http : // demonstrations.wolfram.com/BaseballWithoutSwings/

Cellular Automata on Trivalent Networks, available at http://demonstrations.wolfram.com/CellularAutomataOnTrivalentNetworks/

Cellular Automata With Global Control, available at http://demonstrations.wolfram.com/CellularAutomataWithGlobalControl/

Cellular Automata with Globally Determined Neighborhoods, available at http://demonstrations.-wolfram.com/CellularAutomataWithGloballyDeterminedNeighborhoods/

Clustered Power - Law Networks, available at http://demonstrations.wolfram.com/ClusteredPowerLawNetworks/

Communities of Nations Bridged by Language Similarity, available at http://demonstrations.wolfram.com/CommunitiesOfNationsBridgedByLanguageSimilarity/

Cycles From Permutations, available at http : // demonstrations.wolfram.com/CyclesFromPermutations/

Dynamic Proximity Networks, available at http://demonstrations.wolfram.com/DynamicProximityNetworks/

Enumerating the Directed Graphs, available at http : // demonstrations.wolfram.com/EnumeratingTheDirectedGraphs/ (with additional contributions by Matthew Szudzik and Jesse Nochella)

Exploring with Inset, available at http://demonstrations.wolfram.com/ExploringWithInset/

Generating Realistic Baseball Line Scores, available at http : // demonstrations.wolfram.com/GeneratingRealisticBaseballLineScores/

Genealogy Graphs From XML, available at http://demonstrations.wolfram.com/GenealogyGraphsFromXML/

Graph Embedding Trajectories, available at http://demonstrations.wolfram.com/GraphEmbeddingTrajectories/

Grouping Country Data, available at http://demonstrations.wolfram.com/GroupingCountryData/

Iterative Polygon Simplification, available at http://demonstrations.wolfram.com/IterativePolygonSimplification/

Maximum Likelihood Estimators for Binary Outcomes, available at http://demonstrations.wolfram.com/MaximumLikelihoodEstimatorsForBinaryOutcomes/ (after work by Darren Glosemeyer and J. Scott Long)

Maximum Likelihood Estimators with Normally Distributed Error, available at http : // demonstrations.wolfram.com/MaximumLikelihoodEstimatorsWithNormallyDistributedError/

Mixing Colors with Blend, available at http://demonstrations.wolfram.com/MixingColorsWithBlend/

Random Ayclic Networks, available at http ://demonstrations.wolfram.com/new.html

Randomly Reducing Objects to Spheres, available at http://demonstrations.wolfram.com/RandomlyReducingObjectsToSpheres/

Shakesperean Networks, available at http : // demonstrations.wolfram.com/ShakespeareanNetworks/

Shakesperean Play Summaries, available at http://demonstrations.wolfram.com/ShakespeareanPlaySummaries/

Sports Seasons Based on Score Distributions, available at http://demonstrations.wolfram.com/SportsSeasonsBasedOnScoreDistributions/ (with additional contributions by Theodore Gray)

Stable Marriages, available at http://demonstrations.wolfram.com/StableMarriages/

State Population Growth, available at http : // demonstrations.wolfram.com/StatePopulationGrowth/

Stock Price Envelopes, available at http://demonstrations.wolfram.com/StockPriceEnvelopes/

The Sampling Distribution of a Sampling Quantile, available at http://demonstrations.wolfram.com/TheSamplingDistributionOfASamplingQuantile/

The Sensitivity of Page Rank to Connection Errors, available at http://demonstrations.wolfram.com/TheSensitivityOfPageRankToConnectionErrors/

Travel Time with Waiting and Distance Distributions, available at http://demonstrations.wolfram.com/TravelTimeWithWaitingAndDistanceDistributions/

Turing Snakes, available at http : // demonstrations.wolfram.com/TuringSnakes/

Visualizing the Coarse Graining of a Cellular Automaton, available at http://demonstrations.wolfram.com/VisualizingTheCoarseGrainingOfACellularAutomaton/

Visualizing Turing Machine Enumeration, available at http://demonstrations.wolfram.com/VisualizingTuringMachineEnumeration/

Videos

Available for download and stream at http : /www.law.uh.edu/polac/resources/homepage.php)
Mathematica Problem Set 1 Parts 1-10 (2011)

Understanding Mathematica Expressions (2011)

Sensitivity Specificity Incidence ROC (2011)

Quiz 1 Analytic Methods Fall 2011 (2011)

Very Basic Descriptive Statistics Problem Set (2011)

Chi Square Analysis (2011)

Forensic Regression Parts 1 - 2 (2011)

Understanding Regression (2011)

Simple Settlement (2011)

Evaluating Lotteries Parts 1 - 3 (2011)

Hypothesis Testing Problem Set (2011)

Statistical Distributions Movie (2011)

Quiz 2 (2011)

Quiz 3 (2011)

Editorial Responsibilities

Update on Health, monthly newsletter of the Health Law & Policy Institute for the Texas legislature

Health Law News, biannual publication on developments at the Health Law & Policy Institute and special section on health law

Control Measures and Public Health Emergencies : A Texas Bench Book, special 130 - page publication of the Health Law & Policy Institute designed to provide guidance to Texas courts during a public health emergency

Special Legislative Briefings for the Texas Legislature

2006-07: HIPAA Preemption and Texas Law, Texas Advance Directives Act, EHR Liability Issues (Electronic Records), Prison Condom Distributionm, EMS Services, Medical Peer Review, A General Primer on the State Children's Health Insurance Program, Analysis of Treat to Transfer Provisions in Ten States, Capital Punishment, Consumer Directed Health Care and Transparency, Chiropractice Scope of Practice, Criminal Competency, Electronic Health Records, Health Care Access Under Medicaid, Patient Privacy Rights, Prison Nursery Programs, Proposed Rvisions to the Texas Advance Directives Act, Remedies for Inappropriate Release of PHI, Wards of the State and Experimental Trials

2005 - 06 : Medicare Legislation (Part D), Regulating Mobile Food Vendors, Mental Health Courts, Laser Hair Removal, Anabolic Steroids, Eating Disorders and Mental Health Coverage Limitations, Health Care Center Surge Capacity - Public Health Disaster, Command & Control - Public Health Disaster, Quarantine - Public Health Disaster, Financial Access - Public Health Disaster, Elder Autonomy - Long Term Care, Recent Federal Changes - Medicaid, Recent Changes - State Medicaid Programs, Long-Term Care Insurance, Addressing Obesity Through Nutrition and Physical Activity Plan, Advance Directives

2004 - 05: Medical Savings Accounts, Medicare Legislation (Part D), Abortion-related Statutes, "Not Builty By Reason of Insanity" Criminal Defense, Drug Use During Pregnancy, Regulation of Optometry, Scope of Practice, Health Care Providers' Right ot Refuse to Treat Patients, Preliminary Report: Long Term Care in Texas, Senate Bills 1577 and 1381 Relating to Abortion, The Singapore Model of Health Care Financing, Standardization of Health Care Reimbursement Claim Forms Submitted to Texas Health Plans, Impact on of Key Provisions of

Medicare Prescription Drug, Improvement and Modernization Act of 2003, Health Saving Accounts & High Deductible Health Plans

Speaking Engagements

Modeling Public Pensions with Mathematica and Python, Wolfram Technology Conference (Champaign, Illinois, October 2013)

Machine Learning Supreme Court Behavior, ReinventLaw Dubai 2012 Conference (Dubai, December 2012)

JLink without Java or Mathematica with .class Wolfram Technology Conference (Champaign, Illinois, Oct.2012)

A Look At Power in the American Electoral College : Applied Intermediate Mathematica, 11th International Mathematica Symposium (University College, London, June 2012)

Evolving Binary Decision Trees That Sound Like Law, Genetic Programming Theory and Practice Workshop 2012 (Center for the Study of Complex Systems, University of Michigan (May 2012) (Keynote speech)

Insurance Justice with Two Dimensional Underwriting, Wolfram Technology Conference (Champaign, Illinois, Oct. 2011)

Opening Computations in Law (Inaugural Workshop of the Program on Law and Computation, Houston, 2011)

Comparative Long Term Care Insurance (University of British Columbia Law School, 2010)

Simulating Insurance Justice (Wolfram Technology Conference, Champaign, Illinois October 2010)

The possibilities for improving the disgraceful state of legal data (Washington, D.C., September 2010)

Network Theory as Part of a Program on Law and Computation (Networks Group, Houston, 2010)

Insurance and Its Regulation : An initial project of the Program on Law and Computation, (Opening Keynote Address to the Tenth International Mathematica Symposium, Beijing July 2010)

The CLASS Act : What Went Wrong, Health Law Teacher's Conference (Austin, June 2010)

Celebrating 100 Demonstrations, University of Houston Law Center (April 2009)

Testimony on The Texas Windstorm Insurance Association, House Insurance Committee (Austin, 2009)

Insurance Regulation: The Case for a Trade, at Homeowners and Hurricanes : Modernizing the Insurance Marketplace (Austin, January 2008)

Demonstrating Insurance, American Association of Law Schools Insurance Law Section (New York, January 2008) (poster presentation)

Policy Primer : A Windstorm Insurance Crisis in Texas (Austin, September 2007)

Restricted Non - Cooperative Games, 7th International Conference on Computational Science (Beijing, May 2007)

Comencement Speaker, Loyola (New Orleans) Law School (New Orleans, May 19, 2006)

The Network Structure of the Law, Law in the Age of Networks: Implications of Network Science for Legal Analysis (University, Illinois, March 10, 2006)

The Network Structure of The Law, University of Texas School of Law *(Faculty Colloqiuum* November 2005*)*

The Network Structure of the Uniform Commercial Code: It's a Small World After All (Champaign, Illinois October 2005)

State of the City: Public Policy Forum, Houston Area Urban League (Houston, September 2005)

The Network Structure of Supreme Court Jurisprudence (Seventh International Mathematica Symposium, University of Western Australia, Perth Australia, August 2005)

Cellular Automata on Cubic Graphs (New Kind of Science Summer School, Brown University, July 2005)

How to Give An Interdisciplinary Talk at a Mathematica Conference (New Kind of Science Summer School, Brown University, July 2005)

How to Write Efficient Mathematica Code (New Kind of Science Summer School, Brown University, July 2005)

State of the City: Public Policy Forum, Houston Area Urban League (Houston, September 2004)

Using Mathematica's Global Optimization Technique to Understand Legal Rules: Towards a Better Liability Insurance Contract, to be presented at Wolfram Technical Conference, October 2004 (Champaign, IL)

Exploring Computational Irreducibility and the Predictability of Complex Systems Using Mathematica, presented at NKS2004 (Waltham, Massachusetts)

GCANs: Global Cellular Automaton Networks, presented at NKS2004 (Waltham, Massachusetts)

"Simpler Games: Using Cellular Automata to Model Social Interaction", Fifth Annual *Mathematica* Symposium (London 2003)

"Cellular Automata Extended to Regular Graphs: Applications to Social Sciences" NKS2003 Conference and Mini-course (Waltham, Massachusetts 2003)

“Foggy Game Theory,” Fouth International Mathematica Symposium (Tokyo 2001) (keynote address)

“The Texas-Aetna Settlement,” Houston Bar Association Health Law Section, (Houston 2001)

Speaker, "The Insurance / Genetic Testing Debate", Texas Association of Insurance Officers (San Antonio, July 2000)

"Visualizing Adverse Selection", American Society of Law and Medicine Health Law Teacher's Conference (Cleveland, June 2000)

"What Actuaries Can Contribute to the Debate About Genetic Testing Confidentiality", Southwester Actuaries Association Annual Meeting (Galveston, June 2000)

"Automata Containing Evolutionary Algorithms: Behavior and Learning Under Law", Third International *Mathematica* Symposium (Linz, Austria, August 1999)

"Using Mathematica To Teach Law and Economics", 1999 Conference for Law School Computing (Eugene, Oregon, June 1999)

"Teaching Health Law with Pending Legislation -- And A Little Technology Too," American Society of Law, Medicine & Ethics, 19th Annual Health Law Teachers' Conference (Houston, June 1998)

"Modeling Law", Second International Mathematica Symposium (Rovaniemi, Finland, July 1997)

"Voting Rights," Second Annual Frankel Lecture (Houston, January 1998) (moderator)

"Allocation of Insurance for Temporally Fuzzy Liability", American Association of Law Schools (San Antonio, Texas, January 1996)

“Tort Law and Economics Using Lottery Package and Simulated Annealing,” Advanced Mathematica Developer’s Conference (Champaign-Urbana, October 1995)

“Insurance Insolvency Issues in Professional Malpractice Actions,” 6th Annual Medical Malpractice Conference of the Texas Trial Lawyer’s Association (Houston, September, 1995)

"Visualizing Moral Hazard," Computing in Economics and Finance Workshop, International Federation of Automatic Control, (Amsterdam, The Netherlands 1994)

"Insurance Law" (Continuing Legal Education Program of University of Houston Law Foundation, 1994) (Moderator)

"Visualizing Moral Hazard", Advanced Mathematica Developers Conference (Champaign-Urbana, 1994)

Other Legal Experience

Retained as expert by City of Dallas regarding insurance and defense obligations; Retained as expert in lawsuit involving Texas Windstorm Insurance Association adjustment of claims; Retained as expert in case involving obligations of umbrella insurers and enforceability to policy exclusions; Retained as expert in arbitration regarding alternative dispute resolution agreement; Retained as expert for plaintiffs' in cases involving corporate owned life insurance; retained as consulting expert in Lance Armstrong Prize arbitration on the definition of insurance; testified at deposition as expert in Cannon Films v. Insurance Company of the State of Pennsylvania, Los Angeles Superior Court No. BC026466 regarding coordination of aviation and general liability insurance policies in coverage case arising out of multiple fatality helicopter crash occurring during filming of Delta Force II; testified at deposition as expert in P.T. Freeport Indonesia Co. v. Houston Casualty Co., Harris County No. 93-25010 regarding legality of claims adjustment practices following catastrophic Indonesian pipeline failure under business interruption policy; testified at deposition as expert in Beard v. Liberty Mutual Ins. Co., (S.D. Tex. No. H-93-2365) regarding insured's compliance with notice conditions in excess and primary liability policies; testified at deposition as expert in Robert V. Jones Corp. v. Mt. Hawley Insurance Co, on enforceability of "your work" exclusion; testified as an expert in Rhodes Design & Development Corp. v. RLI Insurance, on enforceability of "your work" exclusion. Testified at trial as expert in divorce dispute on value of life insurance policy prior to death of insured. Consulting expert on duty to settle in American Management Systems, Inc. and Federal Ins. Co. v. National Union Fire Ins. Co. of Pennsylvania, Cause No 3:00CV682BN. Consulting expert on duty to settle in Mississippi case involving conflict among primary and excess insurers. (Confidentiality agreement prevents elaboration). Consulting expert in cases involving statistical review of TWIA adjusting practices (2011).

Associate, Munger, Tolles & Olson, Los Angeles, California (1986-1990)

Associate, Williams & Connolly, Washington, D.C. (1984-86)

Judicial Law Clerk, Hon. Edward R. Becker, United States Court of Appeals for the Third Circuit (1983-84)

Summer Associate, McCutcheon, Doyle, Enerson & Brown, San Francisco, California (1982)

Summer Associate, Squire, Sanders & Dempsey, Washington, D.C. (1981)

Other Employment

Consultant, The Novim Group (summer 2013) (consultant on development of public domain software designed to create interactive open model of public defined benefit pension plans from both employee and employer perspectives)

Visiting Scholar, Wolfram Research, Champaign, Illinois (summer 1996)

Director of Analysis, Penn & Schoen Associates, New York, N.Y. (1979-80)

Active Bar Admissions

California, 1986-present

Miscellaneous

Technical Innovator Award, 2011, Wolfram Research; First Place, 2003 Mathematica Programming Competition, Mathematica Developers' Conference, Champaign, Illinois 2003 (problem involving contraction of point clusters in n-dimensional space; results) (available as *Mathematica*

notebook at http://library.wolfram.com/infocenter/Conferences/4829/ and reprinted in PDF format at http://www.law.uh.edu/faculty/schandler/scholarship/scholarship.htm); Honorable Mention, 2001 *Mathematica* Programming Competition, *Mathematica* Developers' Conference, Champaign, Illinois 2001 (problem involving Type B Eden Models) (available as *Mathematica* notebook at http://library.wolfram.com/infocenter/Conferences/4829/ and reprinted in PDF format at http://www.law.uh.edu/faculty/schandler/scholarship/scholarship.htm)

Married with three children (ages 25, 14 and 13)

Committee on Oversight and Government Reform
Witness Disclosure Requirement – "Truth in Testimony"
Required by House Rule XI, Clause 2(g)(5)

Name:

1. Please list any federal grants or contracts (including subgrants or subcontracts) you have received since October 1, 2011. Include the source and amount of each grant or contract.

NONE

2. Please list any entity you are testifying on behalf of and briefly describe your relationship with these entities.

Myself

3. Please list any federal grants or contracts (including subgrants or subcontracts) received since October 1, 2010, by the entity(ies) you listed above. Include the source and amount of each grant or contract.

NONE

I certify that the above information is true and correct.

Signature: Seth J. Chandler

Date: 6/16/14