Ricardian Equivalence and Consumption Response to Government Transfers: Behavioral Motives Meet Savers and Spenders in the Real World

Wei-Kang Wong[1]

Abstract

This paper surveyed recipients of one-off government transfers in Singapore to investigate to what extent Ricardian equivalence and other behavioral motives might have affected their consumption response. It also investigates how the recipients' personal characteristics might have affected their consumption response and the appeal of different motives. In the sample surveyed, savers were mostly motivated by precautionary saving, followed by Ricardian equivalence, while spenders were mainly driven by rule of thumb and present bias. The bequest motive turned out to be unimportant. Older, better educated, and economically better-off individuals facing no liquidity constraint were more likely to be savers.

JEL Codes: D91, E21, E62, H31

Keywords: Ricardian Equivalence, Mental Accounting, Precautionary Savings, Present Bias, Rule-of-Thumb Consumers

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Introduction

On 17 February 2006, the Singapore government announced a number of one-off transfers and rebates to its citizens in Financial Year 2006 under the so-called "Progress Package."[2] The total package amounted to S$2.6 billion, most of which was distributed as cash transfers.[3] Following survey studies on price stickiness (Blinder, 1994), wage stickiness (Bewley, 1998) and inflation aversion (Shiller, 1996), this paper uses survey to empirically investigate the extent to which competing behavioral motives of Ricardian equivalence and non-equivalence might have influenced the consumption and saving decisions of real-world decision makers with regard to these transfers.

Policy Background

While the Progress Package made transfers to every adult Singaporean, it made larger transfers to the less well-off to achieve specific social objectives. The package contained six different schemes, of which three – Growth Dividends, National Service bonus and Workfare bonus – involved cash transfers.[4] The survey focused on these three transfers, which accounted for 78% of the total value of the package.

A. Growth Dividends

This scheme gave all citizens above the age of 21 a one-off transfer ranging from S$200 to S$800, depending on their income and wealth as measured by their

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[2] See http://www.mof.gov.sg/budget_2006/index.html.
[3] The average exchange rate during 2006 was S$1=US$0.63.
[4] See http://www.progress.gov.sg for more details. For example, a family of four could receive up to S$3,780 in cash under the Progress Package. The median household income in year 2005 was S$3,830. In general, the transfers were given out on 1 May 2006. The three other schemes that did not involve cash transfers were utilities and rental rebates, top-ups of social security funds and accounts, and subsidies to public schools and self-help groups.

annual assessable income and the estimated annual rent of their home (as assessed by the tax authority). Specifically, it made larger transfers to lower income individuals who lived in homes with lower rental value, as shown in the table below.[5] These transfers were expected to amount to S$1.43bn.

	Estimated Annual Rent of Home ≤ $6000	$6000 < Estimated Annual Rent of Home ≤ $10000	Estimated Annual Rent of Home > $10000
Annual Assessable Income ≤ $24000	$800	$600	$200
Annual Assessable Income > $24000	$600	$400	

B. Workfare Bonus

This scheme made cash transfers to older low-wage workers to reward regular and productive work.[6] To qualify, the workers must be at least forty years old, had an average monthly income of S$1,500 or less, lived in a property with an estimated annual rent of S$10,000 or less, and had worked for at least six continuous months in the calendar year.[7] The actual amount received would depend on the worker's average monthly income, as shown in the following table. These transfers were expected to amount to S$0.4bn.

Average Monthly Income	Amount of Workfare Bonus
[0, $400]	1.5 months salary with a minimum bonus of $75
($400, $900]	$600
($900, $1200]	$400
($1200, $1500]	$200

[5] An annual assessable income of S$24,000 was chosen as the cutoff because this was roughly the median wage. Generally, an annual value of home of S$6000 would include the 1, 2, 3, and 4-room Housing and Development Board (HDB) flats, which are public flats built by HDB, a statutory board that is responsible for the building and maintenance of public housing estates in Singapore. It is worth noting that more than 80% of the Singaporean lives in HDB flats that they own (not rented).

[6] 90% of the bonus would be paid in cash. The remaining 10% of the bonus would be credited into the recipients' Medisave account to help build up their savings to take care of their healthcare needs.

[7] A monthly income of S$1,500 corresponded roughly to the 30th percentile of the income distribution. An eligible worker could receive Workfare Bonus twice: eligible workers who had worked continuously for at least six months in 2005 would receive a cash transfer on 1 May 2006. Similarly, if they had worked for at least six consecutive months in 2006, they would receive another cash transfer on 1 May 2007.

C. 40th Anniversary National Service (NS) Bonus

This scheme made cash transfers to all National Servicemen who were serving or had served their national service to recognize their contributions to national defense.[8] The actual amount received would depend on the recipient's national service status, as shown in the table below. These transfers were expected to amount to S$0.2bn.

National Service (NS) Status	Amount
Full-time national servicemen (NSFs)	$100
Operationally ready NSmen who have not completed their Operationally Ready National Service (ORNS) training cycle[9]	$400
NSmen who have completed their ORNS training cycle NSmen who are above statutory age (i.e. 40 years old for non-officers and 50 years old for officers)	

Literature Review

The Ricardian equivalence proposition states that holding constant current and future government spending, tax cuts or government transfers simply change the timing of taxation and shift the tax burden to the future, leaving individuals' lifetime budget constraint and hence consumption unchanged.[10]

There are many reasons why this standard theoretical benchmark may be violated. First, with population turnover and the entry of new households, some of the future tax burden will be borne by new households who are not alive at the time of the transfers.[11] Thus, the transfers increase the lifetime resources of the individuals who are currently living, thereby raising their consumption. However, Barro (1974) argues that if individuals care about the welfare of their descendants, instead of

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[8] National service is compulsory for all male Singaporeans.
[9] For details, see http://www.mindef.gov.sg/imindef/mindef_websites/topics/nsmen/home.html
[10] See Ricciuti (2003) for a review of literature on Ricardian equivalence. See David Romer's (2006) *Advanced Macroeconomics* for the standard textbook treatment of this topic.
[11] The arguments apply equally to a tax cut and a government transfer. However, this paper focuses on the case of a transfer henceforth.

consuming the transfers, they may simply save them as bequests for their descendants to pay for the higher future tax liability.[12]

Second, there may be liquidity or borrowing constraints. With tax cuts or transfers, the government is effectively borrowing on the household's behalf. If household either cannot borrow on its own or can only borrow at a higher interest rate than the government, then the transfers relax the household's budget constraint, making higher consumption feasible (Tobin, 1980; Hubbard and Judd, 1986).[13]

Third, Ricardian equivalence may also be violated because of the non lump-sum nature of taxes (Barsky, Mankiw and Zeldes, 1986). Many households have a small amount of saving that they use in the event of sharp falls in income or emergency spending needs, i.e., they exhibit buffer-stock saving behavior (Deaton, 1991). This type of saving can be explained by a combination of high discount rate and precautionary saving (Carroll, 1992 and 1997).[14] With taxes as a function of income, a combination of government transfers today and higher taxes in the future raises a household's lifetime after-tax income if its future income is low, and vice versa, thereby reducing the variance of its after tax incomes. As a result, precautionary saving falls; the household indulges its high discount rate and consumes the transfers.[15] However, the motive of precautionary saving can also cause the household to save the transfers if the transfers are given in times of greater economic uncertainty, just when the household expects greater variance in its future income.

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[12] Nevertheless, these intergenerational links would break down for individuals with no offspring (Tobin and Buiter, 1980).

[13] However, take into account the households' higher tax liabilities in the future due to the bond issue, rational lenders should reduce the amount they are willing to lend. In some cases, the amount of lending falls one-for-one with government bond issues and Ricardian equivalence may hold even with liquidity constraint (Hayashi, 1987; Yotsuzuka, 1987).

[14] Precautionary saving can arise due to the combination of a positive third derivative of the utility function and uncertainty about future income (Leland, 1968). More uncertainty raises the expected marginal utility for a given level of expected consumption, giving more incentive to save.

[15] In Singapore, the individual taxpayers face two main tax burdens: income tax (which depends on income) and the Goods and Services Tax or GST (which depends on expenditure).

Whether precautionary saving causes the household to save or spend the transfers is an empirical question that this paper investigates.

Fourth, consumers may not re-optimize their saving or consumption plans in the face of small income shocks, due for example to government transfers or tax cuts. This is because having optimized their lifetime consumption plans, the utility foregone from not re-optimizing in the face of a small shock may be even smaller (only second-order in magnitude) because the first order term from utility maximization is zero in the neighborhood of the optimal plans. Thus, such behaviors are near rational (Akerlof and Yellen, 1985). However, because the utility foregone is very small, even a small cost may prevent a fully rational and utility-maximizing consumer from re-optimizing.[16]

Near rationality can explain why the permanent-income hypothesis describes consumption behavior well for predictable movements in income that are large and regular (Paxson, 1993; Browning and Collado, 2001; Hsieh, 2003), whereas small and irregular predictable changes in income are associated with substantial predictable changes in consumption (for example, Shea (1995), Shapiro and Slemrod (1995), Parker (1999), and Souleles (1999)). This is because for large and regular changes in income, the utility lost from repeated failures to re-optimize is more likely to exceed the optimization cost than for small and irregular changes in income.

However, not re-optimizing can mean either sticky (or unchanged) consumption – which leads to Ricardian equivalence with tax cuts or transfers – or sticky saving – which causes current consumption to depend on current income. This paper argues that the latter is the more likely outcome. Campbell and Mankiw (1989) show that as long as there are *some* rule-of-thumb consumers who spend out of their

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[16] In reality, finding the optimal level of consumption often involves complex calculations and a great deal of uncertainty that is difficult to quantify.

current income, Ricardian equivalence will be violated.[17]   They estimate that about half of the income goes to rule-of-thumb consumers who simply spend their current income. Such a rule may be driven by mental accounting, where there is a hierarchy of money locations depending on how tempting it is for a household to spend the money in each, resulting in higher marginal propensity to consume out of cash or check receipts and lower propensity to consume out of planned savings, home equity, and future income (Shefrin and Thaler, 1988). It may also arise from the types of income that the consumers think they *should* or *should not* indulge in spending, say because of norms on prudent financial planning (Akerlof, 2007).[18]

Excess sensitivity of consumption to current income may also arise from the saliency of current consumption, leading to present bias and self-control problem (Laibson, 1997). Even if the consumers fully anticipate the future increase in tax burden and are fully aware of their self-control problem, the consumers will still spend the transfers if the cash transfers relax their pre-imposed liquidity constraint aimed at self-control. Excess sensitivity may also arise from myopia. The myopic consumers may feel wealthier and consume more because they fail to foresee the future increase in tax burden.

Methodology and Results

A number of papers have used survey to empirically distinguish behavioral motives that may have driven price stickiness (Blinder, 1994), wage stickiness

[17] Mankiw (2000) emphasizes that there are various ways to view the rule-of-thumb behavior. For example, it may also reflect the way people process information to form their estimate of permanent income.

[18] As Akerlof (2007, p.16) explains, "any model of mental accounting can be translated into a model of norms: just replace the rules of mental accounting as the norms that people think they should follow." While giving the same outcome, the difference matters to the persistence of rule-of-thumb behavior because mental accounting tends to be thought of as a heuristic for quick decisions (in light of frictions such as optimization cost and bounded rationality) that results in cognitive error and therefore can be corrected over time because people are smart, but norms are embedded in the preferences that results in loss of utility from its deviation and can persist even in the absence of frictions.

(Bewley, 1998), and inflation aversion (Shiller, 1996). Their methodology is based on the belief that even though a person may not be cognitively conscious of the chain of reasoning that he uses to arrive at his decision or be able to give an intellectually coherent explanation of his behavior, if the idea is explained to him in simple terms, he should recognize and agree with it. Sharing this belief, this paper extends the methodology to the study of Ricardian equivalence.

The survey was anonymous. It contained three short sections. Section A collected some personal characteristics, including the respondents' age (in range), sex, educational attainment, income (in range), marital status, type of dwelling, and the amount of cash transfers they had received under each scheme. Section B first asked the respondents whether they had spent the transfers (see Table 1). It then summarized eight standard textbook theories of Ricardian equivalence and non-equivalence in plain English (see Table 2), and asked the respondents to choose the statements that best described how they felt about the transfers.[19] The respondents could, and sometimes did, choose more than one statements. Finally, this section explored mental accounting further with a few questions (see Table 3). Section C elicited the respondents' expectations on future government taxes and spending given the transfers.[20] The survey was presented in hardcopy to people on the streets during late February to late March 2007, roughly one year after the transfers were

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[19] See, for example, David Romer's (2006) *Advanced Macroeconomics* for a standard textbook treatment. The list of explanations appears to be quite exhaustive: only 3.4% of the respondents could not find any statements to describe how they felt about the transfers; they selected "others".

[20] Specifically, the respondents were asked to answer two questions:
1. Because of the Progress Package, taxes will probably be _____ in the future.
    □ lower   □ unchanged   □ higher   □ Don't know
2. Because of the Progress Package, government spending will probably be _____ in the future.
    □ lower   □ unchanged   □ higher   □ Don't know

announced.[21] All 495 respondents were adult Singaporeans who had received some cash transfers.[22]

Most respondents reported that they had either spent the transfers or planned to do so in the near future.[23] Table 1 shows that out of 495 respondents, 320 persons (64.6% of total) had already spent the transfers. Among 175 respondents who had not spent the transfers, 58 persons (36.3% of them) planned to spend them soon. In other words, 378 persons (76.4% of total) reported having spent the transfers or planning to do so soon.[24] The remaining 23.6% reported that they had not spent the transfers and they had no plan to spend them in the near future. Most were not liquidity constrained: 86.7% of the respondents reported that they had some savings at the time of the transfers while 81.4% reported that their savings were more than the amount of transfers they received.

To investigate to what extent competing behavioral motives might have affected the propensity to spend, Table 4 regresses the respondents' self-reported spending decision on their chosen explanations and reports the odds ratios estimated using maximum likelihood logistic regression. The dependent variable is a dummy

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[21] See the Appendix for the actual survey form (available upon request).

[22] Out of the 495 survey forms collected, 190 were collected from different HDB neighborhoods (the public housing estates where more than 80% of Singaporeans live), 184 were collected at Raffles Place (the financial district in Singapore), and 121 were collected at Orchard Road (the popular shopping district in Singapore). The responses collected from different locations are pooled because they yield similar conclusions.

[23] The survey did not distinguish between those who had spent all or part of the transfers. The focus was on the tendency to consume versus the tendency to save.

[24] That most people would spend the transfers was not unexpected from past experience. The Singapore government had previously made transfers using the New Singapore Shares (NSS) in 2001 to help the lower income group tide over the economic downturn at the time and the Economic Restructuring Shares (ERS) in 2003 to offset the increase in the Goods and Services Tax (from 3% to 5%) that year. Under the NSS and ERS, the transfers were in the form of shares, which would earn annual dividends (in the form of bonus shares) for five years after their issuance if the recipients did not encash their shares. The annual dividends were 3% plus the real GDP growth rate of the preceding calendar year, with a guarantee of at least 3%. However, many chose to encash their shares early instead of waiting for the dividends, despite the attractive dividend yields that were significantly above the market interest rates. In fact, the government cited the widespread encashment as the reason for giving the Progress Package in the form of cash checks so that the transfers could be collected immediately upon allotment. For more details on the NSS and ERS, see http://www.ers.org.sg/.

variable that equals one for spender (who reported having spent the transfers or planning to do so soon), and zero otherwise. The independent variables are seven dummy variables, each indicating whether a particular explanation was chosen. Although there were relatively few instances of liquidity constraint in the sample, transfers that relaxed the liquidity constraints were always spent. In other words, being liquidity constrained predicted spending behavior perfectly. Thus, the 35 spenders who chose liquidity constraint and the dummy for liquidity constraint have been dropped from the regression.

All estimates are statistically significant at the 10% level except the effect of bequest motive, which also turns out to be the smallest in magnitude. Three motives reduce the probability of spending the transfers. Precautionary saving has the largest negative effect on the propensity to spend, followed by Ricardian equivalence and the bequest motive. The effects of precautionary saving and Ricardian equivalence are statistically significant at the 1% level and 5% level respectively. Four motives raise the probability of spending the transfers. It turns out that present bias has the largest positive effect on the propensity to spend, followed by rule of thumb, the entry of new households, and non lump-sum taxes respectively. The effects of present bias and rule of thumb are both statistically significant at the 1% level, whereas the effects of entry of new households and non lump-sum taxes are statistically significant at the 10% level and 5% level respectively. Overall, precautionary saving, present bias, and rule of thumb appear to be the most economically and statistically significant motives in the saving and consumption decisions of transfer recipients.

Thaler (1999) proposes that with mental accounting, funds to spend are labeled both as flows (regular income versus windfalls) and as stocks (saving, home equity, pension wealth, etc) with different marginal propensity to consume from each.

Expenditures are also grouped into categories and spending is sometimes constrained by implicit or explicit budgets, resulting in non-fungibility and non-neutrality. Table 3 reports the results from two additional survey questions that investigate this proposition further.[25] There is some evidence for non-fungibility and non-neutrality due to mental accounting: 30.2% of the respondents agreed that they had spent the transfers on things that they would not otherwise spend on had they not received the transfers. Furthermore, 29.1% disagreed or strongly disagreed that if they had received the same amount of money from their salary, they would have spent it in the same way as they had spent the transfers.

Finally, Table 5 regresses the respondents' spending decision and choice of explanations on their personal characteristics.[26] Column (1) investigates how the respondents' personal characteristics might have affected their consumption decisions. The dependent variable is a dummy variable that equals one for spender, and zero otherwise. Columns (2) to (9) explore how the respondents' personal characteristics might have affected their consumption decision through the appeal of different motives. The dependent variable in each column is a dummy variable that equals one if a particular explanation was chosen, and zero otherwise. The estimates reported are the odds ratios from maximum likelihood logistic regressions. All regressions control for the respondents' budgetary expectations by including a dummy for the Ricardian

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[25] These questions were only presented to the respondents after they had selected the statements that best described how they felt about the transfers so that these questions would not affect their choice of the statements.

[26] For details on the categories used in the survey, please refer to the survey form in the appendix. Age group ranges between "1" to "9", where a higher value indicate older respondent: "1" corresponds to those aged between 21-25, "2" to those aged between 26-30, etc. Educational attainment ranges between "1" to "8", where a higher value indicates higher educational attainment and years of schooling: "1" corresponds to those with less than primary education, "2" to those with primary education, etc. Monthly income ranges between "1" to "11", where a higher value indicates higher income: "1" corresponds to those who earned less than SGD1,000 in year 2005, "2" to those who earned between SGD1,000 to 1,999, etc. Residential type ranges from "1" to "9", where higher value generally indicates more expensive residential unit: "1" corresponds to one-room public flat, "2" corresponds to two-room public flat, etc. Values "1" to "7" indicate government-built public housing and values "8" to "9" indicate private housing. Those who chose "Others" as residential unit is assigned a missing value.

expectations – the expectations that taxes would be higher because of the transfers – and a dummy for those who answered that they did not know how taxes and government spending might change because of these transfers.

The estimates in Column (1) suggest that older, more educated, higher income individuals dwelling in more expensive residences were less likely to spend the transfers. The age effect is only marginally statistically significant at the 10% level, whereas education, income and dwelling type are statistically significant at the 5% level. Female and married persons were more likely to spend the transfers but the effects are not statistically significant at the conventional levels. Both budgetary expectations reduced the propensity to spend the transfers but the effects are not statistically significant at the conventional levels. In fact, the estimate for those who expected taxes to be higher appears to be no different from the estimate for those who reported not knowing the budgetary implications of these transfers.

The estimates in Columns (2), (6) and (9) suggest that older transfer recipients were more likely to choose Ricardian equivalence and non lump-sum taxes to describe how they felt about the transfers (both effects are statistically significant at the 10% level), but they were less likely to choose rule of thumb (the effect is statistically significant at the 1% level). The strong appeal of Ricardian equivalence and the weak appeal of rule of thumb to older recipients reduced their propensity to spend, whereas the strong appeal of non lump-sum taxes had the opposite effect.[27] Nevertheless, the net effect is that older recipients were less likely to spend the transfers, as noted above based on the estimate in Column (1).

Generally, there is little evidence that men and women differed in their spending decisions or motivations except that women seemed marginally less likely to

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[27] They thought that by the time the government finally increased the taxes to finance the transfer, their tax burden would be lower because they would be earning (thus paying less income taxes) and spending less (thus paying less Goods and Services Tax).

choose the entry of new households to explain their behavior and the effect is marginally statistically significant at the 10% level, as Column (5) suggests.

The more educated individuals were less likely to spend the transfers because they were much less likely to be liquidity constrained and the effect is statistically significant at the 1% level, as Column (4) suggests. However, educational attainment has no statistically significant effect on the appeal of the other behavioral motives such as Ricardian equivalence, rule of thumb, or present bias.

As noted above, a higher income reduced the propensity of spending the transfers significantly. Nevertheless, income level has no statistically significant effect on the appeal of any of the motives.

Naturally, married couples were much more concerned with bequest than singles. It turns out that they were also less likely to be liquidity constrained. Both effects are statistically significant at the 5% level.

Respondents residing in more expensive types of dwelling were presumably wealthier. It turns out that they were marginally more likely to be affected by present bias (the effect is only statistically significant at the 10% level) and less likely to be affected by rule of thumb (the effect is highly statistically significant at the 1% level). Nevertheless, the net effect is that they were significantly less likely to spend the transfers.

As expected, respondents with the Ricardian expectations – those who expected taxes to be higher because of the transfers – were more likely to choose Ricardian equivalence and the effect is statistically significant at the 5% level. However, it turns out that they were also more likely to choose present bias and the effect is statistically significant at the 10% level. The net effect is that they were not significantly more likely to save the transfers. In comparison, respondents who

reported to be clueless about the budgetary implications of the transfers did not find any of the explanations to be particularly appealing.

Finally, despite its overwhelming popularity, it is worth pointing out that the appeal of precautionary saving is not significantly correlated with any of the personal characteristics included. This finding suggests that precautionary saving may be an appealing motive that transcends personal characteristics.

Conclusion

Using survey responses to a number of real one-off transfers by the Singapore government, this paper empirically investigates to what extent competing motives of Ricardian equivalence and non-equivalence might have affected the propensity to spend the transfers, and how the relative appeal of these motives might be related to the personal characteristics of transfer recipients. It turns out that the most economically and statistically significant motive that promotes saving is precautionary saving, whereas those that drive consumption are present bias and rule of thumb. It is possible that the relative appeal of different motives and the propensity to consume may be sensitive to the specific context of government policy and the larger economic environment. Investigating the robustness of results reported here to other episodes of government transfers or tax cuts is a natural next step.

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Table 1: Evidence on Spending and Liquidity Constraint

Question Number	Question	Number "Yes"	Percent "Yes"
B1(i)	Have you spent the Progress Package?	320	64.6%
B1(ii)	If you have not, do you plan to spend it in the near future?	58	36.3%
B2	Did you have any savings when you received the Progress Package?	429	86.7%
B3	At that time, were your savings more than the amount you received under the Progress Package?	403	81.4%

Notes: The percentage with a "yes" response in the last column is calculated as a percentage among those responded to that particular question.

Table 2: Behavioral Motives Tested and Brief Descriptions Presented to the Respondents

Underlying Theory	Brief Description Presented to the Respondents
Ricardian Equivalence	I will probably have to pay more taxes in the future because of the Progress Package. So I saved it for the future.
Bequest Motive	The future generations will probably have to pay more taxes because of the Progress Package. But not for me. But I am worried for my sons and daughters. So I saved it for them.
Liquidity Constraints	I spent it because I have already spent all my money. If I could borrow some money, I would have borrowed it and spent it.
Entry of New Households	The future generations will probably have to pay more taxes because of the Progress Package. But not for me. So I do not worry about it and I spent it.
Non Lump-sum Taxes	Other people may have to pay more taxes in the future because of the Progress Package. But not for me. My tax burden will be lower in the future because I will be earning less or spending less when that happens.[28]
Precautionary Savings	I do not know what my taxes will be in the future. But with so much uncertainty, I saved it for the rainy days.
Present-Bias	I will probably have to pay more taxes in the future because of the Progress Package. But I do not worry about the future. I spent it while I could.
Rule of Thumb	I do not know what my taxes will be in the future. As a general rule, I just spend whatever I receive in cash or in check, like the Progress Package. But I try not to touch my savings.
Others	Others

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[28] In Singapore, two main tax burdens on the individuals are income tax (which depends on income) and the Goods and Services Tax (i.e., GST, which depends on expenditure).

Table 3: Further Evidence on Mental Accounting

B6	Percent "Yes"
Did you spend it on things that you would not otherwise spend on had you not received the progress package?	30.2%

B7: Do you agree with the following statement?	Percent "No"
"If I had not received the Progress Package, but if I had instead received the same amount of money from my salary, I would have used the money in exactly the same way as I had used the Progress Package"	29.1%

Note: Percent "No" refers to the percentage of respondents who answered "Strongly Disagree" or "Disagree."

Table 4: The Effects of Different Motives on Actual Behavior

	Dummy for Spender
Dummy for Ricardian Equivalence	0.44
	[0.14]**
Dummy for Bequest Motive	0.6
	[0.25]
Dummy for Entry of New Households	8.7
	[9.81]*
Dummy for Non Lump-sum Taxes	5.89
	[4.26]**
Dummy for Precautionary Saving	0.31
	[0.09]***
Dummy for Present Bias	30.23
	[32.68]***
Dummy for Rule-of-Thumb	14.39
	[6.80]***
N	460

Notes: The dummy for liquidity constraint and the 35 respondents who chose liquidity constraint are dropped because they predict spending behavior perfectly.

This table reports the odds ratios. If the odds ratio is greater than one, then it suggests that an explanatory variable raises the probability of spending, vice versa.

Robust standard errors are in the brackets. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Table 5: Logistic Regression of Spending Decision and Motivations on Individual Characteristics

Dependent Variable = Dummy for Spending Decision and Motivations

	[1] Spender	[2] Ricardian Equivalence	[3] Bequest Motive	[4] Liquidity Constraint	[5] Entry of New Households	[6] Non Lump-sum Taxes	[7] Precautionary Saving	[8] Present Bias	[9] Rule-of-Thumb
Age Group	0.89	1.15	1.18	0.96	1.14	1.23	0.99	1.03	0.81
	[0.06]*	[0.09]*	[0.13]	[0.12]	[0.10]	[0.13]*	[0.06]	[0.08]	[0.06]***
Female Dummy	1.27	0.69	0.54	0.92	0.57	1.32	1.26	1.02	1.04
	[0.29]	[0.18]	[0.21]	[0.36]	[0.18]*	[0.48]	[0.26]	[0.24]	[0.21]
Educational Attainment	0.83	1.11	1.03	0.66	1	0.9	1.11	1.07	1.04
	[0.07]**	[0.11]	[0.15]	[0.10]***	[0.12]	[0.13]	[0.08]	[0.11]	[0.08]
Income Group	0.86	1.02	1.05	0.91	0.96	0.81	0.99	0.96	0.99
	[0.06]**	[0.09]	[0.12]	[0.11]	[0.10]	[0.11]	[0.06]	[0.08]	[0.07]
Married Dummy	1.04	0.62	3.55	0.3	1.22	0.68	1.02	0.62	1.5
	[0.27]	[0.20]	[1.81]**	[0.17]**	[0.41]	[0.33]	[0.26]	[0.20]	[0.38]
Residential Type	0.86	1.01	0.85	0.86	0.84	0.89	1.04	1.12	0.83
	[0.06]**	[0.08]	[0.11]	[0.12]	[0.10]	[0.11]	[0.07]	[0.08]*	[0.06]***
Ricardian Exp. Dummy	0.69	2.59	2.72	0.63	0.85	0.63	0.99	1.92	1.09
	[0.22]	[1.00]**	[1.69]	[0.29]	[0.33]	[0.27]	[0.27]	[0.68]*	[0.30]
Clueless Exp. Dummy	0.62	1.46	1.41	0.64	0.64	0.62	0.96	1.17	1.6
	[0.23]	[0.69]	[1.09]	[0.36]	[0.32]	[0.35]	[0.32]	[0.52]	[0.53]
N	469	469	469	469	469	469	469	469	469

Notes:
1. This table reports the odds ratios. If the odds ratio is greater than one, then it suggests that an explanatory variable raises the probability of spending or choosing a particular motive, vice versa.
2. Robust standard errors are in the brackets. * Significant at 10%; ** Significant at 5%; *** Significant at 1%.

Appendix 1: The Questionnaire

We are researchers from NUS. We are interested in issues related to the Progress Package in budget 2006. The survey is completely anonymous. There are no right or wrong answers to the following questions. We just want your honest answers. Please tick (√) the appropriate boxes. Thanks much!

Section A
_____

Age:
□ Below 21 □ 21-25
□ 26-30 □ 31-35
□ 36-40 □ 41-45
□ 46-50 □ 51-55
□ 56-60 □ >60

Sex:
□ Male □ Female

Highest Education Attained:
□ < Primary □ Primary
□ Secondary □ Vocational
□ Junior College □ Polytechnic
□ University Graduate □ Postgraduate

Monthly Income (in 2006):
□ <$1,000 □ $1,000-$1,999 □ $2,000-$2,999
□ $3,000-$3,999 □ $4,000-$4,999 □ $5,000-$5,999
□ $6,000-$6,999 □ $7,000-$7,999 □ $8,000-$8,999
□ $9,000-$9,999 □ >$10,000

Marital Status:
□ Single □ Married □ Others

Current Residential Unit:
□ HDB 1 Room □ HDB 2 Room
□ HDB 3 Room □ HDB 4 Room
□ HDB 5 Room □ HDB Executive
□ HUDC □ Private Condominium/Apartment
□ Landed Property □ Others

How much did you receive under the Progress Package?

Growth Dividends $_____   Workfare Bonus $_____   NS Bonus $_____

Section B
_____

1. Have you spent the Progress Package?
□ Yes   □ No
If you have not, do you plan to spend it in the near future?
□ Yes   □ No

2. Did you have any savings when you received the Progress Package?
□ Yes   □ No

3. At that time, were your savings more than the amount you received under the Progress Package?
□ Yes   □ No

4. Please choose the statements that best describe how you feel about the Progress Package (Please choose all that are applicable) [29]

☐ I will probably have to pay more taxes in the future because of the Progress Package. So I saved it for the future.

☐ I spent it because I have already spent all my money. If I could borrow some money, I would have borrowed it and spent it.

☐ I will probably have to pay more taxes in the future because of the Progress Package. But I do not worry about the future. I spent it while I could.

☐ Other people may have to pay more taxes in the future because of the Progress Package. But not for me. My tax burden will be lower in the future because I will be earning less or spending less when that happens.

☐ The future generations will probably have to pay more taxes because of the Progress Package. But not for me. So I do not worry about it and I spent it.

☐ The future generations will probably have to pay more taxes because of the Progress Package. But not for me. But I am worried for my sons and daughters. So I saved it for them.

☐ I do not know what my taxes will be in the future. But with so much uncertainty, I saved it for the rainy days.

☐ I do not know what my taxes will be in the future. As a general rule, I just spend whatever I receive in cash or in check, like the Progress Package. But I try not to touch my savings.

☐ None of the above. Please elaborate:

5. What did you spend on? (Please specify)

6. Did you spend it on things that you would not otherwise spend on had you not received the progress package?

☐ Yes ☐ No

7. Do you agree with the following statement?
"If I had not received the Progress Package, but if I had instead received the same amount of money from my salary, I would have used the money in exactly the same way as I had used the Progress Package"

☐ Strongly disagree ☐ Disagree ☐ Agree ☐ Strongly Agree ☐ Don't know

Section C

1. Because of the Progress Package, taxes will probably be _____ in the future.

☐ lower ☐ unchanged ☐ higher ☐ Don't know

2. Because of the Progress Package, government spending will probably be _____ in the future.

☐ lower ☐ unchanged ☐ higher ☐ Don't know

---

[29] There are two versions. The only difference between the two versions of the questionnaires is the order in which different explanations appear in Section B Question 4 (to control for order effect): the order of explanations 2-4 and explanations 5-8 are switched, but Ricardian equivalence always appears first at the top of the list (so that if this were really the explanation, the respondents could not have missed it).