TAXPAYERS’ RESPONSES TO PENALTIES: EVIDENCE FROM A TAXPAYER EXPERIMENT IN NEW ZEALAND

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Outline

1. Background & relevant literature
2. Research questions & hypotheses
3. Modelling responses to actual/perceived penalties
4. The experiment: Design & Results
5. Compliance conclusions
Background

_Slemrod (JEP, 2007, p.38):_

“There has been no compelling empirical evidence addressing how noncompliance is affected by the _penalty_ for detected evasion, as distinct from the _probability_ that a given act of noncompliance will be subject to punishment.”

**Questions:**

Does ‘Allingham-Sandmo _vs_ social norms’ debate extend to penalties?  
_or:_

Is evidence on responses to penalties consistent with the AS model?
Background - Related Literature

Slemrod et al. (1995)
- US taxpayers early and late filing of IRS tax returns appears inconsistent with simple utility-max.
  *Why?* - Decision to complete tax return ‘today’ based on stochastic opportunity cost of filing.

Lubell & Scholz (JAPS, 2001)
- introduction of penalties leads to less cooperation (compliance?) among experiment participants:
  “suggested that the increased deterrence motivation did not compensate for the changes higher penalties bring about in how people frame their decisions” (quoted in Slemrod, 2007, p.39).

Hallsworth et al. (2014)
- Distinguish liquidity-constrained and unconstrained taxpayers.
  Latter make rational time choice of when to pay a £1 of tax based on e.g. penalties, social norms, salience.
- Based on utility-max framework but no penalty-specific evidence.
Questions

*General question:* Do taxpayer responses to penalties and interest on unpaid tax conform to ‘crime & punishment’ model?

*Specific research questions:* “How important is knowledge of the tax penalty regime for taxpayer compliance?”

- does awareness of the *existence* of penalties matter?
- does the *size* of penalties make a difference?
- do compliance enforcement interventions affect *actual* payments or just *intentions* to pay?

⇒ Examine via penalties for late payment of New Zealand’s Goods & Service Tax (GST - *New Zealand’s VAT*)
NZ Penalty Regime

**NZ Penalty Regime**

- Late *filing* and late *payment* penalties at similar rates across taxes (PAYE, GST, FBT etc)
- Use-of-money interest (UOMI): 8.4% p.a.: $r = 0.084$

**GST Late Payment Penalties:**

1. 5% initial one-off ‘fixed’ penalty: $\phi = 0.05$
2. 1% per month ‘incremental’ penalty: $f = 0.127$ (annual)

- Incremental penalty ceases ($f = 0$) when in instalment arrangement

<table>
<thead>
<tr>
<th></th>
<th>Effective penalty</th>
<th>In Instalments: Effective penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effective penalty</strong></td>
<td>$(1 + \phi + f)(1 + r)$</td>
<td>$(1 + \phi)(1 + r)$</td>
</tr>
<tr>
<td><strong>Effective marginal penalty</strong></td>
<td>$(1 + f)(1 + r) + \phi r$</td>
<td>$(1 + r) + \phi r$</td>
</tr>
</tbody>
</table>

- Annual *effective* penalty rate: 27.6% in 2015 [max. 34.4% in 2007] or 13.8% when in instalments. (Marginal: 22.6% vs 8.8%)
Modelling Taxpayers’ Choices - 1

• Model tax payment (not declared tax) compliance: taxpayer, $j$, and tax authority agree on outstanding tax liability
• Two period model with individual decision: pay tax liability now versus delay till next period
• Penalty and interest regime: $f$, $\phi$, and $r$
• Each taxpayer has subjective discount rate, $\rho_j$
• Prefer payment option that maximises NPV of expected after-tax income over 2 periods (pre-tax incomes given) = minimise NPV of tax liability.
  [Consistent with C-D utility fn. $U = c_1 c_2^{\xi-1}$ where $\xi = (1 + \rho_j)$]
• 3rd payment option - instalment arrangement. Sets $f = 0$ if fraction, $\alpha_j$, of tax liability paid now, $(1 - \alpha_j)$ paid in period 2.
Modelling Taxpayers’ Choices - 2

- Delaying payment to period 2 involves:
  - *Probability of debt written-off* or otherwise reduced \( \Rightarrow \) perceived probability \( \pi_j \leq 1 \), that debt is fully repaid
  - *Marginal cost of non-compliance, \( c_j > 0 \)*, of avoiding payment till period 2. [can include non-pecuniary and ‘social norm’ costs e.g. social norms against delayed payment \( \Rightarrow \) increase \( c_j \).]

- Let \( \pi'_j = (\pi_j + c_j) \)

- NPV of tax liability (per $ of initial GST debt) for:
  
  Pay now (P) \hspace{2cm} Delay (N) \hspace{2cm} Instalments (I)

  \[
P = 1 \hspace{2cm} N = \frac{\pi'_j (1+\phi+f)(1+r)}{(1+\rho_j)} \hspace{2cm} I = \alpha_j + (1 - \alpha_j) \left\{ \frac{(1+\phi)(1+r)}{(1+\rho_j)} \right\}
  \]
Modelling Taxpayers’ Choices - 3

Solve for values of $\pi'_j$, $\rho_j$, and $\alpha_j$, where taxpayer is indifferent (where $N = P$, $N = I$, $P = I$)

Indifferent between all 3 options at $\rho^*_j$ and $\pi'^*_j$:

$$\pi'^*_j = \frac{(1 + \phi)}{(1 + \phi + f)}$$

$$\rho^*_j = (1 + \phi)(1 + r) - 1 \geq 0$$

Note: values independent of $\alpha_j$

$$\pi'^* = 0.892$$

$$\rho^* = 0.138$$
Loci of equal NPVs

\[
\frac{(1+\phi)}{(1+\phi + f)} = \pi^* \quad \text{N preferred}
\]

\[
\frac{(1+\phi)(1+r) - 1}{(1+\phi + f)} = \pi^* \quad \text{P preferred}
\]
Loci of equal NPVs

\[
\frac{(1+\phi)^\pi}{(1+\phi+f)\pi^*} = (1+\phi)(1+r) - 1
\]

- **N = I** locus
- **N = P** locus
Loci of equal NPVs

Expect fully informed indebted taxpayers here before instalment offer

\[ \frac{(1+\phi)}{(1+\phi +f)} = \pi^* \]

\[ = (1+\phi)(1+r) - 1 \]

\[ \rho^* = 0.138 \text{ and } \pi'^* = 0.892 \]
Modelling Penalty Perceptions - 1

**Question:** How is analysis affected if taxpayers misperceive penalties?

Hypothesise penalty perceptions for 3 experimental groups as:

- **A**: no penalties: \( \phi = f = 0 \); & no instalment reduction (reduced ‘time penalties’)
- **B**: unspecified penalty \((0 \leq \phi_B \leq \phi)\) without instalments; \(\phi_B = 0\) with instalments
- **C**: specific \(\phi > 0, f > 0\) without instalments; \(\phi > 0, f = 0\) with instalments

<table>
<thead>
<tr>
<th>Groups:</th>
<th>(\pi^*)</th>
<th>(\rho^*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A :</td>
<td>1</td>
<td>(r)</td>
</tr>
<tr>
<td>B :</td>
<td>(\frac{1}{1 + \phi_B})</td>
<td>(r)</td>
</tr>
<tr>
<td>C :</td>
<td>(\frac{1 + \phi}{1 + \phi + f})</td>
<td>((1 + r)(1 + \phi) - 1)</td>
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</table>
Modelling Penalty Perceptions - 2
Modelling Penalty Perceptions - 2
4. The GST Experiment
Experiment Questions

1. Does being in penalty information/awareness group A, B or C make a difference to payment decision?

2. What characteristics correlate with $\pi_j$ &/or $\rho_j \Rightarrow$ affect propensity to enter instalments or ‘pay now’?

3. How well do actual repayment outcomes (6-7 months later) align with experiment responses?
The Sample

- **Taxpayers:** ~ 4,400 with GST debts for ‘60-90 days’.
- **Randomly selected** 3 × 333 taxpayers (groups A, B, C) for phone contact with 3 alternative ‘scripts’; in August 2014.
- **Script:** different penalty information/reminder given before offer of instalment arrangement with future penalties turned off.
- **BAU:** mixture of IR-initiated, debtor-initiated, & no contact.
- **A,B,C groups:** exclude some debtors, e.g. if debt > $1m.
The Script

IR initiate phone call. First seek payment in full. If no success, then:

A: “Would you like to enter into an instalment arrangement”.  
No mention of penalties

B: “Did you know that you are being charged penalties on your debt to IR? If you enter into an instalment arrangement, we’ll stop your penalties.”

C: “Did you know that you are being charged penalties on your debt to IR? If you enter into an instalment arrangement, we’ll stop penalties of 1% per month.”
The Responses
Testing Influences on Payment Choices

Test group membership and risk factors in multinomial logit model

- Multinomial logit:
  - analyse discrete experiment response choices
  - compare marginal effects or ‘relative risk ratios’ (RRRs)
  - is $\text{RRR} >$ or $< 1$?
  - RRRs relative to default of ‘no contact’ taxpayers

Test impact of variables likely to affect payment choice via $\pi_j$ & $\rho_j$

- We are interested in:

\[
\left( \frac{dPr(I)}{dX} \right) = \left( \frac{dPr(I)}{d\pi_j} \right) \left( \frac{d\pi_j}{dX} \right) + \left( \frac{dPr(I)}{d\rho_j} \right) \left( \frac{d\rho_j}{dX} \right) \quad [\text{Similarly for } \frac{dPr(P)}{dX}]
\]

where $X$ is a vector of exogenous taxpayer characteristics ($X$ includes groups A, B, C).
### Payment Choice Probabilities

<table>
<thead>
<tr>
<th>Partial derivative</th>
<th>Correl. With $\pi_j'$</th>
<th>Correl. With $\rho_j'$</th>
<th>$Pr(I), Pr(P)$ Expected sign</th>
</tr>
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<tbody>
<tr>
<td><strong>Groups: A</strong></td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>+</td>
<td>+[$\rho^*$]</td>
<td>+</td>
</tr>
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<thead>
<tr>
<th></th>
<th>$dPr(I)/d\pi_j'$</th>
<th>$dPr(P)/d\pi_j'$</th>
<th>$dPr(I)/d\rho_j$</th>
<th>$dPr(P)/d\rho_j$</th>
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<tr>
<td><strong>Expected sign</strong></td>
<td>$\geq 0$</td>
<td>$\geq 0$</td>
<td>$\geq 0$</td>
<td>$&lt; 0$</td>
</tr>
</tbody>
</table>

$Pr(I) =$ probability of Instalment choice  
$Pr(P) =$ probability of Pay Now choice
Experiment Results

Does contact &/or offer of penalty cessation make a difference to payment choices? (Based on multinomial logit model)

[Bar chart showing probability of selecting choice (logit model) with red bar indicating statistically significant difference from BAU]
Experiment Results

Does contact &/or offer of penalty cessation make a difference to payment choices? (Based on multinomial logit model)

Red bar = statistically significant difference from BAU
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<td><strong>B</strong></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>+</td>
<td>$+[\rho^*]$</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Current debt</strong></td>
<td>+</td>
<td>$-$</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Past debt &amp;/or write-off</strong></td>
<td>$-$</td>
<td>$-$</td>
<td>$-$</td>
<td></td>
</tr>
<tr>
<td><strong>Past Instalment default</strong></td>
<td>$-$ ($&amp; \alpha_j$)</td>
<td>$+$</td>
<td>$-$</td>
<td></td>
</tr>
<tr>
<td><strong>IR contact persistence</strong></td>
<td>$\uparrow$</td>
<td></td>
<td>$+$</td>
<td></td>
</tr>
<tr>
<td><strong>Size: no of employees</strong></td>
<td>$?$</td>
<td>$-$</td>
<td>$?$</td>
<td>$[+?]$</td>
</tr>
<tr>
<td><strong>income or profit</strong></td>
<td>$?$</td>
<td>$-$</td>
<td></td>
<td>$[+?]$</td>
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What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

- Group A
- Group B
- Group C
- GST Debt ($ Grp)
- ALL Debts (No.; Grp)
- Prev. GST Debt (No.; Grp)
- Previous Debt write-offs (No.)
- Tax returns outstanding (No.)
- Prev. Default on Instalment ($)
- IR contact persistance (No.)
- Size: Employees (0,1)

Instalments vs. Pay now
What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

- Group A
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- GST Debt (Grp)
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Instalments

Pay now
What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

- **Group A**
- **Group B**
- **Group C**

- **GST Debt ($ Grp)**
- **ALL Debts (No.; Grp)**

- **Prev. GST Debt (No.; Grp)**
- **Previous Debt write-offs (No.)**
- **Tax returns outstanding (No.)**
- **Prev. Default on Instalment ($)**
- **IR contact persistance (No.)**
- **Size: Employees (0,1)**

The diagrams illustrate the relative risk ratios for different factors influencing payment choices, with positive (+) and negative (-) impacts indicated.
What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

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- ALL Debts (No.; Grp)
- Prev. GST Debt (No.; Grp)
- Previous Debt write-offs (No.)
- Tax returns outstanding (No.)
- Prev. Default on Instalment ($) (Grp)
- IR contact persistance (No.)
- Size: Employees (0,1)

- Instalments
- Pay now

0 0.5 1 1.5 2 2.5 3 3.5

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What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

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- Tax returns outstanding (No.)
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- IR contact persistance (No.)
- Size: Employees (0,1)

Instalments vs. Pay now

[Bar charts showing relative risk ratios for each factor, with positive (+) and negative (-) impacts indicated.]
What else influences payment choices?

Impact on debt payment choice: Instalments (Relative risk ratios)

- Group A
- Group B
- Group C
- GST Debt ($ Grp)
- ALL Debts (No.; Grp)
- Prev. GST Debt (No.; Grp)
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- Prev. Default on Instalment ($)
- IR contact persistence (No.)
- Size: Employees (0,1)

Instalments

- Pay now

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Does the penalty ‘punishment’ really work?

Of those who agreed to ‘pay now’ in Aug. 2014, what % in instalments in March 2015?
Does the penalty ‘punishment’ really work?

Of those who agreed to instalments in Aug. 2014, what % actually in instalments in March 2015?
Does the penalty ‘punishment’ *really* work?

Unresolved cases:

- **Percentage 'Case Open' (March 2015):**
  - BAU: 46%
  - A: 49%
  - B: 49%
  - C: 57%

- **Agreed to Enter Instalments (Aug. 2014):**
  - BAU: 15%
  - A: 19%
  - B: 25%
  - C: 8%
4. Conclusions

1. Does evidence on taxpayer responses to penalties conform to a ‘crime and punishment’ model?
   
   Yes; consistent with, but no ‘norm’ motivations tested

2. Phone contact encourages taxpayers to make decisions – including to ‘pay now’ and enter instalments

3. Specific *magnitude* of incremental penalty (and penalty reduction) \(\Rightarrow\) more choose instalment – and ‘pay now’ – options

4. *But* past instalment *defaulters* more likely to agree to instalments

5. Less clear indebted taxpayers follow-through on initial commitments

6. *Persistence* by the revenue authority helps bring ‘closure’ (not necessarily = greater compliance)
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