A Panel Analysis of Behavior Change in Individual Income Tax Compliance

Attah K. Boame,
Canada Revenue Agency

Income tax is an important source of revenue for both federal and provincial/territorial governments in Canada. The Canadian tax system assumes voluntary compliance and self-assessment by taxpayers. Voluntary compliance is based on mutual responsibility. Individuals, corporations, and trusts that are obliged to pay tax in Canada are expected to meet their responsibilities under the law. The Canada Revenue Agency (CRA) is responsible for maintaining public confidence in the fairness and integrity of the tax system through the effective delivery of its mission. The CRA mission is to promote voluntary compliance through communication, quality service, and responsible enforcement. Even though many taxpayers comply with their tax obligations, others do not.

The tax literature identifies several factors, both economic and noneconomic, as determinants of the taxpayer compliance decision. This research aims at identifying the factors that contribute to the observed tax compliance of individual taxpayers over time based on individual income tax returns. This study is carried out within the Baseline Compliance Research, a component of the Compliance Measurement Framework (CMF), which focuses on compliance of all CRA's major client groups. [1,2]

While some of the Baseline Compliance Research studies use cross-section data to analyze tax compliance for a particular year, there is a research gap on panel (longitudinal) data analysis of tax compliance.[3] This research provides a first Canadian study of tax compliance using panel data from 1996 to 2002. This research uses microdata to identify individual income taxpayers' compliance behavior.[4] The same taxpayers are followed for

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1 Canada Revenue Agency (2003), "Compliance Measurement Framework," Ottawa, September.

2 These client segments are Individuals (T1 returns), Businesses [Unincorporated Businesses (T1 returns), Corporations (T2 returns), GST Registrants, and Employers], Charities, and Trusts (T3 returns).

3 Maloney, G. (2005), "The Determinants of Canadian Tax Compliance Behavior: A Filing and Payment Compliance Perspective," Compliance Research Division, CRA; and Li, W. (2007), "Individual Income Tax Reporting Compliance in Canada: Results of Assessment and Reassessment," Compliance Research Division, CRA.

4 Macroeconomic indicators also influence a taxpayer's compliance behavior. However, analysis of macroeconomic variables entails the use of aggregate-level macroeconomic data, which are not available from the T1 tax returns.

Tax Years 1996 to 2002 to find out changes in their tax filing, reporting, and paying patterns over the period.

The paper is structured as follows. It begins with the definition of tax compliance that sets the context for the analysis, and then notes some caveats with the analysis, which is followed by literature review and the data used in the analysis. The next section provides a general overview of tax compliance rates with regard to demography, province/territory, income, tax rates, and filing methods. The following section carries out a multivariate analysis to provide empirical evidence of tax compliance discussed in the preceding section. The last section concludes the paper with suggestions for further research to improve resource allocation strategies.

Tax Compliance Defined

The Compliance Measurement Framework (CMF, 2003) identifies four main compliance requirements as:

- Registering when required (applicable to business clients);
- Filing required tax forms on time;
- Reporting complete and accurate information; and
- Paying any amounts due in a timely manner (without enforcement action).

Tax noncompliance is the failure to register, file, report, and/or pay correctly and on a timely basis. Tax compliance in this study refers to individual filing, reporting, and payment compliance. The tax compliance rate for filing, reporting, and payment is the number of compliant taxpayers divided by the total taxpayers (number of observations is 18,300,485 for each tax year) in the dataset. The detailed definitions of the three compliance requirements for this study are as follows:

Filing Compliance[5]

Filing compliance means filing tax returns on time, while filing noncompliance occurs when this obligation is not met. Thus, late filers are included while nonfilers are excluded in this study. The filing deadlines for each tax

[5] The dataset for the study is Assessed and Reassessed T1 Individual Tax Returns, and, thus, the compliance definitions here are skewed toward T4 recipients.

year are April 30 for individuals, and June 15 for self-employed individuals and spouses of self-employed individuals in the following calendar year.6 If a taxpayer does not file his or her tax return by the deadline, he or she is assessed a late filing penalty.[7] This study uses the presence or otherwise of the late filing penalty charged to an account as an indicator of filing compliance and/or filing noncompliance. The filing compliance rate is defined as the number of taxpayers with no late filing penalty (i.e., they filed taxes on time) as a percentage of the panel population for each tax year.

Reporting Compliance

Researchers working with individual level tax data generally use some measure of unreported income or unreported taxes as the dependent variable in econometric models to measure tax-reporting noncompliance (Andreoni et al, 1998). Unreported (underreported) income is the gap between an individual's calculated total income by CRA and his or her reported total income. The total income is the amount on line 150 of an individual's T1 return. One problem of using the total income reported as a measure of tax noncompliance is that one may report complete and accurate information for line 150 but may overstate deductions and tax credits. Hence, using total income reported to determine tax compliance or tax noncompliance does not capture these effects.

Reporting tax noncompliance in this study is defined as the underreported tax payable. This is the gap between the total tax payable (line 435) as calculated by CRA and the total tax payable (line 435) as reported by individual taxpayers on their T1 returns. The total tax payable (line 435) is the sum of net federal tax (line 420), CPP contributions payable on self-employment and other earnings (line 421), social benefits repayment (line 422), and provincial or territorial tax (line 428).[8] An individual taxpayer is considered reporting noncompliant if the calculated total tax payable is greater than the

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[6] For instance, the filing deadlines for Tax Year 2002 are April 30, 2003, and June 15, 2003, respectively. If any of these dates falls on a holiday or weekend, then the deadline is the next business day after the holiday or weekend.

[7] Taxpayers whose late filing penalty is waived for various reasons are considered filing compliant even though they filed their taxes late. Also, refund returns are not assessed a late filing penalty and are assumed to be filing compliant.

[8] Even though compliance rates within the agency might be restricted to federal tax, provincial tax is included in this study. This is because the agency collects provincial and territorial tax on behalf of the provinces/territories, except Quebec. Also, the definition of tax payable (based on the T1 tax return) in this study includes provincial or territorial tax. To arrive at a refund (line 484) or balance owing (line 485) on the T1 tax return, provincial/territorial tax is included in the calculations.

reported total tax payable. In other words, if the calculated total tax payable is equal to the reported total tax payable, an individual taxpayer is said to be reporting compliant. The total tax payable is calculated based on the components listed above.

Canada Revenue Agency does not charge or refund a difference of $2 or less of tax payable. Hence, any difference greater than $2 tax payable implies taxpayer noncompliance. This study, however, for efficiency reasons (in terms of resources the agency will require to collect balances owing), defines tax noncompliance as any difference greater than $50 of tax payable.[9] The reporting compliance rate is the number of taxpayers reporting accurately (i.e., with a tax payable difference of less than or equal to $50 between assessment and what is reported) as a percentage of the panel population for each tax year.[10]

Payment Compliance

This refers to an individual taxpayer's paying any amounts due in a timely manner without enforcement action by the CRA. In order to establish whether an individual taxpayer is payment compliant or otherwise, it is necessary to find out whether an amount owing is indicated on the return after the payment deadline. If so, then, by definition, the individual is payment noncompliant. The payment deadline for all individuals is April 30 following the tax year.[11] The absence of arrears interest on a return indicates payment compliance; that is, any return with assessed arrears interest would be defined as payment noncompliant. In addition, the amount of installment interest charged will be used as an indicator for payment noncompliance for individuals paying their taxes by installment. Any return that has one of these interest charges against it is deemed to be payment non-compliant.[12] Payment compliance rate is the number of taxpayers without arrears interest charges or installment interest charges as a percentage of the panel population for each tax year.

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9 The Processing Review Program of the Individual Returns and Payment Processing Directorate uses $50 as the threshold for defining tax noncompliance. Li's (2007) paper also used $50 as the threshold.

10 It might be interesting to consider the reporting compliance rate for taxpayers who had tax payable. Since this is a subgroup of the entire taxpayers, a different study that emphasizes the reporting compliance behavior of this subgroup would be appropriate. This might be the subject of a future research project.

11 For instance, the filing deadline for Tax Year 2002 is April 30, 2003. If this date falls on a holiday or weekend, then the deadline is the next business day after the holiday or weekend.

12 Taxpayers whose arrears and installment interest charges are waived for various reasons are considered payment compliant.

Caveats

The following presents the issues that might impact the results of this study; hence, its findings and conclusions should be interpreted noting these caveats:

- The compliant taxpayers in this paper refer only to those identified by the CRA through assessment, reassessment, and compliance review activities and do not include nonfilers. Taxpayers included in the study also may or may not have tax payable. Nonfilers and taxpayers with no tax payable are two subgroups within the taxpayer population, and require separate research projects to analyze their tax compliance behavior. This is beyond the scope of this project.
- Taxpayers using telephone filing (Telefile) to file their tax returns are not required to report their total tax payable. This might affect the reporting compliance rate for telephone filers. Since telephone filers account for about 2 percent of total taxpayers, this does not have a significant effect on the analysis. On the other hand, deleting telephone filers from the dataset would generate an unbalanced panel since the number of telephone filers varies over the study period. Therefore, telephone filing is included in the analysis.
- The total number of observations for each tax year (1996–2002) in the analysis is 18,300,485, which is about 80 percent of all taxpayers for each tax year. Hence, the analysis is not based on all taxpayers who filed tax returns for each tax year but rather on a panel of taxpayers who consistently filed their tax returns for all 7 years of the study period. This does not mean the taxpayer population in this study is skewed toward more compliant taxpayers. Even though the taxpayer population filed their taxes in all 7 years, they could still be late filers, not accurately reporting their tax owing, or not paying their tax owing on time.
- Overreported total tax payable also exists in the dataset. Overreporting is considered as tax reporting compliant in this paper.
- The multivariate regression models assume that there is no interaction between variables, or that the effect of each variable on the outcome is the same regardless of the levels of the other variables. Results of collinearity tests indicate very weak dependencies among the independent variables (see Appendix A for details).

Literature Review

This section briefly reviews the tax compliance literature, noting some previous studies that are relevant to the analysis in this paper. In particular, the review provides information on the relevant variables that influence tax compliance. This provides guidance in selecting appropriate variables for this study. It is also relevant to find out whether the conclusions of this study reinforce or refute previous studies on tax compliance in other countries. In other words, are Canadian taxpayers unique in their tax compliance behavior, or does their behavior follow identified patterns of tax compliance in other countries?

The tax literature identifies several factors, both economic and noneconomic, as determinants of the taxpayer noncompliance decision. Opportunity to evade, the marginal tax rate, income, demographic, and social factors all play roles in the evasion decision (see Andreoni et al. (1998) for an extensive review). Andreoni et al. 1998 note that, in general, the effect of tax rates on evasion remains unclear, which requires further research. Alm and Sanchez (1995) also note several economic and noneconomic factors that influence tax noncompliance. These include detection and punishment, burden of taxation, government services, overweighting of low probabilities, and social norms.

Empirical evidence indicates that older people are more tax compliant than younger people. Older people are more likely to be risk averse than younger people. The tax compliance literature shows that men are less compliant than women. The criminology literature and some papers on corruption have shown that females are on average more compliant than males (Torgler and Schneider, 2004). Baldry (1987) finds that males tend to evade more than females do. Marital status might influence legal or illegal behaviour, depending on the extent to which individuals are constrained by their social networks (Tittle, 1980). Torgler and Schneider (2004) find that married people seem to have a higher tax moral than singles. On the other hand, the Taxpayer Compliance Measurement Program (TCMP) data indicate that noncompliance is more common and of greater magnitude among households in which the head is married (Andreoni et al., 1998).

Tax compliance may be affected by education, the results of which could be favorable or unfavorable. Educated people may better understand the opportunities for tax evasion, which could influence their tax compliance behavior. On the other hand, educated people are more likely to have knowledge of tax laws that may reduce the noncompliance rate. Thus, the impact of education on tax compliance is more of an empirical question than

just speculation. The theoretical models all indicate that, as income rises, tax evasion should increase over most ranges. The tax compliance literature argues that self-employed taxpayers evade more taxes. The self-employed have higher tax compliance costs so taxes that become more visible to them (Lewis, 1982). Self-employed taxpayers would have more opportunity to evade their taxes than taxpayers who have their taxes deducted each payday by their employers. There is also no third party information reporting for self-employed taxpayers, which increases the opportunity to evade taxes.

Data

A panel (longitudinal) dataset is constructed over a 7-year period (1996–2002) to study the tax compliance behavior of individual taxpayers. The dataset is based on T1 Sweep Initial Assessment and Reassessment of individual taxpayers' tax returns. The unit of analysis is the tax filers who filed all returns during 1996–2002, including late filers.[13] The unit of analysis is a balanced panel of taxpayers from 1996–2002, with a total of 18,300,485 observations (tax returns) for each of the 7 years.

Changes in Tax Compliance

This section provides an overview of how tax compliance has changed over time. It uses cross-tabulations and frequency distributions to ascertain the general trends in individual tax compliance. It analyzes tax compliance in general by threshold. Particular emphasis is placed on changes in tax compliance by year and demographic and socioeconomic factors, province/territory, marginal tax rates, and filing methods. It begins with filing compliance, followed by reporting compliance, and finally by payment compliance since individual taxpayers are required to file, report, and pay any taxes owing. It uses percentages to discuss general trends in filing, reporting, and payment compliance in this section. Frequency counts for Tables 1 to 9 in this section are shown in Appendix B.

Tax Compliance in General

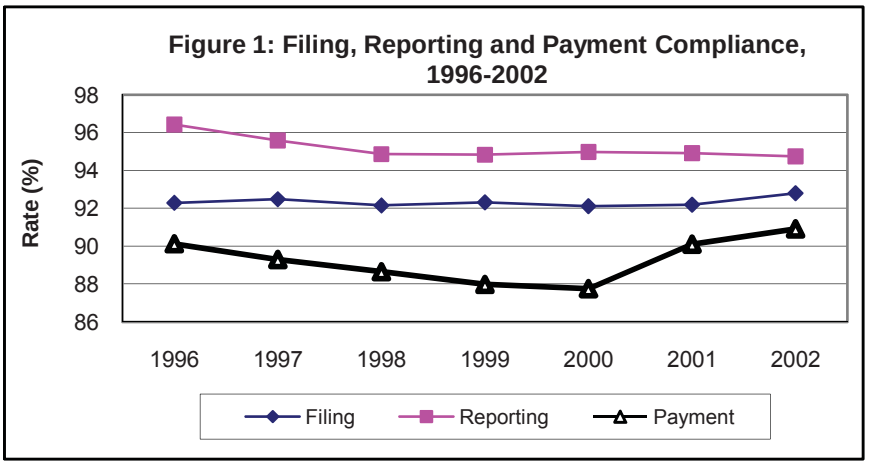
The general trend in tax compliance (filing, reporting, and payment) over the 7-year period is shown in Table 1, and also in Figure 1. Appendix C

[13] This provides a "balanced panel" for the analysis. Exit and entry of tax filers during the study period generate an "unbalanced panel" dataset, which is not discussed in this study.

reports Chi-Square test results for association and Cramer's V statistic for the strength of the association for cross-tabulations of all tables in this section.

Table 1: Tax Compliance in General (%), 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Filing	92.29	92.48	92.15	92.31	92.11	92.19	92.80
Reporting	96.43	95.59	94.86	94.83	94.98	94.91	94.74
Payment	90.13	89.30	88.65	87.98	87.75	90.11	90.92



Filing Behavior

The filing compliance rate has been consistent at 92 percent for the entire period. This implies there has been no significant increase in the risk associated with late filing. However, it is relevant to allocate agency resources to improve filing compliance, given that about 8 percent of Canadian taxpayers did not file their tax returns on time during the 7-year period.

Reporting Behavior

The reporting compliance rate decreased throughout the study period from 96 percent in 1996 to 95 percent in 2002. The reporting compliance rate is generally quite high compared to the filing compliance and payment compliance rates. It is worth noting that the reporting compliance rate is much dependent on the threshold amount (in this study less than or equal to $50 of the difference between calculated tax payable and reported tax payable). If the threshold is increased, the reporting compliance rate might increase.

Payment Behavior

Canadian taxpayers were slow to pay their taxes owing during the study period. The payment compliance rate decreased from 90 percent in 1996 to 88 percent in 2000. There was an improvement in the payment compliance rate for 2001 and 2002. The agency might consider programs that aim at educating taxpayers in the importance of paying their taxes on time. This could decrease future resources allocated by the agency to collect taxes owing and also save noncompliant taxpayers extra penalties for not paying taxes on time.

Tax Compliance by Demographic Group

This section provides a detailed analysis of the tax compliance behavior (filing, reporting, and payment) of Canadian taxpayers from 1992 to 2002 for selected demographic variables.

Gender

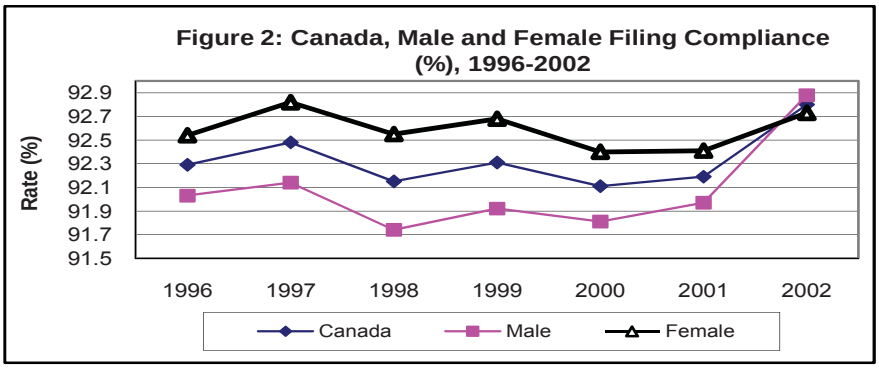
The tax compliance rate (filing, reporting, and payment) by gender is shown in Table 2.

Table 2: Tax Compliance by Gender (%), 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Male							
Filing	92.03	92.14	91.74	91.92	91.81	91.97	92.88
Reporting	95.79	94.95	94.24	94.24	94.48	94.21	94.06
Payment	88.01	86.98	86.16	85.38	85.23	87.89	88.88
Female							
Filing	92.54	92.82	92.55	95.68	92.40	92.41	92.73
Reporting	97.04	96.21	95.46	95.40	95.46	95.59	95.39
Payment	92.18	91.55	91.06	90.50	90.20	92.27	92.90

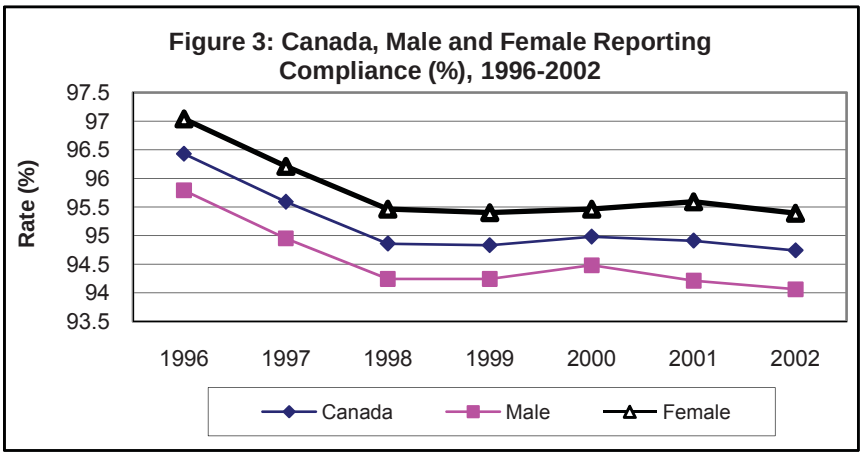
Filing Behavior

The gender filing compliance rate is very similar to the general filing compliance rate. The female filing compliance rate has exceeded the rate for male taxpayers for every year of the study period except 2002. This observation is consistent with the tax compliance literature (Baldry, 1987; Torgler and Schneider, 2004). This finding might imply that male taxpayers are less risk averse than female taxpayers. Figure 2 shows the filing compliance rates for Canadian, male and female taxpayers over the study period.



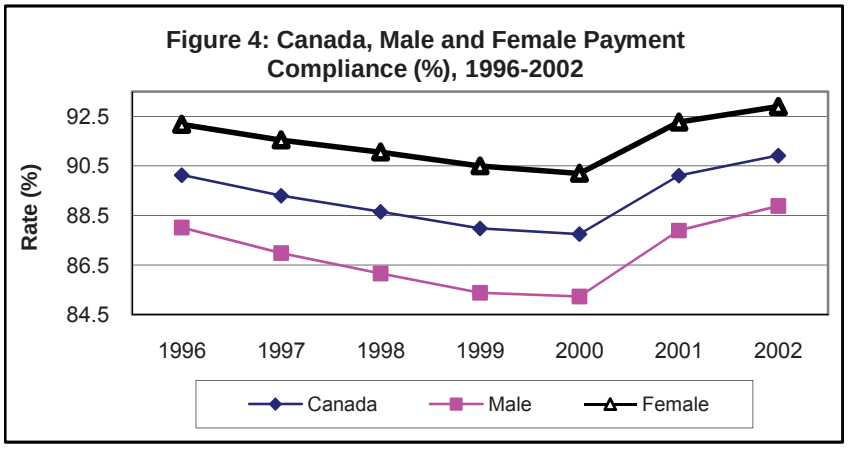
Reporting Behavior

Female taxpayers have consistently outperformed male taxpayers in terms of reporting their taxes owing over the study period. Again, this observation is supported by the existing tax compliance literature. Baldry (1987) finds that males tend to evade more than females do. A comparison of Canadian, male and female reporting compliance is shown in Figure 3. It is interesting to note that females often file for credits (e.g., GST and Child Tax Benefit). They may have little or no reported income, and hence may not be taxable. Another area of interest is refund returns, that is, tax returns that have refunds. Are females more likely to file refund returns than males? This issue is beyond the scope of the present study and may be an area for further research. Recall that the dataset includes all taxpayers who consistently filed their taxes for all 7 years, whether they have tax payable or not, and whether they receive tax refunds or not.



Payment Behavior

The payment compliance rate has generally been lower for both female and male taxpayers compared to filing and reporting compliance rates. As with filing and reporting compliance, female payment compliance is higher than male payment compliance for all years under consideration. Unfortunately, the database does not have variables to explain the differential between female and male taxpayers with regard to payment compliance. Figure 4 compares the Canadian, male and female payment compliance.



Age Group

The tax compliance rate (filing, reporting, and payment) by age group is shown in Table 3, and the mean tax compliance rate from 1996 to 2002 is shown in Figure 5.

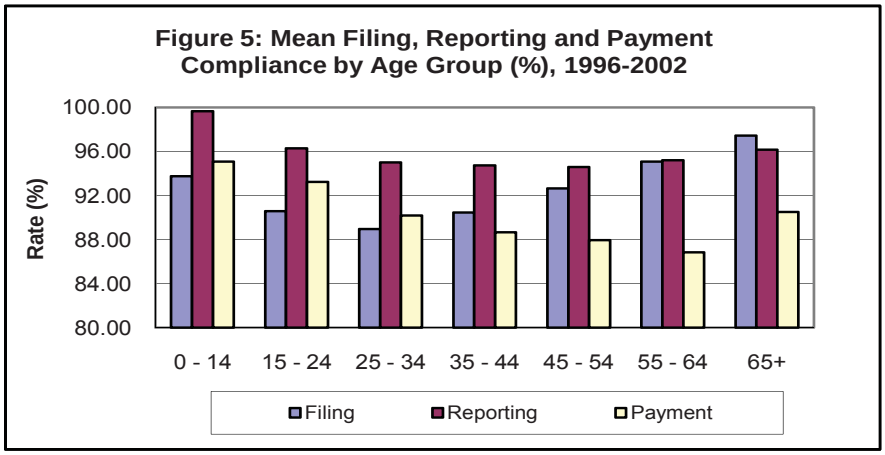


Table 3: Tax Compliance, by Age Group (%), 1996-2002

	Year	Age Group (Years)						
		0-14	15-24	25-34	35-44	45-54	55-64	65+
Filing	1996	89.78	89.88	89.48	91.20	93.00	95.18	97.59
	1997	93.87	90.88	89.31	90.98	92.95	95.32	97.84
	1998	94.31	90.51	88.59	90.33	92.50	95.06	97.86
	1999	95.18	90.51	88.56	90.40	92.67	95.10	97.71
	2000	94.16	90.17	88.29	89.89	92.38	94.98	97.42
	2001	94.36	90.47	88.58	89.86	92.27	94.87	97.05
	2002	94.57	91.62	89.91	90.56	92.72	95.08	96.66
	Mean	93.75	90.53	88.96	90.46	92.64	95.08	97.45
Reporting	1996	99.67	97.97	96.55	96.27	95.78	95.77	96.45
	1997	99.70	96.84	95.54	95.28	95.05	95.42	96.07
	1998	99.65	95.97	94.78	94.48	943.15	94.96	95.69
	1999	99.63	95.58	94.52	94.31	94.25	95.17	96.03
	2000	99.61	95.73	94.73	94.53	94.46	95.24	96.02
	2001	99.55	96.23	94.72	94.28	94.24	94.89	96.41
	2002	99.71	95.75	94.27	93.98	94.13	95.02	96.40
	Mean	99.65	96.30	95.02	94.73	94.58	95.21	96.15
Payment	1996	96.09	94.82	90.83	89.36	88.33	87.46	90.54
	1997	96.67	93.52	89.81	88.59	87.78	86.77	90.54
	1998	94.90	93.18	89.60	88.03	87.19	85.85	89.69
	1999	90.92	92.25	89.03	87.48	86.72	85.23	89.17
	2000	95.13	91.74	88.89	87.14	86.49	85.38	89.23
	2001	95.83	93.10	91.03	89.54	89.10	88.36	91.73
	2002	95.98	94.07	92.15	90.50	89.95	88.85	92.53
	Mean	95.07	93.24	90.19	88.66	87.94	86.84	90.50

Filing Behavior

Tax filers over 55 have a relatively higher filing compliance rate than other age cohorts. This observation is consistent with the tax compliance literature. Older people are more likely to be risk averse than younger people. Also, older people may have acquired more social capital and be more strongly attached to their communities. Older people have a stronger dependency on others' reactions, which may act as a restriction imposing higher potential social costs of sanctions (Torgler et al., 2004).

Reporting Behavior

The younger age group (under 25 years) and the older age group (over 54 years) show a higher reporting compliance rate. This might be due to the fact that younger taxpayers have less complex tax situations and much less earned and reportable income, while older taxpayers might have a broader understanding of their tax obligations. The implied risk aversion of older taxpayers is also important in this case.

Payment Behaviour

Younger taxpayers (under 25 years) have a higher payment compliance rate than middle aged and older taxpayers. This might be due to the fact that there are relatively few of them, most may not have taxable income, and many file credit returns so that there are less instances of arrears or installment interest. The younger cohorts have less financial obligations and are thus able to pay their taxes owing relative to middle-aged and older taxpayers. Financial difficulties might limit the ability of middle-aged and older taxpayers to make good on their taxes owing, all other things being the same. In other words, the risk of middle-aged and older taxpayers not being able to honor their tax payment obligations is relatively higher than for younger taxpayers. CRA programs that aim to educate middle-aged and older taxpayers on the necessity of paying their taxes owing would be a step in the right direction.

Marital Status

The tax compliance rate (filing, reporting, and payment) by marital status is shown in Table 4, and the mean tax compliance rate is shown in Figure 6.

Figure 6: Mean Filing, Reporting and Payment Compliance by Marital Status (%), 1996-2002

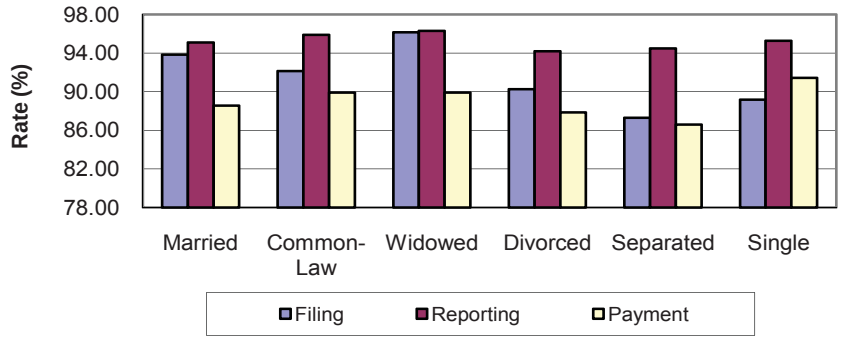


Table 4: Tax Compliance, by Marital Status (%), 1996-2002

	Year	Martial Status					
		Married	Common-Law	Widowed	Divorced	Separated	Single
Filing	1996	94.07	91.62	96.37	90.16	87.45	89.18
	1997	94.12	91.90	96.54	90.20	87.40	89.52
	1998	93.74	91.89	96.61	89.94	86.89	88.92
	1999	93.90	92.23	96.45	90.10	86.98	88.89
	2000	93.62	92.10	96.08	90.02	86.82	88.70
	2001	93.66	92.36	95.68	90.14	86.96	88.76
	2002	93.84	92.92	95.29	91.17	88.48	90.34
	Mean	93.85	92.15	96.15	90.25	87.28	89.19
Reporting	1996	96.28	96.99	96.69	95.60	95.95	96.85
	1997	95.53	96.22	96.27	94.64	94.88	95.77
	1998	94.83	95.77	95.72	93.75	94.20	94.88
	1999	94.84	95.69	95.99	93.76	93.98	94.65
	2000	94.92	95.91	96.21	93.95	94.32	94.88
	2001	94.78	95.37	96.54	93.91	94.07	95.04
	2002	94.59	95.20	96.66	93.72	93.92	94.75
	Mean	95.11	95.88	96.30	94.19	94.47	95.26
Payment	1996	89.25	90.59	89.67	88.27	87.43	92.70
	1997	88.59	89.74	89.84	87.32	86.36	91.54
	1998	87.84	89.33	89.08	86.89	85.98	91.09
	1999	87.11	88.81	88.72	86.81	85.55	90.38
	2000	87.07	88.47	88.80	86.44	85.00	89.85
	2001	89.56	90.85	91.42	89.21	87.38	91.73
	2002	90.39	91.48	91.83	90.10	88.47	92.66
	Mean	88.54	89.90	89.91	87.86	86.60	91.42

Filing Behavior

Widowed taxpayers have the highest filing compliance rate among the various marital statuses. Married and common-law taxpayers have the next highest filing compliance rate. The filing compliance rate for married couples is contrary to the Taxpayer Compliance Measurement Program (TCMP) data,

which indicate that noncompliance is more common and of greater magnitude among households in which the head is married. Separated and single taxpayers have relatively lower filing compliance rates.

Reporting Behavior

The reporting compliance rate is quite similar among the various marital statuses, with the highest rate registered by widowed taxpayers. Divorced and separated taxpayers, however, tend to have the lowest reporting compliance rate.

Payment Behavior

Single taxpayers are more likely to pay their taxes owing compared to the other marital groups. Financial constraints might impact the ability of divorced, separated, and married taxpayers to make good on their taxes owing, all other things being the same.

Province/Territory

The tax compliance rate (filing, reporting, and payment) by province/territory is shown in Table 5, and the mean tax compliance rate is shown in Figure 7.

Figure 7: Mean Filing, Reporting and Payment Compliance by Province/Territory (%), 1996-2002

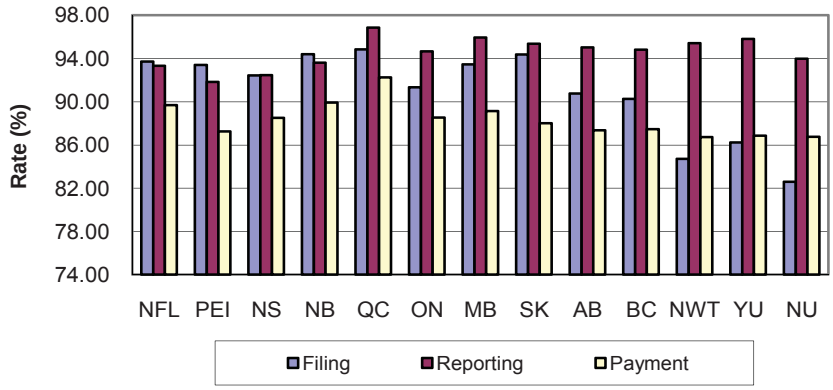


Table 5: Tax Compliance by Province/Territory (%), 1996-2002

	Yr.	Province/Territory												
		NFL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	NWT	YU	NU
Filing	1996	92.36	93.93	92.65	94.48	94.17	91.74	93.04	94.27	90.59	90.30	82.75	85.91	-
	1997	93.99	93.57	92.46	94.26	94.56	91.85	93.58	94.51	90.81	90.21	84.50	85.48	-
	1998	93.67	93.44	92.37	94.35	94.75	91.13	93.30	94.42	90.43	89.87	84.56	84.82	-
	1999	94.65	93.42	92.86	94.78	95.08	91.26	93.33	94.18	90.14	89.96	84.68	85.93	83.64
	2000	93.89	93.02	92.28	94.38	94.93	90.76	93.33	94.20	90.92	89.98	83.93	86.42	78.83
	2001	93.73	93.12	92.08	94.06	95.00	90.89	93.51	94.30	90.68	90.36	85.14	86.59	81.69
	2002	93.65	93.19	92.25	94.48	95.39	91.68	93.98	94.60	91.60	91.04	87.39	88.40	86.20
	Mean	**93.71**	**93.38**	**92.42**	**94.40**	**94.84**	**91.33**	**93.44**	**94.35**	**90.74**	**90.25**	**84.71**	**86.22**	**82.59**
Reporting	1996	96.73	96.46	95.53	96.94	97.43	95.97	96.30	96.23	96.50	95.89	95.61	96.43	-
	1997	94.93	93.54	93.78	94.97	96.86	95.19	96.15	95.56	95.31	95.10	94.81	95.69	-
	1998	93.23	91.09	91.72	93.30	96.62	94.38	95.89	94.91	94.56	94.20	94.54	95.48	-
	1999	92.44	90.04	91.47	92.76	96.66	94.23	95.85	94.87	94.44	94.71	95.32	95.72	93.46
	2000	92.03	90.55	91.61	92.67	97.06	94.31	95.71	95.11	94.82	94.58	95.76	95.84	93.77
	2001	92.37	90.97	91.73	92.66	96.57	94.32	95.96	95.64	94.98	94.62	96.01	95.70	93.99
	2002	91.55	90.04	91.24	92.00	96.66	94.10	95.72	95.11	94.57	94.59	95.79	95.69	94.62
	Mean	**93.33**	**91.81**	**92.44**	**93.61**	**96.84**	**94.64**	**95.94**	**95.35**	**95.03**	**94.81**	**95.41**	**95.79**	**93.96**
Payment	1996	90.65	88.54	89.58	90.97	92.65	89.58	90.23	89.04	88.34	88.31	85.87	85.09	-
	1997	89.54	86.93	88.37	89.62	92.16	88.95	88.99	87.70	86.83	87.23	87.58	87.54	-
	1998	88.27	86.40	87.95	88.96	91.67	88.19	88.52	87.03	86.34	86.48	85.86	86.91	-
	1999	88.61	86.05	87.88	89.34	91.34	86.95	88.08	86.52	86.12	85.85	86.07	86.24	85.76
	2000	89.01	86.00	87.21	88.53	90.95	86.81	87.35	86.94	85.72	85.97	84.78	85.65	86.18
	2001	90.89	88.26	89.38	91.02	93.30	89.05	89.64	88.96	88.13	88.86	86.76	87.83	86.34
	2002	90.70	88.49	89.20	91.00	93.64	90.10	91.07	89.89	89.94	89.49	90.13	88.65	88.66
	Mean	**89.67**	**87.24**	**88.51**	**89.92**	**92.24**	**88.52**	**89.13**	**88.01**	**87.35**	**87.46**	**86.72**	**86.84**	**86.74**

Filing Behavior

New Brunswick, Quebec, and Saskatchewan have the highest filing compliance rate among the provinces. Ontario, Alberta, and British Columbia have similar levels of filing compliance, which is lower than the Atlantic Provinces. The territories consisting of Northwest Territories, Yukon, and Nunavut are the least compliant when it comes to filing tax returns.

Reporting Behavior

Reporting compliance rates are similar among the provinces, though some provinces come ahead of others. Quebec and Manitoba show the highest level of reporting compliance. This is closely followed by Yukon, Northwest Territories, Saskatchewan, Alberta, Ontario, and British Columbia as a group. The Atlantic Provinces have the lowest reporting compliance rate among the provinces. There seems to be no clear reason for the observed reporting compliance behavior.

Payment Behavior

When it comes to paying taxes owing, the provinces/territories seem to be on the same page, except that Quebec comes ahead. Quebec has consistently outpaced all the provinces with regard to making good on tax obligations. The database does not have variables that are able to explain observed payment compliance behavior at the provincial/territorial level.

Tax Compliance by Socioeconomic Group

This section presents evidence on tax compliance for income level, tax rates, and major source of income. The theoretical models of taxpayer compliance literature indicate that, as income rises, tax evasion should increase over most ranges (Andreoni et al., 1998). Empirical studies, though, indicate mixed results on the correlation between taxpayer noncompliance and increases in income (Clotfelter, 1983; Joulfaian and Rider, 1996; Pommerehne and Frey, 1992; Feinstein, 1991). Compliance rates also appear to differ across occupations and/or the source of income. The tax compliance literature argues that self-employed taxpayers evade more taxes than salaried employees. The lack of third party information reporting for self-employed taxpayers tends to increase the opportunity to evade taxes.

Taxable Income

Taxpayers are categorized into three income groups: low-income for taxpayers earning less than or equal to $35,000 annual taxable income; middle-income for taxpayers whose earnings are greater than $35,000 and less than or equal to $113,804 annual taxable income; and high-income for taxpayers whose earnings are greater than $113,804 annual taxable income. These income ranges are based on the 2004 Federal Schedule 1 taxable income.[14] The tax compliance rate (filing, reporting, and payment) by taxable income is shown in Table 6, and the mean tax compliance rate for the various taxable income groups as shown in Figure 8.

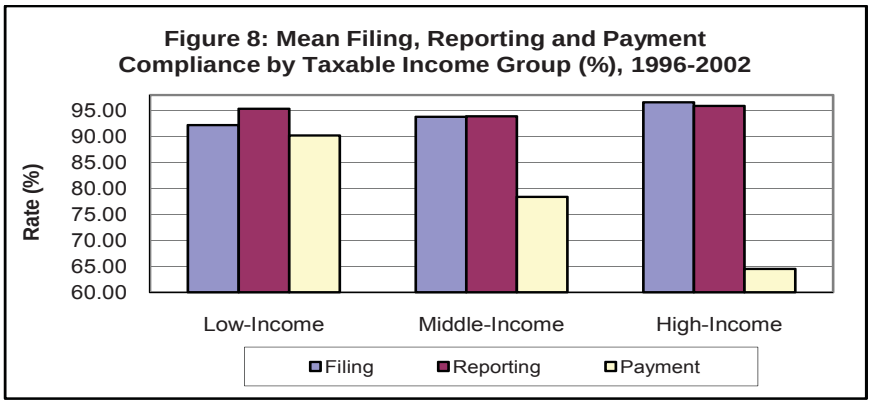
[14] The taxable income is normalized by the annual inflation rate (consumer price index) to convert it into real taxable income. This ensures that taxpayers who move from one tax bracket to another do not invalidate the results/conclusions of the analysis.

Table 6: Tax Compliance by Taxable Income Group (%), 1996-2002

	Year	Taxable Income Group (2004)		
		Low ($35,000 or less)	Middle (More than $35,000 but not more than $113,804)	High (More than $113,804)
Filing	1996	92.14	94.25	96.70
	1997	92.36	93.87	96.64
	1998	91.67	93.12	95.26
	1999	92.20	93.35	96.73
	2000	92.05	94.16	97.05
	2001	92.13	93.99	96.68
	2002	92.73	93.85	97.10
	Mean	92.18	93.80	96.59
Reporting	1996	96.57	94.26	95.84
	1997	95.72	93.94	95.94
	1998	95.71	92.81	95.47
	1999	94.95	93.19	96.41
	2000	94.97	95.03	95.65
	2001	94.93	94.24	95.72
	2002	94.78	93.74	96.22
	Mean	95.38	93.89	95.89
Payment	1996	90.89	80.05	63.72
	1997	90.10	80.32	64.22
	1998	91.01	84.13	67.44
	1999	88.92	77.95	61.28
	2000	88.25	70.14	61.00
	2001	90.61	75.78	65.35
	2002	91.58	80.39	68.22
	Mean	90.19	78.39	64.48

Filing Behavior

A glance at Table 6 indicates some correlation between the willingness of taxpayers to file their taxes and income. High-income taxpayers have a higher propensity to file their taxes than middle- and low-income taxpayers. Low-income taxpayers have a consistently lower filing compliance rate over the entire study period.



Reporting Behavior

Even though low-income taxpayers have the lowest compliance rate when it comes to filing their taxes, their reporting compliance behavior is on par with high-income taxpayers. Thus, low-income taxpayers filing their tax returns on time do report correctly their taxes owing. This might be due to the fact that low-income taxpayers have less complex tax situations and are thus able to report accurately their incomes and taxes. Middle-income taxpayers do not do well when it comes to reporting their taxes owing relative to other income groups.

Payment Behavior

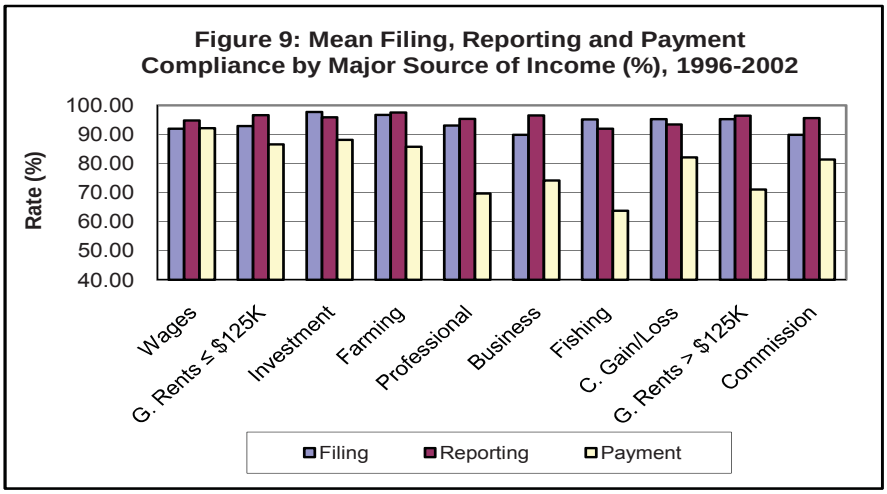
Contrary to filing compliance behavior, payment compliance falls with income, all other things being the same. Low-income taxpayers consistently show higher willingness to pay their taxes owing compared to the middle- and high-income taxpayers. In other words, high-income taxpayers may have a higher risk of not paying their taxes owing. It might be due to the fact that high-income taxpayers have higher tax obligations, and thus their unwillingness to make these payments. Since high-income taxpayers are about 2 percent of taxpayers, the agency might design programs that target this group to increase payment compliance.

Major Source of Income

The tax compliance rate (filing, reporting, and payment) by major source of income is shown in Table 7, and the mean filing, reporting, and payment compliance is shown in Figure 9.

Table 7: Tax Compliance by Major Source of Income (%), 1996-2002

	Year	Major Source of Income									
		Wage Earners	Gross rents up to $125,000	Invest-ment Inc. over $3,000	Farming	Profess -ional	Business	Fishing	Capital Gain/ Losses > $1,000 or Gross Proceeds > $25,000	Gross Rents in Excess of $125,000	Comm -ission
Filing	1996	91.88	93.38	97.98	96.93	92.38	89.68	95.25	95.92	94.44	89.90
	1997	92.24	93.24	98.04	96.71	92.73	89.46	95.08	95.55	94.88	89.79
	1998	91.91	92.78	97.91	96.71	92.28	89.16	95.23	95.22	95.18	89.19
	1999	91.99	92.94	97.82	96.62	92.63	89.40	95.30	95.19	95.50	89.56
	2000	91.71	92.53	97.53	96.65	93.15	89.62	94.94	94.59	95.43	89.35
	2001	91.76	92.64	97.51	96.57	93.36	90.08	94.62	95.09	95.58	89.80
	2002	92.38	92.79	97.30	96.81	94.84	91.89	95.54	95.11	95.82	91.16
	Mean	**91.98**	**92.90**	**97.73**	**96.71**	**93.05**	**89.90**	**95.14**	**95.24**	**95.26**	**89.82**
Reporting	1996	96.45	96.67	96.04	97.40	95.40	96.62	92.72	94.17	96.10	95.69
	1997	95.36	96.64	96.00	97.36	95.29	96.53	91.78	94.34	96.32	95.56
	1998	94.39	96.62	95.76	97.57	95.44	96.52	92.15	93.55	96.13	95.61
	1999	94.25	96.86	95.92	97.74	95.71	96.71	91.71	93.79	96.79	95.82
	2000	94.51	96.74	95.41	97.66	95.55	96.71	92.69	93.33	96.51	95.77
	2001	94.46	96.43	96.02	97.57	95.03	96.28	91.58	92.42	96.60	95.42
	2002	94.24	96.39	96.25	97.45	95.07	96.10	91.22	92.58	96.63	95.39
	Mean	**94.81**	**96.62**	**95.91**	**97.54**	**95.36**	**96.50**	**91.98**	**93.45**	**96.44**	**95.61**
Payment	1996	92.69	87.26	97.38	86.93	70.95	77.13	66.79	81.66	74.56	81.63
	1997	91.91	86.94	87.44	86.19	70.25	75.27	66.01	82.43	73.78	80.89
	1998	91.57	85.71	85.86	85.07	68.61	73.42	63.66	81.88	71.35	80.19
	1999	91.20	84.86	84.80	83.80	67.14	71.76	58.67	79.89	68.09	80.18
	2000	90.91	85.03	84.05	85.00	67.80	72.16	60.90	80.41	67.92	79.98
	2001	92.95	87.99	88.28	86.50	71.02	74.72	65.59	83.57	70.62	83.00
	2002	93.80	88.46	89.18	86.67	72.05	74.85	64.30	84.89	71.27	83.70
	Mean	**92.15**	**86.61**	**88.14**	**85.74**	**69.69**	**74.19**	**63.70**	**82.10**	**71.08**	**81.37**



Filing Behavior

The major source of income seems to influence filing compliance. Among the self-employed, those receiving business income and commission income have the lowest filing compliance rate. Taxpayers receiving investment income over $3,000 and farmers show high levels of filing compliance. Capital

gains and/or losses, gross rents in excess of $125,000, and fishing income have a moderate effect on filing compliance. The general trend for filing compliance is contrary to the observation in the tax compliance literature. Wage earners report a lower filing compliance rate compared to the self-employed (except those receiving commission income) for all the years under study.

Reporting Behavior

It appears that no significant differences exist among the major sources of income with regard to reporting compliance. Wage earners, fishing, and capital gain/losses, though, show a relatively low reporting compliance among the major sources of income. The low reporting compliance rate of wage earners refutes what the tax compliance literature predicts.

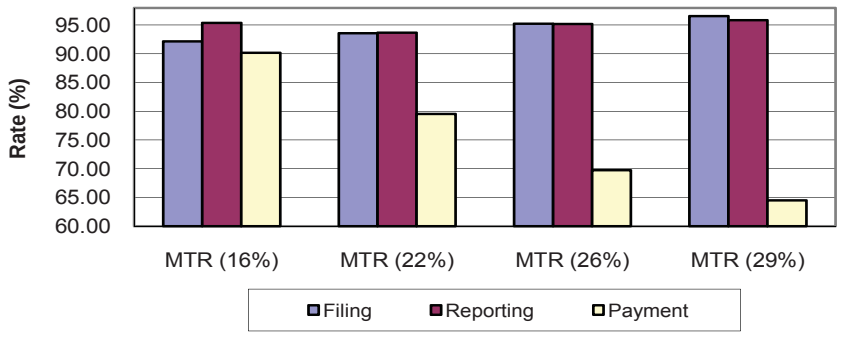
Payment Behavior

Wage earners do a better job than other major income sources when it comes to payment compliance. This observed behavior might reflect the fact that, for wage earners, taxes are deducted at source, which for most taxpayers reduces the taxes owing at the end of the tax year. Among the self-employed, farming, business, and fishing have a high risk of no payment of taxes owing.

Tax Compliance by Marginal Tax Rates

The tax compliance rate (filing, reporting, and payment) based on the 2004 Federal Schedule 1 marginal tax brackets is shown in Table 8, and the mean tax compliance rate is shown in Figure 10. The income range for the low marginal tax bracket (16 percent) and the high marginal tax bracket (29

Figure 10: Mean Filing, Reporting and Payment Compliance by Marginal Tax Rates (%), 1996-2002



percent) corresponds exactly to the low-income and high-income groups in Table 6; hence, the tax compliance rates are the same. The income range for the middle-income group is now split between the two middle marginal tax brackets (22 percent and 26 percent).

Table 8: Tax Compliance by Marginal Tax Rates (%), 1996-2002

	Year	Tax Brackets (2004)			
		Marginal Tax Rate (16	Marginal Tax Rate (22%)	Marginal Tax Rate (26%)	Marginal Tax Rate (29%)
Filing	1996	92.14	34.11	95.67	96.70
	1997	92.36	93.70	95.47	96.64
	1998	91.67	93.15	92.93	95.26
	1999	92.20	93.15	95.12	96.73
	2000	92.05	93.78	96.14	97.05
	2001	92.13	93.66	95.83	96.68
	2002	92.73	93.59	95.69	97.10
	Mean	92.18	93.59	95.26	96.59
Reporting	1996	96.57	94.17	95.14	95.84
	1997	95.72	93.81	95.18	95.94
	1998	95.71	92.77	93.04	95.47
	1999	94.95	92.91	95.66	96.41
	2000	94.97	94.82	96.14	95.65
	2001	94.93	94.02	95.46	95.72
	2002	94.78	93.45	95.76	96.22
	Mean	95.38	93.71	95.20	95.89
Payment	1996	90.89	81.28	67.99	63.72
	1997	90.10	81.51	69.07	64.22
	1998	91.01	84.93	79.34	67.44
	1999	88.92	79.18	67.22	61.28
	2000	88.25	71.37	63.80	61.00
	2001	90.61	77.05	68.75	65.35
	2002	91.58	81.60	72.06	68.33
	Mean	90.19	79.56	69.75	64.48

Filing Behavior

The filing compliance rates for the low marginal tax bracket (16 percent) and the upper marginal tax bracket (29 percent) are the same as the rates for low-income and high-income taxpayers. The split of the middle-income group into two marginal tax brackets (22 percent and 26 percent) does show some slight differences in filing compliance over the study period, with the 26-percent marginal tax bracket having a higher tax compliance rate. The

filing compliance rate for the two marginal tax brackets is higher than the low marginal tax bracket (16 percent) but lower than the high marginal tax bracket (29 percent). The observed pattern is similar to the filing compliance of the taxable income group.

Reporting Behavior

The middle marginal tax brackets (22 percent and 26 percent) have relatively lower reporting compliance compared to the low marginal tax bracket (16 percent) and the high marginal tax bracket (29 percent). The low marginal tax bracket (16 percent) and the high marginal tax bracket (29 percent) have comparable reporting compliance. This observation is contrary to the general observation in the tax compliance literature that tax evasion should increase with higher marginal tax rates.

Payment Behavior

The split of the middle-income group into two marginal tax brackets (22 percent and 26 percent) does show significant differences in payment compliance over the study period. In general, payment compliance decreases with the marginal tax rate, that is, the higher the marginal tax rate, the lower is the payment compliance, all other things being the same. It can be conjectured that taxpayers in the high marginal tax bracket have a higher tax burden relative to the other tax brackets, and this might constrain their ability to make good on tax obligations.

Tax Compliance by Filing Methods

The Canada Revenue Agency provides some programs that encourage taxpayers to file, report, and pay their taxes.[15] This section considers how the various filing methods influence taxpayers' compliance with tax laws.[16]

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[15] Among these programs are the Voluntary Disclosures Program (VDP) and the Community Volunteer Income Tax Program (CVITP).

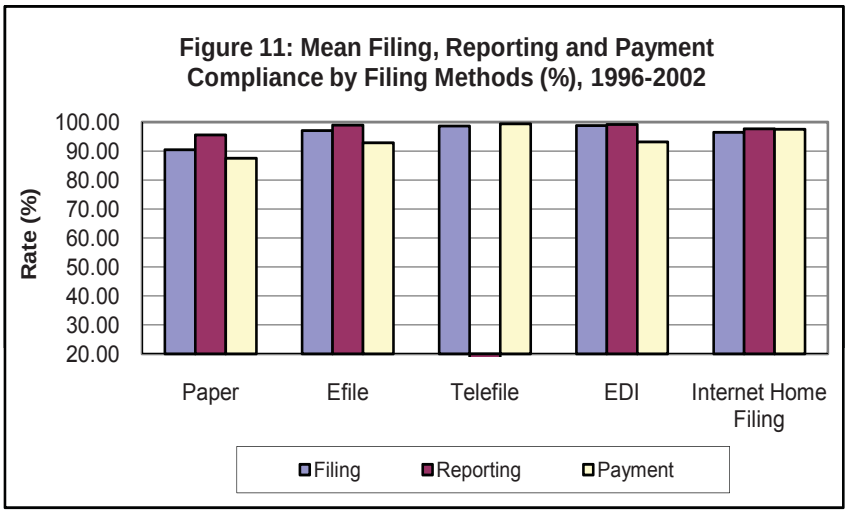
[16] The Canada Revenue Agency (CRA) provides four main methods for taxpayers to file their income tax returns. These are the paper (hardcopy) and the electronic methods (Efile, Telefile, and Netfile). Efile is an electronic service that allows registered tax professionals to send current-year individual tax returns to CRA over the Internet. Telefile is an interactive computer program that allows eligible taxpayers (those with most common types of income tax information such as employment income, pension income, interest income, registered pension plan contributions, and charitable donations) to electronically file their tax returns for free using a touch-tone telephone. Netfile allows taxpayers to file their income tax and benefit returns directly to CRA using the Internet. Netfile is intended for individuals who use commercial software to manage their financial affairs and prepare their tax returns. Netfile is available to most Canadians, but there are some types of tax returns that cannot be submitted electronically using Netfile.

Filing Methods

The filing methods available to taxpayers are paper (hard copy), electronic filing (Efile), telephone filing (Telefile), electronic data interchange (EDI), and Internet home filing. The tax compliance rate (filing, reporting, and payment) by filing method is shown in Table 9, and the mean filing, reporting, and payment compliance is shown in Figure 11.

Table 9: Tax Compliance by Filing Methods (%), 1996-2002

	Year	Filing Method				
		Paper Filing (Hardcopy)	Electronic Filing (EFILE)	Telephone Filing (TELEFILE)	Electronic Data inter-change (EDI/EFILE)	Internet Home Filing
Filing	1996	90.76	98.41	100.00	99.22	–
	1997	90.66	98.80	100.00	98.94	–
	1998	90.53	96.76	100.00	98.91	94.16
	1999	90.52	96.60	100.00	98.92	97.64
	2000	90.03	96.28	96.74	98.45	97.04
	2001	89.64	96.36	96.59	98.13	97.54
	2002	90.76	96.26	97.23	–	95.92
	Mean	90.41	97.07	98.66	98.76	96.46
Reporting	1996	95.75	99.15	–	99.22	–
	1997	95.69	99.05	–	99.09	–
	1998	95.42	99.02	–	99.08	98.30
	1999	95.82	98.91	–	98.97	97.63
	2000	95.84	98.82	–	98.89	97.74
	2001	95.29	98.82	–	99.86	97.40
	2002	95.23	98.71	–	–	97.53
	Mean	95.58	98.93	–	99.19	97.67
Payment	1996	89.07	94.29	99.98	95.96	–
	1997	87.92	93.71	99.50	94.74	–
	1998	87.28	92.21	99.33	93.56	99.51
	1999	86.67	90.14	99.22	91.54	96.25
	2000	85.15	92.23	99.10	91.00	96.97
	2001	87.68	93.45	99.23	91.94	97.15
	2002	88.60	94.17	99.35	–	97.62
	Mean	87.48	92.89	99.39	93.12	97.50



Filing Behavior

Taxpayers using the paper method do perform poorly when it comes to filing their taxes. The electronic methods, on the other hand, have a superior filing compliance record. The agency needs to provide more incentives to taxpayers through outreach programs (e.g., Community Volunteer Income Tax Program) in order to increase filing compliance. Educating taxpayers to use the electronic filing methods should be encouraged. The agency might consider strategies to reduce the monetary costs of using the electronic methods in order to encourage more taxpayers to them in filing their tax returns.

Reporting Behavior

Taxpayers using the electronic methods have a relatively higher reporting compliance rate than those using the paper method, though Telefile has an exceptionally low reporting compliance rate. This is due to the fact that taxpayers using telephone filing are not required to report their total tax payable. Unlike the paper method, the electronic methods have inbuilt mechanisms to control for simple arithmetic errors, which might not be self-correcting with the paper method. Some of the tax noncompliance rate for the paper filing method might be due to genuine arithmetic errors and not intentional, which is difficult to isolate in the database.

Payment Behavior

The paper method shows lower payment compliance relative to the electronic methods. The reason for this observed behavior among taxpayers is not clear.

Multivariate Analysis

The preceding section provided an overview of the tax compliance rates for filing, reporting, and payment. The focus has been frequency counts (percentages) of the number of taxpayers with regard to filing, reporting, and payment tax compliance, but does not provide statistical relationships between the various compliance rates and the relevant variables. This section is an attempt to provide empirical evidence for observed tax compliance rates from 1996 to 2002. That is, the objective here is to identify any statistical relationships and/or significance between the various measures of tax compliance and the relevant variables. Statistical tests of significance are carried out to identify factors that influence tax compliance. Appendix D lists the dummy variable descriptions of all variables used in the analysis, and Appendix E describes the multivariate process (logistic regression) in some detail.

Results of the Logistic Regression Estimates

This section presents logistic regression estimates for the factors likely to influence filing, reporting, and payment tax compliance over the study period. The next subsection discusses factors influencing filing tax compliance, reporting tax compliance, and payment tax compliance.

Filing Compliance Behavior

The odds ratio estimates for filing compliance are shown in Table 10, and the interpretation of the odds ratios is provided in Table 11.[17]

[17] The Odds ratio indicates how much more likely, with respect to odds, a certain event occurs in one group relative to its occurrence in another group. For example, how much more likely are females (reference category) to be filing compliant compared to males? The odds ratio shows the strength of the association between the independent variable and the dependent variable. If the odds ratio is 1, then there is no association between the independent variable and the dependent variable. If the odds ratio is greater than 1, then females (e.g., dummy variable for gender in this study: female = 0 and males = 1) are more likely to be filing compliant than males. If the odds ratio is less than 1, then males are less likely to be filing compliant than females. In Table 10, the odds ratio for gender is 0.888, which implies males are roughly 11 percent less likely to be filing compliant relative to females, all other things being the same.

Table 10: Filing Compliance – Odds Ratio Estimates

Parameters		Point Estimate	95% Wald Confidence Intervals
Demographic Factors			
Gender	Male vs. Female	0.888	0.887 – 0.889
Age Group	Middle vs. Young	1.083	1.081 – 1.085
	Old vs. Young	2.061	2.055 – 2.067
Marital Status	Widowed vs. Married/CL	0.743	0.740 – 0.746
	Divorced vs. Married/CL	0.613	0.611 – 0.615
	Separated vs. Married/CL	0.545	0.544 – 0.547
	Single vs. Married/CL	0.726	0.725 – 0.727
Region	Quebec vs. Atlantic	1.488	1.483 – 1.492
	Ontario vs. Atlantic	0.692	0.690 – 0.694
	Prairies vs. Atlantic	0.783	0.781 – 0.785
	Pacific vs. Atlantic	0.625	0.623 – 0.627
	Non-Residents vs. Atlantic	0.185	0.182 – 0.187
Income Factors			
Pension Income	Pension vs. No Pension	2.096	2.089 – 2.103
RRSP Income	Income vs. No Income	0.818	0.816 – 0.820
Tax-Exempt Income	Exempt vs. No Exempt	0.808	0.806 – 0.809
Main Source of Income	Investment/Rent vs. Wages	1.291	1.288 – 1.295
	Capital Gains/Loss vs. Wages	1.321	1.293 – 1.350
	Self-Employed vs. Wages	0.979	0.977 – 0.981
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses	1.033	1.030 – 1.036
RPP Deduction	Deduction vs. No Deduction	1.122	1.120 – 1.124
RRSP Deduction	Deduction vs. No Deduction	1.785	1.782 – 1.788
Exploration & Devt. Expenses	Expenses vs. No Expenses	1.381	1.356 – 1.405
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	1.508	1.493 – 1.524
Tax Preparer Services	Preparer vs. No Preparer	0.692	0.691 – 0.693
Filing Method	EFILE vs. Paper	4.858	4.846 – 4.870
	TELEFILE vs. Paper	7.030	6.961 – 7.099
	NETFILE vs. Paper	3.040	3.024 – 3.056
Marginal Tax Rates (%)	22% bracket vs. 16% bracket	1.055	1.052 – 1.058
	26% bracket vs. 16% bracket	1.160	1.152 – 1.168
	29% bracket vs. 16% bracket	1.851	1.828 – 1.874

Notes:

- N = 128,103,395
- Nagalkerke R^2 (Max-rescaled R-Square) = 0.1103
- All coefficients in the logistic regression have a statistical significance level of 0.0001.

Demographic Factors

The logistic regression estimates for the demographic factors are mixed, with some factors having positive or adverse influence on filing compliance. Estimates of the filing behavior of females are consistent with the general filing compliance rate. Females are more likely to be filing compliant relative to males. The odds ratio indicates that males are 11 percent more likely to file their taxes late compared to females. This is consistent with the conventional wisdom that females tend to be more risk averse than males.

Compared to young (14–34 years) taxpayers, middle-aged (35–54 years) taxpayers are 8 percent less likely to file their taxes late, while older

Table 11: Filing Compliance – Interpretation of the Odds Ratio Estimates*

Parameters		Filing Compliance Outcome	
Demographic Factors		**Less Likely to File Late**	**More Likely to File Late**
Gender	Male vs. Female		11%
Age Group	Middle vs. Young	8%	
	Old vs. Young	106%	
Marital Status	Widowed vs. Married/CL		26%
	Divorced vs. Married/CL		39%
	Separated vs. Married/CL		45%
	Single vs. Married/CL		27%
Region	Quebec vs. Atlantic	48%	
	Ontario vs. Atlantic		31%
	Prairies vs. Atlantic		22%
	Pacific vs. Atlantic		38%
	Non-Residents vs. Atlantic		82%
Income Factors			
Pension Income	Pension vs. No Pension	109%	
RRSP Income	Income vs. No Income		18%
Tax-Exempt Income	Exempt vs. No Exempt		20%
Main Source of Income	Investment/Rent vs. Wages	29%	
	Capital Gains/Loss vs. Wages	32%	
	Self-Employed vs. Wages		2%
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses	3%	
RPP Deduction	Deduction vs. No Deduction	12%	
RRSP Deduction	Deduction vs. No Deduction	78%	
Exploration & Devt. Expenses	Expenses vs. No Expenses	38%	
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	50%	
Tax Preparer Services	Preparer vs. No Preparer		31%
Filing Method	EFILE vs. Paper	385%	
	TELEFILE vs. Paper	603%	
	NETFILE vs. Paper	204%	
Marginal Tax Rates (%)	22% bracket vs. 16% bracket	5%	
	26% bracket vs. 16% bracket	16%	
	29% bracket vs. 16% bracket	85%	

* All numbers rounded to the nearest whole number

taxpayers (55 years and over) are 106 percent less likely to file their taxes late. This observation is consistent with the frequency distributions. This reinforces the general notion that older people tend to be more risk averse.

Marital status is found to influence filing tax compliance. Compared to married and common-law taxpayers, all other categories of marital status tend to be less filing compliant than those who are married. Specifically, separated taxpayers have the lowest filing compliance rate (45 percent more likely to file late), followed by divorced taxpayers (39 percent more likely to file late).

Quebec Region taxpayers have a significantly higher filing compliance rate compared to all other provinces/territories during the period under study.[18] Quebec Region taxpayers are 48 percent less likely to file their taxes

[18] Tax returns data for Quebec include only the federal tax and do not include taxes paid to the Province of Quebec, while the other provinces/territories include both the federal and Provinces/Territories tax data.

late relative to Atlantic Region (the base category) taxpayers. Non resident taxpayers have the highest likelihood (82 percent) of filing their taxes late.

Income Factors

Similar to demographic factors, income factors also have mixed influence on filing tax compliance. Estimates indicate that taxpayers receiving investment and rent income and capital gains/losses are less likely to file their taxes late (29 percent and 32 percent, respectively) than wage earners. On the other hand, the self-employed are more likely to file their taxes late (2 percent) compared to wage earners.

Taxpayers receiving Registered Pension Plan (RPP) income are 109 percent less likely to file their taxes late, while those receiving Registered Retirement Savings Plan (RRSP) income are 18 percent more likely to file their taxes late compared to taxpayers who do not receive pension and RRSP income. This pattern reiterates the general finding in the tax compliance literature. Older people are more risk averse than the young who tend to be more risk taking.

Taxpayers receiving tax-exempt income (workers' compensation benefits, social assistance payments, and net federal supplements) generally do not file their taxes on time. Specifically, tax-exempt earners are 20 percent more likely to file their taxes late compared to taxpayers who do not receive tax-exempt income.

Deduction Factors

Taxpayers claiming certain deductions are generally less likely to file their taxes late. There seems to be not much of a difference between taxpayers who claimed deductions for childcare expenses and those who do not. Taxpayers claiming childcare expenses are 3 percent less likely to file their taxes late compared to those who do not claim childcare expenses.

Taxpayers claiming RPP deduction are 11 percent less likely to file their taxes late, while those claiming RRSP deduction are 78 percent less likely to file their taxes late compared to taxpayers who do not claim pension and RRSP deductions. Taxpayers who claim exploration and development expenses are quick to file their tax returns. These taxpayers are 38 percent less likely to be filing noncompliant compared to those who do not claim exploration and development expenses.

CRA Factors

Estimates indicate that taxpayers using electronic filing methods (Efile, Telefile, and Netfile) have a significantly higher rate in filing compliance than those using the paper method. Specifically, taxpayers using Efile (385 percent), Telefile (603 percent), and Netfile (204 percent) are less likely to file their taxes late than taxpayers using the paper method. The electronic methods are most attractive to taxpayers expecting to receive a refund since these methods provide instant information on available refunds and balance owing.

Estimates indicate a positive influence of the Community Volunteer Income Tax Program (CVITP) on filing compliance. Taxpayers availing themselves of the program are 50 percent less likely to file their taxes late compared to other taxpayers not using the program. On the other hand, taxpayers using the services of a professional tax preparer are 31 percent more likely to file their taxes late compared to those who do not use tax preparers.

Finally, taxpayers in the lowest marginal tax bracket (16 percent) have a lower filing compliance rate compared to all other marginal tax brackets. Specifically, taxpayers in the 22-percent, 26-percent, and 29-percent marginal tax brackets are 5 percent, 16 percent, and 85 percent less likely to file their taxes late compared to the lowest tax bracket taxpayers (16 percent), respectively.

Reporting Compliance Behavior

This subsection discusses factors that influence reporting tax compliance for the study period, 1996–2002. Table 12 shows the odds ratio estimates, and Table 13 shows the interpretation of the odds ratio estimates.

Demographic Factors

Demographic factors influence tax-reporting compliance over time. Males tend to be less reporting compliant than females. It is not surprising to find that males are 33 percent more likely to underreport their taxes owing compared to females. This observation is consistent with the tax compliance literature (Baldry, 1987; and Torgler and Schneider, 2004). Li (2007) finds that females are 18.9 percent less likely to be reporting noncompliant compared to males, using T1 tax return data for 2002.

Young taxpayers are ahead when it comes to reporting their taxes owing compared to middle-aged and older taxpayers. Again, the observation

Table 12: Reporting Compliance – Odds Ratio Estimates

Parameters		Point Estimate	95% Wald Confidence Intervals
Demographic Factors			
Gender	Male vs. Female	0.671	0.670 – 0.672
Age Group	Middle vs. Young	0.874	0.872 – 0.876
	Old vs. Young	0.917	0.914 – 0.921
Marital Status	Widowed vs. Married/CL	0.899	0.895– 0.903
	Divorced vs. Married/CL	0.747	0.744 – 0.750
	Separated vs. Married/CL	0.714	0.711 – 0.717
	Single vs. Married/CL	0.961	0.959 – 0.964
Region	Quebec vs. Atlantic	1.593	1.587 – 1.598
	Ontario vs. Atlantic	0.916	0.913 – 0.919
	Prairies vs. Atlantic	1.013	1.009 – 1.016
	Pacific vs. Atlantic	0.943	0.940 – 0.947
	Non-Residents vs. Atlantic	0.295	0.289 – 0.301
Income Factors			
Pension Income	Pension vs. No Pension	0.781	0.778 – 0.784
RRSP Income	Income vs. No Income	0.422	0.421 – 0.423
Tax-Exempt Income	Exempt vs. No Exempt	2.780	2.770 – 2.790
Main Source of Income	Investment/Rent vs. Wages	0.974	0.971 – 0.977
	Capital Gains/Loss vs. Wages	0.594	0.583 – 0.605
	Self-Employed vs. Wages	0.833	0.830 – 0.835
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses	0.929	0.925 – 0.933
RPP Deduction	Deduction vs. No Deduction	0.702	0.700 – 0.704
RRSP Deduction	Deduction vs. No Deduction	0.709	0.707 – 0.710
Exploration & Devt. Expenses	Expenses vs. No Expenses	0.895	0.880 – 0.910
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	1.518	1.491 – 1.545
Tax Preparer Services	Preparer vs. No Preparer	2.510	2.503 – 2.516
Filing Method	EFILE vs. Paper	2.527	2.517 – 2.537
	NETFILE vs. Paper	2.331	2.318 – 2.345
Marginal Tax Rates (%)	22% bracket vs. 16% bracket	0.869	0.866 – 0.871
	26% bracket vs. 16% bracket	0.893	0.886 – 0.900
	29% bracket vs. 16% bracket	0.957	0.945 – 0.968

Notes:

- N = 128,103,395
- Nagalkerke R^2 (Max-rescaled R-Square) = 0.2510
- All coefficients in the logistic regression have a statistical significance level of 0.0001.

here is consistent with the earlier pattern in the first part of this report. Young taxpayers might have simpler tax situations relative to the middle-aged and older age cohorts. Specifically, older taxpayers are 8 percent more likely to underreport their taxes, whereas the middle-aged taxpayers are 13 percent more likely to underreport their taxes owing compared to young taxpayers. The middle-aged cohorts might have more complex tax situations and more financial obligations compared to young and older taxpayers. The fact that older taxpayers are less likely to underreport their taxes compared to middle-aged taxpayers is consistent with the tax compliance literature (Andreoni et al., 1998).

The reporting behavior with regard to marital status is very similar to the pattern in filing behavior. Again, separated taxpayers have the lowest reporting compliance rate (29 percent more likely to underreport their taxes

Table 13: Reporting Compliance – Interpretation of the Odds Ratio Estimates*

Parameters		Reporting Compliance Outcome	
Demographic Factors		**Less Likely to Underreport**	**More Likely to Underreport**
Gender	Male vs. Female		33%
Age Group	Middle vs. Young		13%
	Old vs. Young		8%
Marital Status	Widowed vs. Married/CL		10%
	Divorced vs. Married/CL		25%
	Separated vs. Married/CL		29%
	Single vs. Married/CL		4%
Region	Quebec vs. Atlantic	59%	
	Ontario vs. Atlantic		8%
	Prairies vs. Atlantic	1%	
	Pacific vs. Atlantic		6%
	Non-Residents vs. Atlantic		70%
Income Factors			
Pension Income	Pension vs. No Pension		22%
RRSP Income	Income vs. No Income		58%
Tax-Exempt Income	Exempt vs. No Exempt	178%	
Main Source of Income	Investment/Rent vs. Wages		3%
	Capital Gains/Loss vs. Wages		40%
	Self-Employed vs. Wages		17%
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses		7%
RPP Deduction	Deduction vs. No Deduction		30%
RRSP Deduction	Deduction vs. No Deduction		29%
Exploration & Devt. Expenses	Expenses vs. No Expenses		11%
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	52%	
Tax Preparer Services	Preparer vs. No Preparer	151%	
Filing Method	EFILE vs. Paper	152%	
	NETFILE vs. Paper	133%	
Marginal Tax Rates (%)	22% bracket vs. 16% bracket		13%
	26% bracket vs. 16% bracket		11%
	29% bracket vs. 16% bracket		4%

* All numbers rounded to the nearest whole number.

owing); followed by divorced taxpayers (25 percent more likely to underreport their taxes owing) compared to married and common-law taxpayers. For separated and divorce taxpayers, tax complexities in terms of various deductions, credits, and division of assets might influence tax reporting behavior. On the other hand, the Taxpayer Compliance Measurement Program (TCMP) data indicate that noncompliance is more common and of greater magnitude among households in which the head is married (Andreoni et al., 1998).

The observation under filing compliance behavior is mimicked with the reporting compliance. Quebec Region continues to be the province with the highest reporting compliance (59 percent less likely to underreport taxes) compared to taxpayers in the Atlantic Region. Prairies Region taxpayers are 1 percent less likely to underreport taxes owing than the Atlantic Region.

Taxpayers in the Ontario Region (8 percent) and the Pacific Region (6 percent) are more likely to underreport taxes compared to the Atlantic Region. Again, nonresident taxpayers are the least likely (70 percent) to underreport their taxes owing.

Income Factors

All income factors indicate a greater likelihood of tax underreporting except for taxpayers who receive tax-exempt benefits. The reporting compliance levels are very similar among taxpayers who are wage earners and those receiving investment and rent income. Taxpayers receiving capital gains/losses are the least compliant (40 percent more likely to underreport taxes compared to wage earners). The complex accounting and reporting rules among different companies regarding capital gains/losses might explain this pattern.

Self-employed are 17 percent more likely to underreport income compared to wage earners. The case of the self-employed is consistent with the tax compliance literature. Self-employed taxpayers have higher tax compliance costs so that taxes become more visible to them (Lewis, 1982). The 1985 household Taxpayer Compliance Measurement Program (TCMP) data indicate that, among all sole proprietors, those who engaged in sales from fixed locations (car dealerships, stores, restaurants, etc.) understated taxes by the greatest percentage (39 percent), followed by those involved in transportation, communication, and utilities (36 percent) and those in retail sales (31 percent). Business filers in finance, real estate, and insurance; agriculture, forestry, and fishing; and wholesale trade industries understated taxes by the lowest percentages, 16 percent, 18 percent, and 19 percent, respectively (Andreoni et al., 1998).

Even though taxpayers receiving pension income are ahead when it comes to filing their tax returns, they tend to do a poor job with regard to reporting their taxes owing. Registered pension income earners (22 percent) and RRSP income earners (58 percent) are more likely to underreport their taxes owing compared to taxpayers who do not receive pension and RRSP income.

Tax-exempt income earners are over one and one-half times (or 178 percent) less likely to underreport their taxes than nontax-exempt taxpayers. The tax database does not provide any clues as to this observed behaviour. It may be conjectured that since this group of taxpayers did not work for the income it received (especially, social assistance and federal supplements), there is less incentive not to correctly report income.

Deduction Factors

When it comes to deduction items, all taxpayers claiming these deductions are more likely to underreport their taxes owing. Taxpayers claiming deductions for childcare expenses are 7 percent more likely to underreport their taxes than taxpayers who have no childcare expenses. This might be due to lack of recordkeeping and the necessary receipts to back such expense deductions. Assessment Officers might disallow expenses that lack supporting documentation.

Taxpayers who claim the registered pension deduction (30 percent) and the RRSP deduction (29 percent) are more likely to underreport their taxes owing compared to taxpayers who do not claim pension and RRSP deductions. This observation could be due to improper deductions for RRSP contributions that have been previously deducted, for example, repayments for the Home Buyers Plan and the Lifelong Learning Plan, that are later corrected through assessments and/or reassessments.

Even though taxpayers who claim exploration and development expenses are quick to file their tax returns on time, they fall behind when it comes to correctly reporting their incomes. These taxpayers are 11 percent more likely to underreport taxes owing than those who do not claim exploration and development expenses.

CRA Factors

The electronic methods, especially, Efile and Netfile, have exceptionally high levels of reporting compliance compared to the paper method.[19] Taxpayers using Efile (152 percent) and Netfile (133 percent) are less likely to underreport their taxes owing compared to paper filers. The electronic methods have inbuilt mechanisms to control for simple arithmetic errors that might not be self-correcting with the paper method.

It is no coincidence that taxpayers using the CVITP are ahead when it comes to reporting their taxes owing correctly compared to those not using the program. In short, the CVITP seems to achieve its objective, though this study did not take into account agency resources devoted to the program. CVITP users are 52 percent less likely to underreport their taxes owing than

[19] The results of the Processing Review (PR) are quite different. Based on a random sample of all individuals who claim deductions/credits reviewed in the PR program (the majority of deductions/credits on the T1 return), with the added condition of a $50 tax recovery resulting if a claim was disallowed, the 2002-2003 program estimated a noncompliance rate of 10.1 percent for 2001 returns. In addition, the results indicated that the estimated noncompliance rate for the Netfile population (13.7 percent) is higher than for all the other filing methods (9.3 percent for paper and 9.9 percent for Efile) (IRPPD, 2004).

those who do not use the program. Education and outreach programs to encourage low-income taxpayers to use the program would influence reporting compliance, all other things being the same.

The tax literature presents mixed results on the impact of tax preparers on tax compliance. Results in this study indicate that taxpayers using a professional tax preparer are 1.5 times more likely to correctly report their taxes compared to those who do not use a tax preparer. This observation is contrary to some of the findings by Erard (1993) and Klepper and Nagin (1989).

Klepper and Nagin (1989) used data from the Internal Revenue Service's (IRS) Taxpayer Compliance Measurement Program, and an index of legal ambiguity based on Revenue Rulings, to assess the impact of preparation mode (paid third party versus self) on compliance at the level of the return line item. Results suggest that preparers contribute to compliance by enforcing legally clear requirements but also contribute to noncompliance, as measured by the IRS, by helping taxpayers take advantage of legal ambiguity. Furthermore, an analysis of a campaign to enforce estimated tax requirements conducted by the Pennsylvania Department of Revenue suggests that tax preparers also provide an important network for communicating tax agency enforcement priorities to taxpayers.

Erard (1993) provided a joint analysis of tax preparation mode and tax noncompliance. He used microlevel audit data from the Internal Revenue Service. Although the availability of tax practitioners undoubtedly reduces many of the informational and computational barriers to tax compliance, results indicate that use of certified public accountants (CPAs) and attorneys is associated with increased noncompliance. Results may have negative implications for both tax equity and tax efficiency.

The tax literature argues that higher taxes may or may not lead to tax evasion (Allingham and Sandmo, 1972; and Yitzhaki, 1974). Compared to the lowest tax bracket (16 percent), taxpayers in the higher tax brackets (22 percent, 26 percent, and 29 percent) are more likely to underreport taxes owing, all other things being the same. Analysis indicates that taxpayers in the 22-percent, 26-percent, and 29-percent tax brackets are 13 percent, 11 percent, and 4 percent, respectively, more likely not to report taxes correctly compared to the lowest tax bracket taxpayers (16 percent). Estimates in our study reinforce the following previous studies on the marginal tax rate and tax compliance.

Clotfelter (1983) finds that the elasticity of underreporting with respect to the marginal tax rate is positive for every audit class, with the magnitude of the elasticity varying from 0.5 to more than 3.0. In their analysis of

noncompliance based on Swiss canton data, Pommerehne and Frey (1992) include both a measure of the canton tax rate and the median income as independent variables. Their results indicate a positive, significant relationship between each of these variables and noncompliance, similar to Clotfelter's result. Joulfaian and Rider (1996) examine the impact of tax rates (inclusive of Social Security taxes and accounting for the Earned Income Tax Credit) for a random sample of low-income households from the 1988 Taxpayer Compliance Measurement Program (TCMP). They find that both the probability and the level of noncompliance among low-income proprietors are positively and significantly associated with the marginal tax rate, consistent with Clotfelter.

On the contrary, Alm, Bahl, and Murray (1993) report results for Jamaica from the estimation of three-equation models in which the dependent variables are evasion, reported income, and "allowance" income. They include the marginal tax rate as an independent variable in their equations but did not include any measure of income. Their results indicate that an increase in the marginal tax rate actually lowers evasion.

Payment Compliance Behavior

This subsection discusses factors that influence payment tax compliance for the study period, 1996–2002. Table 14 shows the odds ratio estimates, and Table 15 shows the interpretation of the odds ratio estimates.

Demographic Factors

Results of the estimates for demographic factors on tax payment compliance are mixed. Logistic regression estimates indicate that males are 30 percent more likely to pay taxes late compared to females. Males generally have higher incomes and more financial obligations compared to females, and hence have higher tax obligations. This might explain the inability of males to honor their tax payments compared to females.

Older taxpayers come ahead of young and middle-aged taxpayers with regard to payment compliance. Older taxpayers are 20 percent less likely to pay taxes late, while middle-aged taxpayers are 6 percent more likely to pay taxes late compared to young taxpayers.

The same pattern in payment behavior is observed in filing and reporting compliance. Separated and divorced taxpayers have the lowest payment compliance rates compared to married and common-law taxpayers, as well as other marital categories. Separated taxpayers are 33 percent more likely

Table 14: Payment Compliance – Odds Ratio Estimates

Parameters		Point Estimate	95% Wald Confidence Intervals
Demographic Factors			
Gender	Male vs. Female	0.698	0.698– 0.699
Age Group	Middle vs. Young	0.936	0.934 – 0.937
	Old vs. Young	1.201	1.199 – 1.204
Marital Status	Widowed vs. Married/CL	0.814	0.812 – 0.816
	Divorced vs. Married/CL	0.697	0.695 – 0.698
	Separated vs. Married/CL	0.672	0.670 – 0.674
	Single vs. Married/CL	1.023	1.021 – 1.025
Region	Quebec vs. Atlantic	1.708	1.704 – 1.712
	Ontario vs. Atlantic	1.143	1.141 – 1.146
	Prairies vs. Atlantic	1.116	1.113 – 1.119
	Pacific vs. Atlantic	1.047	1.044 – 1.050
	Non-Residents vs. Atlantic	1.464	1.433 – 1.495
Income Factors			
Pension Income	Pension vs. No Pension	0.731	0.729 – 0.733
RRSP Income	Income vs. No Income	0.395	0.394 – 0.396
Tax-Exempt Income	Exempt vs. No Exempt	2.385	2.380 – 2.391
Main Source of Income	Investment/Rent vs. Wages	0.723	0.722 – 0.724
	Capital Gains/Loss vs. Wages	0.586	0.579 – 0.593
	Self-Employed vs. Wages	0.357	0.356 – 0.357
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses	1.083	1.080 – 1.086
RPP Deduction	Deduction vs. No Deduction	1.150	1.148 – 1.152
RRSP Deduction	Deduction vs. No Deduction	1.022	1.021 – 1.024
Exploration & Devt. Expenses	Expenses vs. No Expenses	0.976	0.968 – 0.985
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	3.957	3.878 – 4.038
Tax Preparer Services	Preparer vs. No Preparer	0.637	0.636 – 0.638
Filing Method	EFILE vs. Paper	2.703	2.698– 2.707
	TELEFILE vs. Paper	13.101	12.909 – 13.297
	NETFILE vs. Paper	4.336	4.312 – 4.360
Marginal Tax Rates (%)	22% bracket vs. 16% bracket	0.645	0.644 – 0.646
	26% bracket vs. 16% bracket	0.492	0.490 – 0.494
	29% bracket vs. 16% bracket	0.395	0.393– 0.398

Notes:

- N = 128,103,395
- Nagalkerke R^2 (Max-rescaled R-Square) = 0.1384
- All coefficients in the logistic regression have a statistical significance level of 0.0001.

to pay taxes late, while divorced taxpayers are 30 percent more likely to pay taxes late compared to married and common-law taxpayers.

Estimates indicate that Quebec Region is the favored region when it comes to paying taxes owed. Quebec Region is 71 percent less likely to pay taxes late compared to taxpayers in the Atlantic Region. Unexpectedly, nonresident taxpayers are ranked second regarding their ability to pay taxes owing. Specifically, nonresident taxpayers are 46 percent less likely to pay taxes late than taxpayers in the Atlantic Region.

Income Factors

The taxpayers' sources of income influence their ability to pay taxes on time. Wage earners do a better job paying taxes owing compared to other

Table 15: Payment Compliance – Interpretation of the Odds Ratio Estimates*

Parameters		Payment Compliance Outcome	
Demographic Factors		**Less Likely to Pay Late**	**More Likely to Pay Late**
Gender	Male vs. Female		30%
Age Group	Middle vs. Young		6%
	Old vs. Young	20%	
Marital Status	Widowed vs. Married/CL		19%
	Divorced vs. Married/CL		30%
	Separated vs. Married/CL		33%
	Single vs. Married/CL		2%
Region	Quebec vs. Atlantic	71%	
	Ontario vs. Atlantic	14%	
	Prairies vs. Atlantic	11%	
	Pacific vs. Atlantic	4%	
	Non-Residents vs. Atlantic	46%	
Income Factors			
Pension Income	Pension vs. No Pension		27%
RRSP Income	Income vs. No Income		60%
Tax-Exempt Income	Exempt vs. No Exempt	138%	
Main Source of Income	Investment/Rent vs. Wages		28%
	Capital Gains/Loss vs. Wages		41%
	Self-Employed vs. Wages		64%
Deduction Factors			
Child Care Expenses	Expenses vs. No Expenses	8%	
RPP Deduction	Deduction vs. No Deduction	15%	
RRSP Deduction	Deduction vs. No Deduction	2%	
Exploration & Devt. Expenses	Expenses vs. No Expenses		2%
CRA Program Factors			
Voluntary Program Preparer	Participant vs. Non-Participant	295%	
Tax Preparer Services	Preparer vs. No Preparer		36%
Filing Method	EFILE vs. Paper	170%	
	TELEFILE vs. Paper	1,310%	
	NETFILE vs. Paper	333%	
Marginal Tax Rates (%)	22% bracket vs. 16% bracket		35%
	26% bracket vs. 16% bracket		51%
	29% bracket vs. 16% bracket		60%

* All numbers rounded to the nearest whole number.

major income sources. The self-employed are 64 percent more likely, taxpayers receiving capital gains/losses are 41 percent more likely, and taxpayers receiving investment and rent income are 28 percent more likely to pay taxes late compared to wage earners. Registered pension income earners (27 percent) and RRSP income earners (60 percent) are more likely to pay taxes late compared to those not receiving pension and RRSP income. This might be explained by the low-income status of most pensioners. Tax-exempt taxpayers are 138 percent less likely to pay any taxes late compared to other taxpayers.

Deduction Factors

All taxpayers claiming deductions do a good job when it comes to paying taxes. Taxpayers who claim childcare deductions are 8 percent less likely to pay taxes late compared to those who do not claim childcare deductions. This observation is not surprising, given that most taxpayers who claim childcare deductions are females. Analysis in this study indicates that females are more tax compliant (filing, reporting, and payment) than males, all other things being the same.

Compared to taxpayers who do not claim registered pension and RRSP deductions, taxpayers who claim deductions for pension and RRSP are 15 percent and 2 percent, respectively, less likely to pay taxes late. Taxpayers who claim exploration and development expenses are 2 percent more likely to pay taxes late than those who do not make such claims.

CRA Factors

The general observation is that CRA factors have both favorable and unfavorable influence on the willingness of taxpayers to honor tax payment obligations. Estimates here are very similar to filing and reporting compliance behavior. The electronic methods indicate a higher level of payment compliance than the paper method. CVITP users are less likely to pay taxes late than taxpayers who do not use the program. Specifically, CVITP users are 3.8 times less likely to pay any balance owing late than taxpayers who do not make use of the program. Taxpayers using a professional tax preparer are 36 percent more likely to pay taxes late compared to other taxpayers. This should not be surprising since taxpayers may have an incentive to first pay the tax preparer than to pay the tax authority. This might be due to the need to maintain the established networking relationship with the professional tax preparer.

Similar to reporting behavior, taxpayers in the highest tax brackets (22 percent, 26 percent, and 29 percent) are more likely to pay taxes late. It is obvious that taxpayers in the highest tax brackets have higher tax obligations in addition to other financial responsibilities that might constrain their ability to pay taxes on time. The next section concludes the paper.

Conclusion

Personal income tax is an important source of revenue for both federal and provincial/territorial governments in Canada. For instance, personal income

taxes accounted for an average of $81.6 billion quarterly in revenues for the Federal government from 2000 to 2004. The Canadian tax system assumes voluntary compliance and self-assessment by individual taxpayers. Even though many taxpayers comply with their tax obligations, others do not. The tax literature identifies several factors, both economic and noneconomic, as determinants of the taxpayer compliance decision. This research aims at identifying the factors that contribute to the observed tax compliance of individual taxpayers over time.

A balanced panel (longitudinal microdata from T1 tax returns) was used to analyze the impact of several economic and non-economic factors on Canadian tax compliance from 1996 to 2002. Frequency distributions were used to study patterns in tax compliance among different categories of taxpayers. Also, a multivariate analysis using a logistic regression was used to identify the likelihood of various economic and noneconomic factors influencing tax compliance.

The findings of the study indicate several contributing factors for Canadian tax compliance. At the same time, other factors represent high risks to Canadians' tax compliance. These risk areas are worthy of greater attention by the Canada Revenue Agency. Specifically, the study finds that females are more tax compliant (filing, reporting, and payment) than males. Furthermore, middle-aged taxpayers are less tax compliant compared to young and older taxpayers. Married and common-law taxpayers are more likely to be tax compliant than other marital status categories. Nonresidents have a lower compliance rate than other regions of Canada.

Among others, low-income taxpayers are more likely to be tax compliant compared to middle- and high-income taxpayers. This finding is also true for taxpayers in the lowest tax bracket compared to taxpayers in the highest tax bracket. The likelihood of wage earners filing, reporting, and paying taxes due are better than taxpayers receiving investment and rent income and capital gains/losses and for the self-employed. The electronic methods are superior in promoting tax compliance relative to the paper method. Also, the use of professional tax preparers improves reporting compliance, though the record on filing and payment compliance is unfavorable. Finally, taxpayers who claim various deductions (e.g., childcare expenses, pension and RRSP, and exploration and development expenses) are less likely to be reporting tax compliant than those taxpayers who do not claim such deductions.

The analysis in this paper has revealed several interesting facts about Canadian taxpayers' compliance behavior with regard to filing, reporting, and paying taxes. Other interesting research questions, though, were beyond

the scope of this study. For instance, what are the characteristics of taxpayers who use professional tax preparers to file their tax returns? Or what are the characteristics of taxpayers who avail themselves of the benefits of the community volunteer income tax program to file their tax returns? Given the importance of these topics, they surely deserve further investigation.

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Appendices

Appendix A: Collinearity Tests for the Independent Variables

Variable	Variance Inflation Factor	Eigenvalue	Condition Index
Gender	1.14374	2.22051	1.69249
Child Care Expenses	1.06488	1.35765	2.16451
RPP Income	2.72935	1.25314	2.25296
RRSP Deduction	1.26059	1.11730	2.38598
RRSP Income	1.02607	1.08395	2.42241
Tax Preparer Services	1.50937	1.03641	2.47735
RPP Deduction	1.21546	1.02914	2.48608
Exploration and Development Expenses	1.02160	1.01589	2.50225
Tax-Exempt Income	1.24341	1.00351	2.51763
Voluntary Program Participant	1.01924	1.00155	2.52009
Quebec	3.16964	0.99915	2.52312
Ontario	3.62269	0.98819	2.53708
Prairies	2.62864	0.96714	2.56454
Pacific	2.30588	0.95018	2.58733
Non-residents	1.00910	0.92521	2.62200
Widowed	1.34071	0.90088	2.65718
Divorced	1.05661	0.88466	2.68143
Separated	1.03997	0.84295	2.74697
Single	1.31252	0.76075	2.89157
Efile	1.39501	0.70053	3.01328
Telefile	1.02657	0.94909	3.13040
Netfile	1.03467	0.55963	3.37135
Investment/Rent Income	1.16124	0.52574	3.47832
Capital Gains	1.00316	0.46161	3.71205
Self-employed	1.14546	0.41883	3.89702
Middle Age	1.77874	0.33583	4.35204
Old Age	3.34812	0.29350	4.65528
Marginal Tax Rate (22%)	1.34462	0.20133	5.62086
Marginal Tax Rate (26%)	1.11324	0.12108	7.24811
Marginal Tax Rate (29%)	1.07200	0.03393	13.69200

Notes:

- Variance Inflation Factor (VIF) shows how the variance of an estimator is inflated by the presence of multicollinearity. As a rule of thumb, if the VIF of a variable exceeds 10 that variable is said to be highly collinear.
- Eigenvalues near zero indicate strong collinearity.
- Condition Index values between 10 and 30 suggest weak dependencies, between 30 and 100 indicate moderate dependencies, and greater than 100 indicate strong collinearity.

Appendix B: Frequency Counts for the Tax Compliance Tables

Table 1B: Tax Compliance in General, 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Filing	16,888,770	16,924,902	16,863,767	16,892,582	16,856,664	16,872,000	16,983,174
Reporting	17,646,664	17,494,103	17,360,070	17,354,053	17,381,343	17,369,887	17,337,096
Payment	16,493,785	16,343,111	16,223,042	16,100,707	16,059,130	16,490,572	16,638,926

Table 2B: Tax Compliance by Gender, 1996-2002

	1996	1997	1998	1999	2000	2001	2002
Male							
Filing	8,292,667	8,302,822	8,266,711	8,282,835	8,273,240	8,287,825	8,368,108
Reporting	8,631,889	8,556,320	8,492,096	8,492,078	8,513,754	8,489,711	8,474,884
Payment	7,930,854	7,838,213	7,764,142	7,693,810	7,680,246	7,919,411	8,008,304
Female							
Filing	8,593,154	8,619,126	8,594,109	8,606,770	8,580,455	8,581,195	8,612,064
Reporting	9,011,708	8,934,623	8,864,824	8,858,822	8,864,461	8,877,046	8,859,051
Payment	8,559,958	8,501,876	8,455,861	8,404,079	8,375,913	8,568,168	8,627,633

Table 3B: Tax Compliance by Age Group, 1996-2002

	Year	Age Group (Years)						
		0 – 14	15 – 24	25 - 34	35 – 44	45 – 54	55 - 64	65+
Filing	1996	28,054	2,052,693	3,483,272	3,979,668	3,005,629	1,958,674	2,380,780
	1997	20,634	1,795,303	3,350,296	4,031,827	3,129,875	2,022,910	2,574,057
	1998	15,691	1,511,456	3,195,013	4,050,316	3,238,524	2,094,453	2,758,314
	1999	12,164	1,232,899	3,076,484	4,074,157	3,378,952	2,176,113	2,941,813
	2000	9,432	947,374	2,981,024	4,035,864	3,502,307	2,256,087	3,124,576
	2001	7,484	672,901	2,926,807	3,984,505	3,595,136	2,378,716	3,306,451
	2002	5,904	410,708	2,914,393	3,933,855	3,695,809	2,535,395	3,487,110
Reporting	1996	31,147	2,237,541	3,758,456	4,200,577	3,095,361	1,970,728	2,352,854
	1997	21,915	1,913,049	3,583,725	4,222,261	3,200,577	2,024,916	2,527,660
	1998	16,579	1,602,730	3,418,279	4,236,572	3,296,472	2,092,282	2,697,156
	1999	12,733	1,301,940	3,283,502	4,250,191	3,436,621	2,177,736	2,891,330
	2000	9,978	1,005,716	3,198,590	4,244,116	3,580,987	2,262,205	3,079,751
	2001	7,895	715,758	3,129,702	4,180,686	3,672,004	2,379,298	3,284,544
	2002	6,225	429,206	3,055,474	4,082,728	3,751,974	2,533,816	3,477,673
Payment	1996	30,028	2,165,499	3,535,851	3,899,127	2,854,795	1,799,826	2,208,659
	1997	21,251	1,847,399	3,369,105	3,925,831	2,955,875	1,841,485	2,382,165
	1998	15,790	1,556,188	3,231,509	3,947,379	3,052,726	1,891,540	2,527,910
	1999	11,619	1,256,651	3,092,824	3,942,560	3,162,177	1,950,245	2,684,631
	2000	9,529	963,837	3,001,471	3,912,086	3,278,970	2,028,089	2,865,148
	2001	7,600	692,448	3,007,768	3,970,481	3,471,828	2,215,407	3,125,040
	2002	5,992	421,668	2,986,800	3,931,312	3,585,528	2,369,329	3,338,297

Table 4B: Tax Compliance by Marital Status, 1996-2002

	Year	Marital Status					
		Married	Common-Law	Widowed	Divorced	Separated	Single
Filing	1996	9,217,779	937,427	957,856	848,134	609,688	4,278,377
	1997	9,304,123	1,002,973	1,017,211	861,212	628,337	4,092,107
	1998	9,340,625	1,056,223	1,071,919	869,487	639,660	3,874,568
	1999	9,424,774	1,099,634	1,124,826	882,332	654,287	3,699,231
	2000	9,462,120	1,126,775	1,173,926	894,338	670,920	3,523,440
	2001	9,494,431	1,178,793	1,230,110	917,252	687,532	3,358,650
	2002	9,554,890	1,240,102	1,282,886	937,512	708,500	3,256,968
Reporting	1996	9,434,711	992,299	960,962	899,250	668,935	4,646,565
	1997	9,443,779	1,050,095	1,014,320	903,623	682,089	4,378,054
	1998	9,448,662	1,100,839	1,062,101	906,352	693,472	4,134,256
	1999	9,519,134	1,140,849	1,119,377	918,207	706,929	3,939,264
	2000	9,593,383	1,173,450	1,175,489	933,454	728,886	3,768,922
	2001	9,610,327	1,217,206	1,241,172	955,652	743,707	3,596,525
	2002	9,631,314	1,270,528	1,301,250	963,658	752,002	3,415,780
Payment	1996	8,745,473	926,902	891,204	830,367	609,526	4,447,602
	1997	8,757,239	979,397	946,610	833,694	620,823	4,184,344
	1998	8,752,229	1,026,861	988,411	840,026	633,011	3,969,273
	1999	8,742,950	1,058,908	1,034,644	850,109	643,487	3,761,542
	2000	8,800,230	1,082,399	1,084,942	858,850	656,885	3,569,414
	2001	9,081,641	1,159,529	1,175,416	907,783	690,836	3,471,211
	2002	9,204,078	1,220,882	1,236,229	926,495	708,385	3,340,572

Table 5B: Tax Compliance by Province/Territory, 1996-2002

	Year	Province/Territory					
		NFL	PEI	NS	NB	QC	ON
Filing	1996	323,621	79,857	529,336	449,182	4,368,885	6,199,468
	1997	319,138	79,493	526,302	445,917	4,376,340	6,213,079
	1998	313,011	79,268	525,590	444,782	4,378,547	6,170,229
	1999	313,923	79,256	529,455	446,471	4,385,468	6,191,523
	2000	308,609	79,081	525,376	443,504	4,373,231	6,168,179
	2001	306,674	79,304	523,498	441,179	4,373,534	6,177,758
	2002	306,283	79,538	524,977	443,277	4,390,835	6,230,818
Reporting	1996	338,914	82,533	545,743	460,851	4,520,348	6,485,915
	1997	322,341	79,468	533,806	449,274	4,482,808	6,439,230
	1998	311,532	77,273	521,887	439,812	4,464,865	6,389,884
	1999	306,599	76,392	521,518	436,954	4,458,350	6,393,064
	2000	302,491	76,974	521,567	435,437	4,470,898	6,410,092
	2001	302,209	77,471	521,497	434,600	4,445,727	6,411,352
	2002	299,421	76,844	519,241	431,633	4,449,119	6,395,707
Payment	1996	317,613	75,758	511,771	432,481	4,298,284	6,053,693
	1997	304,041	73,859	503,030	423,954	4,265,341	6,017,019
	1998	294,958	73,294	500,416	419,353	4,236,043	5,971,386
	1999	293,911	73,008	501,023	420,835	4,212,946	5,898,920
	2000	292,583	73,113	496,504	415,994	4,189,704	5,899,948
	2001	297,382	75,161	508,175	426,915	4,295,371	6,052,872
	2002	296,647	75,525	507,616	426,940	4,310,125	6,123,372

Table 5B: Tax Compliance by Province/Territory, 1996-2002 (Continued)

	Year	Province/Territory						
		MB	SK	AB	BC	NWT	YU	NU
Filing	1996	653,824	575,297	1,543,610	2,113,138	27,588	15,171	-
	1997	653,239	574,232	1,574,790	2,110,600	27,588	14,939	-
	1998	649,474	568,688	1,590,310	2,095,609	27,262	14,532	-
	1999	648,181	567,038	1,591,374	2,088,929	18,087	14,699	8,980
	2000	645,594	561,337	1,615,773	2,085,706	17,542	14,558	8,733
	2001	643,526	557,308	1,626,293	2,091,738	17,923	14,432	9,099
	2002	645,072	556,418	1,646,873	2,105,565	18,460	14,775	9,614
Reporting	1996	676,736	587,267	1,644,328	2,243,877	31,877	17,029	-
	1997	671,188	580,598	1,652,738	2,225,097	30,956	16,723	-
	1998	667,496	571,593	1,662,916	2,196,490	30,479	16,358	-
	1999	665,659	571,162	1,667,244	2,199,243	20,360	16,374	10,035
	2000	662,056	566,771	1,685,172	2,192,243	20,013	16,145	10,388
	2001	660,337	565,228	1,703,385	2,190,295	20,211	15,950	10,469
	2002	657,050	559,414	1,700,310	2,187,813	20,224	15,993	10,553
Payment	1996	634,115	543,346	1,505,287	2,066,515	28,628	15,026	-
	1997	621,220	532,859	1,505,813	2,042,058	28,595	15,300	-
	1998	616,178	524,136	1,518,426	2,016,545	27,679	14,890	-
	1999	611,701	520,879	1,520,261	1,993,543	18,384	14,752	9,208
	2000	604,228	518,058	1,523,351	1,992,645	17,718	14,428	9,547
	2001	616,859	525,735	1,580,514	2,057,126	18,263	14,638	9,616
	2002	625,108	528,711	1,617,144	2,069,721	19,077	14,817	9,888

Table 6B: Tax Compliance by Taxable Income Group, 1996-2002

	Year	Taxable Income Group (2004)		
		Low ($35,000 or less)	Middle (More than $35,000 but not more than $113,804)	High (More than $113,804)
Filing	1996	15,763,564	1,060,937	64,269
	1997	15,657,957	1,187,781	79,146
	1998	11,640,644	4,954,480	268,643
	1999	15,553,429	1,248,671	90,482
	2000	16,406,035	399,231	51,398
	2001	16,327,955	487,285	56,760
	2002	16,054,490	850,034	78,650
Reporting	1996	16,521,908	1,061,058	63,698
	1997	16,226,899	1,188,635	78,569
	1998	12,152,613	4,938,236	269,221
	1999	16,017,355	1,246,514	90,184
	2000	16,927,747	402,937	50,659
	2001	16,825,125	488,562	56,200
	2002	16,410,113	849,042	77,941
Payment	1996	15,550,393	901,046	42,346
	1997	15,274,216	1,016,299	52,596
	1998	11,556,728	4,476,124	190,190
	1999	15,000,779	1,042,607	57,321
	2000	15,729,415	297,405	32,310
	2001	16,059,346	392,858	38,368
	2002	15,855,467	728,114	55,345

Table 7B: Tax Compliance by Major Source of Income, 1996-2002

	Year	Major Source of Income				
		Wage Earners	Gross Rents up to $125,000	Investment Income over $3,000	Gross Rents in Excess of $125,000	Capital Gain/Losses > $1,000 or Gross Proceeds > $25,000
Filing	1996	12,556,049	899,143	1,178,590	38,372	19,273
	1997	12,626,746	904,495	1,061,109	38,510	21,274
	1998	12,574,930	903,595	1,030,628	39,710	29,357
	1999	12,381,438	913,637	1,226,943	36,313	30,668
	2000	12,255,095	917,413	1,327,823	33,412	25,084
	2001	12,293,738	926,898	1,301,955	34,645	26,117
	2002	12,523,835	936,612	1,160,641	35,231	26,136
Reporting	1996	13,180,851	930,835	1,155,246	39,049	18,921
	1997	13,053,738	937,483	1,039,015	39,093	21,003
	1998	12,914,478	941,068	1,007,993	40,106	28,843
	1999	12,685,744	952,223	1,203,132	36,806	30,218
	2000	12,619,942	959,185	1,299,044	33,788	24,752
	2001	12,655,869	964,827	1,282,109	35,018	25,385
	2002	12,777,029	972,911	1,148,073	35,531	25,440
Payment	1996	12,666,400	840,259	1,051,057	30,296	16,408
	1997	12,581,984	843,391	946,432	29,946	18,353
	1998	12,529,284	834,816	903,769	29,767	25,244
	1999	12,275,584	834,191	1,063,665	25,893	25,739
	2000	12,139,184	843,055	1,144,367	23,778	21,326
	2001	12,452,587	880,451	1,178,712	25,599	22,954
	2002	12,716,382	892,912	1,063,788	26,205	23,328

Table 7B: Tax Compliance by Major Source of Income, 1996-2002 (Continued)

	Year	Major Source of Income				
		Farming	Professional	Business	Fishing	Commission
Filing	1996	366,748	249,537	1,234,712	37,073	309,273
	1997	367,685	257,265	1,292,014	35,001	320,803
	1998	365,257	262,343	1,314,476	32,147	311,324
	1999	362,449	266,196	1,320,382	31,863	322,693
	2000	360,086	268,802	1,321,300	31,317	325,332
	2001	356,049	264,971	1,313,045	30,550	324,032
	2002	350,979	268,004	1,332,288	30,581	318,867
Reporting	1996	368,548	257,691	1,330,213	36,089	329,221
	1997	370,170	264,345	1,394,060	33,737	341,409
	1998	368,469	271,324	1,422,943	31,109	333,737
	1999	366,636	275,035	1,428,349	30,660	345,250
	2000	363,847	275,718	1,425,807	30,575	348,685
	2001	359,710	269,701	1,403,393	29,569	344,306
	2002	353,298	268,633	1,393,322	29,196	333,663
Payment	1996	328,918	191,661	1,061,956	25,996	280,834
	1997	327,676	194,885	1,087,125	24,302	289,017
	1998	321,298	195,048	1,082,420	21,492	279,904
	1999	314,349	192,944	1,059,835	19,614	288,893
	2000	316,670	195,651	1,063,813	20,090	291,196
	2001	318,913	201,558	1,089,142	21,178	299,478
	2002	314,204	203,594	1,085,189	20,581	292,743

Table 8B: Tax Compliance by Marginal Tax Rates, 1996-2002

	Year	Marginal Tax Rates (2004)			
		Marginal Tax Rate (16%)	Marginal Tax Rate (22%)	Marginal Tax Rate (26%)	Marginal Tax Rate (29%)
Filing	1996	15,763,564	961,206	99,731	64,269
	1997	15,657,957	1,072,071	115,710	79,146
	1998	11,640,644	4,244,605	709,875	268,643
	1999	15,553,429	1,117,645	131,026	90,482
	2000	16,406,035	333,110	66,121	51,398
	2001	16,327,955	411,381	75,904	56,760
	2002	16,054,490	740,215	109,819	78,650
Reporting	1996	16,521,908	961,878	99,180	63,698
	1997	16,226,899	1,073,285	115,350	78,569
	1998	12,152,613	4,227,541	710,695	269,221
	1999	16,017,355	1,114,741	131,773	90,184
	2000	16,927,747	336,818	66,119	50,659
	2001	16,825,125	412,944	75,618	56,200
	2002	16,410,113	739,139	109,903	77,941
Payment	1996	15,550,393	830,171	70,875	42,346
	1997	15,274,216	932,589	83,710	52,596
	1998	11,556,728	3,870,090	606,034	190,190
	1999	15,000,779	950,015	92,592	57,321
	2000	15,729,415	253,528	43,877	32,310
	2001	16,059,346	338,404	54,454	38,368
	2002	15,855,467	645,408	82,706	55,345

Table 9B: Tax Compliance by Filing Methods, 1996-2002

	Year	Filing Method				
		Paper Filing (Hardcopy)	Electronic Filing (EFILE)	Telephone Filing (TELEFILE)	Electronic Data Interchange (EDI)	Internet Home Filing
Filing	1996	13,322,351	3,324,050	4,006	238,363	-
	1997	12,919,977	3,460,209	263,925	280,791	-
	1998	12,567,659	3,559,761	402,693	333,267	387
	1999	12,151,701	3,506,633	490,970	433,685	309,593
	2000	11,341,689	3,425,544	452,872	650,165	986,394
	2001	10,634,046	3,400,485	380,935	807,024	1,649,510
	2002	9,986,227	1,945,549	456,342	-	1,708,796
Reporting	1996	14,055,127	3,349,236	3,928	238,373	-
	1997	13,635,830	3,469,066	107,973	281,234	-
	1998	13,245,572	3,642,766	137,483	333,845	404
	1999	12,862,566	3,590,261	157,781	433,901	309,542
	2000	12,073,795	3,515,959	147,772	653,086	990,731
	2001	11,304,944	3,487,415	117,335	813,077	1,647,116
	2002	10,477,072	1,995,022	146,117	-	1,737,364
Payment	1996	13,074,200	3,185,038	4,005	230,542	-
	1997	12,529,678	3,281,932	262,621	268,880	-
	1998	12,115,222	3,392,153	399,998	315,260	409
	1999	11,635,047	3,271,992	487,162	401,331	305,175
	2000	10,727,209	3,281,367	463,891	600,983	985,680
	2001	10,401,900	3,297,798	391,723	756,143	1,643,008
	2002	9,748,389	1,903,270	465,879	-	1,738,986

Appendix C: Chi-Square and Cramer's V Tests of Association

Table 2C: Tax Compliance by Gender, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0437	0.0418	0.0429	0.0425	0.0421	0.0398	0.0392
Reporting	0.0343	0.0327	0.0322	0.0322	0.0286	0.0347	0.0343
Payment	0.0698	0.0739	0.0772	0.0787	0.0757	0.0734	0.0699

Table 3C: Tax Compliance by Age, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0904	0.0861	0.0893	0.0878	0.0883	0.0837	0.0734
Reporting	0.0225	0.0237	0.0284	0.0304	0.0281	0.0292	0.0311
Payment	0.0706	0.0610	0.0772	0.0544	0.0508	0.0441	0.0480

Table 4C: Tax Compliance by Marital Status, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0738	0.0719	0.0738	0.07430	0.0723	0.0713	0.0546
Reporting	0.0192	0.0176	0.0207	0.0219	0.0212	0.0205	0.0214
Payment	0.0546	0.0474	0.0484	0.0458	0.0419	0.0403	0.0376

Table 5C: Tax Compliance by Province and Territory, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0444	0.0474	0.0577	0.0592	0.0583	0.0562	0.0551
Reporting	0.0241	0.0294	0.0386	0.0416	0.0438	0.0411	0.0455
Payment	0.0539	0.0594	0.0601	0.0638	0.0596	0.0644	0.0564

Table 6C: Tax Compliance by Taxable Income Group, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0375	0.0377	0.0891	0.0378	0.0195	0.0209	0.0214
Reporting	0.0220	0.0172	0.0814	0.0224	0.0021	0.0045	0.0099
Payment	0.1024	0.0970	0.1290	0.1057	0.0940	0.0949	0.0994

Table 7C: Tax Compliance by Major Source of Income, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0594	0.0556	0.0544	0.0551	0.0541	0.0518	0.0444
Reporting	0.0130	0.0248	0.0332	0.0375	0.0352	0.0332	0.0359
Payment	0.1752	0.1769	0.1885	0.1968	0.1881	0.1954	0.2090

Table 8C: Tax Compliance by Marginal Tax Rates, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0377	0.0380	0.0891	0.0382	0.0199	0.0214	0.0284
Reporting	0.0184	0.0146	0.0676	0.0199	0.0027	0.0044	0.0098
Payment	0.1073	0.1018	0.1333	0.1100	0.0949	0.0964	0.1024

Table 9C: Tax Compliance by Filing Methods, Cramer's V Tests

	1996	1997	1998	1999	2000	2001	2002
Filing	0.0814	0.0917	0.0767	0.0804	0.0820	0.0924	0.0746
Reporting	0.0422	0.2866	0.3517	0.3731	0.3795	0.3817	0.3883
Payment	0.0716	0.0866	0.0830	0.0817	0.1256	0.1186	0.1141

Chi-Square Tests

The test examines whether there is an association between two categorical variables. A statistically significant chi-square statistic indicates strong evidence that an association exists between the variables in the analysis. The chi-square test does not measure the strength of the association.

Note: All the Chi-Square tests for the cross-tabulations in the paper are statistically significant with p-values of <0.0001, which implies strong evidence that an association exists between the variables and tax compliance.

Cramer's V Statistic

The test is one measure of the strength of the association between two nominal variables. It is in the range of –1 to +1 for 2-by-2 tables and 0 to 1 for larger tables. Values further away from 0 indicate the presence of a relatively strong association. Cramer's V test results are shown in the following tables.

Appendix D: Characteristics Associated with Filing, Reporting, and Payment Compliance

Variable	Description of Variable	Dummy Variable Description
Dependent Variables		
Filing Compliance	A dummy variable used to indicate whether an individual's tax return has been filed on time or has been filed late.	0 = Filed on Time 1 = Filed Late
Reporting Compliance	A dummy variable used to indicate whether an individual has correctly reported his/her taxes owed or underreported his/her taxes owed.	0 = Reported Taxes Correctly 1 = Underreported Taxes
Payment Compliance	A dummy variable used to indicate whether an individual has paid his/her taxes owing on time or has paid his/her taxes owing late.	0 = Paid Taxes on Time 1 = Paid Taxes Late
Independent Variables		
Demographic Factors		
Gender	A dummy variable indicating the gender of the individual.	0 = Female 1 = Male
Age Group	A dummy variable used to indicate the age category (in years) an individual falls under. Three categories are used in the study: 34 and under, from 35 to 54, and 55 and over.	0 = 34 and under 1 = 35 to 54 2 = 55 and over
Marital Status	A dummy variable used to indicate an individual's marital status.	0 = Married or Common-Law 1 = Widowed 2 = Divorced 3 = Separated 4 = Single
Region	A dummy variable used to indicate the region in which an individual resides.	0 = Atlantic Region 1 = Quebec Region 2 = Ontario Region 3 = Prairies Region 4 = Pacific Region 5 = Non-Resident of Canada
Income Factors		
Pension Income	A dummy variable used to indicate whether an individual received pension income or not.	0 = No Pension Income 1 = Pension Income
RRSP Income	A dummy variable used to indicate whether an individual received RRSP income.	0 = No RRSP Income 1 = RRSP Income
Tax-Exempt Income	A dummy variable used to indicate whether an individual received tax-exempt income (Worker's compensation benefits, Social assistance payments, and Net federal supplements).	0 = No Tax-Exempt Income 1 = Tax-Exempt Income
Main Source of Income	A dummy variable used to indicate an individual's main source of income.	0 = Wage Earner 1 = Investment and Rent Income 2 = Capital Gains and/or Losses 3 = Self-Employed Income

Deduction Factors		
Childcare Expenses	A dummy variable used to indicate whether an individual has childcare expenses or not.	0 = No Childcare Expenses 1 = Childcare Expenses
RPP Deduction	A dummy variable used to indicate whether an individual has a Registered Pension Plan (RPP) deduction or not.	0 = No RPP Deduction 1 = RPP Deduction
RRSP Deduction	A dummy variable used to indicate whether an individual has a Registered Retirement Savings Plan (RRSP) or not.	0 = No RRSP Deduction 1 = RRSP Deduction
Exploration & Devt. Expenses	A dummy variable used to indicate whether an individual has an exploration and development expenses or not.	0 = No Exploration & Development Expenses 1 = Exploration & Development Expenses
CRA Program Factors		
Voluntary Program Preparer	A dummy variable used to indicate whether an individual used the CRA-sponsored Community Volunteer Income Tax Program (CVITP) to prepare his/her tax return or not.	0 = Did not use CVITP 1 = Used CVITP
Tax Preparer Services	A dummy variable used to indicate whether an individual used a tax preparer to prepare his/her tax return or not.	0 = Did not use Tax Preparer 1 = Used Tax Preparer
Filing Method	A dummy variable used to indicate the method an individual used in filing his/her tax return.	0 = Paper 1 = EFILE 2 = TELEFILE 3 = NETFILE
Tax Bracket (%)	A dummy variable used to indicate the tax bracket an individual falls under based on the 2004 Federal Schedule 1.	0 = 16% 1 = 22% 2 = 26% 3 = 29%

Appendix E—The Multivariate Analysis Process

The following is a brief outline of the methodology used in the multivariate analysis.

Dataset

The dataset in the multivariate analysis is based on T1 Initial Assessment and Reassessment of individual taxpayers' tax returns. The unit of analysis is tax filers who filed all tax returns from 1996 through to 2002. A balanced panel (longitudinal) dataset is thus constructed where exit and entry of tax filers are deleted.[20] Thus, any taxpayers who did not file their tax returns for any of the selected years after 1996 are deleted. Any new taxpayers who filed their tax returns after 1996 are also deleted from the sample. Each of the selected years, 1996 to 2002, has 18,300,485 observations, that is, the number of taxpayers who filed their tax returns for all the years. This represents an average of 80 percent of all taxpayers who filed their tax returns

[20] The focus of the analysis on a balanced panel is to avoid complications with econometric estimations.

during the study period. The total number of observations for the multivariate analysis is 128,103,395.

Logistic Regression Method

The T1 Initial Assessment and Reassessment data contain demographic and economic variables for all the individual taxpayers. In addition, there are some variables that pertain to the Canada Revenue Agency, for example, whether a taxpayer participated in the Community Volunteer Income Tax Program (CVITP). Given the large number of observations and the fact that some of the variables have missing or not applicable values, dummy variables were used to recode all the variables, and also in some cases to reduce the number of categories (see *Appendix A* for details). Thus, the dependent and independent variables are all categorical, which necessitates the use of a logistic regression for the multivariate analysis. The logistic regression method seeks to model the likelihood of various socioeconomic variables in determining Canadian tax compliance (filing, reporting, and payment) over the study period.

The time series cross-section procedure in SAS was used to arrange the input dataset for the analysis.[21] The time series cross-section procedure requires that the dataset be sorted by cross-section and by time within each cross-section. To achieve this, the input dataset normally contains a variable that identifies the cross-section for each observation, and a variable that identifies the time period for each observation. In this study, the taxpayer's identification number (a recoded social insurance number for confidentiality reasons) was used to identify the cross-section; and the taxation year variable (TAX-YR) to identify the time period. The dataset was sorted by identification number and tax year (1996-2002). The time series cross-section procedure also requires that the time series for each cross-section has the same number of observations and covers the same time range, that is, a balanced panel. The following variables, based on the T1 Returns database, are used in the logistic regressions.

Dependent Variables

The following dependent variables are used in the analysis. For filing compliance, the late filing penalty is used, that is, if a taxpayer has no late filing

[21] The PROC TSCSREG (Time Series Cross-Section Regression) procedure analyzes a class of linear econometric models that commonly arise when time series and cross-sectional data are combined. The TSCSREG procedure deals with panel data sets that consist of time series observations on each of several cross-sectional units.

penalty assessed, then the taxpayer is filing compliant, but otherwise, he or she is filing noncompliant. For reporting compliance, the underreported tax payable is used, that is, if a taxpayer has no underreported tax payable, then he or she is reporting compliant, but otherwise, he or she is reporting noncompliant. For payment compliance, the arrears interest or installment interest is used, that is, a taxpayer with no arrears interest or installment interest charged is said to be payment compliant, but otherwise, he or she is payment noncompliant.

Independent Variables

The following independent variables are used in the analysis. They are grouped under demographic factors, income factors, deduction factors, and agency factors that facilitate filing of tax returns by taxpayers.

Demographic Factors

These include age group (34 years and under as young, 35 to 54 years as middle-aged, and 55 years and over as older) with young taxpayers as the base or control group; gender (male and female) with female as the base category; marital status (married, common-law, widowed, divorced, separated, single); and region. Married and common-law were combined and used as the base category. There are five regions, namely, Atlantic, Quebec, Ontario, Prairies, and Pacific, in addition to nonresidents.[22] Atlantic Region is the base or control region.

Income Factors

These include main source of income (employment income, self-employment income (business, professional, commission, farming, and fishing income), capital gains and losses, investment income, and rent income); tax-exempt income (workers' compensation benefits, social assistance payments, and net federal supplements); pension income (Old Age Security (OAS), Canada Pension Plan or Quebec Pension Plan (CPP/QPP), and other pensions or superannuation); and registered retirement savings plan (RRSP)

[22] Atlantic Region consists of Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick; Quebec Region consists of Quebec; Ontario Region consists of Ontario and Nunavut; Prairies Region consists of Manitoba, Saskatchewan, Alberta, and Northwest Territories; Pacific Region consists of British Columbia and Yukon.

income. The main source of income variable has been re-grouped as wage earners, investment and rent income, capital gains and losses, and self-employment income. Wage earners are the base category. Taxpayers who do not receive tax-exempt income are the base category, while taxpayers who receive neither pension nor RRSP income are the base category.

Deduction Factors

The Income Tax Act allows some eligible deductions from total income in order to calculate net income and taxable income. Some deduction items are included in the analysis. These are deductions for child care expenses, exploration and development expenses, registered pension plan (RPP) contributions, and RRSP contributions. Taxpayers who do not make claims for any of these deductions are used as the base or control group in the analysis.

CRA Factors

These factors include filing method, marginal tax rates, tax preparer services, and participation in the Community Volunteer Income Tax Program (CVITP).

The Canada Revenue Agency (CRA) provides four main methods for taxpayers to file their income tax returns. These are the paper (hardcopy) and the electronic methods (Efile, Telefile, and Netfile). Efile is an electronic service that allows registered tax professionals to send current-year individual tax returns to CRA over the Internet. Telefile is an interactive computer program that allows eligible taxpayers (those with most common types of income tax information like employment income, pension income, interest income, registered pension plan contributions, and charitable donations) to electronically file their tax returns for free using a touch-tone telephone. Netfile allows taxpayers to file their income tax and benefit returns directly to the CRA using the Internet. Netfile is intended for individuals who use commercial software to manage their financial affairs and prepare their tax returns. Netfile is available to most Canadians, but there are some types of tax returns that cannot be submitted electronically. The paper method is the base or control variable for filing methods.

The extra burden of the income tax reporting system in terms of monetary cost to hire an income tax expert might be high for some taxpayers. Realizing this setback, the Canada Revenue Agency initiated in 1971 the Community Volunteer Income Tax Program (CVITP) to assist individu-

als who have low incomes and simple tax situations to file their income tax returns. The program involves volunteers from CRA who share their time, knowledge, and experience by helping taxpayers who need assistance in filing their income tax returns. The program, which was founded in 1971, assists more than 500,000 people annually. A dummy variable is included in the analysis to assess the impact of CVITP on tax compliance.

Some taxpayers make use of the services of a professional tax preparer to complete their tax returns. Several reasons may account for this. They may not have the time or the knowledge to fill the tax return, or be able to afford the services of tax preparer. Some taxpayers might have the wrong notion that a professional tax preparer would assist them to get a tax refund. A dummy variable is included in the analysis to study the impact of tax preparers on tax compliance.

The Income Tax Act provides four marginal tax rates (or marginal tax brackets) based on the 2004 Federal Schedule 1. These marginal tax rates are 16 percent for taxable income of $35,000 or less; 22 percent for taxable income that is more than $35,000 but not more than $70,000; 26 percent for taxable income that is more than $70,000 but not more than $113,804; and 29 percent for taxable income that is more than $113,804. The lowest marginal tax rate (16 percent) is the base or control category.

Model Specification

In order to reduce the potential for multicollinearity, some of the variables are recoded to reduce the number of categories. The following logistic equation for microlevel regressions is used:

Filing Compliance

$$Logit\ (L_i) = \ln(p_i / 1 - p_i) = \alpha_i + \beta x_{it} + \varepsilon_{it}$$

Equation (1) is modeling the probability of filing compliance. The dependent variable is late filing penalty, which takes a value of 0 if the taxpayer has no late filing penalty assessed (filing compliant) and a value of 1 if the taxpayer has a late filing penalty assessed (filing noncompliant); x_{it} are the set of independent or control variables; and ε_{it} denotes the error term.

Reporting Compliance

$$Logit\ (L_i) = \ln(p_i / 1 - p_i) = \alpha_i + \beta x_{it} + \varepsilon_{it}$$

Equation (2) is modeling the probability of reporting compliance. The dependent variable is underreported tax payable, which takes a value of 0 if the taxpayer has no underreported tax payable (reporting compliant) and a value of 1 if the taxpayer has underreported tax payable (reporting noncompliant); x_{it} are the set of independent or control variables; and ε_{it} denotes the error term.

Payment Compliance

$$Logit\ (L_i) = \ln(p_i / 1 - p_i) = \alpha_i + \beta x_{it} + \varepsilon_{it}$$

Equation (3) is modeling the probability of payment compliance. The dependent variable is arrears interest or installment interest, which takes a value of 0 if the taxpayer has no arrears interest or installment interest charged (payment compliant) and a value of 1 if the taxpayer has arrears interest or installment interest charged (payment noncompliant); x_{it} are the set of independent or control variables; and ε_{it} denotes the error term.