THE IMPACT OF TAX EDUCATION ON TAX COMPLIANCE

by

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STATEMENT OF ORIGINALITY AND DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

(signed)
____________________________________
Kwok Yuk Sim, Betty
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ABSTRACT

Tax compliance has been a topic for academic research since the 1960s. The focus of the research has progressed from sanction-based (Deterrence Model) to non-sanction based (Fischer Model), and has reached out into five main streams. Sanction-based theories assume that taxpayers are motivated by self-interests and make rational choices not to comply when non-compliance benefit (tax savings) exceeds non-compliance risks (punishment cost and detection probability). Subsequent studies found that taxpayers could also be encouraged by compliance factors, and thus an effective tax compliance strategy should address both ends. Compliance is an ‘attitude’ which can be shaped by ‘belief’ and ‘knowledge’. Some previous researchers found that education encouraged tax compliance through raising tax awareness, but some others found that better tax knowledge could possibly drive non-compliance. Despite a vast pool of literature on the relationship between education and tax compliance, only a few were focused on ‘tax education’, as well as in the context of Hong Kong. This study aims at providing empirical evidence to prove the positive impact of tax education on tax compliance in Hong Kong. Public funding in Hong Kong mainly comes from tax revenue and thus taxpayers’ attitude toward accurate reporting is critical to the Hong Kong tax administrator. In this study, data was collected from undergraduate and postgraduate student samples via self-completed questionnaires, and was analysed by regression. Other than the direct impact of tax education on tax compliance, indirect impacts were also tested via three intermediate variables: ability/readiness to comply, perception of tax system fairness and moral reasoning. The findings supported that positive direct and indirect impacts existed except that these impacts were restricted to undergraduate level. For postgraduate level, these impacts were no longer supported. It seems to indicate that tax education’s impact on compliance tend to be worn off when taxpayers
progress to postgraduate level, possibly due to the increasing exposure to other commitments and non-compliance opportunities. A few findings from this study offer new dimensions for future academic research and are also helpful to Hong Kong policy-makers in developing its tax compliance strategy.
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1 INTRODUCTION AND OVERVIEW

1.1 Background to Tax Compliance Studies

Of the three certainties in life: birth, death and taxes, tax is the most controversial, as it normally raises questions about moral and ethics. It also poses the question whether ‘taxation’ is a duty (Ross & McGee, 2012a) or a threat (Kirchler, 1998). When tax compliance becomes a legal obligation, does it mean ‘tax non-compliance’ is a crime (Klepper & Nagin, 1989a)? If non-compliance behaviour is unlawful, are sanctions effective enough to combat this behaviour through creating a fear of punishment via detection (Scott & Grasmick, 1981; Fischer, Wartick & Mark, 1992; Ho & Wong, 2006)?

While most religious rules consider it unethical to evade tax (Ross & McGee, 2012a), others defend that it is not necessarily unethical to evade tax in a corrupt country (Ross & McGee, 2012a). When tax compliance becomes more of a ‘threat’ than a ‘duty’, it may not necessarily be achieved by implementing more sanctions or stricter deterrence to combat non-compliance. Does it imply that policy makers should look for ways for both deterring tax non-compliance and encouraging tax compliance? What are the forces that are driving taxpayers not to comply, and what are the ones that motivate taxpayers to comply?

Tax compliance behaviour has been the topic of considerable academic research in the past few decades from the perspectives of criminology, sociology, economics, psychology and tax administration. There is extensive research on this topic. In these literatures, key factors that may influence both tax compliance and non-compliance are identified. No single formula will do this. To decide to comply or not involves a complex process (Chan, Troutman & O’Bryan, 2000), depending on
not only personal value judgement, such as fairness of the tax system, but also the existence of non-compliance opportunities (Fischer et al., 1992; Chan et al., 2000), as well as the evaluation of potential detection costs against non-compliance benefits (Becker, 1968 as cited in Fischer et al., 1992; Roth, Scholz & Witte, 1989). Early empirical studies (Becker, 1968 as cited in Allingham & Sandmo, 1972) relied on analysing non-compliance behaviour, but subsequent studies (Fischer et al., 1992; Chan et al., 2000; Braithwaite, 2007) emphasised on the importance of behavioural aspects in fostering tax compliance including moral development (Schwartz & Orleans, 1967), personal and social norms (Wenzel & Taylor, 2004), culture (Job, Stout & Smith, 2007; Tsakumis, Curatola & Porcano, 2007) and tax education (Eriksen & Fallan, 1996). This last variable, tax education, is the focus of this research. Literature pertaining to tax compliance behaviour has evolved over the years in various streams and will be discussed in further details in Chapter 2.

1.2 The Importance of Tax Compliance in Hong Kong and the Role of Tax Education

In Hong Kong, tax revenue is the main source of funds for the Government. As demonstrated from Table 1.2.1 showing the tax collection figures over the past four fiscal years in Hong Kong, the total tax revenue collected each year from profits tax, salaries tax, property tax and personal assessments accounted for nearly half of the Government’s general revenue, representing on average 51.8%\(^1\) in the past four years.

\(^1\) Total taxes divided by Government General Revenue for 4 years (Table 1.2.1): $685,775/$1,322,359=51.8\%
<table>
<thead>
<tr>
<th>Type of Tax</th>
<th>Fiscal Year</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010/11</td>
<td>2011/12</td>
</tr>
<tr>
<td><strong>Profits tax</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Corporations</td>
<td>$88,191</td>
<td>$113,799</td>
</tr>
<tr>
<td>- Unincorporated businesses</td>
<td>$4,992</td>
<td>$4,801</td>
</tr>
<tr>
<td><strong>Salaries tax</strong></td>
<td>$44,255</td>
<td>$51,761</td>
</tr>
<tr>
<td><strong>Property tax</strong></td>
<td>$1,647</td>
<td>$1,948</td>
</tr>
<tr>
<td><strong>Personal Assessment</strong></td>
<td>$3,922</td>
<td>$4,512</td>
</tr>
<tr>
<td><strong>Total taxes per Inland Revenue Ordinance ($A)</strong></td>
<td>$143,007</td>
<td>$176,821</td>
</tr>
<tr>
<td><strong>Stamp Duty and others</strong>²</td>
<td>$66,012</td>
<td>$61,504</td>
</tr>
<tr>
<td><strong>Total Revenue Collected</strong></td>
<td>$209,019</td>
<td>$238,325</td>
</tr>
<tr>
<td><strong>Government General Revenue ($B)</strong></td>
<td>$290,304</td>
<td>$332,621</td>
</tr>
<tr>
<td><strong>% Total Taxes ($A) to Government General Revenue ($B)</strong></td>
<td>49.3%</td>
<td>53.1%</td>
</tr>
<tr>
<td><strong>Cost of Collection</strong></td>
<td>0.56%</td>
<td>0.51%</td>
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Source: Annual Report 2013/14 by Hong Kong Inland Revenue Department

Statistics for the past four years revealed that the total tax revenue accounted for approximately 50% of the Government General Revenue each year, and profits tax contributed the greatest portion (more than 60%) of the total tax revenue. This demonstrates a heavy reliance on tax revenue by the Hong Kong Government in

² Stamp Duty and others category in Table 1.2-1 include Stamp Duty, Estate Duty, Betting Duty and Business Registration Fees
maintaining the efficient and effective operation of its fiscal system. Under the Hong Kong tax system, in the absence of a withholding mechanism for employers or other revenue-payers, income-earners are required by tax law to voluntarily report income in their annual tax returns accurately and timely, and are obliged to pay tax when tax assessment is received. Tax reporting can be performed by taxpayers or through tax agents. Engagement of tax agents is not common for individual taxpayers in Hong Kong due to the simple tax structure. Individual taxpayers in Hong Kong are subject to property tax (on property rental income), salaries tax (on employment income), profits tax (on sole-proprietorship business profits), or personal assessment (on aggregated income from different sources); and they file tax returns on their own without requiring any assistance from tax agents. Assuming that all unincorporated businesses in 2013/14 were run by individuals, the total tax payable by individual taxpayers in Hong Kong altogether contributed 27.7% of the total tax revenue ($67,408.4 million) collected in Hong Kong. This is a significant proportion of contribution. Since individual taxpayers usually do not seek professional help in completing their returns, it becomes crucial from the Government’s perspective to enhance the level of tax compliance through increasing the level of tax education of individual taxpayers.

By ‘educating’ taxpayers, the former Commissioner of Inland Revenue of Hong Kong (CIR), Mr Chu Yam-Yuen, in the 2010/11 annual report, referred to ‘tax education’ as

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3 By nature of the tax type and its scope of charge, profits tax is assessed either on corporations or unincorporated businesses which comprise sole-proprietorship businesses and partnerships. Salaries tax, property tax and personal assessment are primarily assessed on individual taxpayers.

4 Per Table 1.2-1: Tax revenue collected from individual taxpayers in 2013/14: $(4,784.3+55,620.3+2,583.8+4,420.0)=67,408.4m; % on total revenue: 67,408.4/243,548.9 = 27.7%

5 As per Commissioner’s Overview included in 2010/11 Annual Report of Inland Revenue Department of Hong Kong.
providing up-to-date tax information as published by the tax authority through website publication and Departmental Interpretation and Practice Notes on contentious topics. Other than these, taxpayers can gain tax knowledge through structured curricular education, such as tax modules taught in undergraduate and postgraduate programmes. In Uganda, a partnership was established in 2007 between the Uganda Revenue Authority and Education Ministry to incorporate tax education in the school curriculum at higher learning and secondary schools. In Malaysia, the Second Finance Minister, Datuk Seri Ahmad Husni Handazlah, in giving his opening address at the National Tax Conference 2011, acknowledged the role of tax education in contributing to the steady increase in tax compliance in Malaysia from 2007 to 2011. In Hong Kong, however, the supports by the Hong Kong Inland Revenue on tax education are, by far, confined to tax information they publish for the use of taxpayers, but not for curricular tax education. There remains to be seen whether more attention and effort will be given by the Government to tax education through curricular channels as part of enhancing its taxpayer compliance strategy.

1.3 An Overview of Tax Compliance and the Taxation System in Hong Kong

1.3.1 Hong Kong’s Tax Compliance Position

In the IMF-Japan High Level Tax Conference for Asian and Pacific Countries held in February 2012, Mr Chu Yam Yuen (former CIR), commented that “tax fraud deprives governments of revenues needed for public spending and erodes community confidence in the equity of the revenue system, hence there needs to be zero tolerance for tax fraud for Hong Kong”. To promote tax compliance, Mr Chu introduced the Hong Kong Inland Revenue Department compliance strategy in the following frameworks:
(i) Legal framework on compliance - relying on the tax law to impose tax-reporting obligations on taxpayers as well as employers, and to empower the local tax authority to seek information when required. In terms of detection, reliance is placed on specific and general anti-avoidance provisions and penal provisions to combat and punish non-compliance taxpayers.

(ii) Organisational structure to improve efficiency - maximising tax administrative efficiency by centralising resources with special units established to handle tax audits and prosecutions.

(iii) Administrative approach to promote compliance - adopting the concept of ‘Audit Trilogy’ by implementing the ‘Assess-First-Audit-Later’ (AFAL) system combined with annual compliance audits and field audit/tax investigations.

(iv) Methodology and tools – making use of information collection tools (e.g. tax returns) to support a more diverse and comprehensive database to facilitate audits and investigation.

(v) Facilitation – making more effort to broaden and strengthen taxpayers’ tax knowledge to help them understand tax obligations, and to enhance their services to taxpayers to make compliance easier.

Under the last framework of ‘facilitation’, Mr Chu obviously was acknowledging the importance of fostering tax compliance through tax knowledge, lending support to the conventional wisdom that tax education is positively associated with tax compliance.

In the same speech, Mr Chu also brought to the attention of the audience that ‘the compliance rates (in Hong Kong) are consistently at a high level’. Based on the official statistics for recent years, as shown in Table 1.3.1-1 below, the proportion of
understated earnings/profits to the total yearly earnings/profits surged from 6% in the 2008/09 assessment year to 19% in 2011/12, but then declined to 7% in 2013/14, with the number of audited/investigated cases remaining steady at around 1,800 each year. This indicates a significant drop in the average understatement per case from $18.9^6$ in 2011/12 to $7.2^6$ in 2013/14.

Table 1.3.1-1  HK Field Audit and Investigation Cases and Collection

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<tbody>
<tr>
<td>Number of cases completed</td>
<td>1,862</td>
<td>1,803</td>
<td>1,805</td>
<td>1,804</td>
<td>1,802</td>
<td>1,802</td>
</tr>
<tr>
<td>Understated earnings and profits ($m)</td>
<td>9,084</td>
<td>12,192</td>
<td>19,470</td>
<td>34,083</td>
<td>16,348</td>
<td>12,936</td>
</tr>
<tr>
<td>Back tax and penalties assessed ($m)</td>
<td>2,181</td>
<td>2,590</td>
<td>3,827</td>
<td>6,003</td>
<td>3,448</td>
<td>2,540</td>
</tr>
<tr>
<td>Total earnings and profits for year ($m)</td>
<td>146,143</td>
<td>123,184</td>
<td>143,006</td>
<td>176,821</td>
<td>182,442</td>
<td>183,506</td>
</tr>
<tr>
<td>% of understated earnings over total(^6) (\text{inserted by researcher})</td>
<td>6%</td>
<td>10%</td>
<td>14%</td>
<td>19%</td>
<td>9%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: CIR’s speech at IMF-Japan High Level Tax Conference in February 2012; 2013-14 annual report of Inland Revenue Department of Hong Kong

In terms of the nature of offences, Table 1.3.1-2 below shows that the majority of convicted cases in 2013/14 were due to the failure to file tax returns and related information, representing about 91% of the total in terms of number of cases, and 62% in terms of the amount of fines. Assuming that all unincorporated businesses were sole-proprietorship businesses run by individuals, the proportion of those cases committed by individual taxpayers to the total cases was 20%\(^9\) (or 19%\(^9\) in terms of the

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\(^6\) Average understatement per case: understated earnings and profits / number of cases completed; 2011/12: $34,083/1,804=$18.9; 2013/14: $12,936/1,802=$7.2.

\(^7\) Year of assessment in Hong Kong follows the fiscal year from 1\(^{st}\) of April to 31\(^{st}\) of March except for profits tax where it depends on the accounting year end date falling within the relevant fiscal year.

\(^8\) Understated earnings and profits / Total earnings and profits for year.

\(^9\) Percentage of convicted cases committed by individual taxpayers: (309+1,420+42)/9,017=20%; or ($0.7m+$3.1m+$0.1m)/$20.6m=19%.
amount of fines), represented by ‘unincorporated businesses’ under profits tax, ‘employees’\(^{10}\) under salaries tax and ‘individuals’ under property tax. These statistics reflect that tax non-compliance behaviour in Hong Kong is predominantly characterised by a failure to file tax returns or related information, and a fair proportion of the convicted cases are committed by individual taxpayers. This indicates why this research of tax education on tax compliance behaviour of individual taxpayers in Hong Kong is so important.

Table 1.3.1-2 - Number of Convicted Cases (and fines in HK$) in 2013/14

<table>
<thead>
<tr>
<th></th>
<th>Number of Convicted Cases ($fines)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Failure to file return/info</td>
<td>Failure to comply with court order</td>
<td>Wilfully to evade tax (or assist others)</td>
<td>Failure to notify chargeability</td>
<td>Total</td>
</tr>
<tr>
<td><strong>Profits Tax:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Corporations</td>
<td>7,093 ($16.3m)</td>
<td>662 ($3.1m)</td>
<td>0</td>
<td>4 ($8.3m)</td>
<td>7,759 ($27.7m)</td>
</tr>
<tr>
<td>- Unincorporated</td>
<td>309 ($0.7m)</td>
<td>32 ($0.1m)</td>
<td>0</td>
<td>0 ($0)</td>
<td>341 ($0.8m)</td>
</tr>
<tr>
<td><strong>Salaries Tax:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Employees</td>
<td>1,420 ($3.1m)</td>
<td>169 ($0.7m)</td>
<td>2</td>
<td>0 ($0)</td>
<td>1,591 ($3.9m)</td>
</tr>
<tr>
<td>- Employers</td>
<td>153 ($0.4m)</td>
<td>45 ($0.2m)</td>
<td>0</td>
<td>0 ($0)</td>
<td>198 ($0.6m)</td>
</tr>
<tr>
<td><strong>Property Tax:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Individuals</td>
<td>42 ($0.1m)</td>
<td>6 ($0)</td>
<td>2</td>
<td>0 ($0)</td>
<td>50 ($0.1m)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9,017 ($20.6m)</td>
<td>914 ($4.1m)</td>
<td>4</td>
<td>4 ($8.3m)</td>
<td>9,939 ($33.1m)</td>
</tr>
<tr>
<td>% of convicted case ($fines) over total(^{11})</td>
<td>91% (62%)</td>
<td>9% (12%)</td>
<td>0</td>
<td>0 (25%)</td>
<td>100% (100%)</td>
</tr>
</tbody>
</table>

Source: 2013/14 Annual Report of IRD of Hong Kong, Schedule 13

\(^{10}\) Table 1.3.1-2 shows ‘employees’ and ‘employers’ under ‘Salaries Tax’. Only the figure for ‘employees’ is counted here but not ‘employers’ as it was assumed that most of the employers are not individuals.

\(^{11}\) Proportion of convicted case ($fines) over total convicted cases (Table 1.3.1-2). For example, for failure to file return/info: 9017/9939=91% in number of case; $20.6m/$33.1m=62% in $fines.
When taxpayers are late in paying tax or filing their returns, or are incorrect in filing without reasonable excuse, they are considered as having committed offences under the Hong Kong Inland Revenue Ordinance. For serious cases, prosecution is undertaken by court. In other cases, the IRD is empowered by tax law to take alternative penal actions against non-complying taxpayers, including late payment surcharges (for late tax payment), compound penalties (mostly for late filing, in lieu of prosecution) and additional tax (for more serious cases of late filing or incorrect filing in lieu of prosecution). As illustrated in Table 1.3.1-3 below, in the year 2013/14, total number of late payment cases accounted for 91%\textsuperscript{12} of the total penalised cases (or 29%\textsuperscript{12} in terms of total penalty amount). However, cases subject to ‘compound penalties’ and ‘additional tax’ involving late tax filing, incorrect filing and failing to notify chargeability to tax, altogether accounted for 8.5%\textsuperscript{13} in terms of number of cases or 70.9%\textsuperscript{13} in terms of the penalty amount collected. This indicates that the major non-compliance issues for Hong Kong taxpayers lie with late tax payment and late as well as incorrect filing.\textsuperscript{14} Moreover, out of the total penalty cases in 2013/14, the proportion attributable to individual taxpayers was 93%\textsuperscript{15} in terms of number of cases or 40%\textsuperscript{16} in terms of the penalty amount. This demonstrates that the majority of non-complying taxpayers are represented by individual taxpayers, as compared to corporate taxpayers.

\textsuperscript{12} Proportion of late tax payment cases to total cases (Table 1.3.1-3): 236,798/258,958=91\% in number of cases; or $302m/$1,038.6m=29\%.
\textsuperscript{13} Proportion of compound penalties cases and additional tax cases to total cases (Table 1.3.1-3): (20,725+1,424)/258,958=8.5\%; or $(670.5m+66.1m)/$1,038.6m=70.9\%.
\textsuperscript{14} ‘Tax compliance’ is defined in this study as accurate reporting, timely filing and timely tax paying.
\textsuperscript{15} Proportion of penalty cases committed by individual taxpayers to total cases (Table 1.3.1-3): (unincorporated business 8,310+property tax 19,949+salaries tax 197,128+personal assessment 14,760)/258,958 = 93\%.
\textsuperscript{16} Proportion of penalty amount committed by individual taxpayers to total penalty (Table 1.3.1-3): $(unincorporated business 139.8+ property tax 27.6+ salaries tax 233.3+ personal assessment 9.8)/$1,038.6 = 40\%.
Table 1.3.1-3 - Surcharges, Compound Penalties and Additional Tax Imposed (in number of cases and amount in HK$) in 2013/14

<table>
<thead>
<tr>
<th></th>
<th>Profits Tax</th>
<th>Property Tax</th>
<th>Salaries Tax</th>
<th>Personal Assessment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corporations</td>
<td>Unincorporated Businesses</td>
<td>Corporations</td>
<td>Salaries Tax</td>
<td>Personal Assessment</td>
</tr>
<tr>
<td>Late payment surcharge</td>
<td>10,357 ($123.9m)</td>
<td>18,958 ($15.2m)</td>
<td>185,995 ($137.7m)</td>
<td>14,594 ($9.3m)</td>
<td>236,798 ($302m)</td>
</tr>
<tr>
<td>Compound penalties</td>
<td>7,637 ($443.4m)</td>
<td>771 ($11.8m)</td>
<td>10,835 ($92.9m)</td>
<td>152 ($0.4m)</td>
<td>20,725 ($670.5m)</td>
</tr>
<tr>
<td>Additional Tax</td>
<td>814 ($60.8m)</td>
<td>219 ($0.6m)</td>
<td>291 ($2.7m)</td>
<td>14 ($0.1m)</td>
<td>1,424 ($66.1m)</td>
</tr>
<tr>
<td>Costs awarded by Board of Review</td>
<td>3 ($0)</td>
<td>1 ($0)</td>
<td>7 ($0)</td>
<td>0 ($0)</td>
<td>11 ($0m)</td>
</tr>
<tr>
<td>Total</td>
<td>18,811 ($628.1m)</td>
<td>19,949 ($27.6m)</td>
<td>197,128 ($233.3m)</td>
<td>14,760 ($9.8m)</td>
<td>258,958 ($1,038.6m)</td>
</tr>
</tbody>
</table>

Figures shown in first row are number of cases, figures in second row are amounts in HK$.
(Source: HKIRD annual report 2013-14, Schedule 14)

1.3.2 Overview of Hong Kong Tax System

Hong Kong tax legislation is governed by the Inland Revenue Ordinance introduced in 1947. The major features of the Hong Kong tax system are:

**Schedular System** - There are three types of tax: property tax, salaries tax and profits tax. Each type of tax has its definitive scope of charge, computation method and tax rate, and is separately assessed and collected. Individual taxpayers can be assessed under all types of tax where applicable, but eligible taxpayers can elect to aggregate their different sources of income together and be assessed in one computation under ‘personal assessment’. Income falling outside the scope of these types of tax is not taxable in Hong Kong.
Source Principle – The Hong Kong tax system works on a territorial source concept under which tax is, in principle, only imposed on income arising in or derived from Hong Kong. Nationality, residence or domicile of an individual taxpayer is not relevant in determining the taxability of income. The source principle is not strictly defined by law, and is interpreted with reference to case law.

Exclusion of Capital Gain – There is no capital gains tax in Hong Kong, and no capital gain is taxable under any type of tax in Hong Kong.

Flat and Low Tax Rate – Individual taxpayers in Hong Kong are taxed at a maximum of 15% under any type of tax, while corporate taxpayers are taxed at 16.5% flat.

Single-tier Corporate Tax System – The Hong Kong tax system aims at taxing income once only, such that any after-tax profits distributed from corporates to shareholders (corporate or individual) are not taxed again.

Direct Assessment, No Withholding – Tax is assessed by the Hong Kong tax authority (IRD) on the basis of information that is declared on tax returns. Under normal circumstances, taxpayers are only required to pay tax upon the receipt of their assessment and tax demand notice. There is no withholding of tax at source except for royalty payments made to non-residents and for consignment income.

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17 Income ‘arising in or derived from Hong Kong’ is defined in Section 2 of the Inland Revenue Ordinance as ‘…without in any way limiting the meaning of the term, includes all profits from business transacted in Hong Kong, whether directly or through an agent.’ No comprehensive guidance is provided in law as to how to determine the ‘source’ and interpretations in different case decisions (court cases or Board of Review cases) are usually used as reference. The prevailing practice follows the broad guiding principle noted by the Privy Council in the Hang Seng Bank case that ‘…one looks to see what the taxpayer has done to earn the profit…and where he has done it’. In the absence of definite direction, the source concept in Hong Kong has remained as the most contentious aspect of the tax system.
Penalty Policy – Tax assessment relies heavily on voluntary compliance by taxpayers to file timely and accurate tax returns (and information) as required under the tax law. Taxpayers who fail to meet the compliance obligations are by law guilty of an offence and are subject to penalty actions if caught. The sanctions for non-tax compliance in Hong Kong include prosecution (by court), compound offers (by IRD in lieu of prosecution) or additional tax assessment (administrative penalty by IRD in lieu of prosecution). The maximum amount of penalty in the form of additional tax is three times the amount of tax found undercharged as a result of the non-compliance. In terms of the late payment of tax, the surcharge is at 5% or 10% if the unpaid amount is not settled after 6 months from the due date.

Provisional Tax – For all types of tax, tax is assessed on the income earned for the current assessment year and a provisional tax is also assessed on income estimated for the succeeding assessment year.

Tax Deduction – Provisions for tax deductions under property tax and salaries tax are relatively more stringent as compared with the profits tax. This potentially results in individual taxpayers being more inclined to hold investment properties through incorporated companies or to restructure employment contracts into independent service contracts through service companies.

Concessionary Deductions and Personal Allowance – Individual taxpayers assessed under the salaries tax or personal assessment are allowed concessionary deductions (charitable donations, loan interest for principal residence, elderly home expenses for parents/grandparents, and retirement fund contributions) and personal allowances (for
single or married taxpayers, dependants, single parent, and disabled dependants).
However, these deductions and allowances are not eligible for property tax or profits tax. As a result, when individual taxpayers not eligible for personal assessment are assessed under property or profits tax, they may regard themselves as paying an excessive share of tax as compared with others earning same level of income but eligible to be assessed under salaries tax or personal assessment.

1.4 Research Gap and Research Questions for This Study

Research Gap
Factors identified from past literature leading to taxpayer compliance behaviour are generally sanction-based or non-sanction-based. Amongst the non-sanction based factors, education has been identified as one potential factor affecting compliance.\(^\text{18}\) However, research on education, in particular ‘tax education’, is limited. On the one hand, tax education increases taxpayer’s knowledge of the tax system and its rationale (Christensen et al., 1994; Richardson, 2005), hence presumably raising taxpayer’s perception of compliance attitude and behaviour (Richardson, 2006b). This traditional wisdom of relating tax education with tax compliance has been widely recognised and relied upon by governments. As mentioned in Section 1.2 above, the Uganda Revenue Authority of the Uganda government published their initiatives in 2007 to collaborate with their Education Ministry to introduce tax education in the school curriculum for universities, followed by secondary schools. The aim was to ‘ensure that more people get to know the basics of taxation as a measure to instil a culture of tax compliance’. The Second Finance Minister of Malaysia spoke at the National Tax Conference 2011,

\(^{18}\) Hite (1995); Lin and Carrol (2000).
saying that ‘the efforts of the tax industry in educating the public on their tax responsibilities are important’. On the other hand, however, other researchers found that the better knowledge of ambiguity in tax law may potentially increase the likelihood of tax non-compliance (Jackson & Milliron, 1986; Gilligan & Richardson, 2005). Certain empirical findings even recorded that tax education was negatively associated with tax compliance in certain countries, but not all (Chan et al., 2000), and samples studying in different disciplines (eg business against language) appeared to give different views on tax compliance (Ross & McGee, 2012a). Research findings in this aspect have not been consistent and conclusive.\(^{19}\)

The main gaps in the past research for the relationship between tax education and tax compliance lie with the inconsistency in findings and the limited studies specific to tax education, especially in the case of Hong Kong. The purpose of this study is to examine whether, and to what extent, tax-specific education relates to the compliance behaviour of taxpayers in the specific context of Hong Kong. For the purpose of this research, ‘tax education’ is confined to tax knowledge attained through formal curricular education such as tax modules taught in undergraduate or post-graduate degree programmes in Hong Kong; and ‘tax compliance’ is confined to ‘accurate reporting’.\(^{20}\)

\(^{19}\) Refer to Section 2.7.3 of Chapter 2 for further discussions.

\(^{20}\) Refer to Section 2.2 for definition of ‘tax compliance’ being accurate reporting, timely filing and timely paying. However, for this study, ‘tax compliance’ is restricted only to accurate reporting for the reason that this study targeted student samples who might not have had any (or substantial) experience in tax filing or tax payment. Refer to Section 5.2.2.1-Years of Tax Paid for sample profile indicating that 60% of the total sample had less than two years of tax payment.
**Research Problem**

The research problem of this study is *whether tax knowledge or ‘tax education’ has a role to play in driving the Hong Kong taxpayer’s compliance attitude.* Broadly speaking, tax knowledge may be attained through different channels such as formal curricular education, tax information published by a tax authority, advice given by tax advisors or experience from past encounters with the tax office. Other than the first channel of formal curricular education, other channels are practically difficult if not impossible to measure. As a result, ‘tax education’ used in this study is confined to tax knowledge attained through formal curricular education such as tax modules taught in undergraduate or post-graduate degree programmes in universities or colleges in Hong Kong.

In answering the research problem, the relationship between tax education and tax compliance attitude should be investigated and proved. A review of prior literature on ‘education’\(^\text{21}\) and ‘tax education’ indicated that the impacts on tax compliance were important but varying. Moreover, the impacts could even be more complicated by the various combinations of education\(^\text{22}\) and tax education, such as higher\(^\text{22}\) education level with tax studied, higher education level without tax studied, lower\(^\text{22}\) education level with tax studied and lower education level without tax studied. Therefore, in addressing each research question, tests in this study were also expanded to explore whether there was a difference between undergraduate and postgraduate levels in terms of the relationship between tax education and tax compliance. To facilitate this, data was also collected from different sub-groups comprising undergraduates with tax

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\(^{21}\) Refer to Section 2.7 of Chapter 2 for ‘Literature on impact of education on tax compliance’.

\(^{22}\) ‘Education level’ for this study refers to either undergraduate level (lower education level) or post-graduate level (higher education level).
studied, undergraduates without tax studied, postgraduates with tax studied and
postgraduates without tax studied.\textsuperscript{23}

\textbf{Relationship Between Tax Education and Tax Compliance}

In the 2010-11 annual report of the Hong Kong Inland Revenue Department, the
Commissioner of Inland Revenue\textsuperscript{24} proposed that tax education should be strengthened
to enhance taxpayer’s high degree of compliance with tax law. The conventional
wisdom that education leads to an increase in tax compliance was also supported by a
vast pool of prior studies. For example, positive impact of education (and tax
education) on taxpayer’s compliance behaviour was found in studies done throughout
the past decades from the 1980-90s (Scott & Grasmick, 1981; Thurman et al., 1984;
Jackson & Milliron, 1986; Kaplan et al., 1988; Klepper & Nagin, 1989c; Grasmick &
Bursik, 1990; Eriksen & Fallon, 1996), to the recent 2000s (Kasipillai et al., 2003;
Richardson, 2005, 2006b; Ross & McGee, 2012a; Hamilton, 2012; Young & Gainsford,
2009). Although inconsistent findings were noted at times, they could possibly be
explained by deficiency in sample compositions or the lapse of time. Therefore, in
general, there is sufficient literature to suggest that tax education should increase tax
compliance. This study aims at investigating if it is true in Hong Kong in the current
environment that tax education is helping taxpayers do the right thing in terms of their
tax reporting. It is the intention of this study to obtain empirical evidence to support the
positive association between tax education and tax compliance. Therefore, one-tailed
test was adopted for this study so that more power was provided to detect the positive
effect.

\textsuperscript{23} Refer to Section 4.6.2 of Chapter 4 for discussion on sample selection.
\textsuperscript{24} The Commissioner of Inland Revenue of Hong Kong in 2010-11 was Mr Chu Yam Yuen.
**Research Questions:**

The first research question was developed to reflect the direct positive relationship between tax education and tax compliance:

**Research Question 1:** Does tax education directly increase tax compliance?

In what way does tax education influence tax compliance attitude? Research Question 1 above tests the direct impact between the two. However, prior studies also revealed that tax education (or education) contributed to tax compliance through indirect ways such as increasing the clarity in tax requirements, promoting the appreciation of the role of government and uplifting the moral standards of oneself. These indirect impacts have been consolidated into three dimensions: (a) ability/readiness to comply, (b) perception of tax system fairness, and (c) moral reasoning,\(^{25}\) as follows:

(a) **Ability/readiness to comply (AbR)** - Tax education enables a taxpayer to learn and understand the tax law and requirements, hence raising the awareness of his/her obligations as well as penal actions for non-compliance. This would enhance a taxpayer’s readiness to comply. Moreover, more tax knowledge would help clarify the ambiguity of tax law/practice and thus increase the taxpayer’s ability to comply.\(^{26}\) For example, a tax-educated taxpayer would understand that income received in ‘cash’ remains taxable and needs to be reported. On the deduction side, a tax-educated taxpayer would understand that a deduction claim needs to be substantiated with documentary proof regardless of the materiality level. Thus, tax education is expected to increase a taxpayer’s ability/readiness to comply, which in turn increases the

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\(^{25}\) Refer to Section 2.7.5 of Chapter 2 for detailed discussions on the three dimensions.

\(^{26}\) Per Eriksen and Fallan (1996); knowledge could narrow the gap between how a taxpayer conceives the tax system and what the actual situation is, hence change a taxpayer’s tax compliance.
Research Question 2: Does tax education increase taxpayers’ ability/readiness to comply, which in turn increases tax compliance?

(b) Perception of the fairness of the tax system and administration (TSF) – The association between taxpayers’ compliance attitude and their perceptions of the tax system was not only supported by prior literature but also by the Organisation for Economic Cooperation and Development (OECD) (OECD, 2010) in promoting the importance of understanding taxpayers’ compliance behaviour. The OECD explained that there were three types of fairness relating to tax compliance: (i) Distributive: whether government spends tax revenue wisely; (ii) Procedural: whether tax administrative procedures are fair in dealing with taxpayers; and (iii) Retributive: whether punishments in the event of non-compliance are applied fairly. Through tax education, a taxpayer understands government policy in spending tax revenue (distributive fairness), appreciates the role of tax administrator/authority\textsuperscript{27} in terms of the procedural policies (procedural fairness), and recognises the rationale behind the penalty actions toward non-complying taxpayers (retributive fairness). Thus, tax education is expected to increase a taxpayer’s perception of tax system fairness, which in turn increases tax compliance attitude. Research Question 3 was thus developed:

Research Question 3: Does tax education increase taxpayers’ perception of fairness of the tax system, which in turn increases tax compliance?

(c) Moral reasoning (‘MR’) – Tax morale, or ‘feeling right to comply’ concerns about the intrinsic motivation of a taxpayer driving his/her compliance behaviour. Tax

\textsuperscript{27} Inland Revenue Department of Hong Kong
education motivates a taxpayer to comply in various ways. For example, a tax-educated taxpayer acknowledges that a good citizen is obliged to generate tax revenue for the good of the community. The increasing sense of obligation could be developed into a social norm of tax compliance (Cullis et al., 2007, 2010), such that taxpayers within the same community tend to follow what their peers do or expect (Torgler, 2002; Hashimzade et al., 2013). If a taxpayer is tax-educated, he/she would have no excuse to explain any non-complying act, and this psychic cost turns out to be a self-motivation to comply (or tax morale). Thus, tax education is expected to foster the importance of maintaining tax ethics to preserve social and personal identity; hence increasing a taxpayer’s moral reasoning, which in turn increases the taxpayer’s tax compliance attitude. Research Question 4 was thus developed:

**Research Question 4:** Does tax education increase taxpayers’ tax moral reasoning, which in turn increases tax compliance?

Combining the research questions 2, 3 and 4, the research question to address the indirect impact of tax education on tax compliance is as follows:

**Research Question 5:** Does tax education increase tax compliance indirectly via the enhancement of ability/readiness to comply, perception of tax system fairness, and moral reasoning?

The details of hypotheses development corresponding to each research question are discussed in Section 3.6 of Chapter 3.
1.5 Research Method for This Study

A positivist deductive research approach was adopted to perform this study, through the statistical analysis of quantitative empirical data collected by way of survey via self-completed questionnaires. In order to examine whether the study of tax education has an impact on tax compliance, and investigate further whether this impact would differ with the level of education, participants were selected from four different student groups: undergraduates with tax studied, postgraduates with tax studied, undergraduates without tax studied, and postgraduates without tax studied. A total of 221 usable responses were collected and used for analysis. Details of the construction of questionnaires, sampling methods and selection, data management and analysis methods are discussed in detail in Chapter 4.

1.6 Significance of this Study

This study aims to explore the impact of tax education on tax compliance in the case of Hong Kong individual taxpayers. Findings from this study will make contributions in different ways:

**Contribution to literature** - As discussed in Section 1.4 of this Chapter, the past literature on studies in tax compliance and its relationship with education has not been consistent and conclusive, possibly for various reasons such as sample composition or time lag. Moreover, empirical studies on tax compliance with specific focus on ‘tax education’ and in the context of Hong Kong were very limited. This study intends to fill these gaps and lay the foundation for further research in this area. What’s more, most of past studies have used student samples (as for this study) but have not separated
the samples by different education levels so as to explore whether tax education’s impact differs by education level. To enrich the findings of this study, samples used in this study were separated in undergraduate and postgraduate sub-groups, and additional analysis was performed for each sub-group to obtain further insights relating to education level. Findings from the additional analysis enrich the understanding of taxpayer’s compliance behaviour in Hong Kong and are useful for researchers to expand further. A summary of the unique aspects of this study in comparison with prior literature is shown in Table 6.4.1-1 of Chapter 6 in which the contribution of this study to literature in various aspects was discussed.

Implications and Recommendations for Policy Makers – The Hong Kong tax system does not rely on withholding or self-assessment. The tax structure is simple and the tax rate is low. A heavy reliance is placed on voluntary reporting by taxpayers as required by tax law. Tax compliance is therefore crucial for policy makers to ensure that sufficient tax revenue is collected to maintain an efficient and effective fiscal system. Findings from this study aim at highlighting relevant areas of focus for the Hong Kong’s tax administrator to enhance their strategies to improve tax compliance among the individual taxpayers.

1.7 Thesis Organisation

The thesis starts with a detailed literature review in Chapter 2. The vast pool of literature on tax compliance behaviour in the last few decades is generally developed into five streams of literature, which are discussed in detail in terms of their trends of
development and respective theories. An extended review of literature on the impact of education/tax education on tax compliance is also contained in Chapter 2.

Based on the literature review, a simplified tax compliance framework was developed for this study, following which the research questions, research model and hypotheses are developed in Chapter 3. The methodology used for the research, including the construction of the survey questionnaire and its administration, sampling selection, data collection and compilation for the purpose of analysis, and data analysis methods are discussed in Chapter 4. The hypotheses were tested by bivariate and multiple regressions and test findings are further discussed in Chapter 5. This is then followed by an overall conclusion, including the contributions and limitations of this research in Chapter 6.

1.8 Summary

This chapter introduces the background to tax compliance studies leading to the initiation of this research to examine the impact of tax specific education on tax compliance in the particular context of Hong Kong. The importance of tax compliance to Hong Kong, the role played by tax education, and the Hong Kong tax compliance position were also discussed. An overview of Hong Kong tax system was also given as a reference. Gaps from the past literature were then outlined leading to the development of research questions for this study and the related methods used. The areas of contribution from this study as well as its limitations were also summarised. The organisation of this thesis was given in Section 1.7 of this chapter.
2 LITERATURE REVIEW

2.1 Introduction

This chapter starts with the discussion of the definition of ‘tax compliance’ in Section 2.2, followed by an introduction of the main streams of tax compliance theories and their trend of development in Section 2.3. The five main streams of tax compliance theories developed in the last several decades are: Deterrence Model, Endogenous Income Theory, Interaction with Tax Administrator/Authority or Government, Behavioural Economics Theories and Third-party Income Reporting. Each of the streams is discussed in Section 2.4, and a critical review is contained in Section 2.5. Literature on tax compliance studies specific to Hong Kong is also reviewed in Section 2.6 and literature on the impact of education/tax education on tax compliance is reviewed in Section 2.7. The chapter ends with a summary in Section 2.8. Figure 2.1-1 below gives an overview of the content of Chapter 2.
2.2 Definition of Tax Compliance

As a starting point, what does ‘tax compliance’ mean? Or conversely, what exactly does non-complying behaviour refer to? The definition of ‘tax compliance’ had not attracted enough attention of researchers and tax administrators to get it ‘conceptualised’ (Long & Swingen, 1991; Roth et al., 1989) until 1989 when a report was released by the panel of National Academy of Sciences (NAS). In the report, ‘compliance’ is defined as follows:

Compliance with reporting requirements means that the taxpayer files all required tax returns at the proper time and that the returns accurately report tax liability in accordance with the Internal Revenue Code, regulations, and court decisions applicable at the time the return is filed.

In essence, the term ‘compliance’ is used to describe whether, and how far, the taxpayers’ behaviour is matched against what is required under the tax law, regulations and relevant court decisions. This is supported by the OECD\(^\text{28}\) in its Guidance Note (2004): Compliance Risk Management: Managing and Improving Tax Compliance (OECD, 2004) which defines ‘compliance’ as essentially relating to the extent to which a taxpayer meets the obligations stipulated under the tax law and regulations. If a taxpayer fulfils the obligations, he/she will be regarded as compliant.

Broadly speaking, there are two types of tax compliance: administrative compliance and technical compliance (OECD, 1999a). Administrative compliance refers to the requirements of (i) preparing and filing the required tax returns on time, and (ii) paying the tax liability as assessed and when due. Technical compliance requires that taxpayers accurately report and calculate the tax liability in accordance with the tax law and regulations as well as court decisions applicable at the time the return is filed (Roth

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\(^{28}\) Organisation for Economic Cooperation and Development
et al., 1989). This direction of defining ‘compliance’ has been adopted by most other researchers such as Slemrod, Blumenthal and Christian (2001), who refer to ‘compliance’ as encompassing accurate reporting, timely filing and timely paying.

Based on the above definitions, ‘compliance’ seems to be measured in terms of the legal obligations of taxpayers (as stipulated by tax law, regulation or courts). Accordingly, when a taxpayer behaves in the way that deviates from the legal obligations, it is non-compliance. Hofstede (1980) tried to take a cultural framework approach to define ‘tax evasion’ as ‘violation of tax law whereby the taxpayer refrains from reporting income which is in principle taxable and seeks to hide real value to avoid tax liability’. However, some researchers raised a fundamental issue that tax laws are not necessarily clear or easy to understand. When there is ambiguity, how should ‘compliance’ be defined (Long & Swingen, 1991)? Broadly speaking, ambiguity in tax law may be found in three perspectives (Long & Swingen, 1991; OECD, 1999b). First, the precise meaning of the statutory language may not be clear and straightforward, hence subject to interpretation. Second, how the law should apply in a specific taxpayer’s situation may remain uncertain, especially when the drawing line between facts is too fine. Last, when it comes to require evidence to prove a particular tax position taken by the taxpayer, the burden of proof falls upon the taxpayer, but it is always unclear as to what, and how much, evidence is sufficient and substantial. When a taxpayer reports his/her tax affairs based on his/her interpretation of the tax law, but is subsequently found to be incorrect, leading to an over-reporting or under-reporting of income or expenditure, the taxpayer would still be regarded as ‘non-compliant’ based on the generally accepted principle that deviation from tax requirements constitutes non-compliance (OECD, 1999a). The problem is that, from
the conservative tax compliance sitting at one extreme to the aggressive tax evasion sitting at the other extreme, there lies a grey area of law where tax planning finds its way (OECD, 1999a). When a taxpayer is found to have benefited from the legitimate tax planning but has not been challenged by tax administrators, is this taxpayer ‘compliant’? If the same taxpayer is subsequently challenged by tax administrators and successfully determined to have contravened the law, is the taxpayer now ‘non-compliant’? If so, does it imply that compliance or non-compliance is actually a phenomenon of a situation at a particular time as a result of a social judgement, rather than behaviour (OECD, 1999a)? Unfortunately, prior literature has not made an adequate attempt to identify this dilemma. For the purpose of this study, reference is made to the OECD definition of ‘compliance’ but is restricted to completely fulfilling the taxpayer’s obligations stipulated by law or regulations in terms of accurate reporting. The requirements of timely filing and timely paying are not included in this study for the reason that the target sample for this study is students who might not have had any (or substantial) experience in tax filing and tax payment. Non-compliance in this study includes deliberate tax evasion as well as inadvertent non-reporting or under-reporting.

2.3 Main Streams of Tax Compliance Theories and Trend of Development

A tremendous pool of research literature has started to accumulate since the 1960s seeking to investigate and explain taxpayers’ behaviour in regard to tax compliance as well as non-compliance. There are broadly five main streams of tax compliance theories: Deterrence Model, Endogenous Income Theory, Interactions with the Tax Administrator/Authority, Behavioural Economics and Third Party Intermediaries.
The earliest stream of research on taxpayers’ complying behaviour was mainly built on Becker’s (1968) basic theoretical model of the Economic-of-Crime Approach which assumed that tax evasion (or non-compliance) behaviour could be deterred by lifting the punishment costs and risks of detection and prosecution. Studies in this stream, the so-called Deterrence Model, were represented by Allingham and Sandmo (1972); Srinivasan (1973); Yitzhaki (1974); Spicer and Lundstedt (1976); Friedland, Maital and Rutenberg (1978); Friedland (1982) and Klepper and Nagin (1989a & b). The fundamental assumption of the Deterrence Model was that taxpayers made rational choices (Piliavin, Gartner, Thornton & Matsueda, 1986) when their overall expected outcome from non-compliance was maximised, taking into account their assessments of detection probability (audit rates) and punishment costs. As a consequence, the best way to ‘deter’ taxpayers from non-complying was to dampen the expected non-compliance outcome by increasing the non-compliance costs (i.e. detection probability and punishment costs). Researchers acting on this model sought to predict compliance patterns by way of exerting sanction-based control over taxpayers.

When researchers continued to study taxpayers’ choice behaviour, they found that the Deterrence Model was over-simplified. The studies done by Andersen (1977) and Pencavel (1979) found that taxpayers’ compliance choices took into account their decisions on labour supply (i.e. how many hours of work), thus indicating that taxpayers’ true and declared income were actually endogenous variables. Some researchers incorporated labour supply theory into their studies of tax compliance behaviour, which forms the second stream of literature on tax compliance (the Endogenous Income Theory).
Under both the Deterrence Model and Endogenous Income Theory, taxpayers were assumed to make compliance choices based on their individual assessments of non-compliance costs or labour supply. However, further studies discovered that taxpayers’ choice behaviour was also influenced by their interactions with others, such as through their interactions with the tax administrator/authority. For example, when a taxpayer assessed the probability of detection or audit risks, he/she was likely to take into account his/her (as well as others’) past experience in dealing with the tax administrator/authority and the prevailing audit rule and strategy (Andreoni, Erard & Feinstein, 1998). These encounters influenced the taxpayer’s perception on the effectiveness and efficiency of the tax administrator/authority and the strategy. In the event that a wrong perception was created, the taxpayer might overestimate (or underestimate) the deterrence factors (detection probability and penalty costs) and behave in a way that deviated from what would have been predicted by using the traditional models (Deterrence Model or Endogenous Income Theory). This interacting effect with the tax administrator/authority has actually gone beyond the deterrence tools embedded in the Deterrence Model, and has become another stream of literature aiming at promoting the relationship between taxpayers and the tax administrator/authority through a responsive regulatory system. Studies under this stream acknowledged that the relationship between taxpayer and government (including the tax administrator/authority) had two dimensions: some taxpayers complied in the hope that they got something in return for the benefit of the society and their long-term well-being (so-called Exchange Principle by Feld & Frey, 2007), while others complied when they found the tax system satisfactory (Responsive Regulatory System by Braithwaite & Braithwaite, 2000). This main stream of tax compliance literature highlighting the effect of the interaction with the tax administrator/authority
comprises a great pool of studies, including Andreoni et al. (1998); Torgler, Schaffner and Macintyre (2003); Kirchler, Hoelzl and Wahl (2008); Braithwaite (2007, 2010); Alm, Cherry, Jones and McKee (2010a); Hamilton (2012); and Whaite (2012).

The in-depth studies by Braithwaite (2007) in taxpayers’ sensibilities in coping with tax compliance not only changed the way that tax administrators/authorities treated taxpayers, but also laid down the foundation for subsequent studies on taxpayers’ compliance (rather than non-compliance) factors. Researchers were inspired to think about ‘why people pay tax’ rather than ‘why people avoid tax’ (Kirchler, Muehlbacher, Kastlunger & Wahl, 2007). Tax compliance studies have started to develop from different perspectives: from a ‘single’ choice behaviour (Deterrence Model) to interactive behaviour (Endogenous Income Theory and Theory on Interaction with Tax Administrator/authority); from a non-compliance perspective (how to deter non-compliance) to a compliance perspective (how to encourage compliance); and from a monetary incentive (financial interest outcome under the Deterrence Model) to non-monetary incentive (responsive tax system and fair interaction between taxpayers and tax administrator/authority). What’s more, researchers found that taxpayers’ compliance was much more complex than one would expect. If compliance is a human behaviour, and to comply or not is a human choice, then this choice behaviour will be influenced by all human factors circumventing the social environment in which the taxpayer lives (Hashimzade, Myles & Tran-Nam, 2013). Taxpayers not only interact with the government or tax administrator/authority, but also with their peers and others in the social community. As a result of various human interactions, taxpayers may act upon what others may think or do (so-called social norm, Torgler, 2002); taxpayers may also develop their own intrinsic values based on their moral sentiment or
ethics toward tax-paying; taxpayers even care about preserving their social identities that may be lost if they are caught for tax non-compliance; and so on. Studies in tax compliance started to move away from the traditional ‘homo economicus’ toward 

**behavioural economics** based on ‘homo realitus’ (Cullis & Lewis, 1997).

Behavioural economics signifies the ‘fourth’ main stream of literature on tax compliance.

Last but not least, somewhere between taxpayers and the tax administrator/authority, researchers found that a third party intermediary existed. There were two types of intermediaries: one playing the (obligatory) role of reporting and collecting tax at source, and the other playing a (servicing) role of a tax preparer and advisor at the request of taxpayers. Third party intermediaries of the first type include employers, banks or investment funds, or paying agents of certain designated incomes, who are statutorily required to report and collect tax from the income earners by way of withholding before the payment was made (so-called withholding at source). The intermediaries of the second type are mainly represented by practising accountants who aim at providing tax-specific services. The evolving of intermediaries was primarily driven by the tax administrator/authority calling for more efficient ways of collecting tax by way of withholding at source. More and more taxpayers also call for assistance from tax practitioners to cope with the increasingly complex tax laws and requirements in fulfilling the tax reporting obligations. In studying the role played by intermediaries, researchers found that collecting tax through intermediaries indeed helps enhance tax compliance and maximise tax revenue, but engaging tax practitioners for tax reporting could encourage tax non-compliance (Kleven, Kreiner & Saez, 2009; Kleven, Knudsen, Kreiner, Pedersen & Saez, 2011). Studies and literature in this ‘fifth’ stream focused
on exploring the role played by third party intermediaries in the context of predicting tax compliance behaviour.

In the following section, each of the five main streams of tax compliance theories, as well as their significant literature, are discussed.

2.4 Streams of Tax Compliance Theories and Models

2.4.1 Stream 1 - Deterrence Model

The Deterrence Model was perceived as the earliest standard neoclassical economic model seeking to explain why taxpayers chose not to comply with tax requirements. The preamble theory preceding the model was the Economics-of-Crime Theory which is introduced in Section 2.4.1.1 below, followed by a detailed discussion of the Deterrence Model in Section 2.4.1.2.

2.4.1.1 Economics-of-Crime or Expected-Utility Theory

Over the last few decades, researchers have started to conduct studies with a view to exploring whether deterrence serves to mitigate taxpayers’ non-compliance behaviour (or tax evasion behaviour), and if so, what kinds of deterrence measures are effective. This hypothesis relies on the conventional wisdom that sanctions and threats of punishment will lower the likelihood of punishable behaviour occurring and thus help improve the level of compliance (Schwartz & Orleans, 1967). In their pioneering field experiments, Schwartz and Orleans assumed that deviation from tax compliance was a ‘crime’ which could be deterred by threat of punishment, although they added that for
tax compliance to be secure, action appealing to one’s conscience could be more effective than sanction threats. It was not until Becker (1968 as cited in Allingham & Sandmo, 1972) that the association of sanction threat with taxpayers’ compliance was conceptualised in the Economics-of-Crime model (as illustrated in Figure 2.4.1.1-1 below). Under this model, the uncertain benefits of successful tax evasion (or non-compliance) were weighed against the risks (and costs) of evasion (or non-compliance), resulting in the expected net outcome which dictated the taxpayers’ decisions to comply or not. If the expected net outcome was positive (i.e. non-compliance benefits outweighing its costs), the taxpayer would choose to evade (or not to comply). If the expected net outcome was negative (i.e. non-compliance costs outweighing its benefits), the taxpayer would choose to comply. This was also referred as expected-utility theory. Assuming that this cost-benefit relationship was valid, by increasing the risks (and costs) component of the equation, the expected net outcome would be reduced, rendering a less attractive incentive for taxpayers to pursue tax evasion (or non-compliance) and thus encouraging tax compliance.

\[
\text{Expected Net Outcome} = \text{Non-compliance Benefits} - \text{Non-compliance Costs}
\]

**Interpretation:**
- IF: \( \text{N/C Benefits} > \text{N/C Risk/Cost} \); THEN: taxpayers choose NOT TO COMPLY
- IF: \( \text{N/C Benefits} < \text{N/C Risk/Cost} \); THEN: taxpayers choose to COMPLY

**Key:** \( N/C = \text{Non-compliance} \)

**Figure 2.4.1.1-1 -Economics-of-Crime Model**

The above Economics-of-Crime model was first applied in Allingham and Sandmo’s (1972) study which aimed at analysing the individual taxpayer’s decision to deliberately under-report. Given that the underlying assumption of the Economics-of-Crime model was that taxpayers made rational choices to comply or not (Allingham & Sandmo,
1972), the act of non-compliance was therefore an ‘intentional’ act (Roth et al., 1989). Therefore, if a taxpayer chose to comply, the only possible reason was that the taxpayer wanted to avoid being penalised given that non-compliance costs outweighed the benefits resulting in negative incentives of non-compliance. However, non-compliance (or evasion) did not automatically lead to a penalty. The risks of non-compliance would only be realised if the taxpayer got caught. This means that the chance of being penalised is uncertain, hence taxpayers’ compliance decision should also be uncertain. Allingham and Sandmo (1972), and some other researchers, described this behaviour as ‘behaviour under uncertainty’.

### 2.4.1.2 Allingham and Sandmo’s Model or Deterrence Model

Under the Economics-of-Crime Model (or Expected Utility Theory), for the non-compliance costs to be estimated, two elements must be made available to taxpayers: the chance of being detected and the rate of punishment. By incorporating these elements into the Economics-of-Crime model, the Allingham’s Deterrence Model was deduced (Allingham & Sandmo, 1972), as an expansion from the Expected Utility Theory as shown in Figure 2.4.1.2-1 below:

\[
E[U] = (1-p) U (W - \phi X) + p U (W - \phi X - \pi (W - X))
\]

Where:
- \(E[U]\): expected utility outcome
- \(W\): actual income not known by tax administrator/authority
- \(X\): declared income
- \(\phi\): tax rate
- \(p\): probability of detection
- \(\pi\): penalty rate, higher than \(\phi\)

**Figure 2.4.1.2-1 Allingham’s Deterrence Model**
Under the above Deterrence Model, the expected utility outcome was the combined result of the after-tax income multiplied by non-detection probability ‘I-p’ and the after-tax-and-penalty income multiplied by detection probability ‘p’. This model was similar to the model deduced by Srinivasan (1973) who analysed how much income was ‘under-declared’ by the taxpayer as a function of true income, the probability of detection, and the tax structure. This probably paved the way for subsequent researchers seeking to demonstrate that tax enforcement rules (by the tax administrator/authority) were to be determined jointly with reporting decisions (by taxpayers) (Andreoni et al., 1998).

As shown in the Deterrence Model, the chance of being detected (detection probability: ‘p’) and the punishment cost (penalty rate: ‘π’) were fundamental to the level of expected outcome. If taxpayers’ non-compliance behaviour could be deterred by uplifting the detection probability and punishment cost, the multiplying effect of detection probability and punishment cost [i.e. the product of p and π (W - X)] could therefore represent the extent of deterrence (Feld & Frey, 2010), indicating the amount of tax to be evaded (Allingham & Sandmo, 1972). Unfortunately, the probability of detection is difficult to know or measure in a practical sense, and in most cases, it is the ‘perceived’ probability rather than the ‘actual’. Moreover, this perceived detection probability was qualified by Spicer and Lundstedt (1976, as cited in Fischer et al., 1992) who postulated that it did not necessarily relate to the taxpayers’ ‘actual’ tax compliance behaviour, but rather, it related to taxpayers’ ‘attitude’ toward tax compliance. If this comment holds true, the predictability of taxpayers’ compliance based on the Deterrence Model would be unreliable. As regards the punishment cost (or penalty rate), the Deterrence Model assumed that non-compliance behaviour would be
discouraged if the penalty rate was raised. However, this relationship was
subsequently challenged by other researchers who found that the deterrent effect of the
penalty was not supported (Kirchler et al., 2007; Pomerehne & Weck-Hannemann,
1996), or increasing the penalty could actually result in tax avoidance (Schwartz &
Orleans, 1967; Fjeldstad & Semboja, 2001). Kirchler et al. (2007) recognised that
taxation was already a threat, which presumably drove taxpayers to avoid it if given a
choice. However, removing the penalty did not necessarily drive tax compliance. On
the contrary, if the penalty rate was increased to an oppressive level, taxpayers’
resistance to paying tax would even get stronger, and their sentiments for
non-compliance would be further stimulated.

When the interacting effect of combining the detection probability and penalty rate was
investigated, prior studies appear to have reported contradictory but interesting findings.
Friedland et al. (1978) found that large fines were more effective than frequent audits,
but Friedman (1982) discovered that low fines had a better deterrent effect if combined
with vague information about the audit probability. Park and Hyun (2003) supported
that compliance was more strongly affected by the penalty cost than by detection
probabilities, but this was consistent with the study of Alm, Sanchez and de Juan (1995)
who found that the penalty would only be effective when it was combined with a high
detection rate. It is obvious that further investigations need be conducted to prove the
deterrent effect from the interaction of the detection probability and penalty rate if the
Deterrence Model is to be supported.
2.4.2 Stream 2 - Endogenous Income Theory

Allingham and Sandmo’s Deterrence Model was further expanded by other researchers such as Andersen (1977) and Pencavel (1979) by incorporating the conventional theories of labour supply into the model. Based on the Deterrence Model, the expected utility outcome (presumably the tax savings) was represented by the difference between the true income (‘W’) and declared income (‘X’) adjusted by the detection rate and further reduced by the potential penalty cost. In labour supply theory, the true income (‘W’) could be represented by the pre-tax hourly wage rate (‘w’) multiplied by the labour supply in terms of hours (‘N’), i.e. (‘NW’). By replacing the true income with the labour supply formula in the Deterrence Model (Andersen, 1977), and added with an additional variable denoting income other than wage (‘S’), the Andersen’s Model is illustrated in Figure 2.4.1.2-1 below:

\[
E(TU) = U(N) + pV(A) + (1-p)V(B)
\]

Where:
- \( p \): probability of detection
- \( A = NW + S - \theta X - \pi (NW + S - X) \); that is after-tax income net of penalty paid on undeclared income
- \( B = NW + S - \theta X \); that is after-tax income (wage and others)
- \( N \): number of hours of labour supply
- \( W \): pre-tax hourly wage rate
- \( NW \): True income represented by pre-tax hourly rate multiplied by number of hours of labour supply
- \( S \): income other than wage
- \( \theta \): tax rate
- \( X \): declared income
- \( \pi \): penalty rate, higher than \( \theta \)

Figure 2.4.1.2-1 - Andersen’s Model with Labour Supply

When Andersen’s Model was compared with Allingham and Sandmo’s model, it was found that both models effectively worked on the same basis. However, the

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29 Refer to Figure 2.4.1.2-1 in Section 2.4.1.2 of this Chapter.
30 Allingham and Sandmo’s model: \( E[U] = (1-p) U(W-X) + p U(W-X - \pi(W-X)) \) as per Figure
incorporation of the labour supply theory into the Deterrence Model appeared to suggest that the rationale behind taxpayers’ choices could be influenced by factors more than non-compliance benefits and costs. When enforcement measures were strengthened to increase the non-compliance costs, the non-compliance (or evasion) rate was expected to be lower under the Deterrence Model (Yitzhaki, 1974). However, excessive tax enforcement could result in taxpayers facing potential losses due to punishment, driving taxpayers to work harder in order to make up the losses, and resulting in a higher incentive for non-compliance (Andreoni et al., 1998). This explained that elimination of evasion opportunities could lead to an increase in labour supply (probably ‘moonlighting’) as well as undeclared income (Batrancea, Nichita, Batrancea & Radu, 2012). Such phenomenon is particularly valid in jurisdiction where tax is collected by intermediary such as an employer, making tax evasion impossible. By integrating labour supply theory into the deterrence model, taxpayers’ decisions about how much income to report would be made simultaneously with their decisions of how much to work (Slemrod & Yitzhaki, 2002), making income endogenous on labour supply. The validity of the enforcement variables (i.e. the penalty cost and detection probability) has therefore become ambiguous, resulting in the effectiveness of the Deterrence Model under challenge and the rationale behind taxpayers’ behaviour even more unpredictable.

2.4.3 Stream 3 - Interaction with Tax Administrator/Authority and Government

As explained above, the Allingham’s Deterrence Model expanded Becker’s Model by explaining the two factors that significantly dictate taxpayers’ perceived costs of non-compliance: the detection probability and punishment costs. Subsequent research

2.4.1.2-1 of this Chapter.
found that these two factors are not within the control of the taxpayers, but rather they are part of the functions of a tax administrator/authority. Taxpayers developed their perceived probability and punishment costs through interaction with the tax administrator/authority, and at the same time, the tax administrator/authority could make use of the taxpayers’ perception to maximise tax revenue. Further discussions follow.

2.4.3.1 Detection Probability

It is primarily the responsibility (as well as the vested interest) of the tax administrator/authority to ensure that taxpayers understand and comply with their tax obligations, and pay their taxes accordingly. Since compliance with tax obligations are stipulated in law, non-compliance is literally a law-breaking offence, or a crime. As a result, tax law must contain enforcement measures to ‘search and catch’ these ‘naughty acts’ by detection, followed by punishment imposed on committed offences. The execution of tax enforcement falls upon the tax administrator/authority, which plays the role of not only a tax-collecting agent but also an enforcement agent. The traditional concept of Agency Principle is inherent in the relationship between the taxpayer and tax administrator/authority. The Agency Principle has been used in the study of Andreoni et al. (1998) to explain how a taxpayer estimates the detection probability in a given tax environment. The researchers critiqued that the detection probability was not necessarily constant or purely random. If the tax administrator/authority aimed to maximise tax revenue, it might take one of the two detection/audit strategies: the pre-filing ‘cut-off’ rule or post-filing ‘no-commitment’ rule. In the former strategy, the tax administrator/authority announced its audit/detection rule (such as threshold for audit selection) before tax returns were due for filing. As taxpayers were fully aware
of the audit threshold, those earning income lower than the threshold would be fully compliant in reporting the true income as they knew that their chances of being audited were high. For taxpayers earning income above the threshold, it was expected that the quantum of income reported would be close to the threshold value as they knew that no audit would be carried out as long as the reported income was above the threshold. This strategy enabled the amount of tax revenue to be easily predicted and maximised. Despite a non-increasing function of income, Andreoni et al. (1998) described this as an optimal audit rule preferred by the tax administrator/authority. However, this strategy assumes that taxpayers are risk neutral and honest, and this is subject to challenge. Alternatively, the tax administrator/authority may pursue the second audit strategy under which no audit rule would be announced beforehand. Cases are selected for tax audit at the full discretion of the tax administrator/authority (so-called post-filing ‘no-commitment’ rule). Taxpayers are expected to respond in the form of a sequential move game whereby taxpayers make a forecast of the audit probability based on their income levels, and decide on their tax evasion (or non-compliance) acts accordingly, like playing a game. A significant criticism of this strategy is that both dishonest and honest taxpayers will have the same chance of being audited, resulting in the deterring effect turning into a demotivating factor for honest taxpayers.

2.4.3.2 Slippery Slope Model

The interaction between the tax administrator/authority and taxpayer is not confined to the need to predict detection probability, but is extended to an ‘exchange’ relationship based on mutual expectation. Taxpayers have started to be aware that tax payment is unavoidable as the government needs tax revenue to finance public expenditure.
Consequently, taxpayers start to impose ‘expectations’ over the tax-collecting agent as well as the government in exchange for the unavoidable tax payment. Broadly, these expectations include quality government services, equitable rule of law, and trustworthy justice system and government (Torgler et al., 2003). At the same time, the government, as well as the tax administrator/authority, is fully aware that taxpayers’ reporting decisions are driven by the complicated behavioural theories, amongst which moral sentiments play a significant role (Erard & Feinstein, 1994). Prior studies have found that taxpayers who were satisfied with the tax administrator/authority (and its government) tended to translate their positive perception into favourable tax morale which in turns motivated voluntary compliance (Andreoni, 1998). On the contrary, low tax morale was strongly correlated with greater tax evasion (Torgler et al., 2003). The relation between the tax administrator/authority and taxpayers was no longer ‘cops and robbers’ (‘antagonistic’) but rather ‘service and client’ (‘synergistic’) – ‘Slippery Slope Model’ by Kirchler et al. (2008). Researchers believed that taxpayers would be more willing to comply with tax obligations voluntarily if the tax administrator/authority was perceived to be trustworthy and benevolent (Kirchler et al., 2008).

2.4.3.3 Responsive Regulatory System

Taxpayers’ decisions to comply or not could be influenced by their perceptions of the fairness of the tax system (Andreoni et al., 1998). Perception, in this perspective, includes the way in which taxpayers are being treated by the tax law and the tax administrator/authority. Some researchers believed that taxpayers’ perceptions should positively associate with tax compliance, and thus focused their studies on how the tax administrator/authority could play a part in enhancing taxpayers’ perceptions.
Braithwaite (2007, 2010) proposed that when dealing with taxpayers, the tax administrator/authority should adopt a responsive regulatory approach to properly address the three coping sensibilities of taxpayers: ‘feeling oppressed’, ‘taking control’ and ‘thinking morally’. Taxation is a threat (Kirschler, 1998), because it represents an intrusion of taxpayers’ freedom when the government extracts money from taxpayers who have no choice to refuse (Braithwaite, 2007). ‘Feeling oppressed’ is believed to be the first of the three coping sensibilities which, if not handled properly, would be translated into tax compliance resistance. ‘Taking control’ is the next sensibility in which taxpayers desire to be in control of their own tax affairs; and ‘thinking morally’ is the third sensibility that could possibly change the taxpayers’ perceptions of ‘tax’ from threatening to social necessity. In addressing these sensibilities, Braithwaite promoted a responsive regulatory process with a view to engaging taxpayers to think about their obligations and self-regulate in line with the requirements of the law. It was hoped that through fair and respectful treatment by the tax system and tax administrator/authority, taxpayers would voluntarily perform tax compliance (Bentley, 1998, as cited in Braithwaite, 2007). In a guidance note on Compliance Risk Management: Managing and Improving Tax Compliance issued by OECD in 2004, it was also commented that the historical approach taken by revenue authorities to only rely on enforcement to ‘treat’ the symptoms of non-compliance needed to be revamped. In today’s environment, revenue authorities should make more attempts to understand the factors that shape the taxpayer’s compliance behaviour and enforce tax obligations by way of ‘treatment strategies’ (OECD, 2004). The OECD described tax compliance behaviour as a ‘continuum’ rather than ‘dualistic’ (OECD, 2010). An individual taxpayer’s compliance behaviour may be found at any point on a continuum ranging from full compliance to deliberate non-compliance, and this point will change
depending on circumstances (OECD, 2010; Hamilton, 2012). If the traditional tax enforcement strategy through the use of deterrence measures (such as punishment) is found to give rise to both positive and negative effects (Braithwaite & Braithwaite, 2000; Andreoni et al., 1998), it could be the right time to explore an alternative strategy to ‘persuade’ the taxpayer to commit voluntary compliance. Nowadays, the role of the tax administrator/authority has gone beyond a collecting and enforcement agent to become a facilitator and a provider of services to taxpayer-citizens (Alm et al., 2010a). Taxpayers and the tax administrator/authority should be partners. This so-called ‘service paradigm’ supports the Compliance Pyramid (see Figure 2.4.3.3-1 below) proposed by Ayres and Braithwaite (1992) for the Australian Tax Office (‘ATO’) in 1992 (the Ayres and Braithwaite Compliance Pyramid).

Figure 2.4.3.3-1 - Compliance Pyramid by Ayres and Braithwaite (1992)
In the pyramid, ‘persuasion’ forms the foundation. As the pyramid escalates upward, the choice of a remedy for non-compliance is increasingly severe, including a warning letter, civil penalties and criminal penalties, with licence suspension and revocation at the top two layers of the pyramid. The whole idea of the pyramid was to create a ‘pressure-down’ effect such that priority was given to ‘persuade’ or ‘encourage’ taxpayers to move toward voluntary compliance (Hamilton, 2012). The rationale of ‘persuasion before punishment, education before enforcement’ was generally followed. Moreover, Whait (2012) added that taxpayers’ expectations on the tax administrator/authority included achieving administrative equity and administrative efficiency. Administrative equity could be horizontal or vertical. Horizontal equity (or horizontal reciprocity, Alm et al., 2010a) would be achieved if taxpayers in the same financial position are asked to pay the same amount of tax (Woellner, Barkoczy, Murphy, Evans & Pinto, 2012). Tax fairness or paying a fair share of tax is especially crucial to honest taxpayers who expected to see that they were not the ones exploited by dishonest taxpayers (Feld & Frey, 2007). Vertical equity would be achieved if taxpayers in different financial positions are asked to pay different tax amounts in correspondence with their tax-paying capacities. Researchers believed that when a tax system was strong in both horizontal and vertical equity, tax compliance is likely more sustainable (Whait, 2012). Administrative efficiency refers to the allocation of resources in an efficient manner, which requires the tax administrator/authority to wisely identify an appropriate means to achieve the taxpayers’ equity, and to wisely and efficiently allocate the limited resources. Take Australia as an example. As per the ATO,\textsuperscript{31} a tax audit as a deterrence measure was easy to administer and effective in generating tax revenue, but it was extremely costly, something like five times as much

\textsuperscript{31} Australian Tax Office
as education or the other methods of collecting tax (Whait, 2012). Before the implementation of the self-assessment system in 1986, the ATO concentrated its resources into enforcing deterrence strategies to achieve maximum tax compliance. With the self-assessment system in place, ATO has diverted its resources to enhancing treatment strategies which aimed at encouraging taxpayers’ voluntary compliance through an integrated approach combining audits, service and education (Whait, 2012).

2.4.3.4 Psychological Tax Contract

Taxpayers interact not only with the tax administrator/authority but also with the government as a whole. Prior researches on taxpayers’ compliance have been extended to the role played by government. Taxpayers understand that a government is required to generate sufficient tax revenue to finance the public expenditure for the purpose of generating adequate public good presumably for the benefit of the whole community in which the taxpayers live. Taxpayers are aware that government revenue is sourced from them, and thus they (or at least some of them) perceive the tax-paying requirement as a means of exchange for the public good that they consider desirable. The more tax revenue is needed by the government, the greater the demand for collecting tax is imposed on the taxpayers, and in return, the higher the quality of public good is expected by the taxpayers from the government. This is a looping relation between government and taxpayer, and was explained by researchers as the theory of ‘psychological tax contract’ (Feld & Frey, 2002a). Under this social contract, tax compliance is considered as a means of exchange for the community’s well-being (or public good). Tax is seen as the price for the public good. If the tax price is perceived as too high, tax evasion (or non-compliance) would be considered as justified.
As an example, tax evasion is commonly found in Latin American and Caribbean countries partly due to the general public’s attitude that corruption has broken the social contractual relationship between government and citizen, hence evasion is acceptable (Alm et al., 2010a). Taxpayers expect not only quality public good, but also quality private good. As an illustration, if the government spends tax revenue to boost economic development, both public and private good would be fostered through the provisions of higher economic freedom, more efficient equity markets, fair market competition via competition law, and a higher standard of moral norm (Feld & Frey, 2007). If taxpayers’ contractual expectations are fulfilled, tax morale will be promoted and transferred into a social norm, leading to tax compliance. Using this rationale, studies on taxpayers’ compliance started to reach out into social science and behavioural economics - the fourth stream of studies, as discussed in Section 2.4.4 below.

2.4.4 Stream 4 - Behavioural Economics Theories

An important theme of behavioural economics studies is to associate human behaviour with the environment in which people interact. If tax compliance is a behaviour resulting from a choice, studies of taxpayers’ behaviour and how they actually make choices in the interaction of the environment should offer further dimensions to explain tax compliance. Prior studies in this direction are discussed below.

2.4.4.1 Tax Morale

In the preceding section, the concept of ‘tax morale’ emerges as a by-product from the interaction between the taxpayer and tax administrator/authority. For example, when
taxpayers are satisfied with the way that they are treated by the tax administrator/authority, they are found to be more willing to pay tax (Feld & Frey, 2002b). Such a motivating force is generally described as ‘tax morale’ (Feld & Frey, 2002b), or ‘intrinsic motivation to pay tax’ (Torgler, 2006; Riahi-Belkaoui, 2004; Hashimzade et al., 2013) or ‘tax mentality’ (Cullis, Jones & Lewis, 2010; Lewis, 1982), or ‘tax ethics’ (Alm & Torgler, 2011). In the paper of Alm and McClellan (2012), a few other prior studies have been cited to describe ‘tax morale’ as being directly or indirectly associated with the following:

- Intrinsic motivation (Frey, 1994, 1997)
- Taxpayer’s ethics (Song & Yarbrough, 1978)
- Social norms (Alm, McClellan & Schulze, 1999)
- Fiscal exchange between taxpayer and government (Feld & Frey, 2002b)
- ‘Committed’ versus ‘capitulative’ versus ‘creative’ compliance (McBarnet, 2004)
- Perceptions of power and trust (Kirchler et al., 2008)
- ‘Def-reference’ and ‘defiance’ motives in compliance (Braithwaite, 2009)

Prior studies revealed that tax morale had a far-reaching effect on taxpayers. How is ‘morale’ defined? A universal rule or standard to define ‘morale’ (or ‘moral act’) is unfortunately found absent, but some researchers have made attempts to consolidate some ethical principles under which an act was considered as ‘morally right’ (Weiss, 2003; Ho & Wong, 2008). First, an act is morally right if it serves one’s self-interest and needs, taking into account the cultural, customs and religious values (‘ethical relativism’). As Hodgson (1988) suggested, taxpayers were motivated by their own interest rather than others’. Second, an act is morally right if the net benefits over costs were greatest for the majority (‘utilitarianism’). Becker’s Economics-of-Crime
Model and Allingham’s Deterrence Model were premised on this principle by comparing costs and benefits from tax non-compliance. Third, an act is also morally right if it respects the rights of those affected and is fair to all parties involved (‘universalism’) – this lays down the foundation for Braithwaite’s responsive regulatory system. Fourth, an act is also morally right if it is based on legal rights and principles of duties (‘rights’). This concept is commonly used when legitimate tax planning is defended against tax avoidance law under the Westminster Principle. Last, an act is morally right if it brings equal opportunities and advantages to the society (‘justice’). This appears to be consistent with the horizontal and vertical reciprocity theory by Schnellenbach (cited in Alm et al., 2010a). In the broad sense, an ethical taxpayer is expected and believed to be tax compliant, although different taxpayers may have different sets of ethical values (Kohlberg, 1976). Researchers have found it increasingly difficult to formulate a standard model to explain and predict taxpayers’ behaviour.

The Deterrence Model explains the effect of deterrence measures on tax compliance, while the tax morale theory explains the behaviour behind tax compliance. But what about the combining effect when tax morale interacts with deterrence? Some researchers tried to explore how tax morale was associated with sanctions and harsh regulations (Frey, 1997). It was found that taxpayers’ intrinsic motivation to pay tax would indeed be crowded out by external interventions such as sanctions (Feld & Frey, 2002b), but such a crowding out effect would be moderated if taxpayers believed that the harsh regulations were actually aimed at counteracting dishonest taxpayers (Torgler,

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32 Westminster principle: every man was entitled to order his affairs within the tax law so that the resulting tax was less than it otherwise would be.
The interacting effects of tax morale are by no means straightforward, but evidence shows that tax morale does effectively contribute to promote tax compliance.

If tax morale is effective, then what are the determinants for tax morale to develop? What would drive a taxpayer to behave honestly, report correctly, and pay tax adequately? There must be some intrinsic values existing within a taxpayer who seeks to comply. Based on the empirical studies by Riahi-Belkaoui (2004) on 30 countries, the tax compliance rate was found to be higher in those countries with higher economic freedom, important equity market, effective competition laws and a low serious crime rate. The findings suggested that when taxpayers found themselves in a safe environment in which quality of life could be secured, tax compliance would be seen more of a citizenship duty rather than a burden, hence tax morale developed. As the economic, social and cultural features were different across countries, tax morale and its factors were also found different by country. Another researcher, Dell’Anno (2009), suggested that tax morale resulted in two different effects: the ‘guilty conscience’ effect and ‘public disgrace’ effect. In a high tax morale climate, a taxpayer would feel ashamed after he got caught for under-reporting, but would also feel guilty if he did under-report but successfully escape from detection (Grasmick & Scott, 1982; Erard & Feinstein, 1994). If feeling ashamed or guilty is intrinsic, avoiding public disgrace can be a genuine reason to explain compliance behaviour, in particular when taxpayers are concerned about their personal and social identities. When the act of evasion or non-compliance is not accepted by the general public, the consequence of being detected will damage a taxpayer’s personal image (i.e. disgrace), hence fostering the taxpayer’s moral sentiment toward tax compliance to sustain. Studies along this direction also promoted that taxpayers made choices not in isolation but through their
interactions with the social environment and its social norm (Hashimzade et al., 2013). Tax morale is developed through interactions with environment. Therefore, Hashimzade et al. (2013) proposed that the traditional economic models based on Becker or Allingham and Sandmo should be modified to incorporate factors arising from social interactions.

### 2.4.4.2 Social Interactions and Psychic Costs

Taxpayers make choices, but not always do this on their own. If taxpayers are assumed to make rational choices (‘rational choice principle’) (Piliavin et al., 1986), the choices are made if the desired payoff (e.g. tax savings) is maximised. ‘Payoff’ is evaluated by various factors such as deterrence factors\(^{33}\) as discussed in Section 2.4.1 above. One of the deterrence factors in the Deterrence Model is punishment cost (Allingham & Sandmo, 1972) which refers to the juridical cost of detection such as penalty, fines, or imprisonment. However, subsequent researchers found that a non-monetary type of detection cost existed - ‘psychic cost’ (Spicer, 1986; Cullis, Jones & Lewis, 2007). Broadly speaking, the psychic cost relates to the psychological pressure associated with the detection, including the fear of being caught, the shame of being exposed to the public, and the damage or loss of social prestige or reputation (Hashimzade et al., 2013). Psychic costs go beyond the monetary form of detection costs. Because they are non-monetary, they are difficult to measure and assess, making the tax compliance model even more complicated. The concept of psychic cost is similar to the guilt and shame sentiments discussed above\(^{34}\) (Erard & Feinstein,

\(^{33}\) Deterrence factors under the Deterrence Model include detection probability and punishment cost (Allingham & Sandmo, 1972)

\(^{34}\) Refer to ‘Tax Morale’ under Section 2.4.4.1 of this chapter.
Taxpayers develop these sentiments when they learn more about what other taxpayers do and compare themselves with what he ‘does’ or ‘intends to do’. When a particular behaviour dominates a choice in a social community or environment, the choice becomes the social norm, which will become a pattern for the society or a particular community (Cullis et al., 2007). In the event that a taxpayer acts differently from the social norm, the pressure of the psychic cost increases (‘social custom theory’ per Hashimzade et al., 2013). If the majority of the taxpaying population is complying, a taxpayer will find himself under greater pressure to choose not to comply. On the other hand, if a taxpayer has friends who are mostly tax evaders, the taxpayer will be in an easier position to choose not to comply due to a lower level of psychic cost (Torgler, 2002). The interactive effect between a taxpayer and his wider social environment was described as social custom theory by Hashimzade et al. (2013). Because social norms take into account what others do, tax morale is believed to reflect the taxpayer’s concern over others (altruism) (Cullis et al., 2007). In a society with a stronger sense of social cohesion and tax morale, tax compliance is expected to be higher (Torgler, 2002). The escalating effect of social cohesion on individual taxpayer’s behaviour could also be explained by the effective group communication which transforms a group decision into a private one (Alm et al., 1999).

2.4.4.3 Fischer’s Model

In general, taxpayers will comply as long as they believe that compliance is the ‘right thing to do’. This ‘moral sentiment’ is believed by most researchers to be a significant determinant of a taxpayer’s compliance behaviour. As human behaviour is dynamic, social norms are therefore not static, and so is the taxpayer’s decision to comply or not.
(Torgler, 2002). This supports the ‘continuum theory’ of Hamilton (2012) that taxpayers’ behaviour would be positioned at some points on a continuum ranging from extreme non-compliance (or evasion) to full compliance, and this position would change depending on circumstances. The problem is: what circumstances are there to affect the tax compliance behaviour, and its changes?

A comprehensive tax compliance study by Jackson and Milliron (1986) has identified 14 key variables, in 4 categories: demographic (age, gender), non-compliance opportunity (education, income level, income source and occupation), attitudes (e.g. ethics, perceived fairness of tax system, peer influence), and tax structure (e.g. tax system, rates, sanction, detection probability) (Fischer et al., 1992). These categories were expanded by Fischer (Fischer et al., 1992) into a tax compliance model as follows:
2.4.4.3.1 Fischer’s Model – Non-compliance Opportunities

Fischer’s model illustrates that the study of taxpayer compliance is complex, represented by the integrated (direct and indirect, positive and negative) relationship amongst factors characterised by demographics, non-compliance opportunities, attitudes/perceptions and the tax system/structure. If a taxpayer chooses not to comply, there must be a reason (or reasons) – incentives or opportunities pulling ‘taxpayers’ away from full compliance. These non-compliance opportunities comprise four aspects: education, income level, income source and occupation, and they may either directly influence taxpayers’ compliance or indirectly influence taxpayers’ moral development,
which in turn influences their tax compliance behaviour. Amongst the four aspects of non-compliance opportunities, ‘education’ has been identified by prior researchers as one significant factor making a difference in attitude toward tax evasion, but the direction of impact was not consistent. On the one hand, lack of literary skills was found to contribute to non-compliance (Jackson & Milliron, 1986) but on the other hand, education was found to increase a taxpayer’s ability to evade tax (Hotaling & Arnold, 1981). The impact of education on tax compliance is the focus of this study and will therefore be discussed in further detail under Section 2.7 of this Chapter below.

Another two non-compliance opportunities identified by Fischer are income level and income source. Taxpayers earning different levels of income or from different sources were found to have different tendencies or chances to comply or not to comply (Roth et al., 1989). The last non-compliance opportunity is occupation, as Fischer believed that different types of occupation were characterised with different culture or attitudes toward paying tax, formulating into a social norm or ‘social identity’ that the taxpayer follows (Webley, Cole & Eidjar, 2001; Richardson & Sawyer, 2001). There are also other possible circumstances under which taxpayers choose not to comply, such as inability to pay, a grievance due to an unjust war or a corrupt government, or dissatisfaction with the government (Alm, Martinez-Vazquez & Torgler, 2010b). Tax unfairness (Richardson, 2005), egoism in rule-breaking (Weigel et al., 1987, as cited in Webley et al., 2001), personal constraints (Hessing et al., 1985, as cited in Webley et al., 2001), and ambiguity in tax law were also found in prior studies as possible circumstances leading to tax non-compliance.
2.4.4.3.2 Fischer’s Model – Moral Development

In Fischer’s Model, moral development was positioned in the centre as it was being impacted by various other factors before it influenced taxpayer’s compliance. Moral development is central to Fischer’s Model. Moralities, or moral reasoning, were referred to by Ho and Wong (2008) as systems of rules of conduct that were developed to provide guidance in social or interpersonal behaviour and were used to regulate and moderate human affairs. Taxpayers draw on their perceived values and codes of conduct to assess whether their behaviour is ‘right’ or ‘wrong’ (Chan et al., 2000), and such assessment is based on the person’s set of salient beliefs (Carroll, 1992). People develop their sets of salient beliefs, hence their levels of tax moralities or ethics through (i) their perceptions of the tax system and structure (including attitude of the tax administrator/authority), (ii) their degrees of exposure to non-compliance opportunities and their respective circumstances; and (iii) their demographic characteristics (e.g. age and gender). Based on the study done by Kohlberg and Candee (1984), individuals with higher levels of moral reasoning were found to make ‘morally right’ decisions. The association of morality with taxpayer’s compliance behaviour, and related prior literature, have been discussed in Section 2.4.4.1 above.

2.4.4.4 Other Tax Compliance Factors and Inconsistent Findings

Other than the tax compliance factors discussed in the earlier sections of this chapter, some other factors have also been discovered by prior researchers, such as culture (Alm et al., 1995; Chan et al., 2000; Tsakumis et al., 2007; Ho, Ho & Young, 2013), personal

35 Younger taxpayers were found in some prior studies to be more risk-seeking (Tittle, 1980; Ross & McGee, 2012b), while female taxpayers were found to be more compliant (Mason & Calvin, 1978).
norms, and national identity (Wenzel, 2007; Wenzel & Taylor, 2003, 2004). Not only is the pool of factors widely diverse in nature, but also their effects are found inconsistent and varying. During the period from 2007 to 2010, McGee (sometimes with co-authors) has conducted a number of studies in nearly 30 countries seeking to explore the general views on tax evasion and the relationship between these views and demographic variables including gender, age, education, religion, ethnicity and country of origin. The findings were that relationships did vary across countries. Despite this, the relationship between certain variables and attitude toward tax evasion did not produce a consistent pattern across the board. This lends support to a suggestion by Kirchler (1998) that different compliance strategies should be tailored for different taxpayers. This is also consistent with OECD (2004) recommending that in adopting a risk management approach by tax revenues to combat non-compliance, diversity in treatments rather than a ‘one size fits all’ approach should be followed.

2.4.5 Stream 5 - Third-party Intermediaries

The earlier streams of literature on tax compliance behaviour basically assume that taxpayers handle tax reporting by themselves – so called ‘self-reporting’. The study of the relationship between taxpayers and the tax administrator/authority is premised on a dual-relationship where taxpayers directly deal with the tax administrator/authority or vice versa. In the real world, however, tax reporting is not necessarily done by the taxpayer, but by a third party intermediary or with the assistance of a third party intermediary. This intermediary could be a tax collecting agent required by law (e.g. employer) or a service provider engaged by taxpayers (e.g. tax practitioner). The involvement of an intermediary for reporting and collecting tax on behalf of the tax
administrator/authority is commonly found in tax jurisdictions like Australia, China and the United Kingdom, where employers (as well as some other payment agents) are statutorily required to ‘withhold’ tax payments from employment income and report it to the tax administrator/authority (so-called ‘tax-withholding mechanism’ or ‘pay-as-you-go’ system). A three-tiered agency model was formulated by Kleven et al. (2009) to describe the relationship comprising government at the top, individual taxpayer at the bottom, and the third-party intermediary in the middle. Prior studies also found that there has been increasing reliance by tax administrator/authorities in advanced economies on the extensive use of third party intermediaries for tax reporting and collection, in particular when the size of employer organisations increased (Kleven et al., 2009, 2011). The use of an intermediary as tax collecting agent is found to be an effective tax enforcement device. However, studies by Kleven et al. (2009) suggested that an intermediary collecting agent was effective only when books and records were comprehensive enough and verifiable to support the vast volume of reporting, and the scale of the employer organisation was large enough to deter collusive cheating acts between employer and employee. When tax is required to be ‘withheld’ by an intermediary, taxpayers are being deprived of the choice to decide, resulting in the level of tax evasion or non-compliance extremely modest. The traditional models like the Deterrence Model to predict taxpayers’ compliance behaviour become ineffective. With this in mind, it seems that different detection policies are required for self-reported cases and other cases with involvement of tax-collecting intermediaries. This implication becomes important for tax policy makers.

The second type of intermediary is the one engaged by taxpayers to prepare or advise on tax reporting on their behalf (‘tax preparer’ or ‘tax advisory’). Literature on the role
played by tax preparer has been limited. In a paper written by Klepper and Nagin (1989c), the influence of the tax preparer on tax compliance has been studied, with the results suggesting that the existence of a tax preparer has influence over tax compliance, but the influence could be positive or negative. The contribution of tax preparers to compliance is recognised in the sense that they help enforce the tax law by clarifying certain ambiguous tax law/practices to taxpayers, explaining and promoting the legal obligations, and acting as a communication channel between the taxpayer and tax revenue (Klepper & Nagin, 1989c). On the contrary, aggressive tax preparer would be inclined to encourage non-compliance by allowing taxpayers to take advantage of any legal ambiguity (Klepper & Nagin, 1989c). Moreover, the study of Erard and Feinstein (1994) also found that the engagement of tax practitioners was associated with the source of income; indicating that certain types of income sources tended to encourage the use of tax practitioners, possibly because of the complicated tax law that called for additional professional help. In addition, Erard (1993) also found that the qualification of the tax practitioner might also be associated with the compliance outcome, for example, an attorney or a certified public accountant acting as the tax preparer was found to likely increase non-compliance.

Other than the above literature, more recent empirical studies are lacking to further explore the role played by a third-party intermediary in affecting tax compliance behaviour. It appears that this remains as a significant gap for further research.
2.5 Critical Review of the Development of Tax Compliance Models/Theories

In Section 2.4, the five main streams of literature on tax compliance behaviour were discussed in detail. Since the 1960s, the relevant models and theories have been progressing from sanction-based to non-sanction-based. A summary table of key literature under different streams of compliance theories was prepared and is presented in Table D2.1 in Appendix D. In this section, a critique of the Standard Model is illustrated in Section 2.5.1 and the distinctive features signifying the development of past studies are discussed in Section 2.5.2.

2.5.1 Critique of the Standard Model

The earliest model on tax compliance was developed by Becker, the Economics-of-Crime Model, and has been well recognised as the ‘Standard Model’ of tax compliance, because it forms a blueprint for the development of subsequent models. Obviously, the Standard Model seeks to explain taxpayers’ behaviour from the perspective of ‘non-compliance’, assuming that taxpayers are by nature dishonest and non-complying. Taxpayers will choose not to comply whenever there is a chance; or when the non-compliance benefits outweigh the non-compliance risks/costs leading to positive expected net outcome. Self-interest, in particular in monetary terms, is the main concern of taxpayers, and accordingly, non-compliance behaviour can be deterred by increasing non-compliance costs. These assumptions, therefore, render the Model unrealistic and ineffective, as follows:

(a) Taxpayers are not necessarily non-compliant by nature. There must be a reason, or even various reasons for their non-compliance. As Braithwaite (2010) suggested,
non-compliant taxpayers should be differentiated based on their intention and willingness to co-operate. Researchers should first investigate ‘why’ people do not comply, before suggesting effective ways to stop these ‘reasons’ from happening. The earlier Deterrence Model tends to assume that there is only one reason for non-compliance, and this reason can be measured by cost and benefit. Nevertheless, human behaviour is far too complex to be explainable by only one factor. Some people may think that it is more important to feed the family than to pay tax (Morales, 1998; Ross and McGee, 2012a); others may consider it justified to evade tax because of the corrupt government (McGee, 1999). The Deterrence Model tends to over-simplify the rationale behind a taxpayer’s behaviour.

(b) By definition, tax compliance behaviour and non-compliance behaviour are opposite; as the former denotes following the law and the latter denotes violating the law. Unfortunately, the factors causing taxpayers not to comply may not necessarily be opposite to factors driving taxpayers to comply. As an example, an ambiguous tax rule may provide an opportunity for taxpayers not to comply, but clearer tax rules do not automatically drive people to comply. Moreover, the benefits of compliance are essentially not the same as the benefits of non-compliance, but both may in practice co-exist. For example, a taxpayer has always complied but he/she may be tempted to choose not to comply on a particular item simply because the tax law is not clear enough. Therefore, a single factor that can successfully deter a taxpayer from non-compliance does not mean that its absence can successfully foster a taxpayer to comply, in particular when interacting with other factors. With this in mind, it makes more sense to investigate why taxpayers choose to comply so that tax compliance strategies are developed to
foster compliance. If one is to modify the Standard Model with a positive compliance perspective, an alternative Incentives Model\footnote{The Standard Model compares non-compliance benefits with non-compliance costs, whereas the modified Incentives Model above compares compliance benefits with compliance costs. The Standard Model aims at deterring non-compliance but the Incentives Model aims at encouraging tax compliance.} should work like this (as shown in Figure 2.5.1-1):

\begin{center}
\begin{tabular}{|l|}
\hline
\textbf{Expected Net Outcome} = \textit{Compliance Benefits} - \textit{Compliance Costs} \\
\hline
\textbf{Interpretation:} \\
IF: T/C Benefits \textgreater{} T/C Risk/Cost; THEN: taxpayers choose TO COMPLY \\
IF: T/C Benefits \textless{} T/C Risk/Cost; THEN: taxpayers choose NOT TO COMPLY \\
\textbf{Key:} T/C = \textit{Tax compliance} \\
\hline
\end{tabular}
\end{center}

\textbf{Figure 2.5.1-1 - Incentives Model (modified from Standard Model)}

The above Incentives Model follows the same assumption as the Standard Model in that benefits and costs are pecuniary and measurable, and individual taxpayers are rational, except that taxpayers choose to comply when the benefits from compliance outweigh the costs for compliance. When the expected net outcome is positive, there is an incentive for taxpayers to comply. As mentioned before, compliance and non-compliance factors may co-exist. The combined effect of both sets of factors undoubtedly makes the pattern of taxpayer behaviour even more complex. As such, for a tax compliance strategy to be effective, it is perhaps desirable to adopt both the Standard Model and Incentives Model such that factors ‘pushing’ taxpayers not to comply and factors ‘pulling’ taxpayers to comply are both taken into account.

\(c\) Taxpayers do not behave in isolation. Individual taxpayers act according to what they perceive as normal and right in their social community. Even in the case of
corporate taxpayers, the responsible directors or managers who decide how to report the taxable income will also act in the same way as individual taxpayers. Therefore, the choice of compliance behaviour is a group decision rather than an individual decision. However, the Deterrence Model stands only on the taxpayer’s own choice without taking into consideration whether and how the taxpayer may have been influenced by external interactions such as his/her social circle, cultural dimension, government and political intervention, or his/her moral perception, etc.

(d) Government (or tax administrator/authority) and taxpayers are not necessarily ‘cops and robbers’. Violation of tax law is an offence, but it remains debatable whether it is a crime. In most countries, including Hong Kong, tax evasion is a crime, but not all types of non-compliance are crimes. Generally speaking, people commit a crime for the benefit of gaining something (e.g. money). But in the area of tax, people commit non-compliance for the benefit of avoiding a loss (i.e. tax payment). In the pursuit of crime control, the government deters crime for the purpose of protecting the community or public good. However, in the pursuit of tax compliance, the government deters tax evasion for the purpose of collecting tax revenue. The relationship between government and taxpayers is fundamentally different from that between cops and robbers. As a consequence, it makes more sense for the government to treat taxpayers as ‘partners’ or ‘stakeholders’, or even ‘customers’. Interestingly, tax collection is the right as well as the obligation of the government. With this right to collect tax, government has the obligation to ensure that taxpayers are compliant. If sanction-based enforcement is not always effective to make taxpayers comply, theories on tax compliance are therefore
moving from a punishment paradigm to a service paradigm (Alm et al., 2010a), then to a trust paradigm (Alm & McClellan, 2012).

2.5.2 Distinctive Development Features of Tax Compliance Theories

The gaps found in the Standard Model, as discussed in Section 2.5.1, contribute to the subsequent studies and theories that are developed into different perspectives. Surfing through the trend of development, some distinctive features are identified:

1. Compliance choice from an individual consideration to an interacting consideration – the Standard Model or Deterrence Model is primarily focused on taxpayers’ choices made on an individual basis, but subsequent studies have proved that taxpayers make choices by incorporating the interactive effects with the tax administrator/authority, government, peers and the social environment.

2. Compliance model from single focus to mixed focus – the Deterrence Model is initially focused solely on the taxpayers’ financial interest, which is subsequently expanded into a mixed focus by incorporating labour supply theory, tax administrator/authority’s detection strategy, taxpayers’ moral development, and the involvement of a third party intermediary for reporting and collecting tax purposes.

3. Research focus from non-compliance to compliance perspective – the Deterrence Model assumes that taxpayers are non-complying and thus predicts factors deterring taxpayers from non-complying behaviour. Subsequent studies are
re-directed towards positive compliance perspectives where factors are predicted to encourage taxpayers to comply.

(4) Compliance theories on monetary assumptions to include non-monetary – the Deterrence Model works on the assumption that the costs and benefits are measurable in monetary terms, as is the expected outcome. Since the evolution of the theories of psychic cost, tax morale, responsive regulatory tax system, and other social behavioural factors, the studies of compliance theories encompass both monetary and non-monetary assumptions.

(5) Taxpayers’ choices from outcome-oriented to experience-oriented – the Deterrence Model predicts taxpayers’ choices based on the expected outcome from a cost-benefit analysis. When researchers started to promote the importance of driving forces for compliance, subsequent studies and theories seek to predict taxpayers’ choices based on what the taxpayers have accumulated from the ‘experience’ in life, such as education and work experience, encounters with government or tax administrator/authority, interaction with others and the external environment.

2.6 Literature on Tax Compliance Studies in Hong Kong

In this section, focus is placed on prior literature on similar studies that are specific to Hong Kong. However, relevant literature is limited. Major studies include Chan et al. (2000); Richardson (2005, 2006a & b); Ho and Wong (2006, 2008); McGee and Butt (2008); and McGee, Ho and Li (2008). Except for Ho and Wong (2006, 2008), the
other studies are empirical studies comparing taxpayers’ compliance behaviour in Hong Kong with those in other countries.

In the study of Chan et al. (2000), a comparison was made between Hong Kong and the United States (US), aiming to explore the similarities and differences in taxpayer compliance behaviour between the two jurisdictions. Chan et al.’s (2000) study was based on Fischer’s Model and apart from demographic factors, only two non-compliance opportunities, namely education and income level, were covered by the study. The other two non-compliance opportunity factors, income source and occupation, were left out of the study. Based on the Hong Kong sample of students, the following significant findings were revealed:

(a) gender had no effect on any variables leading to compliance behaviour;
(b) age was directly and negatively associated with education;
(c) age was directly and positively associated with income level and taxpayer’s attitude towards the tax system;
(d) no significant relationship was found between (i) education and income level (non-compliance opportunity variables) and (ii) tax compliance behaviour.
(e) on the whole, HK taxpayers had a lower stage of moral reasoning, less favourable attitude towards fairness of tax system, and were found less compliant.

Chan et al.’s (2000) overall findings about Hong Kong taxpayers having a less favourable attitude toward the fairness of tax system were elaborated in Richardson’s (2006b) study. The study focused on the impact of tax fairness dimensions on tax compliance. The findings revealed that certain aspects, not all, of the tax fairness dimensions were found to be positively associated with compliance behaviour in Hong
Kong. These aspects include the general representation of the overall fairness of the HK tax system, expectations of benefits from the government in exchange for tax paid, and a tax share/burden concern of middle income earners. However, other tax fairness dimensions, such as tax rate structure, self-interest, special tax provisions for high income earners, tax share/burden concern of low income earners and tax system equality/inequality, were found not to be significant. The study illustrated that in the Hong Kong context, tax fairness dimensions have varying effects on tax compliance behaviour.

In another study by McGee et al. (2008), the following significant tax compliance behaviours relating to Hong Kong were found:

(a) relative to US students, HK students were found to be more acceptable about tax evasion;

(b) HK students were likely to be more conditional in their perceptions as to whether tax evasion is morally wrong;

(c) HK students showed a greater expectation of their government and were more willing to give up compliance if expectations are not met (e.g. corrupt government).

The studies of Ho and Wong (2006, 2008) aimed at investigating the unethical tax behaviour and resultant penalties under the HK tax enforcement system by reviewing real-life tax non-compliance cases. Taking into account the prior literature on tax compliance in conducting the review of the Board of Review cases, the researchers found that for taxpayers with lower levels of moral development, ethical beliefs could be an effective means to enhance tax compliance. It was also found that income level
was not directly related to compliance but a higher level of education may be linked to a lower level of compliance.

Literature on tax compliance behaviour in Hong Kong so far has not been able to give a clear and consistent picture as to whether the level of compliance could be fostered by education, in particular, tax education. It is therefore the main purpose of this study to explore whether a relationship exists in Hong Kong between taxpayers’ level of tax education and their tax compliance behaviour, and if so, how and to what extent.

2.7 Literature on Impact of Education/Tax Education on Tax Compliance

As explained in the last section, ‘tax education’ is the focus of this study. This section will therefore focus on discussing the prior literature on the impact of ‘education’, in particular ‘tax education’, on tax compliance. Section 2.7.1 introduces the impact of knowledge on attitude, sections 2.7.2 and 2.7.3 review the literature illustrating the positive and negative relationship between education (and tax education) and tax compliance, and section 2.7.4 gives a critique on the inconsistent findings from prior studies. Finally, section 2.7.5 consolidates the significant contributions of tax education into three dimensions to be used for this study.

2.7.1 Knowledge influences attitude

Can attitude toward taxation be influenced (Eriksen & Fallan, 1996)? ‘Attitude’ was defined by Rogers (1983) as a ‘relatively enduring organisation of an individual’s beliefs about an object that predisposes his/her actions’. If an attitude is shaped by
beliefs, and a justified true belief is ‘knowledge’ (Plato’s Theory of Knowledge), it is reasonable to assume that there are some degrees of association between attitude and knowledge. Researchers remind us that information is not knowledge until put into context (Nonaka, Toyama & Konno, 2000). When an individual interprets a piece of information in a particular context, and this interpretation becomes the ‘beliefs’ and commitments of the individual, ‘knowledge’ is created. Based on the traditional knowledge-creation process, explicit knowledge can be transferred by externalisation and combination through dissemination such as education. Once acquired, explicit knowledge may be further ‘internalised’ to become tacit knowledge or further transmitted to others as new tacit knowledge through shared experience and socialisation. Through the ‘looping’ interactions between explicit and tacit knowledge, a piece of information ultimately becomes a ‘belief’ which is evidenced by an individual’s ‘attitude’. Based on the study by Mahmoodi, Jafari, Nasrabadi and Liaghatdar (2012), education improves an individual’s awareness, and hence an individual’s attitude (behaviour).

2.7.2 Education/Tax Education positively influences tax compliance attitude

The relationship between education and attitude (behaviour) has been receiving a great deal of attention from researchers (Kane, 1995). Putting this into the context of tax compliance behaviour (or attitude), a number of prior researchers has found that education was one of the significant factors making a positive difference in shaping a taxpayer’s compliance behaviour (Scott & Grasmick, 1981; Thurman, John & Riggs, 1984; Kaplan, Reckers & Roark, 1988; Klepper & Nagin, 1989c; Grasmick & Bursik, 1990; Eriksen & Fallan, 1996; Kasipillai, Aripin & Amran, 2003; Ross & McGee,
A lower level of literary skills was found by Jackson and Milliron (1986) to contribute to non-compliance, hence demonstrating a positive association between educational and compliance. Through education, especially tax education, taxpayers acquire more knowledge about the tax system, thus narrowing the gap between how the taxpayers conceive the tax system and what the situation really is. This would enhance taxpayers’ perception of fairness of the tax system (Strumpel, 1969; Crane & Nourzad, 1990; Christensen, Weihrich & Gerbing-Newman, 1994; Richardson, 2005, 2006a), hence tax attitude. Moreover, ‘knowledge’ was described by Hamilton (2012) as one ‘compliant constraint’, which could be resolved by proper compliance strategy to ‘educate’ taxpayers, through public rulings, speeches, articles or booklets, etc. Without ‘knowledge’, taxpayers are constrained from complying because they are not aware of what is required of them by the tax law, and what is expected by the tax administration/authority (Mahmoodi et al., 2012). Thus, education should increase taxpayers’ ‘abilities’ and ‘readiness’ to comply. With knowledge, especially fiscal knowledge, taxpayers recognise and appreciate the function of government in administering the fiscal position for the benefit of the whole community, thus uplifting their ‘willingness’ to comply and ‘tax ethics’. Tax ethics was also suggested by Song and Yarbrough (1978) as the pre-requisite for a successful tax administration system. For a tax compliance strategy to be effective, Hamilton (2012) suggested that taxpayers should be made ‘able to comply’, ‘ready to comply’ and ‘willing to comply’; and these elements could be promoted through tax education. This mentality is obviously supported and relied upon by the Hong Kong Commissioner of Inland Revenue, who proposed in the 2010-11 annual report that “tax education be strengthened to enhance taxpayers’ high degree of compliance with the tax laws” (HKIRD, 2011). ‘Tax

37 The Commissioner of Inland Revenue of Hong Kong in 2010-11 was Mr Chu Yam Yuen.
education’ in this context refers not only to the academic knowledge of taxation law and practice acquired through structured curricular education, but also to the knowledge transferred by the tax administrator/authority through experience or published information, e.g., departmental notes, pamphlets, website postings, or private rulings. On the other hand, tax knowledge could also be acquired through the engagement of tax practitioners. The role played by tax practitioners as an intermediary between taxpayers and tax administrator/author has also been considered in prior studies and it was found that the role was significant to both taxpayers and the tax administrator/authority (Hasseldine, Hite, James & Toumi, 2007). The impact was positive (Roth et al., 1989), mainly in the sense that tax practitioners were helpful in clarifying the ambiguous or contentious areas in tax law and practice, and their interpretation was closer to the position of the tax administrator/authority, hence promoting compliance.

From the macro perspective, due to the outburst of various compliance scandals in early 2000, there has been increasing pressure calling for a higher level of regulatory control and compliance standards, in particular to the industry of economic and finance, and listed corporations. This development not only calls for an increasing demand for third-party services with related expertise, but also supports additional focus to incorporate ‘ethics’ in the curriculum of higher education programmes. This, in turn, contributes to an increasing awareness of compliance standards (Young & Gainsford, 2009). Researchers seem to believe that a higher compliance standard could be fostered by way of education.
2.7.3 Education/Tax Education has negative or inconsistent influence on tax compliance attitudes

In some other studies, on the contrary, researchers found that tax education did not necessarily encourage compliance, or did not associate with compliance at all. It was generally assumed that intentional non-compliance might require some degree of understanding of the tax system (Kasipillai et al., 2003). This supports the idea that more knowledgeable people with tax knowledge tend to be more capable to take advantage of the tax law/system, and thus are in better positions to evade tax (Hotaling & Arnold, 1981), denoting a negative association between tax education and compliance. This assumption holds true, particularly when taxpayers have had a chance to learn about the ambiguous and contentious areas in tax law, and are thus tempted to take advantage of the ambiguity, potentially leading to tax non-compliance (Jackson & Milliron, 1986; Gilligan & Richardson, 2005). Tax education in this circumstance does not necessarily predict tax compliance; but rather provides an opportunity for taxpayers not to comply.

Some other literature did not reveal that education or tax education was related to tax compliance (regardless of being positive or negative) (Hite, 1995; Lin & Carrol, 2000). Some other studies did reveal a relationship between education and compliance behaviour, but the direction of the relationship (positive or negative) was not clear enough. For example, in the study of Chan et al. (2000), the findings of Hong Kong samples were compared with that of US samples. For Hong Kong samples, no significant relationship was found between education and compliance behaviour, but a contradictory finding was obtained from the US samples (Chan et al., 2000, Figure 2). In another study done by Ross and McGee (2012a) across six countries (including
China, but not Hong Kong), education level was also found to be associated with attitude towards tax evasion but different directions of association were found in different countries. Refer to Figure 2.7.3-1 below for a summary of findings across countries. For China, Russia and Brazil, the group most opposed to tax evasion (i.e. tax complying) was the one with little or no formal education, but in India and the US, it was the group with the highest education that was most strongly opposed to tax evasion. In Germany, however, a mixed result was found - those strongly opposed to tax evasion either had incomplete elementary education or a university degree.

<table>
<thead>
<tr>
<th>Level of education associated with strong opposition to tax evasion</th>
<th>China/Russia/Brazil</th>
<th>India/USA</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little/no education</td>
<td>Highest education</td>
<td>Either: Incomplete elementary education, or University degree</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.7.3-1 – Summary of Findings from Ross and McGee (2012a)

Some prior studies done by Ross and other authors also found that people receiving different streams of education recorded different views on tax compliance, and findings were inconsistent across countries. For example, in Australia, accounting students were found to be significantly more opposed to tax evasion than the business/economics and information technology students, but significantly less opposed than were health services students. The researchers explained that their findings were predictable as accounting-major students were taught to be compliant since the first days of their studies. Yet, interestingly, this rationale did not seem to be valid in New Zealand where accounting and business/economics students were found equally opposed to tax evasion, but law students were found less opposed to tax evasion than accounting and

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38 Refer to Ross and McGee (2012a) for a summary of prior studies (Table 1 of that paper).
39 Findings in Australia were obtained by McGee and Rose (2009) as cited in Ross & McGee (2012a).
As regards the level of education study, Ross and McGee’s (2012a) study indicated that graduate students were more opposed to tax evasion than undergraduate students (e.g. in Australia and New Zealand, but no distinction in other countries), but the reason was not clear. The researchers speculated that it could be due to the age or level of maturity, but this was not significantly supported by the empirical data.

2.7.4 Critique on Inconsistent Findings from Prior Studies on the Impact of Tax Education on Tax Compliance

Despite the majority of prior literature supporting tax education being positively associated with taxpayers’ compliance, some other studies were found to record negative or mixed associations. In order to explore whether there are notable factors to explain the inconsistency in findings, a consolidated review was conducted on the most recent studies with the following findings:

(a) Structural differences in tax systems across countries – The dual-jurisdiction study on tax compliance by Chan et al. (2000) was performed on Hong Kong and the US. The findings were that a significant but negative impact on tax compliance from education was recorded for the US samples, but no significant impact was found from the Hong Kong samples. One possible reason is attributable to the structural differences between the two jurisdictions, such as a relatively lower tax rate in Hong Kong, the absence of a withholding tax system, but an advanced

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40 Findings in New Zealand were obtained by Gupta and McGee (2010a) as cited in Ross & McGee (2012a).
collection of tax by way of provisional assessment in Hong Kong. Another
fundamental difference is that the US tax system operates on a self-assessment
basis while the Hong Kong tax system does not.\footnote{Since April 2001, Hong Kong has adopted the ‘Assess-First-Audit-Later’ system under which all tax returns will be automatically assessed as returned, and cases will be selected for a post assessment audit and investigation. This is, however, not a self-assessment system.} Under the self-assessment system, US taxpayers are obliged to assess their tax liabilities at the time of reporting. However, Hong Kong taxpayers report tax on an annual basis and pay tax according to assessments issued by the Hong Kong tax administrator/authority. This fundamental difference may possibly result in the different compliance attitudes of the two groups of taxpayers, as Hong Kong taxpayers are relatively more reliant on the tax administrator/authority to vet their tax returns. As a result, relative to the US taxpayers, Hong Kong taxpayers are less affected by their tax knowledge in terms of choosing to comply or not. That said, Chan et al.’s (2000) study was conducted about 15 years ago. Since then, Hong Kong taxpayers’ attitude and the impact of tax education, as well as other factors, could have changed. This lends support to the commencement of this study.

(b) Another country-specific study was done by Kasi pillai et al. (2003) in Malaysia, which found that a higher level of education was associated with a higher tax compliance attitude. This study was compared with Chan et al.’s (2000) study on the US samples because both studies were performed close to year 2000 and both the US and Malaysia were under a self-assessment tax system with employment income collected by withholding at source. A significant association between tax education and tax compliance was also proved in the US study, but unlike the Malaysian study, a negative impact was recorded. The two
sample groups were approximate in gender proportion and age, but were different in terms of level of education and average annual family income. In the Malaysian study, all the samples were undergraduate students, while the majority (65%) of the US samples were postgraduates. Moreover, 87.4% of samples in the Malaysian study reported parent’s approximate annual income below RM18,000\(^{42}\) (approximately US$6,400) with the estimated effective tax rate being only 3%, whereas 93% of the US samples reported an average annual income of US$10,000 or above with the minimum effective tax rate being 15%. These differences could render the attitude of one respondent group inconsistent with the other.

(c) Specific to the US samples, the study by Ross and McGee (2012a) was compared with Chan et al. (2000). In Chan et al.’s (2000) study, the US samples recorded a negative direct association between education and compliance, although a positive indirect association was found via moral development. Whereas, in Ross and McGee’s (2012a) study, the US samples recorded that those most opposed to tax evasion came from the most educated group (i.e. with a university degree), denoting a positive association between tax education and tax compliance. Such differences in findings could be attributable to various reasons, such as the two pieces of research being at least 12 years apart, and the great diversity of proportion of samples being at undergraduate level or above (66% in Chan et al.’s (2000) study against only 1.7% in the Ross and McGee (2012a) study).

\(^{42}\) RM18,000 was approximately equivalent to US$6,400 based on US$1:RM2.8 at the year 2000.
In earlier studies by McGee and other various authors before 2012, it was found that accounting students were more opposed to tax evasion than business/economics students in Australia but not in other countries including New Zealand, Latin America, Argentina, Guatemala, Estonia, and Kazakhstan. This illustrates that samples in different streams of study are likely to have different attitudes towards tax evasion (or compliance). However, a recent study by Ross and McGee (2012a) did not differentiate the samples by streams of study. No such differentiation was done either in Chan et al.’s (2000) study. Both studies recorded a mixed result on the association between education and compliance. However, when Kasipillai et al. (2003) performed their study with only accounting students in Malaysia, a positive association was recorded. Although it is not certain whether the inconsistency is solely due to the streams of study, it is considered necessary and reasonable to conduct a further study on a similar topic with samples from accounting and non-accounting streams of study. This lends another support to the initiation of this study.

2.7.5 Consolidated Dimensions of Impacts of Tax Education on Tax Compliance

The detailed reviews in the previous sections on the prior literature on the impact of education (and tax education) on tax compliance evidenced that tax education makes various significant contributions to foster tax compliance. This section seeks to consolidate these contributions into three dimensions: (1) taxpayers’ ability/readiness to comply; (2) taxpayers’ perception of tax system fairness; and (3) taxpayers’ moral reasoning development. These are discussed below:

Summary of findings from these earlier studies is contained in paper written by Ross and McGee (2012a).
2.7.5.1 Ability/readiness to comply

Theories developed along the behavioural economics line seek to predict taxpayer’s behaviour based on the distinctive characteristics of the taxpayer, such as gender, age, income level…and tax morale. However, little research has been done on taxpayer’s ‘ability’ to comply (Roth et al., 1989). A taxpayer who intends to comply with tax law may not be able to do so if he/she is not competent enough to master the correct tax law or regulation. Tax law is difficult to understand. A lack of literary skills may affect the ability (or inability) to comprehend complicated tax law, hence the compliance level (Hotaling & Arnold, 1981). Due to its ‘legal context’, Roth et al. (1989) in their study suggested that tax evasion should be distinguished from other crimes (like robbery) because of the highly complex tax provisions leading to a higher rate of misreporting. Taxpayers who report according to their own interpretation of tax law could also render themselves at risk of non-compliance if their interpretations are not followed by the tax authority. For example, cash transactions are commonly conceived by general taxpayers without tax knowledge to be either not assessable, or not detectable, hence justifying non-reporting. Other taxpayers may also risk non-compliance simply due to their lack of proper records. This has been the focus of a task force\(^{44}\) in Australia (Whaite, 2012), which found that taxpayer’s knowledge of business methods and the appropriate record-keeping requirements were part of the circumstances leading to the taxpayer’s behaviour. Through tax education, taxpayers are able to clarify the ambiguity in tax law and practice, hence increasing the ability to comply (Roth et al., 1989; Jackson & Milliron, 1986).

\(^{44}\) Cash Economy Task Force in Australia to study the taxpayer’s compliance intention in respect of non-reporting the cash transaction (Whaite, 2012)
2.7.5.2 Perception of Tax System Fairness

Prior studies support that taxpayers with a positive perception of tax system fairness tend to be compliant (Jackson & Milliron, 1986; Richardson, 2006b). There are also studies supporting that such perception could be developed through tax education when taxpayers get to know and understand more about the tax system (Strumpel, 1969; Crane & Nourzad, 1990; Eriksen & Fallon, 1996). When taxpayers’ tax knowledge increases, they are likely to better appreciate the role and function of the tax administrator/authority and the related fiscal policy. If the taxpayers also learn that tax strategies are implemented to maintain the equity and fairness of tax payments, the perception is improved and compliance is encouraged (OECD, 1999b; Whaite, 2012).

2.7.5.3 Moral Reasoning

Tax morale has been proved to be critical in fostering a taxpayer’s compliance behaviour (Feld & Frey, 2002b) and this morale could be fostered by an increase in fiscal knowledge through tax education (Song & Yarborough, 1978). Under the reciprocal ‘trade-off’ theory (Torgler, 2002), taxpayers’ tax morale is raised if they maintain a positive perception of the tax administration and government, and this perception can be enhanced by their understanding of the tax system and government policy through tax education. Moreover, a taxpayer who is concerned with how he/she is perceived by others would tend to behave in the way that others perceive. If a taxpayer is tax educated, others’ expectations of his/her tax behaviour are higher, and thus the taxpayer will likely choose to comply to avoid risking his/her personal identity.
2.8 Summary

This chapter gives an overview of prior literature of studies on (a) taxpayers’ compliance following the five main streams of tax compliance theories or models; and (b) impact of education (and tax education) on tax compliance. The main streams of tax compliance theories evolved from the sanction-based Deterrence Model in the 1970s to the Endogenous Income Theory, Interaction with Tax Administrator/Authority, Behavioural Economics Theories and roles played by Third-party Intermediaries. One of the representative models with behavioural economics theories, Fischer’s Taxpayer Compliance Model, identified four elements as ‘non-compliance opportunities’, being education, income level, income source and occupation. ‘Education’ has been acknowledged by researchers to have a direct and indirect impact on one’s awareness and attitude (and behaviour) (Mahmoodi et al., 2012). Studies were performed by various researchers to examine the relationship between education (or tax education) and taxpayers’ compliance attitude/behaviour. Literature on these studies have been briefly discussed in Section 2.7 of this chapter, highlighting the different perspectives in which tax education does or does not have an impact on tax compliance. A critique on the inconsistent findings from these prior studies is also included. Given the focus of this study being on the impact of tax education on taxpayers’ compliance in the context of Hong Kong, factors as identified in prior studies other than tax education have been consolidated into three dimensions: ability/readiness to comply, perception of tax system fairness, and moral reasoning as explained in Section 2.7.5. These three dimensions therefore become the intermediate variables in this study to test the indirect impact of tax education on tax compliance. A compliance framework consolidating all the major tax compliance factors identified in all the previous literature has been developed and will be discussed in Chapter 3.
3 RESEARCH FRAMEWORK AND HYPOTHESES

3.1 Introduction

Following on from the review of prior literature (Chapter 2), major research gaps from prior studies are identified and discussed in Section 3.2, leading to the subsequent development of the research problem and research questions for this study. From the literature, major tax compliance factors contributing to a taxpayer’s compliance attitude/behaviour have been identified and formulated into a broad framework - Tax Compliance Framework (Figure 3.3-1) - which is discussed in Section 3.3 below. This framework is then narrowed to its most relevant components forming the specific focus for this study – Simplified Tax Framework (Figure 3.4-1) - which is discussed in Section 3.4. The research problem and research questions are further explained in Section 3.5, followed by the hypotheses development in Section 3.6. A summary of this chapter is contained in Section 3.7.

3.2 Research Gaps

The compliance factors, ‘education’, ‘moral development’ and ‘tax system/structure’ are derived from Fischer’s taxpayer compliance model (refer to Figure 2.4.4.3-1 of Chapter 2). ‘Education level’ was described by Fischer as one of the four ‘non-compliance’ opportunities,45 which were found to have influence on the compliance attitude, either directly or through affecting the taxpayer’s moral development. The way (direct or indirect) and direction (positive or negative) that ‘education’ relates to ‘tax compliance’

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45 Four non-compliance opportunities per Fischer are: education, income level, income source and occupation.
has been a topical research area in the past. A review of prior studies indicates that the findings have been inconsistent and inconclusive. There could be various reasons for the inconsistent findings. Some prior studies were performed in different countries with structural differences in tax jurisdictions (e.g. self-assessment in the US against direct assessment in Hong Kong); some were performed on samples with different compositions (e.g. undergraduates in Malaysia against postgraduates in the US; or samples in an accounting stream against other streams); or some other studies were just performed a long time ago. Inconsistent findings in prior studies become the major gap in this research area. In this study, different student sample groups (undergraduate and postgraduate) were tested to see if the level of education has an influence on the impact of tax education on tax compliance. Moreover, all past studies have thus far not focused on ‘tax education’. Ross and McGee’s (2012a) study found that students from different disciplines recorded different views on tax compliance, for example, accounting major students were found more opposed to tax evasion. If it is correct to assume that accounting major students are instilled in tax knowledge which leads to tax compliance, then it would be worth performing a further study to focus on the impact of ‘tax education’ (as opposed to ‘education’) on tax compliance. Therefore, this study emphasizes on ‘tax education’. Last, there are limited studies performed in this area in the case of Hong Kong, save for Chan et al. (2000) and Ho and Wong (2006, 2008).

Thus, this study specifically addresses Hong Kong.

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46 Refer to Section 2.7 of Chapter 2 for more detailed discussions of prior literature on the impact of education on tax compliance.
47 For example, a positive relationship was found between education and tax compliance in studies performed by Eriksen and Fallan (1995), Kasipillai et al. (2003) and Hamilton (2012); whereas negative or absence of relationship was found by Hite (1995), Chan et al. (2000) and Ho and Wong (2006, 2008). The cross-country study conducted by Ross & McGee in 2012 even found that different relationships existed in different countries. Refer to Sections 2.7.2 to 2.7.3 of Chapter 2 for details.
48 Chan et al. (2000) as referred in Section 2.7.4 item (a) of Chapter 2.
49 Kasipillai et al. (2003) and Ross and McGee (2012a) as referred in Section 2.7.4 items (b) and (d).
50 Refer to Section 2.7.4 item (c) of Chapter 2.
3.3 Tax Compliance Framework

A vast pool of prior literature on tax compliance under different theories has identified different dimensions of factors as contributing to a taxpayer’s compliance attitude. For example, detection chance and penalty cost under the deterrence theory are factors relating to the government’s enforcement strategy, and tax morale and education under the behavioural theories are factors associated with an individual’s development. All these major factors can be grouped into a few broad groups of factors such as demographic factors, individual factors, third-party intermediary, social factors, government factors and economic factors, as illustrated in Figure 3.3-1 below.

![Figure 3.3-1 - Tax Compliance Framework]

Each dimension of compliance factors in the Framework is briefly explained below as well as their relevancy to this study. It is the aim of this study to minimise interference
from irrelevant factors and to focus on the student group so that the impact of tax
education can be studied:

3.3.1 Demographic Factors

Age - Prior studies have demonstrated that tax compliance may vary by age.
However, evidence as to whether tax compliance improves or deteriorates by age is not
conclusive. For example, older (younger) taxpayers were found to be more (less)
compliant in studies by Jackson and Milliron (1986), Andreoni et al. (1998), Ritsema,
Thomas & Ferrier (2003) and Chung and Trivedi (2003). In contrast to this, Tittle
(1980), Spicer and Becker (1980) and Wahlund (1992) found that tax compliance may
not be influenced by age or it may get worse as the taxpayer gets older.

Gender - Prior studies on tax compliance also revealed a mixed result for the
impact of gender. For example, females were found to be more compliant in the study
by Mason and Calvin (1978), both genders were found equally opposed to tax evasion
in McGee and Butt (2008), and gender was found not statistically significant in Ross
and McGee (2012b) and Chan et al. (2000).

Income level - Again, a mixed result was found in prior studies on the impact of
income level on tax compliance. Some studies found that higher income earners were
less compliant (Ross & McGee, 2012b; Andreoni et al., 1998; Jackson & Milliron,
1986), while other studies reported that those less compliant were actually in the lower
income group (Torgler, 2007; Houston & Tran, 2001).
**Occupation/income Source** - Occupation and source of income were found to be important to compliance decisions in some prior studies (Richardson & Sawyer, 2001; Richardson, 2006a; Jackson & Milliron, 1986). Most studies found that self-employed taxpayers, especially those engaged in fixed location businesses, were more tempted to commit non-compliance, and income not subject to withholding tax were also more vulnerable to be under-reported (Richardson, 2006b; Fjeldstad & Semboja, 2001; Andreoni et al., 1998).

**Relevance to This Study** - In order to minimise interference from related demographic factors, this study chose to focus on a homogenous age and occupation group of students.⁵¹

### 3.3.2 Individual Factors

**(Tax) Education/knowledge** - Most prior literature supports that education positively relates to a taxpayer’s ability to comply and the development of a higher moral standard through the acquisition of more fiscal knowledge or better understanding of tax law and requirements (Jackson & Milliron, 1986; Song & Yarborough, 1978; Chan et al., 2000; Hotaling & Arnold, 1981; Ross & McGee, 2012a; Singh & Bhupalan, 2001; Eriksen & Fallon, 1996; Crane & Nourzad, 1990; Kasipillai et al., 2003). However, a few other studies recorded inconsistent findings where educated taxpayers were found to be less compliant as they were aware of non-compliance opportunities, hence, they were in a better position to evade tax (Ross & McGee, 2012a).

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⁵¹ Detailed discussions on demographic features of the sample used for this study are found in Section 5.2.2 of Chapter 5.
**Perception of tax fairness** - Taxpayers’ attitude towards compliance was also found to be influenced by their satisfaction or perception of the tax administrator as well as the tax system (Andreoni et al., 1998; Braithwaite, 2007, 2010; Whait, 2012). Most prior studies found that taxpayers with a positive perception tend to be compliant (Crane & Nourzad, 1990), but a recent study by Richardson (2006b) found that the effect was variable in relation to tax compliance behaviour in Hong Kong, probably due to the multi-dimensional nature of tax fairness as a tax compliance variable (Jackson & Milliron, 1986; Richardson & Sawyer, 2001).

**Tax morale** - Research under behavioural economics theory found that tax morale (or intrinsic motivation) was significant in driving tax compliance (Alm et al., 2010b; Feld & Frey, 2002b; Torgler, 2006). Taxpayers develop tax morale through tax knowledge and experience with government, or via their social interactions and comparison with peers and norms (Cullis et al., 2007; Ho & Wong, 2008; Hashimzade et al., 2013).

**Ability/readiness to comply** - Earlier studies were inclined to focus on a taxpayer’s ‘willingness to comply’ rather than their ‘ability to comply’ (Roth et al., 1989). Later studies were gradually directed towards the reasons driving compliance in terms of ‘ability’ and ‘readiness’. A taxpayer has a greater ability to comply if he/she understands the tax law and requirements (Eriksen & Fallan, 1996) and is more ready to comply if he/she is aware of the consequences of non-complying (e.g. penalties) (Allingham & Sandmo, 1972).

**Relevance to This Study** - While tax education can be acquired through formal curricular studies or other educational channels, the other three factors (perception of
tax fairness, tax morale and ability/readiness to comply) can be developed through education or tax education. Therefore, all these four factors are used as core variables for this study, so that the direct impact of tax education on tax compliance is tested and the indirect impacts of tax education via the other three ‘intermediate’ factors on tax compliance are also tested.

3.3.3 Third Party Intermediary

Some recent studies on tax compliance found that a higher compliance rate was found in situations where tax is collected through an intermediary by withholding at source (Kleven et al., 2009, 2011), as taxpayers are effectively deprived of the right to choose to comply or not. Another kind of intermediary refers to tax practitioners who are usually engaged by taxpayers to handle tax affairs on their behalf. These tax practitioners are, in general, competent in tax knowledge and thus could help enhance compliance levels through clarifying tax law ambiguity (Klepper & Nagin, 1989c) but at the same time offer a non-compliance opportunity for taxpayers (Erard et al., 1994).

Relevance to This Study – This factor is not relevant for this study given that Hong Kong does not collect tax by way of withholding and the student group is not expected to have experience with tax agents or practitioners. Moreover, the student group is not expected to generate a sufficiently large sample to have an impact by intermediary and be able to do the statistical tests. Therefore, this factor has not been included in the testing for this study.

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52 Refer to Section 2.4.5 of Chapter 2 for detailed literature review.
3.3.4 Social Factors

From a social perspective, taxpayers’ compliance attitude was found to be affected by their interaction with the social environment including family and peers (Torgler, 2007; Jackson & Milliron, 1986). Taxpayers compare their acts with the social norms as well as others’ expectations on them corresponding to their personal identities. Individual choice of compliance is to a certain extent translated into a group choice (Hashimzade et al., 2013).

Relevance to This Study - An individual taxpayer may also develop his/her moral reasoning through interaction with their social environment, such as the practices and culture of their social group. Tax morale is one factor under individual dimension and this will be included in this study as an indicator to measure an individual’s moral reasoning. Note that social aspect is not in the scope of this study.

3.3.5 Government

Detection Probability and Penalty Cost - These two variables were addressed in the earliest sanction-based theory such as the Deterrence Model (Allingham & Sandmo, 1972). Taxpayers were assumed to make a rational choice to comply or not by comparing non-compliance cost against benefits. Detection probability and penalty cost were identified to be the main concerns giving rise to non-compliance cost. Studies found that raising the detection probability or penalty cost should increase tax compliance (Alm, 1991; Grasmick & Scott, 1982; Hasseldine et al., 2007).

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53 Refer to Section 2.4.4 of Chapter 2 for a detailed literature review.
**Tax Administration and System** - The role played by the tax administrator/authority in implementing the tax system has been found by many studies as important in promoting voluntary compliance behaviour (Richardson, 2008; Hasseldine & Li, 1999). Studies by Braithwaite (2007, 2008) and OECD emphasised the need to promote a responsive tax system as well as administration which treats taxpayers fairly, since taxpayers may react in the way they were treated by the tax administrator/authority (Feld & Frey, 2002b).

**Relevance to This Study** - If an individual learns more about the tax enforcement strategy such as detection chance and penalty cost, the individual’s ability and readiness to comply is thought to have increased. Therefore, the understanding of detection chance and penalty cost are used in this study as indicators to measure an individual’s ability/readiness to comply. Moreover, the clarity of the tax system and the fair treatment by tax authority on taxpayers are expected to influence the taxpayer’s understanding of the tax system and appreciation of the role played by the tax authority, hence affecting their perceptions on tax system fairness. Therefore, government factors relating to tax system and tax administration are used in this study as indicators to measure an individual’s perception of tax system fairness.

3.3.6 **Economic Factors**

Taxpayer compliance may not only be affected by the social environment but also depend upon the economic environment which could be influenced by the policies that the government may adopt toward the economy. This may include the management and utilisation of tax revenue as it is spent for the community. Prior literature found that if
taxpayers maintained a positive perception of the government’s policy on spending tax
revenue, they were more prepared to comply as their psychological tax contract
expectations were fulfilled (Feld & Frey, 2002a, 2007). The economic environment
also includes the external global environment which may indirectly affect taxpayers’
attitude toward tax compliance if their personal constraints (financial or stability) are
being threatened (Mohani, 2001).

**Relevance to This Study** - An individual’s understanding and perception of the
government’s fiscal policy may impact the individual’s perception of tax system fairness,
therefore, this factor is also included in this study as an indicator to measure an individual’s perception of tax system fairness. However, macro-economic factors are not considered relevant for this study given that the survey has been conducted during a short window between April 2014 and June 2014. Macroeconomic conditions take time to change and a study to analyse their impact would need to be conducted over a much longer period. Due to the limited timeframe available for this study, such an analysis has not been conducted as there was no major economic shock that has impact on the HK economy during the short April-June 2014 window.54

### 3.4 Simplified Tax Compliance Framework

In the previous section, a general tax compliance framework was introduced comprising
the major compliance factors grouped under different dimensions. As explained, not

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54 In the knowledge of the researcher, the HK economy did not face any significant shock during this period.
all factors are considered relevant for this study. A parsimonious framework for this study is therefore shown in Figure 3.4-1 where irrelevant factors are faded out:

![Figure 3.4-1 - Simplified Tax Compliance Framework](image)

The four factors under the individual dimension are the four core variables used in this study: Tax Education, Perception of Tax System Fairness, Ability/readiness to comply and Moral Reasoning. Other factors, as highlighted, have been used as measurement indicators, for example, social factors for measuring ‘Moral Reasoning’, government factors for measuring either ‘Ability/readiness to comply’ or ‘Perception of Tax System Fairness’, and the public/fiscal policy under the economic dimension for measuring ‘Perception of Tax System Fairness’. Based on this grouping, the research problem was initiated for this study to examine whether tax education has a role to play in
driving the Hong Kong taxpayer’s compliance attitude. This leads to four research questions as explained in Section 3.5 below.

3.5 Research Questions and Model:

The research problem of this study is whether tax knowledge or ‘tax education’ has a role to play in driving the Hong Kong taxpayer’s compliance attitude. In answering the research problem, the relationship between tax education and tax compliance attitude should be investigated, and the study would be conducted from both direct and indirect dimensions. First, the direct positive relationship between tax education and tax compliance would be studied, followed by the indirect positive relationship via 3 perspectives: (a) ability/readiness to comply (b) perception of tax system fairness and (c) moral reasoning. A total of five research questions are developed for this study. The first research question aims at answering the direct relationship while the other research questions aim at answering the indirect relationships. Further details can be found in Section 1.4 of Chapter 1. As a recap, the five research questions are as follows:

Research Questions:

The first research question was developed to reflect the direct relationship:

Research Question 1: Does tax education directly increase tax compliance?

The research questions on the indirect impacts via (a) ability/readiness to comply, (b) perception of tax system fairness, and (c) moral reasoning, are as follows:

55 Refer to Section 2.7.5 of Chapter 2 for detailed discussions on the three dimensions.
**Research Question 2:** Does tax education increase taxpayers’ ability/readiness to comply, which in turn increases tax compliance?

**Research Question 3:** Does tax education increase taxpayers’ perception of fairness of the tax system, which in turn increases tax compliance?

**Research Question 4:** Does tax education increase taxpayers’ tax moral reasoning, which in turn increases tax compliance?

Combining the research questions 2, 3 and 4, the research question to address the indirect impact of tax education on tax compliance is as follows:

**Research Question 5:** Does tax education increase tax compliance indirectly via the enhancement of ability/readiness to comply, perception of tax system fairness, and moral reasoning?

The above five research questions were then formulated into the research model for this study, as illustrated in Figure 3.5-1 below:
3.6 Hypotheses Development

The following hypotheses are developed to facilitate the testing.

**Direct Impact** - To provide evidence to answer Research Question 1, Hypothesis $H_1$ is developed, as follows:

*Set 1 of Hypothesis:*

- $H_0$: Tax education has no direct impact on increasing tax compliance.
- $H_1$: Tax education has a direct and positive impact on tax compliance.

**Indirect Impact** - To provide evidence to answer Research Questions 2, 3 and 4, a three-step approach is adopted: step 1 includes Hypotheses $H_2$, $H_3$ and $H_4$; step 2 includes Hypotheses $H_5$, $H_6$ and $H_7$; and step 3 includes Hypothesis $H_8$; as follows:
Step 1 – Impact of Tax Education on Intermediate Variables

Set 2 of Hypothesis (Tax Education on Ability/readiness to Comply):
H₀: Tax education has no impact on improving ability/readiness to comply
H₂: Tax education has a positive impact on ability/readiness to comply.

Set 3 of Hypothesis (Tax Education on Perception of Tax System Fairness):
H₀: Tax education has no impact on the perception of tax system fairness.
H₃: Tax education has a positive impact on perception of tax system fairness.

Set 4 of Hypothesis (Tax Education on Moral Reasoning):
H₀: Tax education has no impact on improving moral reasoning.
H₄: Tax education has a positive impact on moral reasoning.

Step 2 – Impact of Intermediate Variables on Tax Compliance

Set 5 of Hypothesis (Ability/readiness to Comply on Tax Compliance):
H₀: Ability/readiness to comply has no impact on tax compliance.
H₅: Ability/readiness to comply has a positive impact on tax compliance.

Set 6 of Hypothesis (Perception of tax system fairness on Tax Compliance):
H₀: Perception of tax system fairness has no impact on improving tax compliance.
H₆: Perception of tax system fairness has a positive impact on tax compliance.

Set 7 of Hypothesis (Moral Reasoning on Tax Compliance):
H₀: Moral reasoning has no impact on improving tax compliance.
H₇: Moral reasoning has a positive impact on tax compliance.

Step 3 - Combined Indirect Impact of Tax Education on Tax Compliance

Set 8 of Hypothesis (Combined Indirect Impact of Tax Education on Tax Compliance):
H₀: Tax education has no indirect impact on improving tax compliance via AbR/TSF/MR.
H₈: Tax education has indirect positive impact on tax compliance via AbR/TSF/MR.

The above hypotheses in correspondence with the respective research question together with the expected signs for the testing done to support the hypotheses are summarized in Table 3.6-1 below.
Table 3.3.6-1 - Research Questions and Hypotheses

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Hypotheses</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does tax education directly increase tax compliance?</td>
<td>Set 1:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TE has no positive direct impact on TC</td>
</tr>
<tr>
<td></td>
<td>$H_1$</td>
<td>TE has positive direct impact on TC</td>
</tr>
<tr>
<td><strong>Indirect Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does tax education increase taxpayers’ ability/readiness to comply, which in turn increases tax compliance?</td>
<td>Set 2:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TE has no positive impact on AbR</td>
</tr>
<tr>
<td></td>
<td>$H_2$</td>
<td>TE has positive impact on AbR</td>
</tr>
<tr>
<td></td>
<td>Set 5:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>AbR has no positive impact on TC</td>
</tr>
<tr>
<td></td>
<td>$H_5$</td>
<td>AbR has positive impact on TC</td>
</tr>
<tr>
<td>Does tax education increase taxpayers’ perception of fairness of the tax system, which in turn increases tax compliance?</td>
<td>Set 3:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TE has no positive impact on TSF</td>
</tr>
<tr>
<td></td>
<td>$H_3$</td>
<td>TE has positive impact on TSF</td>
</tr>
<tr>
<td></td>
<td>Set 6:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TSF has no positive impact on TC</td>
</tr>
<tr>
<td></td>
<td>$H_6$</td>
<td>TSF has positive impact on TC</td>
</tr>
<tr>
<td>Does tax education increase taxpayers’ tax moral reasoning, which in turn increases tax compliance?</td>
<td>Set 4:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TE has no positive impact on MR</td>
</tr>
<tr>
<td></td>
<td>$H_4$</td>
<td>TE has positive impact on MR</td>
</tr>
<tr>
<td></td>
<td>Set 7:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>MR has no positive impact on TC</td>
</tr>
<tr>
<td></td>
<td>$H_7$</td>
<td>MR has positive impact on TC</td>
</tr>
<tr>
<td>Does tax education increase tax compliance indirectly via enhancement of AbR, TSF and MR?</td>
<td>Set 8:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$H_0$</td>
<td>TE has no indirect positive impact on TC via AbR, TSF and MR</td>
</tr>
<tr>
<td></td>
<td>$H_8$</td>
<td>TE has indirect positive impact on TC via AbR, TSF and MR</td>
</tr>
</tbody>
</table>

For each of the Hypotheses, regression is used to detect the relationship between the variables. The testing is first done based on the total sample group, followed by further testing on the undergraduate sub-group and postgraduate sub-group respectively. Extending the testing into these two sub-groups would help explore the longevity of the impact of tax education and hopefully enrich the understanding of the impacts at different level of education. Regression models developed under the hypotheses and their test findings are reported under Section 5.3 of Chapter 5.
3.7 Summary

Chapter 3 introduces the research gaps identified from the prior literature review leading to the initiation of this study. A broad-based Tax Compliance Framework was developed to consolidate the major tax compliance factors as shown in Figure 3.3-1 and discussed in Section 3.3 of this chapter. Each dimension of factors was explained and the relevancy of each dimension to this study was also discussed. Those factors considered as relevant are thus included in this study, and are formulated into a Simplified Tax Compliance Framework as shown in Figure 3.4-1. The impact on tax compliance by tax education can be direct and indirect. Direct impact between tax education and tax compliance is tested under Hypothesis $H_1$ seeking to answer Research Question 1. Indirect impact is then tested on three intermediate variables respectively: ability/readiness to comply (AbR), perception of tax system fairness (TSF), and moral reasoning (MR). The testing is to be done in three steps: the first step covering the impact of tax education on each of the three intermediate variables under Hypotheses $H_2$, $H_3$ and $H_4$; the second step covering the impact of each intermediate variable on tax compliance under Hypotheses $H_5$, $H_6$ and $H_7$; and the last step combining the effects from steps 1 and 2 to conclude the combined indirect impact under Hypothesis $H_8$. A summary of the research questions and corresponding hypotheses is shown in Table 3.6-1 of this chapter.
4 RESEARCH METHODOLOGY

4.1 Introduction

Following the identification of research questions and the development of hypotheses in Chapter 3, this chapter seeks to outline the methodology used to test the hypotheses. The chapter starts with an introduction of the research paradigm adopted by this study (Section 4.2), followed by the explanation of the need for obtaining ethical clearance as well as the approval obtained for this study (Section 4.3). Research design and methodology for this study are discussed in Section 4.4. Given that survey is used for this study, the rationale of developing the questionnaires and their construction is explained in Section 4.5, followed by the explanation of the sampling design and data collection procedure in Sections 4.6 and 4.7. Upon the collection of data, steps to prepare the data for subsequent analysis are explained in Section 4.8, and the various analytical methods and approaches to analyse the data are explained in Section 4.9. Altogether there are 22 equations used in this study for estimation, and they are summarised in Table 4.9.3.2-1 under Section 4.9.3.2. An overall summary of this chapter is provided in Section 4.10.

4.2 The Research Paradigm

Research is a process of steps used to collect and analyse information to increase our understanding of a topic or issue (Creswell, 2008), and through investigation, to find answers to a problem (Burns & Bush, 2000). Depending on the nature of the problem,
as well as the researchers’ beliefs, researchers adopt different paradigms\(^{56}\) as a guide to determine the most appropriate research approach and method to be taken. In the discipline of human science or social science, there are, in general, two main paradigms: positivism and anti-positivism. Positivism emphasizes the understanding of human behaviour by way of scientific observation and experiment. Positivist researchers search for regularities and causal relationships in the tradition of natural sciences (Burrell & Morgan, 1979), using quantitative empirical evidence to support theories or hypotheses, followed by generalising the observations to the world. Anti-positivism, on the contrary, works on the premise that the world is relativistic (Burrell & Morgan, 1979), whereby social reality should be interpreted by individuals taking their respective viewpoints. Anti-positivist researchers study social phenomena by a qualitative approach through the understanding of how an individual’s behaviour is affected by one’s interacting experience with the phenomena (phenomenology), how common sense reality is being established in everyday life (ethnomethodology), and how human beings interact with each other and affect the society (symbolic interactionism) (Dash, 2005).

In the process of selecting the appropriate research setting for this study, the pros and cons of using positivist deductive versus anti-positivist inductive research approaches are considered. Given that the research problem of this study is derived from the long-established theories on tax compliance, the aim of this study is to deduce from these theories that tax education has an association with tax compliance. It therefore appears more appropriate to conduct the study based on the positivist deductive approach, through the statistical analysis of quantitative empirical data collected by way of surveys.

\(^{56}\) A paradigm is ‘a cluster of beliefs and (it) dictates which for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted’ (Bryman & Bell, 2011; Weaver & Olson, 2006).
4.3 Ethical Clearance

As this study is to be performed by way of survey involving human subjects, measures are taken to ensure that the survey is conducted ethically with the risk of harm minimised. Application was made to the Ethics Committee of the University of Newcastle and ethical clearance was obtained. Approval was duly granted by the University’s Human Research Ethics Committee of the University of Newcastle, Australia (Ethics Committee) (H-2013-0412, dated 28 January 2014).

Ethics are norms or standards that distinguish acceptable and unacceptable behaviour (Resnik, 2011). In designing the data collection approach and methods for this study, consideration is given to three ethical principles: respect for persons, beneficence, and justice.

Respect for persons – Given that participants in this study are mainly students, care is exercised to ensure that all participants are treated with respect from different perspectives, namely consent, rights, confidentiality and a negative impact on their academic performance. Before the survey, participants are presented with the participants’ information sheet and briefed on the topic of the survey and the identity of the researcher and the supervisor. They are also provided with the purpose of the survey, their rights of choice to participate, what is required of them and the time to complete the process. Participation is voluntary and thus participants are able to

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57 Based on the Belmont Report published by the National Commission for the Protection of Human Subjects in Biomedical and Behavioural Research, (published in Guidelines for Ethical Conduct of Behavioural Projects Involving Human Participants by High School Students, APA), three ethical principles should be observed: respect for persons (requiring voluntary informed consent for participants), beneficence (requiring the maximising of benefits and minimising harm), and justice (requiring sample selection on an equitable basis).
refrain from doing the survey or can withdraw at any time before completion without giving a reason. However, by completing and submitting the questionnaires, participants are deemed to have given their consent to the survey. Upon completion, participants are asked to deposit the questionnaires into the collection box. For those surveys administered to students during lessons, assurance is given that their decisions to participate in the survey or not would not carry any impact on their academic performance. In terms of confidentiality, apart from the questionnaires being anonymous, any information that might possibly lead to any participant being identified would not be included in any of the outputs of the study. All data collected is analysed only for academic purposes, and is then usually retained for five years, following which it will then be disposed of in accordance with the University policy and procedures. Hard copies of all questionnaires are kept in safe custody by the researcher and soft copies of the result findings are password protected. Access to the data is limited to the researchers except as required by law.

Participants are also provided with the contacts of the University’s Human Research Ethics Committee in the event that further enquiries or complaints need to be made.

**Beneficence** - Participants in this survey do not receive any direct benefits nor suffer any potential risks, except that they are required to spend 20-30 minutes to complete the questionnaires.

**Justice** – Participants for this survey are chosen on the basis of their levels of education (undergraduate or post-graduate) and whether or not they have previously studied taxation.
Research Design and Methodology for this Study

A research design provides a framework for the collection and analysis of data, while a research method refers to a technique for collecting data (Bryman & Bell, 2011). In general, there are five types of research design: experimental design, cross-sectional or social survey design, longitudinal design, case study design, and comparative design (Bryman & Bell, 2011). In planning for this study, careful consideration was given to the selection of the research design, and it was found that experimental design, case study and comparative design were not appropriate. Cross-sectional design and longitudinal study were the two designs that had been seriously considered for this study, and ultimately cross-sectional design was selected. Cross-sectional design can be performed by way of questionnaires or interviews, which seek to detect the variations amongst objects, and thus is effective in predicting the pattern of associations amongst variables. Quantitative and quantifiable data can be collected on more than one case at a single point in time and on more than one variable (Bryman & Bell, 2011), and can be further measured to explore the association between variables or sample groups. If a pre-designed questionnaire is used, measurement is standardised across the objects which is effective in securing consistency in benchmarking. Administration is also relatively easy and less costly. A longitudinal study, on the other hand, is an extension of a cross-sectional study, which allows data to be collected at multiple points in time. In doing so, the changes in outcomes due to time variance can be observed. Such

58 In experimental design, the results from the experiment (or treatment) sample group are compared against those from the controlled sample group, in order to measure the effect of the independent variable on the dependent variable with the effects of additional extraneous variables being controlled (Burns & Bush, 2000). Doing true experiments ensures a high degree of internal validity and representativeness, but this approach was not adopted for this study due to the fact that it would have been expensive and time consuming. Another two types of research designs, case study and comparative design, were also considered not appropriate as the former refers to the detailed analysis of a single case (or more similar cases), whereas the latter refers to the study of two or more contrasting cases. These did not serve the purpose of this study.
approach could be adopted for this study where data could be collected from the same sample groups before and after they have studied taxation, as well as at different stages between, and thus any variation in tax compliance attitude before and after studying tax could be investigated. Nevertheless, such a longitudinal study obviously requires a longer timespan to complete, as well as a greater deal of effort to keep track of the samples’ progression in tax study. Considering the constraints in time and cost for this study, longitudinal research was eventually not adopted, but instead, a simple cross-sectional survey was employed. For future research on a similar topic where resources are allowed, a longitudinal study is worth consideration. This will be further addressed in Sections 6.5 and 6.6 of Chapter 6.

In terms of research method, the various types of instruments for collecting primary data include, amongst others, questionnaire, interview and participant observation (Bryman & Bell, 2011). Each method has its benefits and drawbacks, and their selection is primarily dependent upon the objective of the study and the prevailing constraints. In designing this study, particular attention was given to the ‘sensitivity effect’ (Tourangeau, Rips & Rasinski, 2000) that the topic of ‘tax compliance’ might bring to the participants if open-ended questionnaires or face-to-face interviews were adopted. To most taxpayers, any open discussion about tax-payment or tax compliance might be perceived as ‘threatening’ (Braithwaite, 2007, 2010) or as an invasion of privacy, leading to potential social desirability bias or a low response rate. With this in mind, an anonymous self-completed questionnaire survey, instead of interviews or

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59 Social desirability bias refers to a phenomenon where survey respondents tend to give answers on sensitive topics in such a way as to present themselves in the best possible light (Fisher, 1993).
60 Relative to self-completion questionnaires, conducting interviews are expensive and time consuming. More importantly, information collected from interviewees (as well as observant participant) tends to be descriptive and implicit knowledge (Dyer, 1995) which makes benchmarking across participants difficult.
participant observation,\textsuperscript{61} was considered as most appropriate for this study.

In the survey used for this study, self-completed questionnaires with standard choices of answers (such as the Likert scale) were developed. To the survey participants, self-completion questionnaires are more convenient (Bryman & Bell, 2011) and less time consuming (Husen & Postlethwaite, 1994), hence leading to less reluctance from participants. To the researcher, self-completion questionnaires ensure a higher response rate (Dillman, Sinclair & Clark, 1993), are easier to administer, give minimum interviewer effect\textsuperscript{62} (Bryman & Bell, 2011), and are probably the cheapest method relative to interviews and participant observations. In some cases, assistance from third-party helpers was sought to administer the distribution and collection of the survey questionnaires. A respondent-friendly and easy-to-administer design was therefore adopted for this research to obtain a maximum response at minimum cost and in a manageable timeframe.

\textbf{4.5 Questionnaire Development in this Study}

The aim of this survey was to measure the level of tax compliance of undergraduate and postgraduate sample groups in association with their tax education. Given that tax compliance and its variables are latent variables which are literally not observable, the questionnaire must be able to translate this aim into a format that contains relevant, measureable indicators to allow a statistical measurement (ECGA, 2006) to be conducted. In the process of developing the questionnaire, the 5-stage approach as

\textsuperscript{61} Participant observation provides a direct way for the researcher to observe the behaviour of the participants, which may not be appropriate for study of a behaviour which is not easily observable such as tax compliance behaviour.

\textsuperscript{62} Interviewer effect refers to the effect that participants might be influenced by the characteristics of an interviewer (Bryman & Bell, 2011, p. 232).
recommended by the European Commission (ECGA, 2006) was adopted, as illustrated in Figure 4.5-1 below:

![Figure 4.5-1 - The Five Stages of Questionnaire Design and Testing](source: Handbook of Recommended Practices for Questionnaire Development and Testing in the European Statistical System, European Commission Grant Agreement, released in 2006)

Stages 1 and 2 are discussed in the following Sections 4.5.1 and 4.5.2 respectively, and pilot study and data collection are discussed in Section 4.7.

### 4.5.1 Conceptualisation

To design a good survey instrument, the pre-requisite is to decide what is to be measured (Fowler, 2002). Questionnaire design starts with the survey concept rather than the questions (ECGA, 2006). For this study, the survey concept was represented by the research questions outlined in Section 3.5 of Chapter 3 earlier, being the association between tax education and tax compliance, both direct and indirect through the intermediate variables: ability/readiness to comply, perception of tax system fairness, and moral reasoning. Other than tax education, which was directly indicated by whether tax has or has not been studied, other variables are latent in nature and their measurements have to be represented by some measurable indicators. For example,

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63 Tax education is either ‘0’ for ‘without studied’ or ‘1’ for ‘with tax studied’.
perception of tax system fairness has been found to be a multi-dimensional variable\textsuperscript{64} and thus needs to be measured by way of different indicators. As defined by the OECD (OECD, 2010), there are three types of fairness: distributive (fairness of government fiscal policy), procedural (fairness of tax administrative procedures) and retributive (fairness of penalty provisions). On top of these, the complexity of the tax system was also considered by Ho et al. (2013) as contributing to taxpayers’ perception leading to compliance. Based on this literature, three sub-constructs were formulated for this study to indicate taxpayers’ perception of tax system fairness: (i) the level of participants’ general understanding of the Hong Kong tax system, (ii) appreciation of the Hong Kong tax authority’s role and efforts, and (iii) satisfaction of the Hong Kong government’s fiscal policy. Figure 4.5.1-1 below illustrates examples of measurable indicators used for each variable involved in the research model of this study:

\textbf{Keys:} TC refers to Tax Compliance; TSF refers to Perceived Tax System Fairness, AbR refers to Ability/Readiness to comply; MR refers to Moral Reasoning; TE refers to Tax Education

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4511.png}
\caption{Figure 4.5.1-1 - Examples of Measurable Indicators}
\end{figure}

\textsuperscript{64} Richardson (2006b).
4.5.2 Questionnaire Design and Construct Development

As illustrated in Figure 4.5.1-1 above, five construct variables\textsuperscript{65} were identified for this study and translated into measurable indicators\textsuperscript{66} (referred to as operationalisation by Hox, 1997). Except for tax education and tax compliance, the three constructs (perception of tax system fairness, ability/readiness to comply and moral reasoning) were to be measured by a total of 38 statements in the survey questionnaire. The grouping of measurement indicators is illustrated in Figure 4.5.2-1 below:

\textsuperscript{65} Five variables: tax education, ability/readiness to comply, perception of tax system fairness, moral reasoning and tax compliance.

\textsuperscript{66} When designing the measurement indicators for this study, reference was made to the survey instruments used by Chan et al. (2000) and Ho et al. (2013).
A summary of construct variables and their corresponding measurement items can be found in Table D4.1 of Appendix D. A sample of the survey questionnaire is contained in Appendix B.

4.5.2.1 Hypothetical Tax Non-compliance Scenarios

In designing the measurable indicators for construct variables: Ability/readiness to comply, moral reasoning and tax compliance, two hypothetical tax non-compliance scenarios were used (Part II of Questionnaire), one with the omission of cash income and the other with over-claiming of deductions. Scenario 1 described extra cash income being earned from sources other than an employer or ordinary sources without receipts. The purpose of Scenario 1 was to test participants’ treatment of cash income which potentially might not be detectable. Scenario 2 described a deduction claim of a charitable donation based on last year’s higher amount that had been assessed instead of the lower actual amount incurred in the current year. The purpose of Scenario 2 was to test participants’ treatment of immaterial claims that had been interrogated before and thus perceived as not likely to be subject to interrogation again. The design of the hypothetical scenarios was based on the 2013-14 statistics on Hong Kong tax offence cases indicating that 91% of the total offence cases (and 62% in terms of fines in HK$) related to failure to file tax returns or information. Given that the consequence (or motivation) of non-filing of tax returns was either under-declaration of income or over-claim of deductions, these two dimensions were therefore used in designing the two hypothetical scenarios for the questionnaire.

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67 Reference was made to the survey instrument used in Chan et al. (2000).
68 As per Table 1.3.1-2 of Chapter 1.
4.5.3 Scale of Measurement

In completing the survey questionnaires, participants were posed with different statements (measurement items) and asked to indicate to what extent they ‘agree/support/believe/think’ for each statement. As the intention is to measure the ‘mental properties’ of the participants (e.g. attitudes or opinions) (Burns & Bush, 2000; Cooper & Schindler, 2006), measurement needs to be indicated by way of a synthetic metric scale. A 6-point Likert-scale\(^{69}\) was therefore adopted, ranging from 1 (strongly-disagree) to 6 (strongly-agree). An example of the measurement scale for one measurement item is shown in Table 4.5.3-1 below. A 6-point scale instead of 5-point or 7-point was used in order to mitigate the possible acquiescence risk where participants tend to agree with all or disagree with all, or the possible inclination to give neutral responses (the mid-point scale) (Weems & Onwuegbuzie, 2001) especially on sensitive items.

<table>
<thead>
<tr>
<th>Table 4.5.3-1 - Example of Scale of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>I believe that the HK tax system ensures that each taxpayer is paying a fair share of tax.</td>
</tr>
</tbody>
</table>

4.5.4 Demographic Data

Apart from the measurable indicators for the construct variables, the questionnaire also collects demographic data from the participants. These data help the researcher understand the characteristics of the survey sample. Demographic data collected from the sample for this study include age, gender, origin, marital status, education, years of

\(^{69}\) The ‘Likert scale’, developed by Rensis Likert (Likert, 1932), refers to a kind of rating scale usually used for measuring attitudes by rating the responses towards a series of statements in terms of the extent to which they agree or disagree with them.
work, occupation, average family income, years of tax paid, whether or not tax has been studied, experience of dispute with the tax authority, and experience of hiring a tax advisor. These data are helpful to ascertain the degree of representativeness of the test findings to the population. Moreover, certain demographic features are relevant to the study, such as education level, whereby further in-depth investigation could be carried out by comparing an undergraduate sub-group with a postgraduate sub-group.

For each demographic feature, participants were given not more than three ‘tick-the-box’ choices in order to minimise the risk of fatigue bias (Hart, Rennison & Gibson, 2005). A summary of the demographic features collected in the questionnaire is contained in Table 4.5.4-1 as follows:

<table>
<thead>
<tr>
<th>Demographic Features</th>
<th>Choices</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;20; 20-29; 30-39; 40-49; 50-59</td>
<td>41</td>
</tr>
<tr>
<td>Gender</td>
<td>Male; Female</td>
<td>42</td>
</tr>
<tr>
<td>Origin</td>
<td>Chinese; Non-Chinese (specify)</td>
<td>43</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Single; Married</td>
<td>44</td>
</tr>
<tr>
<td>Education</td>
<td>Undergraduate; Post-graduate</td>
<td>45</td>
</tr>
<tr>
<td>Years of work</td>
<td>1-2 years; 3-5 years; &gt;5 years</td>
<td>46</td>
</tr>
<tr>
<td>Occupation</td>
<td>Students; Accountants; Others (specify)</td>
<td>47</td>
</tr>
<tr>
<td>Family income p.a.</td>
<td>&lt;$120,000; $120,000-$500,000; &gt;$500,000</td>
<td>48</td>
</tr>
<tr>
<td>Years of tax paid</td>
<td>&lt;2 years; 2-5 years; &gt;5 years</td>
<td>49</td>
</tr>
<tr>
<td>Have you studied taxation before?</td>
<td>Yes; No</td>
<td>50</td>
</tr>
<tr>
<td>Have you ever disputed with IRD before?</td>
<td>Yes; No</td>
<td>51</td>
</tr>
<tr>
<td>Have you ever hired tax advisors or professional to handle tax affairs before?</td>
<td>Yes; No</td>
<td>52</td>
</tr>
</tbody>
</table>
4.6 Sampling Design

4.6.1 Theories of Sampling Methodologies

In general, there are two types of sampling methodologies\textsuperscript{70}: probability sampling and non-probability sampling. In probability sampling, samples are randomly selected. There is no pattern or subjectivity in the selection process but a controlled procedure has to be in place to assure that each population element is given a known non-zero chance of selection. As the random procedure is unbiased, results from probability sampling surveys are able to be generalised to represent the population to which the samples attribute to. For non-probability sampling, however, it involves a certain degree of subjective selection by the researcher because the selection pattern is usually subject to the choice of the researcher. This sampling method is easier to administer but test results are only limited to the category of population to which the samples represent.

Probability sampling can be done by random, systematic, stratified, or cluster.
Random sampling is the most unbiased and independent because human intervention is minimised and human bias is mitigated. However, it may not be practically applicable if the whole population is not readily accessible and available. The same concerns hold valid for systematic sampling when the samples have to be drawn in a systematic way from a population which must be readily accessible. Stratified sampling divides a population into sub-groups (strata) with common characteristics, followed by simple random sampling in each sub-group. This is practically useful if the whole population contains mutually exclusive and collectively exhaustive groups, and the difference between groups is greater than the difference within each group. Cluster sampling

\textsuperscript{70} Bryman and Bell (2011); Groves et al. (2009).
divides the population into homogenous sub-groups (clusters) with similar characteristics. Breaking the population into clusters is usually driven by easy administration, especially when the population is widely dispersed.

4.6.2 Sample Selection for this Study

Before the sampling method and size are determined, it is necessary to define the ‘population’ which the samples represent. The aim of this study is to explore the association between tax education and tax compliance. Tax compliance for this study refers to completely fulfilling the taxpayer’s obligations in terms of accurate reporting. Therefore, the appropriate population should include that portion of the Hong Kong population with tax reporting requirements. Based on the official statistics in Hong Kong, the total population in Hong Kong in 2013/14 is slightly over 7 million, with around 3.8 million people working. Within this working population, around 2.3 million were required to report tax. It is therefore this tax-reporting population of 2.3 million that this study is targeted to represent, as illustrated in Figure 4.6.2-1 below:

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71 Refer to Section 2.1 of Chapter 2 for the defined scope of ‘tax compliance’ for this study.
72 Based on 2013/14 statistics released in the websites of the Hong Kong Inland Revenue Department and Census and Statistics Department of Hong Kong.
Selecting samples from the whole tax-reporting population based on the probability random sampling method appears to be the most desirable, but is practically difficult due to the absence of information on the level of education (undergraduate versus postgraduate) and tax education (whether or not tax was studied) of the population. The great diversity of the population in terms of demographic characteristics also adds practical difficulty to gaining access to them to conduct the survey. Moreover, such a large-scale study would have required time and resources far beyond what was available for this study. As a consequence, an alternate sampling selection method was used. The researcher considered that drawing samples from the existing studying population (at undergraduate degree and above) \textsuperscript{73} could make some sense because the focus of this study is to examine the impact of ‘tax education’ on the tax compliance attitude. The effect of education should be better measured when the study was conducted close to the time when education was actually being delivered and before

\textsuperscript{73} Based on the statistics released by the Education Bureau of Hong Kong, the total number of students undertaking post-secondary education in 2013/14 was 330,400 which included around 260,000 on undergraduate degree programmes and above.
other influences (such as work experience and financial pressure) played a role to interfere the students’ perceptions toward compliance. Therefore, student sample was chosen. Given the low unemployment rate\(^74\) in Hong Kong, these students will possibly enter the working population and become taxpayers soon after graduation. Their views should therefore explain their compliance behavior which is most immediately affected by their education. Moreover, students are expected to be less reluctant to give genuine views on sensitive questions such as tax reporting. This would hopefully enhance the reliability of the data collected.

The sample from students may appear to limit the wide applicability of findings of this study. However, it enables the researcher to assess the most immediate effect of education on their behaviour and thus it helps improve the quality of results.

Targeting toward the studying population at undergraduate level and above, this study adopted stratified sampling methodology to select participants from four different student groups: undergraduates with tax studied (UGT),\(^75\) post-graduates with tax studied (PGT),\(^75\) undergraduates without tax studied (UGNT)\(^76\) and post-graduates without tax studied (PGNT).\(^76\) Selection was performed making reference to the educational institutions offering higher education in Hong Kong. There are a total of 8 UGC-funded universities\(^77\) and 9 self-funded institutions in Hong Kong offering

\(^{74}\) 2013 unemployment rate in Hong Kong was 3.4%, as per Hong Kong Monthly Digest of Statistics October 2014.

\(^{75}\) Undergraduates and postgraduates with tax studied refer to students studying degrees in Hong Kong with curriculum containing taxation module (or newly graduated from these degrees) and have completed studying taxation.

\(^{76}\) Undergraduates and postgraduates without tax studied refer to students studying degrees in Hong Kong with curriculum not containing a taxation module (or newly graduated from these degrees) and have never studied taxation module before.

\(^{77}\) ‘UGC-funded universities’ refer to universities funded by University Grants Committee established by the Hong Kong Government. Currently, there are 8 UGC-funded universities in Hong Kong. Refer to
programmes of higher education (refer to Table 4.6.2-1 below). Almost all the bachelor accounting-related degree programmes\textsuperscript{78}, except two,\textsuperscript{79} incorporate ‘taxation’ module in the curriculum, but not all postgraduate degree programmes teach ‘taxation’. Table 4.6.2-1 below gives an overview of the educational institutions offering higher education in Hong Kong and their undergraduate and/or postgraduate accounting-related programmes with taxation taught:

<table>
<thead>
<tr>
<th>UGC-funded Universities</th>
<th>Bachelor Degree with ‘Taxation’ Taught</th>
<th>Postgraduate Degree with ‘Taxation’ Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>City University of Hong Kong</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Hong Kong Baptist University</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Lingnan University</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>The Chinese University of Hong Kong</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>The Hong Kong Polytechnic University</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>The Hong Kong University of Science &amp; Technology</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>The Hong Kong Institute of Education</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>The University of Hong Kong</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-funded Institutions</th>
<th>Bachelor Degree with ‘Taxation’ Taught</th>
<th>Postgraduate Degree with ‘Taxation’ Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caritas Institute of Higher Education</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Centennial College</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Chu Hai College of Higher Education</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Hang Seng Management College</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Hong Kong Shue Yan University</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Hong Kong Nang Yan College of Higher Education</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Open University of Hong Kong</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Technological &amp; Higher Education Institute of HK</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Tung Wah College</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

Drawing random samples of students from each institution in the above list offering relevant degree programmes would have been most desirable but was not affordable given the limitation of time and cost for this study. The researcher then reviewed the curricula of these programmes and found that nearly all the bachelor degree programmes offering ‘taxation’ module are majors in accounting with an aim to

\textsuperscript{78} For the purpose of this study, only bachelor degree programmes are included. Associate degree or diploma-level programmes are excluded.

\textsuperscript{79} Two institutions not offering accounting-related degree programmes are: Institute of Education (UGC-funded) and Technological & Higher Education Institute of HK. Refer to Table 4.6.2-1.
preparing their graduates for accountancy professional examination. Therefore, the syllabi of their accounting-related modules (including ‘taxation’ module) make substantial reference to the professional examination requirements and thus are largely similar in the content and level of knowledge. As for postgraduate degree programmes, only 6 institutions (5 UGC-funded and 1 self-funded) offer ‘taxation’ in their curricula, with a focus on practical application since their target students are already in the workforce. The differences in the syllabus of ‘taxation’ module taught in these postgraduate programmes again are not substantial. Based on the above findings, the researcher decided to pick one bachelor degree programme with ‘taxation’ taught for the UGT sample, and one postgraduate degree programme with ‘taxation’ taught for the PGT sample. As the majority of postgraduate degree programmes are provided by UGC-funded universities, the PGT sample was selected from one UGC-funded university, while the UGT sample was selected from one self-funded institution. As for selecting UGNT and PGNT samples, the only criterion is that ‘taxation’ module is not taught in the programme. Therefore, convenience sampling method was adopted in order to save time and cost. Convenience sample refers to one that is available by virtue of its accessibility (Bryman & Bell, 2011). UGNT sample was selected from the same institution as the UGT sample. PGNT sample was selected from another two UGC-funded universities from which administrative help was immediately available to the researcher. The major limitation of using convenience samples is that the degree of variety is restricted in terms of both the sample profile and the types of degree programme. Altogether, four institutions were involved.
The researcher randomly selected one class (or two, depending on class size) from each student group, and administered the survey (either by the researcher or with help from others) to the students during the period April to June 2014. All student participants were above 18 years of age, and were proficient in English (which was the language that was used for the survey).

4.6.3 Sample Size

In terms of determining the sample size, the absolute amount in the sample is more relevant than the relative proportion to the population (Bryman & Bell, 2011; De Veaux et al., 2012). For this study, reference was made to the sample size formula by Yamane (1967) as shown below:

\[
\begin{equation}
\text{n} = \frac{\text{N}}{1 + \text{N} \cdot (\varepsilon)^2}
\end{equation}
\]

where, \(\text{n}\) = sample size; \(\text{N}\) = population size; \(\varepsilon\) = precision level.

Based on the number in the working population with tax reporting requirements in Hong Kong being 2.3 million (refer to Section 4.6.2), the calculated sample size is 400 assuming a 5% precision level or 100 assuming a 10% precision level. Given the resource constraints for this study, the researcher aimed at 10% precision level and distributed 400 questionnaires to achieve this. The statistics of the questionnaires distributed and response rates of respective sample groups are summarised in Table 4.6.3-1 below:

---

80 For student groups ‘with tax studied’, the survey was done at the end of the semester in which taxation was taught (e.g. year 3 in a 4-year undergraduate degree programme), and for other student groups, the survey was done either during the same semester or next semester.
The highest rate of responses from undergraduates with tax studied group (71%) was expected because the questionnaires were administered to accounting students by the researcher at the end of class. On the contrary, the lowest response rate was recorded for the undergraduates without tax studied group (37%), due to the possible reason that these were non-accounting students who were obviously not interested in the topic of this study and the survey was not administered by the researcher. Ultimately, a total of 221 usable responses were collected.

The sample size of 221 was below the 400 based on a 5% precision level but substantially above the 100 based on a 10% precision level. Based on Yamane’s formula, a total sample size of 221 could be justified with a precision level of 6.7%. This sample should enable a reasonably reliable analysis. Moreover, the aim of this study is on the effect of tax education. This primary aim does not require a split of sample into undergraduate (UG) and post-graduate (PG) groups. Therefore the analysis was primarily done on the total sample group of 221. Separate additional analysis on UG and PG groups was performed to gain further insights with a high level understanding of the difference and to add richness to the findings. As a result, the total usable responses of 221 were accepted for this study.
On the other hand, further reference was also made to the sample sizes adopted in prior literature on similar topics targeting student participants. A review of several of the most relevant literature on tax compliance studies conducted in Hong Kong (or Asian countries) revealed that the sample size broadly ranged from less than 100 to over 1,000 (refer to Table 4.6.3-2 below), of which student samples of undergraduates or above ranged from 27 to 450. The average size of student samples was 181.

<table>
<thead>
<tr>
<th>Literature</th>
<th>Jurisdictions Studied and Sample Size</th>
<th>Size of Student Sample (undergraduate or above) included in Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richardson, G. (2006b)</td>
<td>HK: 302</td>
<td>HK: 302</td>
</tr>
<tr>
<td>Ho et al. (2013)</td>
<td>HK: 152</td>
<td>HK: nil</td>
</tr>
</tbody>
</table>

Supported by the average sample size of 181 used in prior literature on similar topics, the usable responses of 221 were considered acceptable for this study. In addition, as discussed in Section 5.2.2 of Chapter 5, the sample profile in general matches that of the population in Hong Kong. The size is therefore considered as adequate for this study.

4.7 Data Collection Procedure

4.7.1 Pilot Testing

The validity of a survey instrument refers to the degree to which the instrument is able to measure what it aims to measure (De Vaus, 2002). Despite that the survey
instrument for this study was designed with reference to the questionnaires adopted by Chan et al. (2000) and Ho et al. (2013), the researcher made an effort to conduct a pilot test with a view to assessing the instrument’s validity in terms of its content and constructs. A group of 30 students with tax studied was invited by the researcher to participate in the pilot test.

Pilot testing has various advantages. First, pilot testing confirms whether, and to what extent, the instrument was clear enough in terms of its purpose and what it was trying to achieve (face validity) (Lewis-Beck, Bryman & Liao, 2004). Feedback was obtained on the clarity and adequacy of the instructions as well as the expected time for completion. For example, the initial time estimated by the researcher was 15 minutes but it was subsequently found to be inadequate. Based on the feedback collected, the number of questions was reduced and the descriptions of the hypothetical scenarios were simplified. Another example was the use of double-negative words leading to ambiguity and potential problem of internal validity. Those problematic statements were subsequently revised. Moreover, the sequential flow of the measurable items was also fine-tuned based on participants’ feedback. For example, the statements on potential penal actions due to non-compliance were moved from the earlier part to the later part of the questionnaire in order to avoid the participants from being ‘reminded’ of the negative consequences at too early a stage.

4.7.2 Questionnaire Administration

For each sub-sample group, the researcher initially contacted the management or person in charge of the relevant degree programme to seek approval for conducting the

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81 4 sub-sample groups: undergraduates with tax studied, undergraduates without tax studied, postgraduates with tax studied, postgraduates without tax studied.
survey on their students. Once approved, the researcher liaised with the responsible teachers on the administrative procedures. Before the survey, an introduction was given to the students, including the topic and the purpose of the survey, the anonymous nature of the questionnaires, the expected time for completion, and their discretionary rights to participate in the survey without any impact on their academic rating. However, by completing and submitting the questionnaires, students were deemed to have given their consent to the survey. Thereafter, a set of questionnaires together with the participant’s information statement was distributed. Students were also assured that confidentiality would be observed in respect of all the information collected. Completed questionnaires were then collected and retained by the researcher for further data processing.

4.8 Data Preparation and Screening

Upon the completion of the survey, the raw data collected from the survey was transformed into usable data through the data preparation process including data entry, recoding and creation of construct variables. Data screening, including a reliability analysis and normality assessment, was also conducted. These are discussed below.

4.8.1 Data Entry and Coding

In this study, the IBM ‘software package for statistical analysis’ Version 22 (SPSS)\(^{82}\) was used for estimation purposes. Two master data files were created, one for the demographic variables and the other for all other items. Each item was labelled with

\(^{82}\) The short form of ‘SPSS’ will be used in the rest of the dissertation.
value defined and entered. For numeric variables (Items 1 to 38), numeric codes were assigned (e.g. 1 for strongly disagree, 2 for disagree, 3 for marginally disagree, 4 for marginally agree, 5 for agree, and 6 for strongly agree). For categorical variables such as tax education, 1 was assigned for ‘with tax studied’ and 0 for ‘without tax studied’. For missing values, the common treatments include deletion (list wise or pairwise) and substitution of the mean (Little & Rubin, 1987). Given that the deletion of missing values would further reduce the usable responses for this study, and the occurrence was found ad hoc and not frequent, the researcher chose to substitute all missing values with ‘series means’ so that all returned cases could be included in the analysis.

4.8.2 Recoding

In designing the questionnaire, the underlying assumption was that a higher scale (e.g. 6 or 5) should indicate a positive direction towards tax compliance whereas a lower scale (e.g. 1 or 2) should indicate lower compliance. However, in order to minimise extreme response bias and acquiescent bias, some items were purposely negatively worded. These negatively worded items were recoded, such that scale 1 was recoded to 6, 2 to 5, 3 to 4, 4 to 3, 5 to 2 and 6 to 1. Moreover, certain recoded items were effectively designed to measure the same behaviour as another item (for example, negatively-worded item 18 measures the same construct as item 15), and thus the outcome scores of recoded items (e.g. item 18) were mapped against the scores of their corresponding items (e.g. item 15). In the event that the two scores were different by more than 3 in value, potential acquiescent bias, i.e., tendency of respondents to agree

---

83 ‘Series means’ were obtained by first computing the mean score of all available responses on a particular item for which values were found missing, and entering the computed mean score to all missing values.
84 Items negatively worded include: Q13, Q14, Q15, Q16, Q17, Q22, Q25, Q26, Q27, Q28, Q29, Q30, Q35 and Q38.
(or disagree) with all questions, was assumed and both scores were removed and replaced by zero. Based on this criterion, those pairs of values involving ‘1’ with ‘6’ or ‘5’ (or vice versa), or involving ‘2’ with ‘6’ (or vice versa) obviously indicate contradictory responses, and thus were removed.

4.8.3 Creation of Construct Variables

As discussed in Section 4.5.1 above, five construct variables were created for this study: tax education (TE), ability/readiness to comply (AbR), perception of tax system fairness (TSF), moral reasoning (MR) and tax compliance (TC). Other than tax education (TE) which was represented by categorical value of either ‘1’ (with tax studied) or ‘0’ (without tax studied), the other construct variables were created with the mean scores of the corresponding measurement items for each variable. A summary of the construct variables and their measurement items is contained in Table 4.8.3-1 below:

<table>
<thead>
<tr>
<th>Variables:</th>
<th>TSF</th>
<th>AbR</th>
<th>MR</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSF Sub-variables</td>
<td>TxsSys</td>
<td>IRD</td>
<td>Govt</td>
<td>13, 14,</td>
</tr>
<tr>
<td>Measurement items included in the Questionnaire</td>
<td>1, 5, 9,</td>
<td>2, 6, 10,</td>
<td>13, 14, 23, 24, 28 to 35</td>
<td>38</td>
</tr>
<tr>
<td>3, 7, 11,</td>
<td>26, 27,</td>
<td>36, 37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TSF: Perception of tax system fairness; AbR: Ability/readiness to comply; MR: Moral reasoning; TC: Tax compliance; TxsSys: Tax System; IRD: Hong Kong Inland Revenue Department; Govt: Hong Kong Government

4.8.4 Factor Analysis

4.8.4.1 Procedures of Factor Analysis

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85 Five construct variables: tax education, ability/readiness to comply, perception of tax system fairness, moral reasoning, tax compliance.
In using a multiple-item questionnaire, several measurement items collectively serve as the indicators of a particular concept or a latent variable. Factor analysis was used to meaningfully group the items to develop indicators. Under this technique, the measurement items are grouped into distinct clusters and these clusters become the ‘factors’ or ‘constructs’ for use in the analysis. Five steps were suggested by Williams, Brown & Onsman (2012) in performing the factor analysis:

Step 1: Is the data suitable for factor analysis (i.e. factorability)?
Step 2: How to extract factors?
Step 3: What criteria to determine factor extraction?
Step 4: What rotational method technique is appropriate?
Step 5: Which variables are attributable to each factor?

As an initial step, data should be assessed for its suitability for factor analysis by a correlation matrix, Kaiser-Meyer-Olkin’s (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity. A correlation matrix illustrates the relationships between individual variables and a correlation coefficient of +0.30 or above indicates an acceptable level of factorability (i.e. the % relationship within the data that is accounted for by the factor). If the KMO index gives 0.50 or above, and Bartlett’s Test of Sphericity gives a significant level of 95% or above, the data is accepted as suitable for factor analysis. Step 2 involves determination of the factor extraction method.

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87 The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy provides an index (between 0 and 1) of the proportion of variance among the variables that might be common variance (i.e., that might be indicative of underlying or latent common factors). Bartlett’s test is usually used for large samples to approximate a chi-square distribution, where the value of significance below 0.05 indicates a high probability that there are significant relationships between the variables but a higher value of 0.1 or above indicates that the data is inappropriate for factor analysis. Seen at http://www.aliquote.org/articles/tech/multivar/22_Appendix_6.pdf
88 As per Hair, Andersen, Tatham & Black (1998), correlation coefficient of +0.30 is minimal, +0.40 is important and +0.50 is practically significant.
The most commonly used extraction methods are principal components analysis and principal axis factoring, with no significant practical differences found between the two. This is then followed by step 3 where factors are extracted based on criteria including Kaiser’s ‘eigenvalue > 1 rule’, the Scree test, and the cumulative percent of variance. When some variables are found to relate to more than one factor, an appropriate rotational method is used (step 4) to ensure that high item loadings are maximised and low item loadings are minimised. Either of the two common rotation techniques can be used: the orthogonal varimax/quartimax method or oblique oblimin/promax method. The last step requires the researcher to examine and determine which variables are attributable to a factor, which is then given a name.

4.8.4.2 Factor Analysis for this Study

In this study, a total of 38 measurement items collectively represent the four construct variables: TSF, AbR, MR and TC. Other than items 25 and 38 which were directly related to tax compliance attitude, the other 36 measurement items are required to be further reduced to the three construct variables: TSF, AbR and MR. The following steps were taken to identify the factors leading to the three construct variables and how the measurement items were grouped with the factors. First of all, the correlation matrices of all items revealed that the correlation coefficients of individual variables were above 0.5, indicating that all items were suitable for the analysis. The KMO index showed the level of sampling adequacy of 0.757, which was well above the average level of 0.5. Moreover, the Bartlett’s Test of Sphericity gave 4925.524.

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89 As per Thompson (2004).
90 Refer to Table E4.2 of Appendix E for Correlation Matrices.
91 Based on Kaiser (1974), values greater than 0.5 are acceptable and values between 0.5 and 0.7 are
with a significance level $< 1\%$, indicating that the data is suitable for factor analysis. Principal axis factoring was used with a total of ten factors identified based on Kaiser’s eigenvalues of $> 1$, cumulatively contributing to $69.798\%$ of the variance. This result was also supported by the Scree plot as shown in Figure 4.8.4.2-1 below:

![Scree Plot](image)

**Figure 4.8.4.2-1 - Scree Plot of Factor Analysis**

These ten factors were further reduced to 3 construct variables (TSF, AbR and MR) by grouping the items that are correlated with high factor loadings using the oblique oblimin method. The oblique rotation method was adopted as factors are correlated and all factors under this method give high loadings of 0.32 or above. A summary of the factor reduction is contained in Table 4.8.4.2-1 below. The table illustrates how mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great, and values above 0.9 are superb (Hutcheson & Sofroniou, 1999). Refer to Table E4.1 of Appendix E for test output on KMO and Bartlett’s Test.

92 The top 10 factors have initial Eigenvalues of more than 1. Refer to Table E4.4 of Appendix E for test output from principal axis factoring.

93 Refer to Table E4.5 of Appendix E test output.

94 Oblique rotation method assumes that the factors are correlated. Tabachnick and Fiddell (2007) suggested that, if correlations among factors under the oblique method exceed 0.32, then there was 10% or more overlap in variance among factors and this was enough to warrant the oblique rotation method.
the 36 measurement items (total of 38 items excluding items 25 and 38 for tax compliance TC) were grouped under each of the three construct variables and their respective loadings. The respective Eigenvalues of the ten factors and how they were further grouped under each construct variable are also shown, together with the percentage of variance each construct variable contributes. Altogether, the three construct variables (represented by the ten factors) explain 69.798% of the variance. Cronbach’s alpha for each construct variable was calculated to ensure inter-item reliability. The coefficient alphas for variables TSF and MR are above the acceptable level of 0.70 suggesting that the inter-item correlation is justified. However, the coefficient alpha for AbR is 0.639 which is slightly below 0.7, but further testing on the variable, by removing any item, found that the alpha value did not improve. As a conclusion, the current grouping of the items amongst the three construct variables was considered acceptable.
Table 4.8.4.2-1: Factor Reduction with Factor Loadings for All Measurement Items

<table>
<thead>
<tr>
<th>Item No.</th>
<th>TSF</th>
<th>MR</th>
<th>AbR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.413</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.579</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.848</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.746</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.698</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.455</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.415</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
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<tr>
<td>12</td>
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<td>13</td>
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<td>0.829</td>
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<td>0.757</td>
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<td>15</td>
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<td>0.827</td>
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<td>16</td>
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<td>0.744</td>
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<td>0.571</td>
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<td>36</td>
<td></td>
<td>0.652</td>
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<tr>
<td>37</td>
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</tr>
</tbody>
</table>

Eigen value

| Factor 2: 5.866 | Factor 1: 6.396 | Factor 3: 2.852 |
| Factor 7: 1.428 | Factor 4: 2.596 | Factor 5: 2.017 |
| Factor 6: 1.845 | Factor 8: 1.335 | Factor 9: 1.166 |
| Factor 10: 1.023 |             |                |

% of variance

| 19.195 | 34.723 | 15.88 |
| 19.195 | 34.723 | 15.88 |
| Total %: 69.798 |

Cronbach’s alpha

| 0.876 | 0.850 | 0.639 |
| 0.876 | 0.850 | 0.639 |
| (value does not increase if any item is deleted; thus accepted) |

Notes: A total of 10 factors (dimensions) were identified from the factor analysis. To further reduce the number of factors into 3 constructs (TSF, MR and AbR), highly correlated factors were grouped into respective construct. E.g. Factors 2 & 7 were grouped under TSF. Cronbach’s alpha tests were done to assess the inter-item correlation within each construct to ensure reliability. The coefficient alpha for TSF and MR were above the acceptable level of .70. The coefficient alpha for AbR was slightly lower than .70 but considered acceptable as the statistics of alpha value if any item was deleted did not increase the alpha value.
4.8.5 Normality Assessment

Most statistical tests require the samples to be normally distributed. A normal distribution is represented by the mean (µ) and the standard deviation (σ), and the shape of the data’s distribution is unimodal and symmetric. When µ=0 and σ=1, the distribution is a standard normal distribution. The normality of distribution can be tested by way of graphical methodology such as a histogram, stem and leaf plot, dot plot, normal probability plot, quantile-quantile (Q-Q) plot, chi-squared plot and beta probability plot. In this study, a histogram and Q-Q plot are mainly used to assess the normality of the distribution in each sub-sample group with and without tax studied in terms of each variable: tax compliance (TC), perception of tax system fairness (TSF), ability/readiness to comply (AbR) and moral reasoning (MR). The results revealed that normality was satisfactory except the sub-group without tax studied in terms of ability/readiness to comply, which was found to be moderately skewed. Despite this, no transformation of data was considered necessary given that the size of the sub-group exceeds 30, which is sufficient to support the approximate normal distribution under the Central Limit Theorem.

4.9 Data Analysis Methods and Approaches

After preparation and screening, data was ready for analysis by way of various methods or approaches, with a view to test the hypotheses for answering the research questions.

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95 Ramzan, Saleem & Butt (2013)
96 Histogram was introduced by Pearson (1895) in which data is presented in the form of rectangles on x-axis and the heights of rectangles represent the frequency of data on the y-axis. A normal curve is drawn over the histogram. If the pattern of the histogram approximates to the normal curve, the data distribution is considered as normal.
97 Q-Q plot displays a diagram showing a plot of the sample quantiles on the x-axis versus the theoretical quantiles from a normal distribution on the y-axis. If the sample distribution is normal, the plots will be close to a straight line.
98 Refer to Table E4.7 of Appendix E for extracts of histograms and Q-Q plots of each sub-group.
99 As per Laplace (1812).
The following sections describe the different data analysis methods or approaches used for this study, including descriptive analysis, correlation, comparison of means test and regression.

4.9.1 Descriptive Analysis

It is useful to provide a snapshot of the samples in terms of their composition, such as the total number of observations in the entire sample group as well as in each sub-sample group. The demographic background was also summarised, including gender, age, origin, marital status, education, years of work, occupation, annual family income, years of tax paid, whether taxation studied, experience of disputing with IRD, and experience of previously hiring a tax advisor. Other than the educational background, which differentiated the samples into different sub-groups, 4 demographic factors such as gender, age, years of work and years of tax paid were also regressed with other core variables to investigate whether they were also relevant to the test result. Moreover, certain distinctive demographic features were also highlighted and compared amongst sub-groups, such that the degree of homogeneity (or heterogeneity) of the samples could be estimated. Some distinctive features could be advantages for the study as well as limitations of the study. Further discussions are found in Section 5.2 of Chapter 5. Other than composition in terms of demographic features, the descriptive statistics of different sample sub-groups (e.g. group with tax studied and group without tax studied), such as means and mean differences, were also examined where appropriate in order to identify the variance in findings between groups.
4.9.2 Correlation

Following the description of sample composition, the data analysis focused on testing the variables and their correlations as well as direction. Correlation coefficients measure the strength of the linear association between two quantitative variables (De Veaux, Velleman & Bock, 2012). The most commonly used coefficient is Pearson’s product-moment correlation coefficient (Pearson, 1895). The absolute value of the coefficient, ranging from -1 to +1, describes the magnitude of the association and the sign describes the direction. When the coefficient gets closer to -1 or +1, the linear relationship is stronger. No linear relationship exists if the coefficient is equal to zero.

A positive relationship exists when the two variables change in the same direction such that when all values are plotted (scatterplots), the pattern runs from lower left to upper right. A negative relationship exists when the two variables change in the opposite direction such that the pattern of the scatterplots runs from upper left to the lower right.

Correlation does not tell us about causality between the two variables. When the relationship between variables (x, y) is further examined to see whether one variable predicts the other, it can be expressed as

\[ Y = f(X) \ldots \ldots \quad \quad \quad \quad \ldots \text{Eq. (4.1)} \]

This relationship can be estimated using various functional forms. In linear form, the relationship can be expressed by the following equation:

\[ Y = \alpha + \beta X + \epsilon \ldots \ldots \quad \quad \quad \quad \ldots \text{Eq. (4.2)} \]

where
- \( Y \) = Dependent variable
- \( X \) = Independent variable
- \( \alpha \) = Population intercept parameter
- \( \beta \) = Population slope parameter
- \( \epsilon \) = Residual or random error term
The above equations, when estimated, can be expressed as

\[ y = a + bx + e \quad \text{.........} \quad \text{Eq. (4.3)} \]

where
- \( y \) = dependent variable (i.e. the variable to be predicted),
- \( x \) = independent variable (i.e. the predictor),
- \( a \) = estimator of intercept (i.e. the value of the line hitting y-axis when \( x \) is zero)
- \( b \) = estimator of slope coefficient (i.e. the slope telling how rapidly \( y \) changes in response to \( x \))
- \( e \) = random or error term

In this research, the relationship between tax education (TE) and tax compliance (TC) is examined. Based on the framework developed in Chapter 3, Tax education is thought to improve tax compliance. Tax compliance (TC) can therefore be expressed as a function of tax education (TE), i.e.

\[ TC = f(TE) \quad \text{.........} \quad \text{Eq. (4.4)} \]

where
- \( TC \) = Tax compliance
- \( TE \) = Tax education

The relationship can be expanded to include the indirect effects from the ability/readiness to comply, perception of tax system fairness and moral reasoning respectively. This can be expressed by the following equation:

\[ TC = f(TE, \text{AbR, TSF and MR}) \quad \text{.........} \quad \text{Eq. (4.5)} \]

where
- \( TC \) = Tax Compliance
- \( TE \) = Tax Education
- \( \text{AbR} \) = Ability and Readiness to comply
- \( \text{TSF} \) = Perception of Tax System Fairness
- \( \text{MR} \) = Moral Reasoning

The main focus of this research is on analysing the impact of tax education (TE) on tax compliance (TC) which can either be direct or indirect via \( \text{AbR}, \text{TSF} \) and \( \text{MR} \). A three stage approach was adopted for testing the indirect relationships. In the first stage, impact of TE on \( \text{AbR}, \text{TSF} \) and MR was tested; in the second stage, impacts of TE,
AbR, TSF and MR were tested on TC; and in the final stage, test results from the first and second stages are combined by way of multiplication of coefficients to obtain the combined indirect impact. At last, both direct impact and indirect impact will be analysed on an aggregate basis. Table 4.9.2-1 below gives a summary of the testing in different stages and the equations to be estimated under each testing.

<table>
<thead>
<tr>
<th>Table 4.9.2-1 - Different Stages of Testing and Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Direct Relationship</strong></td>
</tr>
<tr>
<td><strong>Indirect Relationship – Step One</strong></td>
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<tr>
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<tr>
<td></td>
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<tr>
<td><strong>Indirect Relationship – Step Two</strong></td>
</tr>
</tbody>
</table>
| **Indirect Relationship – Step Three** | (TE) Tax Education | -TE’s impact on TC via AbR at coefficient of (b_{AbR}*b_2)  
-TE’s impact on TC via TSF at coefficient of (b_{TSF}*b_3)  
-TE’s impact on TC via MR at coefficient of (b_{MR}*b_4) |
| **Both Direct and Indirect Relationship** | (TE) Tax Education | Analysis of combined results from direct and indirect relationship |

Regression analysis was used to estimate the intercept and slope coefficients of equations under each testing. Discussion of test results is found in Section 5.3 of Chapter 5.
4.9.3 Regression

4.9.3.1 Assumptions of Regression

There are four principal assumptions of multiple regression:

1. **linear relationship** – Linearity exists if the amount of change, or rate of change, between scores on two variables is constant. Correlation coefficient measures the strength of the linear association between two quantitative variables (dependent and independent variables), and thus linearity is assumed for regression to work effectively. By using the Pearson correlation and scatterplots of data, linearity can be tested. Linear relationship exists when the correlation coefficient gets closer to -1 or +1, while no linear relationship exists if the coefficient equals to zero. For this study, the assumption was tested\(^{100}\) and met.

2. **multivariate normality** - Regression assumes that the residuals of all variables to be tested are normally distributed, with a mean of 0, and in an approximate bell-shape. This has been discussed under Section 4.8.5 of this chapter above under ‘Normality Assessment’\(^{101}\).

3. **no or little multi-collinearity** - Multi-collinearity in the data occurs when two or more predictor variables in a multiple regression model are highly correlated. This may be caused by an inaccurate use of dummy variables, inclusion of a variable that is computed from other variables in the dataset, repetition of the same kind of variable, or simply when the variables are highly correlated to each other. Multi-collinearity may lead to inaccurate prediction by the regression. There are various ways to detect

\(^{100}\) Refer to Table E4.8 of Appendix E for test output for linearity.

\(^{101}\) Refer to Table E4.7 of Appendix E for test output for normality.
multi-collinearity, and a commonly used tool is by obtaining the tolerance level\textsuperscript{102} and its reciprocal, called Variance Inflation Factor (VIF)\textsuperscript{103}. If the value of tolerance is less than 0.2 and the value of VIF is > 10, multi-collinearity problem is indicated. For this study, the testing\textsuperscript{104} of all core variables revealed that all tolerance levels exceed 0.2 and all VIF are less than 10. The assumption is met.

4. **Homoscedasticity** - Homoscedasticity (or homogeneity of variance) assumes that the dependent variable gives similar amounts of variance across the range of values for an independent variable. It is usually tested by viewing a residual scatterplot based on predicted scores on the x-axis and errors of prediction on the y-axis. The assumption is met if the scatterplot takes the approximate shape of a rectangular, scores are concentrated in the center around 0 point and distributed in a rectangular pattern, and scores are randomly scattered about a horizontal line without systematic pattern of clustering. For this study, the scatterplot\textsuperscript{105} was produced showing an approximate shape of rectangular with scores randomly scattered around 0. The assumption is considered as met.

4.9.3.2 **Estimated Equations**

In this study, there are altogether 22 equations being estimated by way of bivariate and multiple regressions. On top of the Equations 5.1 to 5.5 as shown in Table 4.9.2-1 above, other equations were developed to extend the tests covering undergraduate (e.g. Eq. 5.5-UG) and postgraduate groups (e.g. Eq. 5.5-PG), to test the effect of demographic variables on tax compliance (Eq. 5.5D), to exclude tax education from the full model (Eq. 5.5) so as to check the sensitivity of other variables to tax education (e.g.

\textsuperscript{102} Tolerance refers to the influence of one independent variable on all other independent variables, measured by $T=1+R^2$. If $T<0.01$, multi-collinearity is certain; if $T<0.2$, multi-collinearity is likely.

\textsuperscript{103} Variance Inflation Factor (VIF) is measured by $1/T$, where multi-collinearity is indicated if VIF>10.

\textsuperscript{104} Refer to Table E4.9 of Appendix E for test output on multi-collinearity.

\textsuperscript{105} Refer to Table E4.10 of Appendix E for test output for homoscedasticity.
Eq. 5.5X), and to expand the full model with the sub-constructs of TSF (perception of tax system fairness) so as to find out the contributing factor for the negative result (e.g. Eq. 5.5-TSF). For easy reference, a summary of all estimated equations used in this study is provided in Table 4.9.3.2-1 below:

<table>
<thead>
<tr>
<th>Eq. No.</th>
<th>Estimated Equation</th>
<th>Test Objective</th>
<th>Table Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 TC  = a + b_TC TE + e</td>
<td>TE on TC in total group</td>
<td>5.3.1.1-1</td>
<td></td>
</tr>
<tr>
<td>5.1-UG TC_UG = a + b_UGTE_UG + e</td>
<td>TE on TC in UG group</td>
<td>5.3.1.2-1</td>
<td></td>
</tr>
<tr>
<td>5.1-PG TC_PG = a + b_PGTE_PG + e</td>
<td>TE on TC in PG group</td>
<td>5.3.1.2-1</td>
<td></td>
</tr>
<tr>
<td>5.2 AbR = a + b_AbR TE + e</td>
<td>TE on AbR in total group</td>
<td>5.3.2.1-2</td>
<td></td>
</tr>
<tr>
<td>5.2-UG AbR_UG = a + b_UGAbR_UG + e</td>
<td>TE on AbR in UG group</td>
<td>5.3.2.1-2</td>
<td></td>
</tr>
<tr>
<td>5.2-PG AbR_PG = a + b_PGAbR_PG + e</td>
<td>TE on AbR in PG group</td>
<td>5.3.2.1-2</td>
<td></td>
</tr>
<tr>
<td>5.3 TSF = a + b_TSF TE + e</td>
<td>TE on TSF in total group</td>
<td>5.3.2.1-3</td>
<td></td>
</tr>
<tr>
<td>5.3-UG TSF_UG = a + b_UGTSF_UG + e</td>
<td>TE on TSF in UG group</td>
<td>5.3.2.1-3</td>
<td></td>
</tr>
<tr>
<td>5.3-PG TSF_PG = a + b_PGTSF_PG + e</td>
<td>TE on TSF in PG group</td>
<td>5.3.2.1-3</td>
<td></td>
</tr>
<tr>
<td>5.4 MR = a + b_MR TE + e</td>
<td>TE on MR in total group</td>
<td>5.3.2.1-5</td>
<td></td>
</tr>
<tr>
<td>5.4-UG MR_UG = a + b_UGMR_UG + e</td>
<td>TE on MR in UG group</td>
<td>5.3.2.1-5</td>
<td></td>
</tr>
<tr>
<td>5.4-PG MR_PG = a + b_PGMR_PG + e</td>
<td>TE on MR in PG group</td>
<td>5.3.2.1-5</td>
<td></td>
</tr>
<tr>
<td>5.5 TC = a + b_1 Age + b_2 Gender + b_3 YrsWk + b_4 YrsTx + e</td>
<td>Demographics on TC in total group</td>
<td>5.3.2.2.1-1</td>
<td></td>
</tr>
<tr>
<td>5.5-UG TC_UG = a + b_1UG TE + b_2UG AbR + b_3UG TSF + b_4UG MR + e</td>
<td>Full model in UG group</td>
<td>5.3.2.2.2-3</td>
<td></td>
</tr>
<tr>
<td>5.5-PG TC_PG = a + b_1PG TE + b_2PG AbR + b_3PG TSF + b_4PG MR + e</td>
<td>Full model in PG group</td>
<td>5.3.2.2.2-5</td>
<td></td>
</tr>
<tr>
<td>5.5-TSF TC_TSF = a + b_1TSF TE + b_2TSF AbR + b_3TSF MR + b_4TSF TxS + b_5TSF IRD + b_6TSF Gov + e</td>
<td>Full model - TSF expanded in total group</td>
<td>5.3.4-1</td>
<td></td>
</tr>
<tr>
<td>5.5UG-TSF TC_UGTSF = a + b_1UGTSF TE_UG + b_2UGTSF AbR_UG + b_3UGTSF MR_UG + b_4UGTSF TxS_UG + b_5UGTSF IRD_UG + b_6UGTSF Gov_UG + e</td>
<td>Full model - TSF expanded in UG group</td>
<td>5.3.4-1</td>
<td></td>
</tr>
<tr>
<td>5.5PG-TSF TC_PGTSF = a + b_1PGTSF TE_PG + b_2PGTSF AbR_PG + b_3PGTSF MR_PG + b_4PGTSF TxS_PG + b_5PGTSF IRD_PG + b_6PGTSF Gov_PG + e</td>
<td>Full model - TSF expanded in PG group</td>
<td>5.3.4-1</td>
<td></td>
</tr>
</tbody>
</table>

All tables are found in Chapter 5; UG: undergraduate; PG: postgraduate
**Equation No. 5.5D** - This equation sought to predict TC by four demographic factors: age, gender, years of work and years of tax payment. Amongst all the demographic data collected from the survey, the researcher considered that origin, marital status, occupation and family income were considered not relevant in terms of influencing the tax compliance attitude. The experience of disputing with the Hong Kong tax office and hiring a tax practitioner/advisor could have an impact on the taxpayer’s compliance attitude, but only 5% of the samples have responded with this experience leading to the sample size being too small for this to be included in the research. As a result, only four demographic variables (gender, age, years of work and years of tax paid) were considered as possibly being associated with tax compliance. A separate test was therefore conducted to test whether these four demographic variables contribute significantly to the variance in tax compliance. If no significant contributing power was found, they would be excluded from the full model (Eq. 5.5) for the sake of simplicity. The test was done by way of regression to an extended Equation No. 5.5D as follows:

\[
\text{Equation No. 5.5D: } TC = a + b_1 \text{Age} + b_2 \text{Gender} + b_3 \text{YrsWk} + b_4 \text{YrsTx} + e
\]

The contribution of the four demographic factors to the overall test result was represented by the value of R-square, indicating that these variables would not add significant impact on the regression results from the full model (Eq. No.5.5). Test results were shown in Section 5.3.2.2.1 and Table 5.3.2.2.1-1 of Chapter 5.

---

106 Refer to Table 4.5.4-1 of this chapter for details of demographic data collected from the survey.

107 Refer to Section 5.3.2.2.1 of Chapter 5 for details.

108 YrsWk denotes no. of years of work

109 YrsTx denotes no. of years of experience in tax payments.

110 R-squared refers to the coefficient of determination.
**Equation No. 5.5X** – This equation excludes the variable: TE from the full model (Eq. No. 5.5) as follows:

\[
TC_X = a + b_{1X}AbR + b_{2X}TSF + b_{3X}MR + e
\]

This equation sought to check the sensitivity of each intermediate variable (AbR, TSF and MR) to tax education (TE) in their impacts on tax compliance. This could help identify which intermediate variable is most influenced by tax education. The test was done for total group, undergraduate group and postgraduate group respectively. Detailed test findings can be found in Section 5.3.2.2.2 of Chapter 5.

**Equation No. 5.5-TSF** – This equation expands the full model (Eq. 5.5) by replacing the TSF with its three sub-constructs: TxS\textsuperscript{111}, IRD\textsuperscript{111} and Gov\textsuperscript{111}, as follows:

\[
TC_{TSF} = a + b_{1TSF}TE + b_{2TSF}AbR + b_{3TSF}MR \\
+ b_{4TSF}TxS + b_{5TSF}IRD + b_{6TSF}Gov + e
\]

This equation was driven by the test findings from the full model (Eq. No. 5.5) that a negative significant relationship was detected between TSF (perception of tax system fairness) and TC (tax compliance). In order to further explore the main contributing factor for the negative relationship, the estimated equation was expanded by replacing the TSF with its three sub-constructs. Same test was also done for undergraduate and postgraduate groups. Test findings indicated that the main contributing factor was Gov (satisfaction of government). Detailed test findings can be found in Section 5.3.4 of Chapter 5.

\textsuperscript{111} TxS denotes understanding of Hong Kong tax system; IRD denotes appreciation of Hong Kong tax authority (Inland Revenue Department of Hong Kong); Gov denotes satisfaction of Hong Kong government.
4.9.3.3 Analysis of Test Outputs

The measures explained below were used for testing the relationships:

**Coefficient of determination (R²)** - The coefficient of determination is the square of the correlation between x and y values in a linear regression. It ranges from 0 to 1, where R² of 0 indicates that the dependent variable cannot be predicted from the independent variable and R² of 1 indicates a perfect predictability without error. Therefore, an R² value also represents the proportion of variance in the dependent variable that can be predicted or explained by the independent variable.

**T-statistics** - A T-test was adopted to test the hypotheses as the population mean and standard deviation were unknown. Based on the sample drawn from the population, the sample mean was compared with the hypothesised population mean to obtain the difference and the variability (or standard error). The T-value was then obtained by dividing the mean difference by the standard error:

\[ t = (\bar{x} - \mu) / SE \]

where \( \bar{x} \) is the sample mean, \( \mu \) is the hypothesised population mean in the null hypothesis, and SE is the standard error.

The calculated t-value was then compared with the critical t-value based on the applicable degrees of freedom at a certain significance level. In this study,

---

112 Mean = 0 in the null hypothesis.
113 Standard error is the square of standard deviation.
114 Critical t-value is obtained from the Student’s t distribution table, making reference to the degree of freedom and required significance level.
115 Degree of freedom is the number of observations in a sample that are free to vary. To estimate the population mean through sample mean (n), degree of freedom = (n-1). To estimate several parameters (k) in a regression model, degree of freedom = (n-k-1).
116 Significance level or (p-value) is a probability of observing the sample result when the null hypothesis is true.
significance levels of 5% and 10% were used to denote higher (5%) or lower (10%) degree of significance. If the calculated t-value is greater than the critical t-value, the null hypothesis would be rejected.

F-statistics - In comparing the means amongst two or more groups, an F-ratio was used to measure how the inter-group variance compares with the intra-group variance.

In a null hypothesis, the mean between each group is zero:

$$H_0 = \mu_1 = \mu_2 = \mu_3 = \mu_k$$

Inter-group variance (or $SS_{\text{explained}}$) = (Group mean – Grand mean)

Intra-group variance (or $SS_{\text{unexplained}}$) = (Individual score – Group mean)

$$F-value = \frac{\text{Average of } (SS_{\text{explained}})}{\text{Average of } (SS_{\text{unexplained}})}$$

The calculated F-value was then compared with the critical F-value. If the calculated F-value is greater, the null hypothesis would be rejected. In a regression, the F-test is useful to test whether the model is useful for predicting the dependent variable. In this case, an F-value can be calculated by:

$$F = \frac{MSR}{MSE}$$

where

MSR = SSR / K, i.e., the ratio that the regression sum of squares (SSR) to the degree of freedom K represented by the total number of independent variables (excluding constant).

MSE = SSE / (N-K-1), i.e., the ratio that the error or residual sum of squares (SSE) to the degree of freedom (N-K-1) represented by the total number of observations reduced by number of independent variables (excluding constant) plus one.

---

117 SS = Sum of squares
118 Critical F-value is obtained from the F-distribution table, making reference to the degree of freedom (K, N-K-1) where K is the total number of independent variables, N is the total number of observations.
4.10 Summary

Chapter 4 outlines the research methodology for this study from various perspectives. For this study, the positivist deductive paradigm was adopted, following which a quantitative type of survey was considered as the most appropriate. Ethical clearance for the administration of the survey was obtained. The research was conducted with the use of a self-completion questionnaire covering basic demographic background and 38 measurement items to represent four construct variables: tax compliance, ability/readiness to comply, perception of tax system fairness, and moral reasoning. The operationalisation of the construct variables was justified by the findings from a factor analysis. The survey was administered to a total of 400 student samples selected from the undergraduate and postgraduate degree programmes in the universities or colleges in Hong Kong. The response rate was 55%, leading to a total of 221 observations used for the study. The size of the sample was comparable to that calculated from Yamane’s formula and justified by experience in prior studies. Data collected was processed in terms of recoding and creation of construct variables, following which data was further screened in terms of reliability and normality of distribution. Finally, different methods were used to analyse the data, including a descriptive analysis of the sample composition and regression, to explore the correlation amongst variables. There are altogether 22 equations used for estimation in this study and they are summarised in Table 4.9.3.2-1 under Section 4.9.3.2 of this chapter. The test results from the data analysis are further discussed in Chapter 5 that follows.
5 RESULTS AND ANALYSIS

5.1 Introduction

The purpose of this study is to explore the impact of tax education (TE) on tax compliance attitude (TC). The investigation was conducted from two dimensions: direct impact and indirect impact. As discussed in Section 3.6 of Chapter 3, both direct and indirect relationships were hypothesised between tax education and taxpayer’s compliance attitude. A direct relationship was tested under the Hypothesis H₁ (refer to Section 5.3.1), and an indirect relationship was tested through the enhancement of three intermediate variables: ‘ability/readiness to comply’, ‘perception of tax system fairness’ and ‘moral reasoning’, under three steps (refer to Section 5.3.2). As a first step, the impact of tax education on each intermediate variable was tested (Hypotheses H₂, H₃ and H₄), followed by the second step testing the impact of each intermediate variable on tax compliance (Hypotheses H₅, H₆ and H₇). As a final step for indirect impact, the results from the first and second steps are aggregated by multiplication of coefficients of each intermediate variable to arrive at the combined indirect impact of tax education on tax compliance via each variable (Hypothesis H₈). As a conclusion, the overall direct and indirect impacts of tax education on tax compliance were aggregated and interpreted (refer to Section 5.3.3). Figure 5.3.3-3 under Section 5.3 of this chapter illustrates the research model for this study with the respective hypotheses results for each relationship.

Before analyzing the overall test results in Section 5.3, a descriptive analysis of the samples used in this study was given in Section 5.2 in terms of the level of education
and other demographic characteristics. The chapter ends with a summary given in Section 5.4.

5.2 Descriptive Analysis of Samples

5.2.1 Sample Composition in terms of Level of Education

The total sample contained 221 observations (total group),\(^{119}\) with 124 (56%) having studied taxation\(^{120}\) and 97 (44%) not having studied taxation (refer to Figure 5.1 below). Of the 124 cases with tax studied, 71 (57%) had undergraduate level education and 53 (43%) had post-graduate level education.\(^{121}\) In the no-tax education group, 37 (38%) had only undergraduate level education and 60 (62%) had post-graduate level education. Considering that the central limit theorem\(^{122}\) states that a sampling distribution for 30 or more cases is approximately normally distributed,\(^{123}\) each of the sample sub-groups used in this study is considered sufficiently large for the statistical tests to be applicable.

\(^{119}\) Out of a total of 400 questionnaires distributed, 221 responses were collected (55%). Refer to Sections 4.6.2 and 4.6.3 of Chapter 4 for discussions of sample selection and sample size respectively.

\(^{120}\) They had either completed tax education or they were currently studying tax education.

\(^{121}\) Undergraduate or post-graduate level of education refers to someone either currently enrolled in studies at the undergraduate or post-graduate level or already having completed the study at that level.

\(^{122}\) The central limit theorem states that the distribution of the sample means will be approximately normally distributed provided that sample size is sufficiently large (n \(\geq\) 30).

\(^{123}\) Normality assessments have also been done for the distributions within each sub-sample group in terms of each variable in the respective sample groups, and the findings are satisfactory. Refer to Section 4.8.5 of Chapter 4 for details.
5.2.2 Demographic Characteristics of Samples

5.2.2.1 Descriptive Statistics

A number of demographic characteristics of samples were collected from the survey and these were summarised in Table D5.1 of Appendix D. Each of the distinctive demographic characteristics is analysed below:

Age

As shown in Figure 5.2.2.1-1 below, 76.4% of the total sample group of known age was of age group below 30 years, and 92.7% was of age group from 20 to 49 years. Based on the 2014/15 statistics, the total population in Hong Kong was 7.3m, of which 3.8m was working population. Of this working population, 3.2m was aged from 20 to 49, representing 84% of the total working population\textsuperscript{124}. Benchmarking this with 92.7% of the sample group used for this study falling within the same age group, this sample is

\textsuperscript{124} Mid-2015 figure of population aged 20-49 is 3.2m (aggregation of total for age group 20-24 up to 45-49) per http://www.censtatd.gov.hk/hkstat/sub/sp150.jsp?tableID=002&ID=0&productType=8

2014 figure of total working population (labour force participation rate) is 3.8m per http://www.gov.hk/en/about/abouthk/factsheets/docs/population.pdf

Therefore, proportion of age group 20–49 to working population: 3.2m/3.8m = 84%
slightly younger than the general working population in Hong Kong probably due to students being used, but the variation is small and therefore reasonably representative of the city’s population. Therefore, in general, the age distribution in this sample should be fairly in line with that of the working population in Hong Kong. All undergraduates with known age (UGT\textsuperscript{125} and UGNT\textsuperscript{125}) were of age group below 30. Postgraduate groups had a large proportion of sampled cases with known age (39\% PGT\textsuperscript{125} and 55\% PGNT\textsuperscript{125}) in the over 30 years of age segment. This is not contrary to expectation, as one would expect postgraduate students to be a few years older than the undergraduate students. With a significant proportion of postgraduate students being in the 30 years or older group, it suggests that this group may have had more work experience.

\textbf{Figure 5.2.2.1-1 - Age Distribution of Sample}

\footnotesize\textsuperscript{125} UGT denotes undergraduates with tax education; UGNT denotes undergraduates without tax education; PGT denotes postgraduates with tax education; PGNT denotes postgraduate without tax education.
Gender

As shown in Figure 5.2.1-2 below, females represented 58% of the total sample with known gender. The UGT (63%) and UGNT (69%) groups had a slightly higher proportion of females. The PGT group also had 56% females. The PGNT group was the only group with more males (55%) than females. However, the difference was not large and the sample was reasonably consistent with the other groups. In general, this distribution is fairly consistent with the HK population which constituted 56% females in the 14–49 years of age group at the end of 2014.¹²⁶

![Gender Distribution of the Sample](image)

Marital Status

The majority (88%) of the sample was single, which is also expected of the sampled age group (refer to Figure 5.2.2.1-3 below).

![Marital Status of the Sample](image)

Figure 5.2.2.1-3 - Marital Status of the Sample

Years of Work

As shown in Figure 5.2.2.1-4 below, almost all of the undergraduate samples consisted of individuals with less than 5 years of work experience with most (72% UGT and 83% UGNT) having less than 2 years. A large proportion of the postgraduate group (41% for PGT and 46% PGNT) was represented by those with over 5 years of work experience. Therefore, there is a strong likelihood that this group’s impact of education will be more tainted by factors other than education.
Figure 5.2.2.1-4 - Years of Work

Occupation

As illustrated in Figure 5.2.2.1-5 below, two thirds (66%) of the sample consisted of students with almost all undergraduates being students. Postgraduate groups had a significantly smaller share of students (PGT 40% and PGNT 26%). Nearly a quarter (24%) of the PGT samples was accountants and 36% was in other occupations. The PGNT group had only 12% accountants and nearly half (61%) were in other occupations. Again, both postgraduate groups would have had an influence from work, whereas undergraduate groups may not have been influenced by this factor.
Family Income

Referring to Figure 5.2.2.1-6 below, about a third (34%) of the total sample had annual family income below $120,000, which is the minimum personal allowance for an individual taxpayer in Hong Kong, indicating that this portion of the sample would not have had exposure to the tax reporting requirement. Within the remaining 66% that earned more than the minimum threshold, more than half (56%) were postgraduates. Within this postgraduate group earning more than the minimum threshold, one-third (31%) belonged to a higher income group earning more than $500,000 per annum. This indicates that postgraduate groups would have had more experience than undergraduates in tax reporting and tax payments, hence were more likely to be influenced by factors other than education when they decide to comply or not.
Years of Tax Paid

Figure 5.2.2.1-7 below illustrates the number of years of tax payments that the sample had. Nearly all the responded sample has had some experience of tax payments, with the majority (60%) of the total sample having less than two years. This population was mainly represented by undergraduates with UGT accounting for 79% with less than two years of tax payments and UGNT accounting for 82%. Conversely, the majority of postgraduates had more than two years of tax payment experience, with PGT accounting for 56% and PGNT accounting for 66%. Consistent with the findings on years of work and annual family income, postgraduate groups would have had more impact from factors relating to work and income rather than education in terms of compliance behaviour.
5.2.2.2 Overall Characteristics of the Sample

Demographic information such as age, gender, years of work and tax payments was collected to gain a better understanding of the characteristics of the sample groups analysed. This information should be helpful in understanding the difference in responses among groups. Based on the above descriptive statistics, the majority of sample was students, representing almost the entire undergraduate group. Relative to postgraduate groups, the undergraduate groups were younger, with less work and tax payment experience, and with lower annual family income. This implies that the undergraduate groups may not have been affected by factors other than education and therefore are more relevant for the study of the effect of education on tax compliance behaviour. While it might be true that the less experience in work and tax payments of the overall sample group would limit the representativeness of this survey in relation to the overall working population in Hong Kong, the tax reporting behaviour of the general taxpayers is believed to be influenced by lots of variables other than education, and these impacts would not have been examined without conducting a large-scale study.
Given the limited resources available for this study and its focus on tax education, samples were selected from those more likely to be influenced by their education and less likely tainted by other factors.

As regards the characteristics between tax-educated groups and no-tax-educated groups, there was no noticeable difference found. For example, all the undergraduate groups are under 30 years of age while a large proportion of postgraduates being over 30 years of age holds true for both PGT (39%) and PGNT (55%). In terms of work experience, the majority of the undergraduate groups with less than 5 years of work holds true for both UGT (72%) and UGNT (83%) while the majority of the postgraduate groups with more than 5 years of work holds true for both PGT (41%) and PGNT (46%). In terms of experience in tax payments, the majority of the undergraduate groups with less than 2 years of tax payments holds true for both UGT (77%) and UGNT (76%), while the majority of the postgraduate groups with more than 2 years of tax payments holds true for both PGT (56%) and PGNT (66%). The high degree of homogeneity between the tax-educated and no-tax-educated group for undergraduate and postgraduate levels respectively lends support to the assumption that the impact of tax education is more relevant to explain any difference in findings between the two groups. A sample profile of distinctive characteristics (in terms of four sub-sample groups by education level and with or without tax studied) is illustrated in Table 5.2.2.2-1 below.
Table 5.2.2.2-1 - Sample Profile of Distinctive Characteristics:

<table>
<thead>
<tr>
<th>Sub-groups</th>
<th>Distinctive Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td>Age &lt;30 (71%), female (58%), Single (88%), ≤5 years of work (77%), ≤2 years of tax payment (60%), annual family income &gt;$120,000 (66%).</td>
</tr>
<tr>
<td>Undergraduate with tax education (UGT)</td>
<td>Age &lt;30 (100%), female (63%), Single (100%), ≤2 years of work (72%), &lt; 2 years of tax payment (79%), annual family income &gt;$120,000 (62%).</td>
</tr>
<tr>
<td>Undergraduate without tax education (UGNT)</td>
<td>Age &lt;30 (100%), female (69%), Single (100%), ≤2 years of work (83%), &lt; 2 years of tax payment (82%), annual family income &gt;$120,000 (55%).</td>
</tr>
<tr>
<td>Postgraduate with tax education (PGT)</td>
<td>Age &gt;30 (39%), female (56%), Single (79%), &gt; 5 years of work (41%), ≥2 years of tax payment (56%), annual family income &gt;$120,000 (63%).</td>
</tr>
<tr>
<td>Postgraduate without tax education (PGNT)</td>
<td>Age &gt;30 (55%), male (55%), Single (74%), &gt; 5 years of work (46%), ≥2 years of tax payment (66%), annual family income &gt;$120,000 (94%).</td>
</tr>
</tbody>
</table>

Other than demographic features, descriptive of different sample groups in terms of tax education, tax compliance, ability/readiness to comply, perception of tax system fairness and moral reasoning were also given in Table E5.1 of Appendix E.

5.3 Hypotheses Testing

There are altogether 8 sets of hypotheses covering both direct and indirect impacts of tax education on tax compliance as illustrated in Figure 5.3-1 below:

127 As per Section 3.6 of Chapter 3.
One-tailed Testing

As explained in Section 1.4 of Chapter 1, all hypotheses are to be tested on a one-tailed basis. That is, this study will only test for the positive association between the dependent and independent variables. This is driven by the review of prior literature that mainly supported the conventional wisdom that education (and tax education) positively leads to higher taxpayer’s compliance. These studies include those from the 1980-90s (Scott & Grasmick, 1981; Thurman et al., 1984; Jackson & Milliron, 1986; Kaplan et al., 1988; Klepper & Nagin, 1989c; Grasmick & Bursik, 1990; Eriksen & Fallan, 1995), to the 2000s (Kasipillai et al., 2003; Richardson, 2005, 2006b; Ross & McGee, 2012a; Hamilton, 2012; Young & Gainsford, 2009). In the specific context of Hong Kong, the former Commissioner of Inland Revenue proposed in the 2010-11
annual report of the Hong Kong Inland Revenue Department that tax education should be strengthened to enhance taxpayers' high degree of compliance with tax law. Therefore, this study aims at collecting empirical evidence to support that it is true in the context of Hong Kong in the current environment that tax education is helping the taxpayers to do the right thing in terms of their tax reporting. The null hypothesis is that the mean is less than or equal to \( \mu \), and the alternate hypothesis is that the mean is greater than \( \mu \) \cite{Larose2014}.

The testing of direct impact (Hypothesis H1) is reported in Section 5.3.1, and the testing of indirect impact is reported in Section 5.3.2. The combined impact is discussed in Section 5.3.3. All hypotheses were tested by regression analysis and the impact was confirmed at the 10%, 5% or 1% level of significance.\footnote{All expected directions for hypotheses are positive, leading to all testings being based on one-tailed tests.}

### 5.3.1 Direct Impact of Tax Education on Tax Compliance:

This Section reports and discusses results for the testing of a direct relationship between tax education (TE) and tax compliance (TC). The direct relationship can be expressed by the following function:

\[
TC = f(TE)
\]

The linear equation was specified for testing the hypothesis:

\[
\text{Est. Equation: } TC = a + b_{TE}TE + e \quad \ldots \quad \ldots \text{(Eq 5.1)}
\]

where,

\footnote{There are two conventions to describe null hypothesis for one-tailed test. One convention is that null hypothesis equals zero; the other is that null hypothesis equals or is less than (or greater than) zero. For this study, the latter convention is adopted, making reference to Larose (2014). \footnote{*, ** and *** denote a significance level of 10%, 5% and 1% respectively.}}
TC = Attitude towards tax compliance; a binary variable with value equal to ‘1’ if an individual intended to comply and ‘0’ otherwise
TE = Tax education; a binary variable with value of ‘1’ if the individual had studied tax before and ‘0’ otherwise
A = Intercept coefficient to be estimated
b_{TC} = Slope coefficient to be estimated
e = Error term or residual

Set 1 of Hypothesis:

Null hypothesis H_0: Tax education has no positive direct impact on tax compliance.
Alternate hypothesis H_1: Tax education has a positive direct impact on tax compliance (one-tailed)

The direct impact was investigated for the total group first [Equation 5.1], then followed by the sub-groups for undergraduate [Equation 5.1-UG] and postgraduate groups [Equation 5.1-PG]. Findings are as follows:

5.3.1.1 Direct Impact for Total Group (Hypothesis H_1)

Bivariate regression analysis was used to estimate tax compliance (TC) by tax education (TE) for the total group based on the Estimated Equation 5.1. Detailed test outputs can be found in Table E5.2 of Appendix E. The findings are analysed as follows:
Table 5.3.1.1-1 - Regression for Direct Impact - Equation 5.1 – Total Group

<table>
<thead>
<tr>
<th>Dependent Variable: TC</th>
<th>Estimated Coefficients</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=219)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.678</td>
<td>0.117</td>
<td>-</td>
<td>31.433***</td>
<td>0.000</td>
</tr>
<tr>
<td>TE</td>
<td>0.307</td>
<td>0.156</td>
<td>0.132</td>
<td>1.966**</td>
<td>0.051</td>
</tr>
</tbody>
</table>

R-Square 0.017
F-Ratio 3.865**

Test Result for Hypothesis H₁ – Total Group:

The calculated t-value of 1.966 is greater than the critical t-value of 1.652 for 219 degrees of freedom at the 5% significance level in a 1-tailed test. The null hypothesis was therefore rejected. Tax education was found to be statistically significant, having a positive but small (0.307) impact on tax compliance for the total sample group. When no tax education was studied, tax compliance was estimated to be 3.678; whereas with tax education, tax compliance was estimated to be 3.985 (3.678 + 0.307). This validated that tax education has a positive impact on tax compliance, contributing to 1.7% (R-square 0.017) of the variance in tax compliance. The estimated coefficient of 0.307 is the mean difference between the two sample groups with and without tax education (mean of tax-group = 3.99; mean of no-tax-group = 3.68). This is consistent with the findings comparing the group means between tax-education and no-tax-education groups (refer to Table D5.2 of Appendix D under variable: tax compliance – total - mean difference of 0.31).

---

130 T-ratio = (B – 0)/ SE(B) when value is being tested equal to zero in null hypothesis. This t-value is for N-K-1 degrees of freedom where N=number of observations, K=number of independent variables.

131 R-square is a measure of how good the fit is and explains what proportion of variation is explained by a variable, i.e., explained sum of squares over total sum of squares

132 F-ratio = explained sum of squares (MSR) / unexplained sum of squares (MSE) where MSR = sum of squares for regression / K (= number of independent variable) and MSE = sum of squares for residual / (N-K-1) (N=number of observations).

133 When TE equals 0, TC = intercept value = 3.678.

134 Refer to Table D5.2 of Appendix D for details of mean statistics for different groups.
5.3.1.2 Direct Impact for Sub-Groups (Hypothesis H₁)

In order to further find out whether and how the positive impact of tax education on tax compliance is influenced by the education level, a further study was conducted based on the undergraduate and postgraduate sub-groups respectively. Test findings are summarised in Table 5.3.1.2-1 below:

<table>
<thead>
<tr>
<th>Est. regression equation 5.1-UG : $TC_{UG} = a + b_{UGTC}TE_{UG} + e$</th>
<th>Null hypothesis: $b_{UGTC} \leq 0$, Alternate hypothesis: $b_{UGTC} &gt; 0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: $TC_{UG}$</td>
<td>Estimated Coefficients</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.351</td>
</tr>
<tr>
<td>$TE_{UG}$</td>
<td>0.895</td>
</tr>
</tbody>
</table>

R-Square 0.163
F-Ratio 20.686***

<table>
<thead>
<tr>
<th>Est. regression equation 5.1-PG : $TC_{PG} = a + b_{PGTC}TE_{PG} + e$</th>
<th>Null hypothesis: $b_{PGTC} \leq 0$, Alternate hypothesis: $b_{PGTC} &gt; 0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: $TC_{PG}$</td>
<td>Estimated Coefficients</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.880</td>
</tr>
<tr>
<td>$TE_{PG}$</td>
<td>-0.244</td>
</tr>
</tbody>
</table>

R-Square 0.010
F-Ratio 1.074

*** = at 1% significant level

Test Results for Hypothesis H₁ - Sub-Groups:

The test result showed that a significant positive impact of tax education on tax compliance was only found for the undergraduate sub-group. For this sub-group, the calculated t-value of 4.548 is greater than the critical t-value of 2.364 for 106 degrees of freedom at the 1% significance level in a 1-tailed test. The null hypothesis was therefore rejected. Tax education for the undergraduate group was found to be statistically significant in having a positive impact (0.895) on tax compliance for the undergraduates. However, for the postgraduate group, the calculated t-value of 1.037 is

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135 In terms of undergraduate level and post-graduate level.
136 Significant at the 1% level.
not greater than the critical t-value of 1.659 for 111 degrees of freedom at the 5% significance level in a 1-tailed test. The null hypothesis was therefore not rejected. Tax education for the postgraduate group was found to be not statistically significant in having a positive impact on tax compliance for the postgraduates.

In the undergraduate group, with no tax education studied, the mean value for tax compliance was 3.351 (intercept); for those with tax education, tax compliance was higher at 4.246 (3.351 + 0.895). The mean difference (0.895) represents the extent by which the tax compliance of tax-educated undergraduates is higher than that of the no-tax-educated undergraduates (UGT’s mean = 4.25; UGNT’s mean = 3.35).\textsuperscript{137} Comparing this with the mean difference for the total sample group (0.307), the undergraduate group has a larger variance in tax compliance as influenced by tax education. The substantial and significant t-ratio (4.548\textsuperscript{***}) and F-ratio (20.686\textsuperscript{***}) supported that tax education in this undergraduate sub-group made a substantial contribution of 16.3\% in the variance in tax compliance.

5.3.1.3 Overall Conclusion for Direct Impact

At an overall level, tax education was found to have a direct and significant impact on tax compliance. However, there was a difference between undergraduate and postgraduate sub-groups as the postgraduate sub-group was not found to be significant. There could be various reasons to explain the difference between sub-groups. One possible reason could be due to the focus in technical content in designing the tax module syllabus for undergraduate education and the incorporation of business ethics in

\textsuperscript{137} Refer to Table D5.2 of Appendix D for details of mean statistics for different groups.
the undergraduate curriculum, hence uplifting the ability/readiness of undergraduate students to comply with tax reporting requirements. As for postgraduate groups, the absence of a statistically significant impact of tax education on this group’s compliance could be due to the influence of factors other than education. For example, postgraduates with more years of work and tax-paying experience may have other pressures, such as care for family that may encourage them to adopt less compliant behaviour. On balance, the overall test result was supportive to Hypothesis H₁, that tax education has a positive impact on tax compliance. This is consistent with prior literature (Ross & McGee, 2012a; Hamilton, 2012).

5.3.1.4 Alternate Regression for Direct Impact

The above testing for Hypothesis H₁ was performed based on bivariate regression to predict tax compliance with only one variable: tax education. This result should hold true when tax compliance is only affected by tax education. However, if tax compliance is effectively affected by tax education and other factors, it is uncertain whether the estimated impact as calculated from the bivariate regression includes the impact of other factors acting together. Given that this study has identified three other core factors that affect tax compliance being: ability/readiness to comply, perception of tax system fairness and moral reasoning, it was considered more appropriate to include tax education in the multiple regression covering all the core factors, such that the isolated effect of tax education on tax compliance could be obtained while holding other variables (ability/readiness to comply, perception of tax system fairness and moral reasoning) constant. The multiple regression covering all the four core variables on tax compliance has been tested based on the following equation:
\[ TC = a + b_1 TE + b_2 AbR + b_3 TSF + b_4 MR + e \ldots \quad \text{Eq. No. 5.5} \]

Test findings are discussed in Section 5.3.2.2.2 and estimated impact of tax education (TE) can be found in Table 5.3.2.2.2-1 (total group), Table 5.3.2.2.2-3 (undergraduate group) and Table 5.3.2.2.2-5 (postgraduate group) below. Consistent with the Equation No. 5.1, the Equation No. 5.5 also revealed that tax education was statistically significant in having a positive impact on tax compliance at the total group level and undergraduate level, but not postgraduate level. However, a different coefficient was recorded. The positive impact estimated under Equation No. 5.1 was 0.307 for total group and 0.895 for undergraduate group; whereas the positive impact under Equation No. 5.5 was 0.187 for total group and 0.579 for undergraduate group. As the results from Equation No. 5.5 are more accurate, the coefficients of 0.187 (total group) and 0.579 (undergraduate) are adopted in the overall conclusion as illustrated in Section 5.3.3 in the later part of this chapter (see Figures 5.3.3-1 and 5.3.3-2 of Section 5.3.3).

Other than direct impact, the researcher believes that the positive impact of tax education on tax compliance could also be attributable to the enhancement of intermediate factors such as the understanding of tax system (Eriksen & Fallan, 1996), ability/readiness to comply (Hamilton, 2012) and tax ethics (Song & Yarborough, 1978). Further study was therefore conducted to investigate the indirect impacts through these intermediate variables in the sections that follow.
5.3.2 Indirect Impact of Tax Education on Tax Compliance:

This section seeks to investigate whether, and to what extent, tax education (TE) has an indirect impact on tax compliance attitude (TC) through the enhancement of three intermediate variables: (1) ability/readiness to comply (AbR), (2) perception of tax system fairness (TSF) and (3) moral development (MR). Three steps were involved in this investigation:

**Step 1:** The relationship of tax education (TE) on each of the three intermediate variables: AbR, TSF and MR was tested under Hypotheses H$_2$, H$_3$ and H$_4$ (refer to Section 5.3.2.1 below);

**Step 2:** the respective relationship of each of AbR, TSF and MR on tax compliance (TC) was tested under Hypotheses H$_5$, H$_6$ and H$_7$ (refer to Section 5.3.2.2 below);

**Step 3:** the combined indirect impact was obtained from aggregating the significant results from first and second steps and tested under Hypothesis H$_8$ (refer to Section 5.3.2.3 below).

Testing of each hypothesis was also extended into undergraduate and postgraduate sub-groups to detect further explainable phenomenon. Estimated regression equations were developed to facilitate the testing. All hypotheses were tested by way of regression analysis.

5.3.2.1 Step 1 - Impact of Tax Education on Intermediate Variables

Estimated regression equations developed for Hypotheses H$_2$ to H$_4$ for the total group are shown in Table 5.3.2.1-1.
Table 5.3.2.1-1 - Regression for Indirect Impact Step 1 - Summary of Equations

<table>
<thead>
<tr>
<th>Eq. No.</th>
<th>Functional Form</th>
<th>Regression Equation</th>
<th>Hypotheses</th>
<th>Sample group</th>
</tr>
</thead>
</table>
| 5.2     | AbR = f(TE)    | AbR = a + b_{AbR}TE + e | Set 2 of Hypothesis: H(null): b₁ ≤ 0  
|         |                |                     | H(alt): b₁ > 0  | 221 observations |
| 5.3     | TSF = f(TE)    | TSF = a + b_{TSF}TE + e | Set 3 of Hypothesis: H(null): b₁ ≤ 0  
|         |                |                     | H(alt): b₁ > 0  | 221 observations |
| 5.4     | MR = f(TE)     | MR = a + b_{MR}TE + e | Set 4 of Hypothesis: H(null): b₁ ≤ 0  
|         |                |                     | H(alt): b₁ > 0  | 221 observations |

AbR = Ability and readiness to comply. Respondents chose a value between 1 and 6.¹³⁸  
TSF = Perception to tax system fairness. Respondents chose a value between 1 and 6.¹³⁸  
MR = Moral reasoning. Respondents chose a value between 1 and 6.¹³⁸  
a’s and b’s = coefficients to be estimated; e = residual.

The test result for each hypothesis (total group and sub-groups) is illustrated under paragraphs (a) to (c) below, with the findings summarised in Table 5.3.2.1-6 and concluded under paragraph (d).

(a) Indirect Impact via Ability/readiness to Comply (AbR) (Hypothesis H₂):

Est. Equation: AbR = a + b_{AbR}TE + e...  
...Eq. 5.2

Set 2 of Hypothesis:

Null hypothesis H₀: Tax education has no positive impact on ability/readiness to comply.

Alternate hypothesis H₂: Tax education has a positive impact on ability/readiness to comply

Results from Estimated Equation 5.2 are shown in Table 5.3.2.1-2 (refer to Table E5.3 of Appendix E for detailed test outputs):

¹³⁸ Likert scales from 1 to 6 where 1 is ‘strongly disagree’ and 6 is ‘strongly agree’.
Table 5.3.2.1-2 - Regression for Indirect Impact Step 1 via AbR: Equation 5.2 - Total group/sub-groups

<table>
<thead>
<tr>
<th>Regression equation 5.2 : AbR = a + bAbR TE + e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null hypothesis: b ≤ 0, Alternate hypothesis: b &gt; 0</td>
</tr>
<tr>
<td>Dependent</td>
</tr>
<tr>
<td>Variable: AbR</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>TE</td>
</tr>
<tr>
<td>R-Square</td>
</tr>
<tr>
<td>F-Ratio</td>
</tr>
</tbody>
</table>

Regression equation 5.2-UG for Undergraduates: AbR<sub>UG</sub> = a + b<sub>UGAbR</sub> TE<sub>UG</sub> + e

| Null hypothesis: b<sub>UG</sub> ≤ 0, Alternate hypothesis: b<sub>UG</sub> > 0 |
| Dependent | Estimated Coefficient | Standard Error | Standardised Coefficient | T-Ratio (df=106) | p-value |
| Variable: AbR<sub>UG</sub> |  |  |  |  |  |
| Intercept | 3.787 | 0.099 | - | 38.209*** | 0.000 |
| TE | 0.428 | 0.122 | 0.322 | 3.498*** | 0.001 |
| R-Square | 0.104 |
| F-Ratio | 12.239*** |

Regression equation 5.2-PG for Postgraduates: AbR<sub>PG</sub> = a + b<sub>PGAbR</sub> TE<sub>PG</sub> + e

| Null hypothesis: b<sub>PG</sub> ≤ 0, Alternate hypothesis: b<sub>PG</sub> > 0 |
| Dependent | Estimated Coefficient | Standard Error | Standardised Coefficient | T-Ratio (df=111) | p-value |
| Variable: AbR<sub>PG</sub> |  |  |  |  |  |
| Intercept | 3.909 | 0.080 | - | 49.073*** | 0.000 |
| TE | -0.006 | 0.116 | -0.005 | -0.051 | 0.959 |
| R-Square | 0.000 |
| F-Ratio | 0.003 |

*** = Significant at 1% level

Test Result for Hypothesis H2:

Hypothesis H₂ tests the impact of tax education (TE) on the ability/readiness to comply (AbR). At an overall level, the calculated t-value of 2.608 is greater than the critical t-value of 2.344 for 219 degrees of freedom at the 1% significance level in a 1-tailed test. The null hypothesis was therefore rejected. Tax education was found to be statistically significant and to have a positive but small (0.219) impact on the total sample's ability/readiness to comply. When no tax education was studied, the mean value for ability/readiness to comply was 3.862 (intercept); for those with tax education, the ability/readiness to comply was higher at 4.081 (3.862 + 0.219). This supports tax

---

139 df = N-K-1; df for total group: 221-1-1=219; df for undergraduate group: 108-1-1=106; df for postgraduate group: 113-1-1=111.
140 The stated p-value is based on two-tailed distribution, whereas this study is for one-tailed.
education having a positive impact on ability/readiness to comply, contributing to 3% (R-square 0.03) of the variance in ability/readiness to comply.

In terms of sub-groups, the test results showed that, similar to Hypothesis H₁, the significant and positive impact of tax education on ability/readiness to comply was only recorded for the undergraduate sub-group, but the postgraduate sub-group was found to be insignificant. For undergraduates, the calculated t-value of 3.498 is greater than the critical t-value of 2.364 for 106 degrees of freedom at the 1% significance level in a 1-tailed test. The null hypothesis was therefore rejected. Tax education for the undergraduate group was found to have a statistically significant and positive impact (0.428) on the undergraduates’ abilities/readiness to comply. For undergraduates without tax education studied, the mean value for ability/readiness to comply was 3.787 (intercept); for those with tax education, ability/readiness to comply was higher at 4.215 (3.787 + 0.428). This is consistent with the mean statistics obtained from different sub-group (UGT’s mean = 4.21; UGNT’s mean = 3.79).¹⁴¹ Comparing this with the mean difference for the total sample group (0.219), the undergraduate group had a larger variance in ability/readiness to comply as influenced by tax education. Tax education explains 10.4% (R-square 0.104) of the variance in ability/readiness to comply at the undergraduate level. However, for the postgraduate group, the calculated t-value of 0.051 is not greater than the critical t-value of 1.659 for 111 degrees of freedom at the 5% significance level in a 1-tailed test. The null hypothesis was therefore not rejected. Tax education for the postgraduate group was found to be not statistically significant and to have a positive impact on the postgraduates’ abilities/readiness to comply.

¹⁴¹ Refer to Table D5.2 of Appendix D for details of mean statistics for different groups.
Although difference was detected between sub-groups, the findings for postgraduates were not significant, possibly for external influences that may have occurred since the completion of the undergraduate degree. On balance, Hypothesis H₂ was supported; that tax education has a positive impact on ability/readiness to comply. This result is consistent with prior literature that shows that tax knowledge helped reduce ambiguity of tax law/practice, hence enhancing taxpayer’s ability/readiness to comply (Roth et al., 1989; Hotaling & Arnold, 1981). Through the enhancement of ability/readiness to comply, the taxpayers’ compliance level is expected to follow. This expectation will be further tested under Hypothesis H₅ under Section 5.3.2.2.2 below.

(b) Indirect Impact via Perception of tax system fairness (TSF) (Hypothesis H₃):

Est. Equation: \[ TSF = a + b_{TSF} TE + e \] …Eq. 5.3

Set 3 of Hypothesis:

Null hypothesis H₀: Tax education has no positive impact on perception of tax system fairness.
Alternate hypothesis H₃: Tax education has a positive impact on perception of tax system fairness. (one-tailed)

Results from Estimated Equation 5.3 are shown in Table 5.3.2.1-3 below (refer to Table E5.4 of Appendix E for detailed test outputs):
Table 5.3.2.1-3 - Regression for Indirect Impact Step 1 via TSF: Equation 5.3 - Total group/sub-groups

Est. regression equation (5.3) : \[ TSF = a + b_{TSF} \cdot TE + e \]

Null hypothesis: \( b_{TSF} \leq 0 \), Alternate hypothesis: \( b_{TSF} > 0 \)

<table>
<thead>
<tr>
<th>Dependent Variable: TSF</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=219)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.102</td>
<td>0.071</td>
<td>-</td>
<td>57.965***</td>
<td>0.000</td>
</tr>
<tr>
<td>TE</td>
<td>0.079</td>
<td>0.094</td>
<td>0.057</td>
<td>0.838</td>
<td>0.403</td>
</tr>
</tbody>
</table>

R-Square 0.003
F-Ratio 0.702

Est. regression equation 5.3-UG for Undergraduates: \[ TSF_{UG} = a + b_{UGTSF} \cdot TE_{UG} + e \]

Null hypothesis: \( b_{UGTSF} \leq 0 \), Alternate hypothesis: \( b_{UGTSF} > 0 \)

<table>
<thead>
<tr>
<th>Dependent Variable:TSFUG</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=106)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.847</td>
<td>0.099</td>
<td>-</td>
<td>38.963***</td>
<td>0.000</td>
</tr>
<tr>
<td>TE</td>
<td>0.201</td>
<td>0.122</td>
<td>0.158</td>
<td>1.648*</td>
<td>0.102</td>
</tr>
</tbody>
</table>

R-Square 0.025
F-Ratio 2.716

Est. regression equation 5.3-PG for Postgraduates: \[ TSF_{PG} = a + b_{PGTSF} \cdot TE_{PG} + e \]

Null hypothesis: \( b_{PGTSF} \leq 0 \), Alternate hypothesis: \( b_{PGTSF} > 0 \)

<table>
<thead>
<tr>
<th>Dependent Variable:TSFPG</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=111)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.259</td>
<td>0.096</td>
<td>-</td>
<td>44.394***</td>
<td>0.000</td>
</tr>
<tr>
<td>TE</td>
<td>0.101</td>
<td>0.140</td>
<td>0.068</td>
<td>0.719</td>
<td>0.474</td>
</tr>
</tbody>
</table>

R-Square 0.005
F-Ratio 0.517

‘*’, ‘***’ = Significant at 10% and 1% level respectively

Test Result for Hypothesis H₃:

Hypothesis H₃ tests the impact of tax education (TE) on the perception of tax system fairness (TSF). The test found that at total sample and postgraduate levels, no statistical significant relationship was found between tax education and the perception of tax system fairness. A significant impact was found at the undergraduate level at the 10% significance level, with the impact of 0.201 and contributing power of 2.5% (R-square of 0.025). Generally speaking, this finding is consistent with prior literature which suggested that knowledge and understanding of the tax system should help increase taxpayer’s perception of fairness and attitudes toward tax compliance (Strumpel, 1969; Crane & Nourzad, 1990), although the relationship only holds true for
the undergraduate group. Given that the variable TSF was represented by the mean of three sub-constructs: (1) understanding of tax system (TxS), (2) appreciation of Hong Kong tax office (IRD), and (3) satisfaction of Hong Kong government (Gov), an expanded study was performed to explore how each sub-construct in each sample group would explain the relationship with tax education.

**Expanded Test of Hypothesis $H_3$ via TSF Sub-constructs:**

The estimated equation Eq.5.3 was expanded into three sub-equations as follows:

- **Est. Equation for TSF:**
  \[ TSF = a + b_{TSF} \times TE + e \]  
  ...Eq. 5.3

- **Expanded sub-equation for TxS:**
  \[ TxS = a + b_{TxS} \times TE + e \]  
  ...Eq. 5.3a

- **Expanded sub-equation for IRD:**
  \[ IRD = a + b_{IRD} \times TE + e \]  
  ...Eq. 5.3b

- **Expanded sub-equation for Gov:**
  \[ Gov = a + b_{Gov} \times TE + e \]  
  ...Eq. 5.3c

The test results are summarised in Table 5.3.2.1-4 below (refer to Table E5.4(a) of Appendix E for detailed test outputs):
Table 5.3.2.1-4 - Regression for Indirect Impact Step 1 via TSF-sub-constructs: Expanded Equation

5.3 - Total group/sub-groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>TSF = mean of (TxSys, IRD, Govt)</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio</th>
<th>p-value</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Results for Total Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TxS=a₁+b₁TE+e₁</td>
<td>H(null): b₁ ≤0, H(alt): b₁ &gt;0</td>
<td>-0.012</td>
<td>0.103</td>
<td>-0.008</td>
<td>-0.112</td>
<td>0.911</td>
<td>0.000</td>
</tr>
<tr>
<td>IRD=a₂+b₂TE+e₂</td>
<td>H(null): b₂ ≤0, H(alt): b₂ &gt;0</td>
<td>0.188</td>
<td>0.108</td>
<td>0.117</td>
<td>1.749**</td>
<td>0.082</td>
<td>0.014</td>
</tr>
<tr>
<td>Gov=a₃+b₃TE+e₃</td>
<td>H(null): b₃ ≤0, H(alt): b₃ &gt;0</td>
<td>0.061</td>
<td>0.127</td>
<td>0.032</td>
<td>0.479</td>
<td>0.633</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Results for Undergraduate Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TxSUG=a₁+b₁TE+e₁</td>
<td>H(null): b₁ ≤0, H(alt): b₁ &gt;0</td>
<td>0.150</td>
<td>0.142</td>
<td>0.102</td>
<td>1.056</td>
<td>0.293</td>
<td>0.010</td>
</tr>
<tr>
<td>IRDUG = a₂+b₂TE+e₂</td>
<td>H(null): b₂ ≤0, H(alt): b₂ &gt;0</td>
<td>0.326</td>
<td>0.135</td>
<td>0.228</td>
<td>2.409***</td>
<td>0.018</td>
<td>0.052</td>
</tr>
<tr>
<td>GovUG=a₃+b₃TE+e₃</td>
<td>H(null): b₃ ≤0, H(alt): b₃ &gt;0</td>
<td>0.127</td>
<td>0.164</td>
<td>0.075</td>
<td>0.772</td>
<td>0.442</td>
<td>0.006</td>
</tr>
<tr>
<td><strong>Results for Postgraduate Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TxSPG=a₁+b₁TE+e₁</td>
<td>H(null): b₁ ≤0, H(alt): b₁ &gt;0</td>
<td>-0.053</td>
<td>0.150</td>
<td>-0.033</td>
<td>-0.350</td>
<td>0.727</td>
<td>0.001</td>
</tr>
<tr>
<td>IRD_PG = a₂+b₂TE+e₂</td>
<td>H(null): b₂ ≤0, H(alt): b₂ &gt;0</td>
<td>0.223</td>
<td>0.161</td>
<td>0.130</td>
<td>1.382*</td>
<td>0.170</td>
<td>0.017</td>
</tr>
<tr>
<td>GovPG =a₃+b₃TE+e₃</td>
<td>H(null): b₃ ≤0, H(alt): b₃ &gt;0</td>
<td>0.132</td>
<td>0.193</td>
<td>0.065</td>
<td>0.686</td>
<td>0.494</td>
<td>0.004</td>
</tr>
</tbody>
</table>

* *, ** *, *** denote significant level at 10%, 5% and 1% level.

Based on the above test results, a significant impact (5% for total group, 1% for undergraduate and 10% for postgraduate) was found only on the sub-construct IRD, suggesting that tax education increases taxpayers’ appreciation of the tax authority’s role and function, which probably helps to explain the significant (10%) impact of tax
education on the undergraduates’ perception of tax system fairness (refer to Equation 5.3-UG for undergraduates shown in Table 5.3.2.1-3 above).

(c) Indirect Impact via Moral Reasoning (MR) (Hypothesis $H_4$):

Est. Equation:  
\[ MR = a + b_{MR} \cdot TE + e \]  \(...Eq. 5.4\)

Set 4 of Hypothesis:

Null hypothesis $H_0$: Tax education has no positive impact on moral reasoning.
Alternate hypothesis $H_A$: Tax education has a positive impact on (one-tailed) moral reasoning.

Results from Estimated Equation 5.4 are shown in Table 5.3.2.1-5 below (refer to Table E5.5 of Appendix E for detailed test outputs):

Table 5.3.2.1-5 - Regression for Indirect Impact Step 1 via MR: Equation 5.4 - Total group/sub-groups

<table>
<thead>
<tr>
<th>Dependent Variable: $MR$</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=219)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.479</td>
<td>0.083</td>
<td>42.052***</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>0.082</td>
<td>0.110</td>
<td>0.050</td>
<td>0.740</td>
<td>0.460</td>
</tr>
</tbody>
</table>

R-Square 0.002
F-Ratio 0.547

Table 5.3.2.1-5 - Regression for Indirect Impact Step 1 via MR: Equation 5.4 - Undergraduates: $MR_{UG}$

<table>
<thead>
<tr>
<th>Dependent Variable: $MR_{UG}$</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=106)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.407</td>
<td>0.113</td>
<td>30.226***</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>0.251</td>
<td>0.139</td>
<td>0.173</td>
<td>1.805**</td>
<td>0.074</td>
</tr>
</tbody>
</table>

R-Square 0.030
F-Ratio 3.260

Table 5.3.2.1-5 - Regression for Indirect Impact Step 1 via MR: Equation 5.4 - Postgraduates: $MR_{PG}$

<table>
<thead>
<tr>
<th>Dependent Variable: $MR_{PG}$</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=111)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.524</td>
<td>0.119</td>
<td>29.706***</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>-0.093</td>
<td>0.173</td>
<td>-0.536</td>
<td>0.593</td>
<td></td>
</tr>
</tbody>
</table>

R-Square 0.003
F-Ratio 0.287

‘**’, ‘***’ = at 5% and 1% significance levels respectively
Test Result for Hypothesis H₄:

Hypothesis H₄ tests the impact of tax education (TE) on moral reasoning (MR). At an overall level and postgraduate level, no significant impact was found by tax education on moral reasoning. A significant positive impact was only recorded for the undergraduate sub-group, with a t-ratio of 1.805 which was found to be significant at the 5% level, contributing to 3% of the variance in moral reasoning. Given the calculated t-ratio exceeded the critical t-ratio,¹⁴² the null hypothesis is rejected. Tax education for undergraduates was found to have a statistically significant impact on moral reasoning. For the undergraduate group, when no tax education was studied, the mean value for moral reasoning was 3.407 (intercept); for those with tax education, moral reasoning was higher at 3.658 (3.407 + 0.251). This is consistent with the mean statistics obtained from different sub-groups (UGT’s mean = 3.66; UGNT’s mean = 3.41).¹⁴³ This finding was also consistent with prior literature which suggested that more fiscal knowledge helped increase tax ethics and tax compliance (Song & Yarborough, 1978). This could possibly be attributable to the curricular design of the undergraduate program that incorporates ethics and moral development in most of business and accountancy-related modules. As taxpayers progress to being post-graduates, with increasing work experience and exposure to non-compliance opportunities, the impact of tax education on their moral reasoning has possibly been worn out.

(d) Interim Conclusion of Indirect Impact (Step 1): H₂, H₃ and H₄

The test results on the impact of tax education on ability/readiness to comply, perception of tax system fairness, and moral reasoning, as obtained from Equations 5.2,

¹⁴² Calculated t-ratio (1.805) is greater than critical t-ratio (1.652) (df =106; one-tailed; 5%)
¹⁴³ Refer to Table D5.2 of Appendix D for details of mean statistics for different groups.
5.3 and 5.4 (tables 5.5, 5.6 and 5.8 above) are summarised in Table 5.3.2.1-6 below:

Table 5.3.2.1-6 - Interim Conclusion for Indirect Impact – Step 1: Impact of Tax Education on Intermediate Variables

<table>
<thead>
<tr>
<th></th>
<th>Total Group</th>
<th>Undergraduate Group</th>
<th>Postgraduate Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimated Coefficient</td>
<td>Sign Expected /per test</td>
<td>Estimated Coefficient</td>
</tr>
<tr>
<td>AbR</td>
<td>0.219***</td>
<td>+ve/+ve</td>
<td>0.428***</td>
</tr>
<tr>
<td>TSF</td>
<td>0.079</td>
<td>+ve/NS</td>
<td>0.201*</td>
</tr>
<tr>
<td>MR</td>
<td>0.082</td>
<td>+ve/NS</td>
<td>0.251**</td>
</tr>
</tbody>
</table>

* *, **, *** denote 10%, 5% and 1% significance level. NS denotes 'not significant' thus no sign was shown. Shaded cells highlight significant findings. AbR: Ability/readiness to comply; TSF: Perception of tax system fairness; MR: Moral Reasoning

Source: Tables 5.5, 5.6, 5.8

Based on the test findings, conclusions were drawn for Hypotheses H₂ to H₄ as illustrated in Table 5.3.2.1-7:

Table 5.3.2.1-7 - Conclusions for Hypotheses H₂, H₃ and H₄

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Test Resultsa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>H₂  Tax education has a positive impact on ability/readiness to comply.</td>
<td>Supported</td>
</tr>
<tr>
<td>H₃  Tax education has a positive impact on perception of tax system fairness.</td>
<td>Supported</td>
</tr>
<tr>
<td>H₄  Tax education has a positive impact on moral reasoning.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Note a: Test results for each hypothesis are presented for total group, undergraduate group (UG) and postgraduate group (PG). For total group, the hypothesis is regarded as supported if the hypothesis is supported either for UG or PG.

Based on the test results¹⁴⁴ for Hypotheses H₂ to H₄, it was found that tax education has a substantial significant impact on ability/readiness to comply, tax system fairness and moral reasoning, despite being confined to the undergraduate group. All the relationships found significant were positive, which is consistent with what was expected for the hypotheses.¹⁴⁵ As a result, hypotheses H₂, H₃ and H₄ are considered as supported. The findings being confined to undergraduate group could possibly be

¹⁴⁴ Refer to Table D5.3 of Appendix D for summary of test results for H₁ to H₄.
¹⁴⁵ All hypotheses were one-tailed with expectation of positive signs, i.e. tax education increases level of each intermediate variable.
due to the curricular design of taxation modules taught in the undergraduate level in Hong Kong where focus is usually placed on the technical content of the subject, leading to the general enhancement of the students’ abilities and readiness to comply and their perception of tax system fairness. Ethics is also commonly incorporated in the undergraduate degree curriculum, enhancing the general moral standards of undergraduates, leading to higher tax compliance. The test result lends support to the findings that tax education enhances taxpayers’ compliance attitudes through increasing their abilities and readiness to comply (Hamilton, 2012), through strengthening their perception of tax system fairness (Braithwaite, 2007) and through enhancing their ethical standards (Song & Yarborough, 1978).

5.3.2.2 Step 2 - Impact of Intermediate Variables on Tax Compliance

In the above section, the impact of tax education on each of the intermediate variables was tested (Step 1). The test result confirmed that tax education has significant positive impacts on ability/readiness to comply and moral reasoning. In this section, the impact of each intermediate variable on tax compliance was tested (Step 2) under Sets 5, 6 and 7 of hypotheses (H₅ to H₇), as follows:

**Set 5 of Hypothesis:**

**Null hypothesis H₀:** Ability/readiness to comply (AbR) has no positive impact on tax compliance.

**Alternate hypothesis H₅:** (one-tailed) Ability/readiness to comply (AbR) has a positive impact on tax compliance.

**Set 6 of Hypothesis:**

**Null hypothesis H₀:** Perception of tax system fairness (TSF) has no positive impact on tax compliance.

**Alternate hypothesis H₆:** (one-tailed) Perception of tax system fairness (TSF) has a positive impact on tax compliance.
Set 7 of Hypothesis:

Null hypothesis $H_0$: Moral reasoning (MR) has no positive impact on tax compliance.

Alternate hypothesis $H_1$: Moral reasoning (MR) has a positive impact on tax compliance.

(one-tailed)

The following regression model and estimated equation were developed to test the above hypotheses:

Regression model 5.5: $TC = \alpha + \beta_1 TE + \beta_2 AbR + \beta_3 TSF + \beta_4 MR + \epsilon$

Estimated Equation\(^{146}\): $TC = a + b_1 TE + b_2 AbR + b_3 TSF + b_4 MR + \epsilon \ldots$ Eq. 5.5

Where,

$TC =$ Tax Compliance; measured as expression of respondents’ intent that they are likely to comply. It is represented by a variable with values ranging from 1 to 6. ‘1’ means ‘strongly disagree’ and ‘6’ means ‘strongly agree’.

$TE =$ Tax education; measured as a binary variable with value ‘1’ indicating that respondent had undergraduate or postgraduate level of tax education and ‘0’ otherwise

$AbR =$ Ability and readiness to comply. It is represented by a variable with values ranging from 1 to 6. ‘1’ means ‘strongly disagree’ and ‘6’ means ‘strongly agree’.

$TSF =$ Perception of tax system fairness. It is the mean value of three sub-constructs: TxS, IRD and Gov. TxS measures respondents’ level of understanding of Hong Kong tax system; IRD measures respondents’ level of appreciation of Hong Kong tax authority; Gov measures respondents’ level of satisfaction of Hong Kong government. Values range from 1 to 6. ‘1’ means ‘strongly disagree’ and ‘6’ means ‘strongly agree’.

$MR =$ Moral Reasoning. It is represented by a variable with values ranging from 1 to 6. ‘1’ means ‘strongly disagree’ and ‘6’ means ‘strongly agree’.

Estimated Equation 5.5 covers the total sample group, and the test was also extended to cover the undergraduate (Eq.5.5-UG) and postgraduate sub-groups (Eq.5.5-PG). Test findings were discussed in Section 5.3.2.2.2 below, after the discussion on the testing of demographic factors in Section 5.3.2.2.1 that follows.

\(^{146}\) Linear relationships between tax compliance and independent variables were confirmed by two dimensional scatter plots. See Table E4.8 of Appendix E for detailed test outputs.
5.3.2.2.1 Impact of Demographic Factors on Tax Compliance (Eq.5.5D):

The equation (Eq 5.5) sought to predict tax compliance in terms of the four core variables identified by the researcher earlier for this study: tax education (TE), ability/readiness to comply (AbR), perception of the tax system (TSF) and moral reasoning (MR). Demographic variables have not been taken into account in this equation for the reasons that they were either not relevant or not material in terms of impacting tax compliance. As explained in Section 4.9.3.2 of Chapter 4 under ‘Equation 5.5D’, only four demographic variables were identified as potentially relevant to tax compliance in this study. These four variables are: age, gender, years of work and years of tax payment. A separate test was performed to test their impacts on tax compliance under Equation 5.5D below:

Est. Equation 5.5D:

\[ TC = a + b_1 \text{Age} + b_2 \text{Gender} + b_3 \text{YrsWk} + b_4 \text{YrsTx} + e \ldots \]  

Where
\[ \text{YrsWk} = \text{Number of years of work experience} \]
\[ \text{YrsTx} = \text{Number of years of experience as a taxpayer} \]

Results from the above estimated equations are shown in Table 5.3.2.2.1-1 (refer to Table E5.6 of Appendix E for detailed test outputs) below:

---

\(^{147}\) Refer to Section 3.5 of Chapter 3 for research model and questions.
Table 5.3.2.2.1-1 - Indirect Impact Step 2: Testing on Demographic Variables: Equation 5.5D - Total group

**Est. regression equation 5.5D**:  
TC= a + b\(_1\)Age + b\(_2\)Gender + b\(_3\)YrsWk + b\(_4\)YrsTx + e  
Null hypothesis: b\(_1\) or b\(_2\) or b\(_3\) or b\(_4\) ≤0,  
Alternate hypothesis: at least one of the coefficients is > 0

<table>
<thead>
<tr>
<th>Dependent Variable: TC</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=216)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>3.061</td>
<td>0.451</td>
<td>-</td>
<td>6.793***</td>
<td>0.000</td>
</tr>
<tr>
<td>Age</td>
<td>0.250</td>
<td>0.183</td>
<td>0.153</td>
<td>1.371</td>
<td>0.172</td>
</tr>
<tr>
<td>Gender</td>
<td>0.058</td>
<td>0.179</td>
<td>0.024</td>
<td>0.324</td>
<td>0.746</td>
</tr>
<tr>
<td>YrsWk</td>
<td>0.137</td>
<td>0.166</td>
<td>0.095</td>
<td>0.826</td>
<td>0.410</td>
</tr>
<tr>
<td>YrsTx</td>
<td>-0.024</td>
<td>0.141</td>
<td>-0.017</td>
<td>-0.168</td>
<td>0.867</td>
</tr>
</tbody>
</table>

**R-Square** 0.046  
**F-Ratio** 2.189

The F-ratio 2.189 was not statistically significant at the 5% level. This means that the null hypothesis could not be rejected. Therefore it can be concluded that demographic variables do not have any explanatory power as far as this sample is concerned. This indicates that the sample is fairly homogenous from a demographic perspective. None of the individual coefficients were statistically significant at the 5% level when estimated t-values were compared to the critical value of 1.652 for 216 degrees of freedom. In order to minimize noise and keep focus on the core variables, demographic variables were not included in the regression model and a reduced form of model with only the core variables (Eq.5.5) was adopted for this study. The insignificant findings from Eq No. 5.5D only imply that there was not enough demographic variation in the sample and should not be interpreted that demographic variables do not influence tax compliance. Given that the focus of this study was not on the impact of demographics, this sample was not considered as limiting the study. In future when further studies are done on similar topic, consideration could be given to collect a stratified sample by demography.
5.3.2.2.2 Indirect Impact Step 2: Testing of Hypotheses H₅, H₆ and H₇

In this section, the impacts of the three intermediate variables: (AbR) ability/readiness to comply (H₅), (TSF) perception of tax system fairness (H₆) and (MR) moral reasoning (H₇) on (TC) tax compliance were investigated by regression based on the Regression Model (5.5). The regression was first run for the full model (Eq.5.5) which includes tax education (TE), and then second run for a modified model (Eq.5.5X) which excludes tax education (TE). By comparing the results from the two runs, the magnitude of the impact of each intermediate variable being affected by the inclusion of tax education (TE) could be ascertained. Testing was primarily done for the total group (Eq.5.5 and Eq.5.5X) as shown in Table 5.3.2.2.2-1\textsuperscript{148}. To gain further insights with a high level understanding of the difference and to add richness to the findings, further regression was done on undergraduate group (Eq. 5.5-UG and Eq.5.5X-UG)\textsuperscript{149} as shown in Table 5.3.2.2.2-3 and postgraduate group (Eq. 5.5-PG and Eq.5.5X-PG)\textsuperscript{150} as shown in Table 5.3.2.2.2-5. Based on the test results, conclusions were drawn for Hypotheses H₅, H₆ and H₇.

\textsuperscript{148} Refer to Table E5.7 of Appendix E for detailed test outputs for regression on total group.
\textsuperscript{149} Refer to Table E5.8 of Appendix E for detailed test outputs for regression on undergraduate.
\textsuperscript{150} Refer to Table E5.9 of Appendix E for detailed test outputs for regression on postgraduate.
(a) **Indirect Impact Step 2 - Total Group**

Table 5.3.2.2.2-1 - Regression for Indirect Impact Step 2: Equation 5.5/5.5X-Total group:

<table>
<thead>
<tr>
<th>Dependent Variable: TC</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=216)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.839</td>
<td>0.512</td>
<td>-</td>
<td>1.637*</td>
<td>0.103</td>
</tr>
<tr>
<td>TE</td>
<td>0.187</td>
<td>0.123</td>
<td>0.080</td>
<td>1.523*</td>
<td>0.129</td>
</tr>
<tr>
<td>AbR</td>
<td>0.380</td>
<td>0.107</td>
<td>0.206</td>
<td>3.564***</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.285</td>
<td>0.087</td>
<td>-0.171</td>
<td>-3.261^</td>
<td>0.001</td>
</tr>
<tr>
<td>MR</td>
<td>0.730</td>
<td>0.080</td>
<td>0.512</td>
<td>9.094***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**R-Square 0.421**

**F-Ratio 39.275***

Est. regression equation 5.5X (excluding TE as independent variable):

TC\(_X\) = a+ b\(_1\)AbR +b\(_2\)TSF +b\(_3\)MR + e

Null hypothesis: b\(_1\) or b\(_2\) or b\(_3\) ≤0

Alternate hypothesis: at least one of the coefficients is > 0

<table>
<thead>
<tr>
<th>Dependent Variable: TC</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=217)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.829</td>
<td>0.514</td>
<td>-</td>
<td>1.614*</td>
<td>0.108</td>
</tr>
<tr>
<td>AbR</td>
<td>0.406</td>
<td>0.106</td>
<td>0.220</td>
<td>3.848***</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.280</td>
<td>0.088</td>
<td>-0.168</td>
<td>-3.205^</td>
<td>0.002</td>
</tr>
<tr>
<td>MR</td>
<td>0.728</td>
<td>0.081</td>
<td>0.511</td>
<td>9.041***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**R-Square 0.415**

**F-Ratio 51.282***

\(*\), \(***\), \(****\) = 10\%, 5\% and 1\% significance levels

^ insignificant due to negative sign; null hypothesis not rejected in one-tailed test.

Preliminary Findings for the Total Group:

Based on the above test result (Table 5.3.2.2.2-1), all the four core variables (TE, AbR, TSF, MR) altogether contribute 42.1\% of the variance in the tax compliance level. If tax education (TE) is excluded, the remaining three intermediate variables (AbR, TSF and MR) altogether contribute 41.5\% of the variance in tax compliance. Therefore, the contributing power of tax education (TE) to tax compliance (TC) is 0.6\%. Statistical significance (either at 1\% or 10\% level) were found for TE, AbR and MR in terms of their impacts on tax compliance. In terms of the impact of including (or excluding) tax education on the three intermediate variables, ability/readiness to comply (AbR) was
found to be most affected by tax education (TE) as the estimated coefficient of AbR was 0.38 when TE was included and 0.406 when TE was excluded. The magnitude of change was -6.4%. Refer to Table 5.3.2.2-2 below:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Including TE</th>
<th>Excluding TE</th>
<th>Magnitude of Change if TE is included</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.380</td>
<td>0.406</td>
<td>-6.4%</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.285</td>
<td>-0.280</td>
<td>1.8%</td>
</tr>
<tr>
<td>MR</td>
<td>0.730</td>
<td>0.728</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

When TE was included, the significant impact of AbR on TC reduced by 6.4%, which is the largest impact brought amongst the three intermediate variables. This is also confirmed by the result from Hypothesis H\textsubscript{2} [i.e. AbR = f(TE)] showing that AbR was significantly affected by TE with coefficient of 0.219\textsuperscript{152} was the only significant variable for the total group, and has the largest coefficient amongst the three intermediate variables affected by TE. TSF and MR were not found significant. In conclusion, at total group level, tax education has indirect significant impact on tax compliance through the enhancement of ability/readiness to comply.

\textsuperscript{151} Magnitude of change = (0.380-0.406)/0.406 = 6.4%
\textsuperscript{152} Refer to Table 5.3.2.1-2 of this Chapter.
\textsuperscript{153} Refer to Table 5.3.2.1-6 of this Chapter.
(b) **Indirect Impact Step 2 - Undergraduate Group**

Table 5.3.2.2.2-3 - Regression for Indirect Impact Step 2: Equation 5.5-UG/ 5.5X-UG - Undergraduate group:

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=103)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.480</td>
<td>0.683</td>
<td>-</td>
<td>0.702</td>
<td>0.484</td>
</tr>
<tr>
<td>TE</td>
<td>0.579</td>
<td>0.169</td>
<td>0.261</td>
<td>3.433***</td>
<td>0.001</td>
</tr>
<tr>
<td>AbR</td>
<td>0.561</td>
<td>0.143</td>
<td>0.337</td>
<td>3.915***</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.258</td>
<td>0.130</td>
<td>-0.148</td>
<td>-1.986^</td>
<td>0.050</td>
</tr>
<tr>
<td>MR</td>
<td>0.510</td>
<td>0.124</td>
<td>0.335</td>
<td>4.121***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**R-Square 0.471**

**F-Ratio 22.881***

Est. regression equation 5.5X-UG (excluding TE as independent variable):

\[ \text{TC}_{UGX} = a + b_{1UGX} \text{AbR}_{UG} + b_{2UGX} \text{TSF}_{UG} + b_{3UGX} \text{MR}_{UG} + e \]

Null hypothesis: \( b_{1UGX} \) or \( b_{2UGX} \) or \( b_{3UGX} \) \( \leq 0 \)

Alternate hypothesis: at least one of the coefficients is \( > 0 \)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=104)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.13</td>
<td>0.710</td>
<td>-</td>
<td>0.183</td>
<td>0.855</td>
</tr>
<tr>
<td>AbR</td>
<td>0.683</td>
<td>0.146</td>
<td>0.410</td>
<td>4.680***</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.215</td>
<td>0.136</td>
<td>-0.123</td>
<td>-1.584^</td>
<td>0.116</td>
</tr>
<tr>
<td>MR</td>
<td>0.528</td>
<td>0.130</td>
<td>0.347</td>
<td>4.064***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**R-Square 0.410**

**F-Ratio 24.084***

\*'*, **', ***' = 10%, 5% and 1% significance levels

^ insignificant due to negative sign; null hypothesis not rejected in one-tailed test.

Preliminary Findings for the Undergraduate Group:

Based on the above test result (Table 5.3.2.2.2-3), all the four core variables (TE, AbR, TSF, MR) altogether contribute to 47.1% of the variance in the tax compliance level.

If tax education (TE) is excluded, the remaining three intermediate variables (AbR, TSF and MR) altogether contribute to 41.0% of the variance in tax compliance. Therefore, the contributing power of tax education (TE) to tax compliance (TC) for undergraduate group is 5.9% which is substantially larger than the total group and postgraduate group, indicating that tax education’s impact on tax compliance is most substantial for the undergraduates. This is also supported by findings from Hypothesis H\textsubscript{1} [TC = f(TE)].
where the greatest impact with coefficient 0.895 was found in the undergraduate group (refer to Table 5.3.1.2-1 under Section 5.3.1.2 of this chapter). Similar to the findings from total group, impacts on TC brought by TE, AbR and MR were found statistically significant (at 1% significance level). In terms of the impact of including (or excluding) tax education on the three intermediate variables, both ability/readiness to comply (AbR) and perception of tax system fairness (TSF) were found substantially affected by tax education (TE) with the magnitude of change of -17.9% for AbR and -20% for TSF, as shown in Table 5.3.2.2.2-4 below:

<table>
<thead>
<tr>
<th>(Coefficients)</th>
<th>Including TE</th>
<th>Excluding TE</th>
<th>Magnitude of Change if TE is included</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.561</td>
<td>0.683</td>
<td>-17.9%</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.258</td>
<td>-0.215</td>
<td>-20%</td>
</tr>
<tr>
<td>MR</td>
<td>0.510</td>
<td>0.528</td>
<td>-3.4%</td>
</tr>
</tbody>
</table>

When TE was included, the significant impacts of AbR and TSF on TC for undergraduates were reduced by 17.9% and 20% respectively. The change in MR was 3.4% which is relatively lower. This is also supported by the result obtained from Hypothesis H$_2$, H$_3$ and H$_4$ for undergraduates (see Table 5.3.2.1-6) showing that TE has significant impacts on all the three intermediate variables for this sample group. In conclusion, for the undergraduate group, tax education has a significant indirect impact on tax compliance through the enhancement of intermediate variables: AbR and MR. TSF was not accepted as significant in one tailed test due to the negative sign revealed from the testing. Further testing and discussion on the combined indirect impact can be found in Section 5.3.2.3 below.
Table 5.3.2.2-5 - Regression for Indirect Impact Step 2: Equation 5.5-PG/5.5X-PG - Postgraduate group:

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=108)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.746</td>
<td>0.746</td>
<td>-</td>
<td>2.340***</td>
<td>0.021</td>
</tr>
<tr>
<td>TE</td>
<td>-0.131</td>
<td>0.178</td>
<td>-0.053</td>
<td>-0.736</td>
<td>0.464</td>
</tr>
<tr>
<td>AbR</td>
<td>0.183</td>
<td>0.156</td>
<td>0.090</td>
<td>1.170</td>
<td>0.244</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.350</td>
<td>0.122</td>
<td>-0.207</td>
<td>-2.872^</td>
<td>0.005</td>
</tr>
<tr>
<td>MR</td>
<td>0.826</td>
<td>0.104</td>
<td>0.605</td>
<td>7.957***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

R-Square 0.451
F-Ratio 22.203***

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio (df=109)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.698</td>
<td>0.742</td>
<td>-</td>
<td>2.291**</td>
<td>0.024</td>
</tr>
<tr>
<td>AbR</td>
<td>0.182</td>
<td>0.156</td>
<td>0.090</td>
<td>1.170</td>
<td>0.245</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.356</td>
<td>0.121</td>
<td>-0.211</td>
<td>-2.935^</td>
<td>0.004</td>
</tr>
<tr>
<td>MR</td>
<td>0.829</td>
<td>0.103</td>
<td>0.608</td>
<td>8.021***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

R-Square 0.448
F-Ratio 29.547***

'**', '***' = 10%, 5% and 1% significance levels
^ insignificant due to negative sign; null hypothesis not rejected in one-tailed test.

Preliminary Findings for the Postgraduate Group:

Based on the above test result (Table 5.3.2.2.2-5), only one core variable, MR, was found statistically significant (at 1% level) in terms of the impact on tax compliance. All the variables together contribute to 45.1% of the variance in the tax compliance level or 44.8% if tax education (TE) was excluded. This indicates that tax education’s impact on tax compliance for the postgraduate group does not exist. This is also supported by the findings from Hypothesis H1 for the postgraduate group [Equation 5.1-PG in Table 5.3.1.2-1 of this chapter] where no impact was found in the postgraduate group. In terms of the impact of including (or excluding) tax education

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on the three intermediate variables, all the changes were found immaterial in magnitude as shown in Table 5.3.2.2.2-6 below:

<table>
<thead>
<tr>
<th>(Coefficients)</th>
<th>Including TE</th>
<th>Excluding TE</th>
<th>Magnitude of Change if TE is included</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.183</td>
<td>0.182</td>
<td>-0.1%</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.350</td>
<td>-0.356</td>
<td>1.7%</td>
</tr>
<tr>
<td>MR</td>
<td>0.826</td>
<td>0.829</td>
<td>-0.4%</td>
</tr>
</tbody>
</table>

TE=Tax Education; AbR=Ability/readiness to Comply; TSF=Perception of Tax System Fairness; MR=Moral Reasoning; UG=Undergraduate; Magnitude of change= (Coefficient including TE – Coefficient excluding TE) / Coefficient excluding TE

When TE was included, the significant impact of TSF on TC was increased by only 1.7% and the impact of MR on TC reduced by less than 1% for postgraduates. The magnitudes of change are immaterial. This is also supported by the result obtained from Hypothesis H$_2$, H$_3$ and H$_4$ for postgraduates (see Table 5.3.2.1-6) showing that TE has no significant impact on any of the three intermediate variables. In conclusion, for the postgraduate group, tax education does not have an indirect impact on tax compliance through any of the intermediate variables: AbR, TSF and MR. Refer to Section 5.3.2.3 below for combined indirect impact.

(d) Interim Conclusion of Indirect Impact (Step 2): H$_5$, H$_6$ and H$_7$

The test results from Equations 5.5 for all sample groups under Section 5.3.2.2.2 above are summarised in Table 5.3.2.2.2-7 below:
Table 5.3.2.2.2-7 - Interim Conclusion for Indirect Impact – Step 2: Relative Impact of Intermediate Variables on Tax Compliance

<table>
<thead>
<tr>
<th>Total Group</th>
<th>Undergraduate Group</th>
<th>Postgraduate Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimated Coefficient</td>
<td>Sign Expected /per test</td>
</tr>
<tr>
<td>AbR</td>
<td>0.380***</td>
<td>+ve/+ve</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.285</td>
<td>+ve/-ve</td>
</tr>
<tr>
<td>MR</td>
<td>0.730***</td>
<td>+ve/+ve</td>
</tr>
</tbody>
</table>

* * * denote 10%, 5% and 1% significance level. NS denotes ‘not significant’ thus no sign was shown. ^ insignificant due to negative sign; null hypothesis not rejected due to one-tailed test. Shaded cells highlight significant findings. AbR: Ability/readiness to comply; TSF: Perception of tax system fairness; MR: Moral Reasoning

Source: Tables 5.11, 5.12, 5.13

Based on the test findings, conclusions were drawn for Hypotheses $H_5$ to $H_7$ as illustrated in Table 5.3.2.2.2-8:

Table 5.3.2.2.2-8 - Conclusions for Hypotheses $H_5$, $H_6$ and $H_7$

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_5$ Ability/readiness to comply has a positive impact on tax compliance.</td>
<td>Supported</td>
</tr>
<tr>
<td>$H_6$ Perception of tax system fairness has a positive impact on tax compliance.</td>
<td>Not supported</td>
</tr>
<tr>
<td>$H_7$ Moral reasoning has a positive impact on tax compliance.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

**Hypothesis $H_5$ (AbR)** Ability/readiness to comply was found to have a statistically significant impact on tax compliance with a positive sign, despite being mainly confined to undergraduates. The hypothesis is supported. This could possibly be due to the fact that undergraduates have been intensively taught tax knowledge and this has improved their ability/readiness to comply which in turn drives their tax compliance levels. As for postgraduates, when reading in conjunction with the test result for Hypothesis $H_2$, no statistically significant relations were found for both relationships between tax education and ability/readiness to comply, and between ability/readiness to comply and tax compliance. This indicates that taxpayers at higher education levels

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154 Refer to Section 5.3.2.1 (paragraph (a)) of this chapter.
are not necessarily affected by their tax knowledge or ability/readiness to comply when they come to decide to comply or not.

**Hypothesis H₆ (TSF)** Hypothesis H₆ tests the positive impact of the perception of tax system fairness (TSF) on tax compliance, but it is not supported by the test findings. A negative sign was recorded between TSF and tax compliance for all groups, suggesting that the compliance level of taxpayers is not positively affected by their perceptions of tax system fairness. These findings seem to be inconsistent with some prior literature (Eriksen & Fallan, 1996) although other researchers (Richardson, 2006b) also found that taxpayer’s perception of tax system fairness actually had varying effects on tax compliance. A further test was done in this aspect and findings are reported and discussed in Section 5.3.2.2.3 below.

**Hypothesis H₇ (MR)** Across all the groups, moral reasoning has the strongest correlation to tax compliance, and all impacts were positive. Hypothesis H₇ is therefore supported. The test result also showed that moral reasoning was the most distinctive factor contributing to the variance in tax compliance: 22.2% (total group), 8.7% (undergraduate group) and 32.2% (postgraduate group). Although the lowest moral reasoning’s impact was found in the undergraduate group, this 8.7% is already the largest amongst all the core variables (TE: 6.1%; AbR: 7.9%; TSF: 2%; MR: 8.7%). Therefore, moral reasoning has the strongest influence on compliance behaviour across the groups, and this holds true regardless of education level or whether tax has been studied or not.

---

155 Estimated coefficients for moral reasoning: 0.730*** for total group; 0.510** for undergraduates; 0.826*** for postgraduates.

156 Refer to Table D5.4 of Appendix D for the summary of analysis results for regression models. See the separate coefficient of determination (ΔR²) for each variable under each model. The ΔR² represents the contributing percentage of that specific variable individually on tax compliance.
Moreover, as tax education was found to have a statistically significant influence on moral reasoning under Hypothesis H₄₁⁵⁷ (despite only being restricted to the undergraduate sub-group), a significant impact on tax compliance through moral reasoning was obviously explained by tax education especially for undergraduates. For postgraduates, however, moral reasoning was found to be important in driving their tax compliance levels but their moral reasoning was not necessarily associated with whether or not they had studied tax before. The combined effect for the indirect relationship between tax education and tax compliance was discussed in the next section.

5.3.2.3 Step 3 – Combined Indirect Impact of Tax Education on Tax Compliance (Combining Step 1 and Step 2)

As a recap, the indirect impact of tax education (TE) on tax compliance (TC) was tested in three steps: Step 1 investigates the impact of TE on each intermediate variable (AbR, TSF and MR); step 2 investigates the impact of each intermediate variable on TC; and step 3 combines the results from steps 1 and 2 to arrive at the combined indirect impact of TE on TC as hypothesized under Hypothesis H₈ below. Test results for step 1 were explained under Section 5.3.2.1 above, and results for step 2 were explained under Section 5.3.2.2 above. In this section, the results of two steps are combined.

Set 8 of Hypothesis:

Null hypothesis H₀: Tax education has no positive indirect impact on tax compliance.
Alternate hypothesis H₈: Tax education has a positive indirect impact on tax compliance.

(one-tailed)

¹⁵⁷ Refer to Section 5.3.2 paragraph (c) of Chapter 5.
The combined impact was obtained by way of multiplication of estimated coefficients found for each core variable under Steps 1 and 2. The estimated coefficients of AbR/TSF/MR as a function of TE are summarised in Table 5.3.2.1-6 (step 1) and the estimated coefficients of AbR/TSF/MR leading to TC are summarised in Table 5.3.2.2-7 (step 2). The two sets of coefficients were used and multiplied to obtain the aggregated effect between tax education and tax compliance. Note that only coefficients with statistical significance (1%, 5% or 10%) were multiplied. The combined impact is shown in Table 5.3.2.3-1 below:

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H8</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Based on the test findings, conclusion was drawn for Hypothesis H8 as follows:

In conclusion, at the overall level, tax education has a significant and positive indirect impact on tax compliance through the enhancement of the ability/readiness to comply, and this impact was most obvious and substantial in the undergraduate group. In the undergraduate group, tax education improves all the three intermediate variables but
only AbR and MR improve tax compliance, whereas TSF decreases tax compliance with a slight effect of -0.05. No indirect impact was found for postgraduates.

5.3.3 Combined Impact (Direct and Indirect) of Tax Education on Tax Compliance

Section 5.3.1 above discusses the direct impact of tax education on tax compliance (Hypothesis H₁), and Section 5.3.2 above discusses the indirect impact (three steps covering Hypotheses H₂ to H₈). In this section, the combined effect of direct and indirect impacts of tax education on tax compliance is analysed. To recap the preliminary findings, for direct impact, tax education was found to have a significant and positive direct impact on tax compliance at the total group level and undergraduate group level. For indirect impact, tax education was found to have a significant and positive indirect impact on tax compliance via ability/readiness to comply at the total group level, but via both ability/readiness to comply and moral reasoning at the undergraduate group level. However, a negative indirect impact was found via the perception of tax system fairness in the undergraduate group. As for postgraduate group, no significant impact was found for either direct or indirect relationship. The significant direct and indirect impacts are captured in Figure 5.3.3-1 (in estimated coefficients) and Figure 5.3.3-2 (in elasticity) below:
**Direct Impact**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>0.187</td>
<td>0.579</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Indirect Impact**

**Step 1**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>0.187</td>
<td>0.579</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Step 2**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>0.187</td>
<td>0.579</td>
<td>0.000</td>
</tr>
</tbody>
</table>

---

**Table A:** Impact of TE on AbR/TSF/MR

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.219</td>
<td>0.428</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>0.000</td>
<td>0.201</td>
<td>0.000</td>
</tr>
<tr>
<td>MR</td>
<td>0.000</td>
<td>0.251</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Table B:** Impact of AbR/TSF/MR on TC

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.380</td>
<td>0.561</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>-0.285</td>
<td>-0.280</td>
<td>-0.350</td>
</tr>
<tr>
<td>MR</td>
<td>0.730</td>
<td>0.510</td>
<td>0.826</td>
</tr>
</tbody>
</table>

Source: Table 5.3.2.1-6

Source: Table 5.3.2.2-7

**Table C:** Combined Indirect Impact of TE on TC

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>UG</th>
<th>PG</th>
</tr>
</thead>
<tbody>
<tr>
<td>AbR</td>
<td>0.083</td>
<td>0.240</td>
<td>0.000</td>
</tr>
<tr>
<td>TSF</td>
<td>0.000</td>
<td>-0.052</td>
<td>0.000</td>
</tr>
<tr>
<td>MR</td>
<td>0.000</td>
<td>0.128</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table C = Table A * Table B

---

**Direction of impact**

**TE=Tax Education; AbR=Ability/readiness to Comply; TSF=Perception of Tax System Fairness; MR=Moral Reasoning; Total=Total group; UG=Undergraduate group; PG=Postgraduate group**

---

Figure 5.3.2.3-1 - Combined Direct and Indirect Impact of TE on TC (in Estimated Coefficients)

---

158 Combined coefficient for AbR (total) = 0.219*0.380 = 0.083; AbR (UG) = 0.428*0.561 = 0.240; Combined coefficient for TSF (UG) = 0.201*-0.258 = -0.052; MR (UG) = 0.251*0.510 = 0.128.
Direction of impact

TE=Tax Education; AbR=Ability/readiness to Comply; TSF=Perception of Tax System Fairness; MR=Moral Reasoning; Total=Total group; UG=Undergraduate group; PG=Postgraduate group

Elasticity for Direct Impact: Total Group: \( b_{TE} \frac{\text{MeanTE}}{\text{MeanTC}} = 0.187 \times 0.56 / 3.85 = 0.03 \); UG Group: \( b_{UG} \frac{\text{MeanTE}_{UG}}{\text{MeanTC}_{UG}} = 0.579 \times 0.66 / 3.94 = 0.097 \) (Source: \( b_{TE} \) is from Table 5.11, \( b_{UG} \) is from Table 5.12)

Elasticity for Indirect Impact:

TE to TC via AbR (Total Group): (1) \( b_1 \frac{\text{MeanTE}}{\text{MeanAbR}} = 0.219 \times 0.56 / 3.98 = 0.03 \); (2) \( b_2 \frac{\text{MeanAbR}_{UG}}{\text{MeanTC}_{UG}} = 0.38 \times 3.98 / 3.85 = 0.39 \); (3) Combined elasticity: 0.03*0.39=0.01. (Source: \( b_1 \) is from Table 5.5; \( b_2 \) is from Table 5.11).

TE to TC via AbR (UG Group): (1) \( b_{1UG} \frac{\text{MeanTE}_{UG}}{\text{MeanAbR}_{UG}} = 0.428 \times 0.66 / 4.07 = 0.07 \); (2) \( b_{2UG} \frac{\text{MeanAbR}_{UG}}{\text{MeanTC}_{UG}} = 0.561 \times 4.07 / 3.94 = 0.58 \); (3) Combined elasticity: 0.07*0.58=0.04. (Source: \( b_{1UG} \) is from Table 5.5; \( b_{2UG} \) is from Table 5.12).

TE to TC via MR (UG Group): (1) \( b_{1UG} \frac{\text{MeanTE}_{UG}}{\text{MeanMR}_{UG}} = 0.251 \times 0.66 / 3.57 = 0.05 \); (2) \( b_{2UG} \frac{\text{MeanMR}_{UG}}{\text{MeanTC}_{UG}} = 0.51 \times 3.57 / 3.94 = 0.46 \); (3) Combined elasticity: 0.05*0.46=0.02. (Source: \( b_{1UG} \) is from Table 5.8; \( b_{2UG} \) is from Table 5.12).

TE to TC via TSF (UG Group): (1) \( b_{1UG} \frac{\text{MeanTE}_{UG}}{\text{MeanTSF}_{UG}} = 0.201 \times 0.66 / 3.98 = 0.03 \); (2) \( b_{2UG} \frac{\text{MeanTSF}_{UG}}{\text{MeanTC}_{UG}} = -0.258 \times 3.98 / 3.94 = -0.26 \); (3) Combined elasticity: 0.03*-0.26=-0.01. \( b_{1UG} \) is from Table 5.6; \( b_{2UG} \) is from Table 5.12.

All means are found in Table D5.2 of Appendix D.

Figure 5.3.2.3-2 - Combined Direct and Indirect Impact of TE on TC (in Elasticity)
(a) Direct Impact

In Figure 5.3.3-1, for direct impact, the coefficient of TE leading to TC was shown as 0.187 for total group\(^{159}\) and 0.579 for undergraduate group.\(^{160}\) The results were obtained from the Multiple Regression Equations 5.5 and 5.5-UG based on \(TC = a + b_1 \text{TE} + b_2 \text{AbR} + b_3 \text{TSF} + b_4 \text{MR} + e\). These coefficients were used to replace the test results found from Equation 5.1 based on \(TC = a + b_{TC} \text{TE} + e\), for the reason that the Equations 5.5 and 5.5-UG take into account the other three core variables and the coefficient derived therefrom for tax education while holding other variables constant is considered as more accurate. Refer to the discussion of alternate regression for direct impact in Section 5.3.1.4.

In conclusion, tax education has a significant and positive direct impact on tax compliance at an overall level and the undergraduate level. The model estimates that when tax education is studied, the mean value of tax compliance increases by 0.187 at the overall level or 0.579 at the undergraduate level (see Figure 5.3.3-1). In terms of elasticity as shown in Figure 5.3.3-2, a 1% increase in mean value of tax education will lead to a 0.03% increase in mean value of tax compliance at the overall level, or 0.097% increase in mean value of tax compliance at undergraduate level. No significant impact was found for postgraduate level in terms of tax education leading to tax compliance.

\(^{159}\) The coefficient of TE on TC for total group (0.187) was obtained from the multiple regression equation (5.5): \(TC = a + b_1 \text{TE} + b_2 \text{AbR} + b_3 \text{TSF} + b_4 \text{MR} + e\) (Table 5.3.2.2.2-1 of this Chapter), which takes into account all the core variables: TE, AbR, TSF and MR. This replaces the coefficient of 0.307 obtained from the simple regression equation (5.1): \(TC = a + b_{TE} + e\) (Figure 5.3.1.1-1 of this Chapter).

\(^{160}\) The coefficient of TE on TC for the undergraduate group (0.579) was obtained from multiple regression equation (5.5-UG) (Table 5.3.2.2.2-3 of this chapter), which replaces the coefficient of 0.895 obtained from the simple regression equation (5.1-UG) (Table 5.3.1.2-1 of this Chapter).
(b) Indirect Impact

For the total group, the combined indirect model estimates that when tax education is studied, the mean value of ability/readiness to comply increases by 0.219, which in turn increases tax compliance by 0.083 (0.219*0.380). In terms of elasticity, a 1% increase in mean value of tax education will lead to 0.01% increase in mean value of tax compliance via an increase in mean value of ability/readiness to comply. For the undergraduate group, the combined indirect model estimates that when tax education is studied, the mean value of ability/readiness to comply increases by 0.428, the mean value of the perception of tax system fairness increases by 0.201 and the mean value of moral reasoning increases by 0.251, which collectively increases tax compliance by 0.316 (0.240 - 0.052 + 0.128). In terms of elasticity, a 1% increase in mean value of tax education will lead to 0.04% increase in mean value of tax compliance via an increase in mean value of ability/readiness to comply, 0.02% increase in mean value of tax compliance via an increase in mean value of moral reasoning, and 0.01% decrease in mean value of tax compliance via an increase in perception of tax system fairness.

(c) Analysis of Research Result and Hypotheses

By incorporating the test results for direct impact and indirect impact into the Research Model for this study, the overall research result is captured in Figure 5.3.3-3 below:
Figure 5.3.2.3-3 - Research Model and Hypotheses Results (in estimated coefficients)
1. **Both Direct and Indirect Impacts Supported**

In Figure 5.3.3-3, the direct impact of TE on TC was illustrated in a solid arrow between the two, giving a coefficient of 0.187 for the total group and 0.579 for undergraduate group. The indirect impact between the two was illustrated in a dotted arrow, giving a coefficient of 0.083 via ability/readiness to comply for the total group and 0.316 (0.240 - 0.052 + 0.128) via all intermediate variables for the undergraduate group. Therefore, in summary, the total impact (direct and indirect) of tax education on tax compliance at an overall level is 0.27 (direct 0.187 + indirect 0.083). For the undergraduate group level, the total impact (direct and indirect) of tax education on tax compliance is 0.895 (direct 0.579 + indirect 0.316). This indicates that tax education has a strong impact on tax compliance for undergraduate group. The study found that tax education does not have a direct or indirect impact on tax compliance for the postgraduate group.

2. **Impacts Confined to Undergraduates**

Results indicated that taxpayers who have studied tax before are generally expected to be more tax-compliant, but taxpayers with a higher education level tend to be less affected by their tax knowledge (regardless of tax studied before or not) when they come to decide on their tax-complying or non-complying attitude. This could be because undergraduates with fresh memories of tax law and its requirements are more inclined to comply. The findings are largely consistent with that found by Kasipillai et al. (2003) who conducted a similar study on a group of undergraduate
students (aged between 20 and 30) in Malaysia and found that students’ attitude toward tax compliance generally improved after they had completed a taxation course. However, when compared with the study of Chan et al. (2000), an inconsistency was detected as no significant relationship was found in their study between education and tax compliance for the Hong Kong samples. Given that the demographic characteristics of Chan et al.’s (2000) study were largely similar to the undergraduate sub-group used for this study, it is uncertain whether the difference in test findings was due to a time factor as Chan et al.’s (2000) study was conducted 15 years ago.

3. Impacts via Ability/readiness to Comply Supported

Tax education does enhance taxpayer’s ability/readiness to comply, which in turn increases tax compliance. However the effect may wear off with the work and life experiences and pressures as is evidenced by the lack of statistical significance at the postgraduate level. Results indicate that taxpayers at the undergraduate level, with tax studied before, are generally expected to be more tax-compliant due to their ability/readiness to comply being enhanced by their previous tax education. The findings support Hamilton’s (2012) suggestion that compliance strategies should aim at getting taxpayers ‘ready to comply’, ‘willing to comply’ and ‘able to comply’. That said, the relationship for the postgraduate group was statistically insignificant. Taxpayers at postgraduate level tend to have developed ability/readiness to take advantage of tax ambiguity or loopholes if they have

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161 In Chan et al.’s (2000) study, their Hong Kong samples comprised 55% as undergraduates and 35% as graduates with Bachelor degrees.

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studied tax education, resulting in a non-complying attitude. This could possibly be explained by the general assumption that tax knowledge received by postgraduates is biased towards tax planning opportunities, hence may increase taxpayer’s ability to evade tax (Ho & Wong, 2006, 2008; Hotaling & Arnold, 1981). Given that the negative impact for this group of samples was not statistical significant, the impact should not be exaggerated. On balance, the positive position should hold in the sense that tax education enhances ability/readiness to comply, and in turn improves tax compliance.

4. **Impact via Moral Reasoning Wearing Off**

Tax education generally improves taxpayer’s moral reasoning, again at undergraduate level, but the effect appears to wear off as indicated by a statistically insignificant relationship at the postgraduate level. However, moral reasoning was found to be a distinctive driving factor for tax compliance for all groups\(^{162}\) of taxpayers. Results indicate that taxpayers are predominantly driven by their moral standards to choose to comply or not to comply with tax requirements, and this driving force may be sourced from tax education or from some other sources. Such a finding is in line with that of Song and Yarborough (1978) that more fiscal knowledge should increase tax ethics and tax compliance. To policy makers, this is an important finding as resources should be diverted to strategies to enhance taxpayers’ moral reasoning, either by tax education or other means, in order to improve tax compliance.

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\(^{162}\) Including total group, undergraduate sub-group and postgraduate sub-group.
5. **Varying Impact via Perception of Tax System Fairness**

The only unexpected and contradictory finding lies with the insignificant impact of tax education on taxpayer’s perception of tax system fairness, and the negative impact of perception of tax system fairness on tax compliance. This result is inconsistent with prior literature that tax knowledge was believed to improve the perception of tax system fairness hence leading to a positive attitude toward tax compliance (Eriksen & Fallan, 1996; Strumpel, 1969; Crane & Nourzad, 1990). In this aspect, it is worth noting that in Richardson’s (2006b) study, a varying effect was also found for the impact of the perception of tax system fairness on tax compliance and this was believed to be attributable to the multi-dimensional problem with the measurement items. An expanded study was performed and reported in Section 5.3.4 below.
5.3.4 Expanded Study of Perception of Tax System Fairness (TSF)

In this study, the construct TSF (Perception of Tax System Fairness) was represented by 3 sub-constructs: Hong Kong tax system (TxS), Hong Kong tax office (IRD), and Hong Kong government policy (Gov). The first sub-construct (TxS) seeks to explore views from samples on their understanding of the Hong Kong tax system, such as whether the Hong Kong tax system is simple. The second sub-construct (IRD) seeks to explore views from samples on their recognition of the Hong Kong tax authority (Hong Kong Inland Revenue Department), such as whether the Hong Kong IRD is accountable. The third sub-construct (Gov) seeks to explore views from samples on their appreciation of the Hong Kong government on fiscal policy and the overall fairness of the tax share/burden, such as whether they trust the HK government in the allocation and spending of tax revenue. These sub-constructs represent the dimensions used to measure the general perception of the fairness of the Hong Kong tax system.

The test results from Hypothesis $H_6$ revealed that the perception of tax system fairness has a negative relationship with tax compliance for all groups. This is contrary to the researcher’s expectation as well as findings from prior literature. It was therefore considered necessary to further investigate which of the three sub-constructs was the major contributing indicator for the negative association. The regression model (Eq. 5.5) was further expanded to replace the core variable TSF with the 3 sub-constructs (TxS, IRD and Gov). Multiple regression was used to test the individual impact of each sub-construct variable on tax compliance. The expanded regression model 5.5-TSF was developed as follows:

\[ \text{(Refer to Section 4.8.3 of Chapter 4 for creation of construct variables)} \]
\[ \text{(Refer to Table 5.3.2.2-8 of Chapter 5.)} \]
Estimated Equation\textsuperscript{165}: \[TC = a + b_1\text{TE} + b_2\text{AbR} + b_3\text{TSF} + b_4\text{MR} + e \quad \ldots\text{Eq. 5.5}\]

Expanded Equation:

\[TC = a + b_1\text{TE} + b_2\text{AbR} + b_3\text{MR} + b_4\text{TxS} + b_5\text{IRD} + b_6\text{Gov} + e \quad \ldots\text{Eq. 5.5-TSF}\]

Test result is summarised in Table 5.3.4-1 below (refer to Table E5.10 of Appendix E for detailed test outputs):

\textbf{Table 5.3.4-1- Regression for Indirect Impact Step 2: TSF-Expanded Equation 5.5-TSF -Total group/Sub-groups:}

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>Standardised Coefficient</th>
<th>T-Ratio</th>
<th>p-value</th>
</tr>
</thead>
</table>
| TC \textit{Total Group} | \textit{Est. regression equation 5.5-TSF (expanded TSF) for Total Group:} \[TC = a + b_1\text{TE} + b_2\text{AbR} + b_3\text{MR} + b_4\text{TxS} + b_5\text{IRD} + b_6\text{Gov} + e \]
Null hypothesis: \( b_1 \text{ or } b_2 \text{ or } b_3 \text{ or } b_4 \text{ or } b_5 \text{ or } b_6 \leq 0 \)
Alternate hypothesis: \( \text{at least one of the coefficient is } > 0 \)
| Intercept | 0.725 | 0.503 | - | 1.442* | 0.151 |
| TE | 0.205 | 0.122 | 0.088 | 1.684** | 0.094 |
| AbR | 0.324 | 0.106 | 0.175 | 3.064*** | 0.002 |
| MR | 0.723 | 0.079 | 0.507 | 9.203*** | 0.000 |
| Txs | 0.140 | 0.101 | 0.092 | 1.384* | 0.168 |
| IRD | -0.033 | 0.103 | -0.023 | -0.322 | 0.748 |
| Gov | -0.325 | 0.079 | -0.262 | -4.113^ | 0.000 |

| R-Square | 0.452 |
| F-Ratio | 29.362*** |

\textbf{Est. regression equation 5.5UG-TSF (expanded TSF) for Undergraduates:} \[TC_{UG} = a + b_1\text{TE}_{UG} + b_2\text{AbR}_{UG} + b_3\text{MR}_{UG} + b_4\text{TxS}_{UG} + b_5\text{IRD}_{UG} + b_6\text{Gov}_{UG} + e \]
Null hypothesis: \( b_1 \text{ or } b_2 \text{ or } b_3 \text{ or } b_4 \text{ or } b_5 \text{ or } b_6 \leq 0 \)
Alternate hypothesis: \( \text{at least one of the coefficient is } > 0 \)
| Intercept | 0.374 | 0.708 | - | 0.528 | 0.598 |
| TE | 0.572 | 0.173 | 0.258 | 3.300*** | 0.001 |
| AbR | 0.537 | 0.147 | 0.322 | 3.660*** | 0.000 |
| MR | 0.536 | 0.129 | 0.352 | 4.157*** | 0.000 |
| Txs | -0.002 | 0.146 | -0.002 | -0.016 | 0.987 |
| IRD | -0.053 | 0.154 | -0.034 | -0.347 | 0.729 |
| Gov | -0.182 | 0.116 | -0.139 | -1.570^ | 0.119 |

| R-Square | 0.475 |
| F-Ratio | 15.225*** |

\textsuperscript{165} Note that the sequences of variable MR and TSF in the model are interchanged to facilitate easy reference to sub-constructs of TSF.
Est. regression equation 5.5PG-TSF (expanded TSF) for Postgraduates:

\[ TC_{PG} = a + b_1TE_{PG} + b_2AbR_{PG} + b_3MR_{PG} + b_4TxS_{PG} + b_5IRD_{PG} + b_6Gov_{PG} + e \]

Null hypothesis: \( b_1 \) or \( b_2 \) or \( b_3 \) or \( b_4 \) or \( b_5 \) or \( b_6 \leq 0 \)

Alternate hypothesis: at least one of the coefficient is > 0

| Intercept | 1.667 | 0.721 | 2.313** | 0.023 |
|----------------------------------------|
| TE | -0.100 | 0.175 | -0.040 | -0.569 | 0.570 |
| AbR | 0.104 | 0.153 | 0.051 | 0.679 | 0.498 |
| MR | 0.776 | 0.102 | 0.569 | 7.619*** | 0.000 |
| TxS | 0.193 | 0.137 | 0.123 | 1.408* | 0.162 |
| IRD | -0.046 | 0.142 | -0.032 | -0.324 | 0.747 |
| Gov | -0.390 | 0.110 | -0.318 | -3.560^ | 0.001 |

**R-Square 0.498**

F-Ratio 17.519***

^ insignificant due to negative sign; null hypothesis not rejected in one-tailed test

Based on the above regression results, a summary of Expanded Equations 5.5-TSF for total group, undergraduate and postgraduate is provided in Table 5.3.4-2.

Table 5.3.4-2 - Summary of Expanded Model 5.5-TSF by groups (in Estimated Coefficients with Standard Errors in brackets)

<table>
<thead>
<tr>
<th>Dependent Variable: TC</th>
<th>Equation 5.5-TSF (Total Group)</th>
<th>Equation 5.5UG-TSF (Undergraduate)</th>
<th>Equation 5.5PG-TSF (Postgraduate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.725 (0.503)</td>
<td>0.374 (0.708)</td>
<td>1.667** (0.721)</td>
</tr>
<tr>
<td>TE</td>
<td>0.205* (0.122)</td>
<td>0.572*** (0.173)</td>
<td>-0.100 (0.175)</td>
</tr>
<tr>
<td>AbR</td>
<td>0.324*** (0.106)</td>
<td>0.537*** (0.147)</td>
<td>0.104 (0.153)</td>
</tr>
<tr>
<td>MR</td>
<td>0.723*** (0.079)</td>
<td>0.536*** (0.129)</td>
<td>0.776*** (0.102)</td>
</tr>
<tr>
<td>TxS</td>
<td>0.140* (0.101)</td>
<td>-0.002 (0.146)</td>
<td>0.193* (0.137)</td>
</tr>
<tr>
<td>IRD</td>
<td>-0.033 (0.103)</td>
<td>-0.053 (0.154)</td>
<td>-0.046 (0.142)</td>
</tr>
<tr>
<td>Gov</td>
<td>-0.325 (0.079)</td>
<td>-0.182 (0.116)</td>
<td>-0.390 (0.110)</td>
</tr>
<tr>
<td>R-square</td>
<td>0.452</td>
<td>0.475</td>
<td>0.498</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>29.362***</td>
<td>15.225***</td>
<td>17.519***</td>
</tr>
</tbody>
</table>
Findings: Based on the test results, it was revealed that sub-construct variable (TxS): Hong Kong Tax System recorded a significant relationship with tax compliance and the impact was positive. The sub-construct variable (Gov): Hong Kong Government was negatively associated with tax compliance, predominantly attributable to the postgraduate sub-group. No significant relationship was detected for the sub-construct (IRD): Hong Kong Inland Revenue Department (IRD).

The negative relationship between the measure of satisfaction of the Hong Kong Government (Gov) and Tax Compliance (TC) for the postgraduate sub-group indicated that postgraduates might satisfy with Hong Kong Government policy but recorded a lower tax compliance attitude, or, they might not satisfy with Hong Kong Government policy but still recorded a higher tax compliance attitude. This result is inconsistent with prior studies that generally suggested a positive relationship between taxpayers’ satisfaction level of their government and their tax compliance attitude (McGee et al., 2008). However, it is worth noting that in McGee et al.’s (2008) study, all Hong Kong samples were undergraduates studying in universities at that time. Their test results should not be comparable with the test result from the postgraduate sub-group in this study. Note that the undergraduate sub-group in this study recorded only a slight significant but negative relationship (-0.182 at 10% significant level) between Gov and tax compliance.

When comparing the mean scores of the sub-construct (Gov) and core variable (TC) between undergraduates and postgraduates, it was found that postgraduates recorded a

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166 At the 10% significance level.
167 Refer to mean scores in Table D5.5 of Appendix D, last two columns.
higher mean score than undergraduates for Gov but lower mean score for TC. The result appears to indicate that while postgraduates’ mean score for Gov strongly reduce their tax compliance, their Gov score remained above the undergraduates’ Gov score, implying that postgraduates on average were more satisfied with the Hong Kong Government than undergraduates. This could possibly be explained by the fact that postgraduates were older in age and more experienced in work and fiscal environments. As illustrated in the sample profile in Table 5.2.2.2-1 of this chapter, the majority of postgraduate samples are above the age of 30 (as opposed to the majority of undergraduate samples falling below 30). As most of these postgraduates had reached their early adulthood by 1997 when Hong Kong changed its sovereignty, they probably have had a stronger attachment to the British colonial settlement (relative to the undergraduate samples), resulting in a higher level of trust in the government (Richardson, 2006b). However, they had relatively lower tax compliance scores, which could possibly be attributable to the increasing financial burden making them more tempted to go for non-compliance in exchange for tax savings. It could also be possible that more experienced postgraduates might already have had similar risk-seeking experiences similar to the hypothetical non-compliance scenarios given in the survey questionnaire, and so they responded towards non-compliance based on what they had done before.

It is not certain whether or not a relationship exists between Gov and TC, despite the negative test findings. Prior literature also found that the effect of taxpayers’ perception of tax system fairness on tax compliance tends to be varying and inconsistent (Jackson & Milliron, 1986; Richardson, 2006b), and this was due to the

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168 For Gov, means of PG (4.08) > UG (3.75); for TC, means of PG (3.77) < UG (3.94).
multi-dimensional nature of the measurement indicators for this variable. It is considered that further in-depth study in this dimension would be useful to further clarify the impact on tax compliance by the perception of tax system fairness.

5.4 Chapter Summary

In this chapter, the impact of tax education on tax compliance was investigated in two dimensions: direct impact (by way of Hypothesis H1) and indirect impact through the enhancement of three intermediate variables: ability/readiness to comply, perception of tax system fairness and moral reasoning (Hypotheses H2 to H8). Before testing the hypotheses, the sample composition was analysed in Section 5.2. A sample profile of distinctive characteristics is contained in Table 5.2.2.2-1. This is followed by Section 5.3 which discusses all the test findings for the 8 hypotheses to be tested in this study. Figure 5.3-1 under Section 5.3 incorporates the hypotheses into the research model of this study. The direct impact of tax education on tax compliance was discussed in Section 5.3.1, and it was concluded that direct and positive significant impact was found at the overall group as well as undergraduate group level. Indirect impact was tested in three steps and discussed in Section 5.3.2. The interim results of step 1 were summarised in Table 5.3.2.1-6, and the interim results of step 2 were summarised in Table 5.3.2.2.2-7. Combining the findings from steps 1 and 2, the aggregated indirect impact of tax education on tax compliance was found significant through the enhancement of ability/readiness to comply at the overall group level, and through the enhancement of both ability/readiness to comply and moral reasoning at the undergraduate level.
The direct and indirect impact was captured in Figure 5.3.3-1 (in estimated coefficients) and Figure 5.3.3-2 (in elasticity). The research model incorporated with the overall test results was presented in Figure 5.3.3-3 in support of the overall analysis of test results under Section 5.3.3. In conclusion, taxpayers who have studied tax before were found to be in general more tax compliant, either directly or through the enhancement of ability/readiness to comply or moral reasoning. However, taxpayers with a higher education level tend to be less affected by their tax knowledge or ability/readiness to comply when they come to decide whether to comply or not; but their decisions are likely influenced by their moral reasoning (positive). Amongst the core variables, moral reasoning is the most effective contributing factor for tax compliance, and this factor can be improved by tax education for undergraduates but for postgraduates, it seems to be influenced by factors unrelated to tax education. Unexpectedly, the study found that the perception of tax system fairness was found negatively associated with tax compliance. As such, an expanded study was performed and discussed in Section 5.3.4. It was found that the negative impact was predominantly attributable to the negative relationship between postgraduates’ satisfaction of the Hong Kong government and their tax compliance attitude, but insignificant findings were recorded for all groups’ appreciation of Hong Kong tax authority. This indicates that the impact of tax education on tax compliance via perception of tax system fairness is varying, which renders opportunity for further studies by researcher.

At the overall level, this study’s most important implication for Government and tax administrators is that strategies aiming to foster tax compliance should be focused on enhancing taxpayers’ abilities/readiness to comply and moral development, probably through formal curriculum education in taxation. More resources should be invested
in improving the young population’s perception of the Government through either curriculum tax education or other forms of tax education. Further discussions on the contributions of this study to literature as well as policy makers can be found in Section 6.4 of Chapter 6 that follows.
6 CONCLUSION

6.1 Introduction

In this chapter, a synopsis of this study is first given to recap the purpose of this study
and its importance to Hong Kong. This is followed by a summary of the work done,
including a review of the literature, development of a compliance framework and
hypotheses, and identification of research methodologies such as survey instruments
and data analysis. Key findings from the study are then summarized and interpreted in
different dimensions: direct impact, indirect impact and combined impact. The
contributions of the findings to the literature and to policy makers in Hong Kong are
then discussed, followed by the limitations of this study. In the last section, certain
areas that evolved during the study have been identified as worthy of further study and
thus are recommended for future research.

6.2 The Study

6.2.1 Why this study and why for Hong Kong?

The government levies tax on people by law, making the paying of tax a legal obligation
or duty (Song & Yarborough, 1978). When people do not comply with the law,
penalties may arise. During the past few decades, a vast pool of literature has been
performed to study the underlying factors driving taxpayers to comply with the law as
well as factors deterring taxpayers from non-complying. The earlier streams of study
focused on deterrence measures such as the Deterrence Model (Allingham & Sandmo,
1972) but the direction has gradually moved toward the behavioural and psychological
rationale that motivates taxpayers to choose to comply. A review of this literature and the different streams of study was contained in Chapter 2 of this paper.

A taxpayer’s choice of complying or not is a behaviour, and therefore tax compliance can be explained by behavioural economic theories that seek to rationalise, for example, how a taxpayer develops his/her ability, as well as readiness to comply with tax law, and how a high level of ‘tax morale’ can be fostered. Researchers discovered that ‘education’ should play a role in improving an individual’s awareness and supporting the individual’s attitude or behaviour (Mahmoodi et al., 2012). There have been a few studies exploring the relationship between ‘education’ and ‘tax compliance’, but findings are inconsistent and inconclusive. For example, a positive relationship was found in some studies, while negative, insignificant or a mixed relationship was found in other studies.\textsuperscript{169} In a study by Ross and McGee (2012a), students from different disciplines were found to have different views on tax compliance, and accounting-major students were found more opposed to tax evasion. If it is reasonable to assume that accounting-major students are equipped with tax knowledge leading to the enhancement of their ability/readiness to comply with tax and the development of their tax morale, it would be justified to conduct a study focusing on ‘tax education’ and its impact on tax compliance. However, prior studies focusing on ‘tax education’ and ‘tax compliance’ are limited. This initiates the commencement of this study.

**Hong Kong-specific**

Hong Kong adopts a scheduler tax system under which there are only three types of tax: property tax (on property rental), salaries tax (on income from employment, office and pension), and profits tax (on profits from trade, profession and business). Tax is

\textsuperscript{169} Further discussions can be found in Section 2.7.4 of Chapter 2 and Section 3.2 of Chapter 3 of this paper.
assessed by the Hong Kong tax authority which relies heavily on the information reported by taxpayers, and there is no withholding tax mechanism except for certain royalty income. In the circumstances, a high level of voluntary tax compliance is critical in Hong Kong to ensure adequate tax revenue is collected. Moreover, based on the official statistics for the past four years (from 2010/11 to 2013/14), the total revenue collected each year from the above three types of tax accounted for nearly half of the Government’s general revenue each year (refer to Table 1.2-1 of Chapter 1). This demonstrates that the Hong Kong Government relies heavily on tax revenue in maintaining the efficient and effective operation of the fiscal system. Within the taxpayer population, individual taxpayers accounted for an estimated 27.7% of the total tax revenue collected in 2013/14. This is a significant proportion of contributions, denoting that compliance of individual taxpayers is very important to Hong Kong.

Country-specific studies on tax compliance have been done in the US, European and Asian countries. Studies in the context of Hong Kong were few, and none of them focused on tax education. The one studied by Chan et al. (2000) included ‘education’ in their study and delivered findings that are useful for reference in this study. Other studies in the case of Hong Kong were focused on either the perception of the tax system or culture. This study, therefore, is the first of its kind to explore the extent of contributions by ‘tax education’ on ‘tax compliance’.

6.2.2 What has been done?

Definition

This study aims at investigating whether tax compliance is impacted by tax education,
and if so, the extent and direction. Tax compliance is defined in this study as completely fulfilling the taxpayer’s statutory obligations in terms of accurate reporting, timely filing and timely paying, and tax education is confined to academic knowledge of taxation law and practice acquired through structured curricular education.

**Literature Review (Chapter 2)**

A detailed review was performed on prior literature in (a) taxpayers’ compliance, in particular the five main streams of tax compliance theories or models, and (b) impact of education (and tax education) on tax compliance. The main streams of compliance theories or models include, starting in the 1970s, the Deterrence Model, Endogenous Income Theory, Interaction with Tax Administrator/Authority, Behavioural Economics Theories, and Third-party Intermediaries. The focus of the theories has progressed from sanction-based to non-sanction based, and from non-compliance perspectives to compliance perspectives then to a mixed perspective. Detailed discussions of these theories and a critique on their findings are found in Chapter 2.

**Research Framework and Hypotheses (Chapter 3)**

Based on prior literature, major factors influencing tax compliance attitude have been identified and grouped under dimensions such as demographic factors, individual factors, third-party intermediary, social factors, government factors and economic factors. All factors were then formulated into a Tax Compliance Framework as in Figure 3.3-1 of Chapter 3. Each dimension was discussed and finally, four core variables were identified as relevant for this study: tax education, perception of tax system fairness, ability/readiness to comply, and moral reasoning. Some other factors in the framework were also found relevant and used as indicators to measure any of the
The research problem of this study is whether tax knowledge or ‘tax education’ has a role to play in driving the Hong Kong taxpayer’s compliance attitude. The impact of tax education on tax compliance was tested from the following perspectives: (a) direct, (b) indirect via three intermediate variables: ability/readiness to comply, perception of tax system fairness and moral reasoning, and (c) both direct and indirect. Altogether eight sets hypotheses and 22 equations have been developed to facilitate the testing. Further details of the research framework and hypotheses can be found in Chapter 3.

**Research Methodology (Chapter 4)**

The study was performed by way of a **deductive quantitative** survey via anonymous self-completed questionnaires to four groups of student samples: undergraduates with tax studied, undergraduates without tax studied, postgraduates with tax studied and postgraduates without tax studied. **Student samples** were used as they were relatively demographically homogenous and their attitude toward tax compliance is expected to be less influenced by factors other than their education, which is the focus for this study. The **questionnaire** contained 38 items as indicators to measure participants’ levels of tax compliance, ability/readiness to comply, perception of tax system fairness and moral reasoning, via a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). Factor analysis was done and questionnaire items were reduced to the four core variables to facilitate subsequent analysis. **Data** from a total of 221 observations was
collected and analysed primarily by bivariate and multiple regression. Testing was done in three stages as summarised in Table 4.9.2-1 of Chapter 4 and as follows:

(a) **Direct relationship** between tax education (TE) and tax compliance (TC);

(b) **Indirect relationship** between tax education and tax compliance – in three steps:

1. Step one tests the impact of tax education on each intermediate variable, via: ability/readiness to comply (AbR), perception of tax system fairness (TSF), and moral reasoning (MR);
2. Step two tests the impact of each intermediate variable on tax compliance;
3. Step three analyses the combined indirect impact from tax education on tax compliance via these intermediate variables by multiplying the coefficients estimated at steps one and two.

(c) **Combined direct and indirect relationship** based on the aggregated test results from stages (a) and (b).

Details of the methodologies used are discussed in Chapter 4.

### 6.3 Key Findings of the Study (Chapter 5)

The study provides empirical evidence to support the proposition that tax education has a positive relationship with tax compliance, both directly and indirectly, although variability was observed between the undergraduate and postgraduate groups. Detailed test results and findings can be found in Chapter 5 and are illustrated in Figures 5.3.3-1 to 5.3.3-3 of Chapter 5. The key findings are summarized as follows:
**Direct Impact:**

1. Tax education was found to have a significant **direct and positive** impact on tax compliance, but this is confined to the overall group and undergraduate group, giving an estimated coefficient of 0.187 at the overall level and 0.579 at the undergraduate level.

2. This result is expected and in conformity with prior literature that tax knowledge should improve taxpayer’s tax compliance. The favourable result from undergraduates could possibly be explained by the syllabus design of tax modules that focuses on technical content including tax law requirements and compliance obligations, and the incorporation of business ethics in the undergraduates’ curriculum. These will uplift the undergraduates’ ability and readiness to comply with the tax law.

3. As for the **postgraduate group, no direct relationship** was found to be statistically significant between tax education and tax compliance. This could possibly be due to the fact that postgraduates with more years of work and taxpaying experience may have other pressures, so that their choices of complying or not may be driven by factors other than education.

**Indirect Impact**

1. Tax education was also found to have a **significant and positive** indirect impact on tax compliance, mainly through the enhancement of ability/readiness to **comply**. Again, this result holds valid for both the overall group and undergraduate group, giving an estimated coefficient of 0.083 for the overall group and 0.240 for the undergraduate group.
2. This result is expected and in conformity with prior literature that tax knowledge should increase taxpayer’s understanding of tax requirements, hence enhancing the ability and readiness to comply with tax obligations, which in turn improves tax compliance. However, postgraduates are obviously not influenced by tax education, directly or indirectly, when they come to make decisions on tax compliance. This group could possibly be more influenced by external factors that may have occurred since the completion of their undergraduate degrees.

3. Other than ability/readiness to comply, undergraduates’ tax compliance was also found to be improved by tax education via enhancement of their moral reasoning, giving an estimated coefficient of 0.128. The strength of impact is not as great as ability/readiness to comply but is still substantial and statistically significant. This is possibly attributable to the curricular design of the undergraduate programmes that generally aims at increasing students’ awareness to observe individual integrity and ethical behaviour.

4. For postgraduates, moral reasoning was also found to be significantly and strongly driving their tax compliance, but such moral reasoning was not found associated with their tax education. As a result, tax education was not found to have an indirect impact on postgraduates’ tax compliance via moral reasoning. This may imply that the success of developing undergraduates’ moral reasoning through tax education leading to tax compliance will gradually wear off as postgraduates get older in age and they have more experience in work and tax payment. However, postgraduates remain to be substantially influenced by their moral reasoning on their choice of compliance, but their moral reasoning seems to be fostered by factors other than tax education.
5. Unexpectedly, a **slight negative indirect impact** on tax compliance by **perception of tax system fairness** was recorded and this result was found only for the **undergraduate group**. This is inconsistent with prior literature which generally suggested that a higher perception of tax system fairness would improve tax compliance. An elaborated study into the components of the variable was done, revealing that the major contributor was the negative relationship between the satisfaction level of the Hong Kong Government and tax compliance. This may not necessarily imply that undergraduates’ level of satisfaction of the government has an inverse impact on their tax compliance, but it could be explained by a phenomenon as observed by Alm et al. (2010a), that tax compliance could still exist even though taxpayers were not treated fairly, if these taxpayers were strongly motivated by their personal norms that ‘tax compliance is right’. Obviously, this implication has a value to invite further research, in particular by policy-maker in Hong Kong.

**Combined Impact**

1. Tax education was found to have a **significant and positive impact** on tax compliance **both directly and indirectly for undergraduates**, but both a direct and indirect relationship was found absent for postgraduates. This may suggest that postgraduates are less influenced by their tax knowledge when they make decisions to comply or not. Taxpayers who are older in age and more experienced in life and tax payment may be more concerned about other factors, such as financial commitments and culture, which are not the focus of this study.
2. The strongest intermediate compliance factor caused by tax education at the undergraduate level is ability and readiness to comply. Through acquiring tax education, undergraduates have a better knowledge and understanding of tax requirements and obligations, leading to increased awareness and readiness to comply with tax law. At the same time, students’ moral reasoning was also found to be the second factor positively caused by tax education at the undergraduate level leading to tax compliance.

3. A slight negative impact was found between tax education and tax compliance via the perception of tax system fairness, mainly attributable to the negative relationship between the satisfaction of the Hong Kong Government and tax compliance. This unfavourable variable reduces the overall impact of tax education on tax compliance when the combined result is ascertained.

6.4 Contribution of the Study

The findings on the direct and indirect impact of tax education on tax compliance will make a contribution in the following ways:

6.4.1 Contribution to Literature

A vast pool of literature has been developed in this topical research area, but the findings have been inconsistent and inconclusive. This study and its findings make a unique contribution to the literature on the study of tax compliance, from various aspects, as illustrated in Table 6.4.1-1 below. Note that only studies that are the most
relevant to this study are included in this comparison table, including studies performed after year 2000, and studies on Hong Kong samples.

Table 6.4.1-1 - Comparison of This Study with the Most Relevant Prior Studies

<table>
<thead>
<tr>
<th>Unique Aspects of this Study</th>
<th>Prior Literature and Critique</th>
</tr>
</thead>
</table>
| 1. Tax Education, direct and indirect impacts – Findings supported positive direct and indirect impacts on tax compliance via ability/readiness to comply and moral reasoning, but are only confined to undergraduates. | -Kasipillai et al. (2003) supported that tax education improved tax compliance in the case of Malaysia, but no distinction was made between direct and indirect.  
-Chan et al. (2000) focused on ‘education’ (not tax education), comparing HK and US student samples. No significant relationship was found for HK samples.  
-McGee et al. (2008) found HK students were more acceptable to tax evasion, more conditional in their perceptions as to whether tax evasion is morally wrong, and show greater expectations of government.  
-Ho and Wong (2006, 2008) found ethical beliefs were effective, but high education might link to low compliance. |
| 2. Negative relationship between perception of tax system fairness and tax compliance, varying among dimensions | -Richardson (2006b) studied tax fairness dimensions on tax compliance in HK. Found significant impacts only in certain dimensions of tax fairness but not in others, hence varying effects. Tax fairness dimension relating to ‘exchange with government’ recorded significant positive association. |
| 3. Specific focus on ‘tax education’ and specific context in Hong Kong | -Kasipillai et al. (2003) focused on tax education but in the context of Malaysia.  
-Chan et al. (2000) studied ‘education’ (not ‘tax education’) and compliance for US and HK samples.  
-Richardson (2005) focused on HK but only on the perception of tax system fairness.  
-Ho et al. (2013) focused on China but only on culture.  
-McGee et al. (2008) studied HK’s perception of tax evasion. |
| 4. Compare impact of tax education at undergraduate and postgraduate levels | -Chan et al. (2000) did not separate student samples between levels of education.  
-Gilligan and Richardson (2005) studied postgraduate business students in Australia and Hong Kong, but focused on the perception of tax fairness. |

1. **Positive direct and indirect impacts** were found on tax compliance by tax education. In some prior studies, tax education was found to be associated with higher tax compliance, but in other studies, it was found to have increased taxpayer’s ability to take advantage of the ambiguous and contentious areas of tax law, hence a negative relationship. In some other studies, no relationship was found between the two.

Findings from prior studies have been inconsistent and inconclusive. This study adds
additional empirical evidence to support the positive contribution made by tax education on tax compliance. Moreover, most prior studies did not specifically address tax education, and for those which did, no attempt was made to differentiate the impacts into direct and indirect perspectives. This study specifically addresses both the direct and indirect impacts by drawing on other intermediate factors (such as ability/readiness to comply, perception of tax system fairness, and moral reasoning) that could have been related to both tax education and tax compliance.

2. **A negative impact was found between perception of tax system fairness** (TSF) and tax compliance (TC). In the interest of facilitating future research, an expanded study on TSF was conducted under Section 5.3.4 of Chapter 5 with an aim to exploring any explainable factor. The expanded study into the three components of ‘perception of tax system fairness’ revealed that the component ‘satisfaction of government’ was found negative, while the other components ‘understanding of tax system’ and ‘appreciation of tax authority’ were found positive. This variation in findings supported Richardson’s (2005) study that not all the dimensions in tax fairness perception were found to be consistently associated with tax compliance, and the varying effect of these dimensions led to complications in predicting tax compliance based on taxpayers’ perception of tax fairness. Nonetheless, the elaborated findings seem to indicate that the negative association could be due to the negative satisfaction of the Hong Kong Government (Gov) by total group as well as all sub-groups. It was well noted that this test result was not supported by adequate data (represented by only four measurement items in the survey tool). Moreover, given the restricted size and component of the sample used for this study, the possibility of sampling bias, measurement error or weakness in the framework could not be ruled out. However,
there exists an opportunity for elaborated research in this area (see Section 6.6 of this chapter).

3. **This study specifically focuses on ‘tax education’ and in the context of Hong Kong.** Other than the inconsistent findings, prior literature was also found to be not representative enough, either because most studies were not focused on tax-specific education or comparative studies were done between tax jurisdictions with different tax structures (e.g. self-assessment system against direct assessment system). There was also very few empirical studies in the case of Hong Kong on tax compliance. Therefore, the major contribution of the study is to fill the research gap by providing empirically proved results to evaluate the effectiveness of tax education in improving tax compliance in the context of Hong Kong.

4. **The study also compares the impact of tax education between undergraduate and postgraduate levels.** While taxpayer’s compliance is found to be improved by tax knowledge acquired from curricular study, it is not certain whether this impact holds true when the taxpayer progresses to a higher education level. In most of the prior studies, student samples were used but no attempt was made to differentiate the samples by education level, rendering doubt on the reliability and representativeness of the results. As evidenced from this study’s findings, variations were found between undergraduate and postgraduate groups. One interesting finding from this study was that tax education was found positively leading to tax compliance through enhancement of moral reasoning for total group, but this enhancement effect was only found in the undergraduate group, not in postgraduate group. Postgraduate group’s compliance was indeed positively driven by moral reasoning but unlike undergraduate group, their moral
reasoning was not positively enhanced by tax education. The combined outcome seem to imply that tax education does have a positive impact on tax compliance at undergraduate level through enhancing moral reasoning; but the enhancement effect is somehow worn out at postgraduate level. Based on the sample profile, more than 75% of undergraduates have ≤ 2 years of work experience but more than 40% of postgraduates have ≥ 5 years of work experience. This may imply that a possible factor to wear out the effect of tax education on moral reasoning could be the increasing work experience. Greater exposure to non-compliance opportunities could be another factor. Further investigation is required to better understand the relationship between ‘being post-graduates’ and ‘working experience’ and ‘non-compliance opportunities’. However, this is outside the scope of this study and no further work was done. However, this should provide another interesting and important area for academic researchers to explore further.

6.4.2 Implications and Recommendations for Policy Makers

As mentioned before, the Hong Kong tax system relies heavily on voluntary reporting by taxpayers and tax is collected by assessment, not by withholding. Therefore, tax compliance is particularly crucial to maintain the effective use of government resources in Hong Kong. This study helps identify the key factors driving tax compliance behaviour in Hong Kong, especially amongst the younger generation, which should be useful for the Hong Kong tax administrator to develop its compliance strategy. Moreover, the positive and significant findings between tax education and tax compliance from this study lends support to the tax authority to invest extra resources in fostering tax education for the general taxpaying population with a view to improving
Education is a learning process. Taxpayers can be educated through formal curricular education while they are still young, and this is obviously an area that should also be included in the tax compliance strategy developed by the Hong Kong Government. Further research is obviously required to find out ways to extend the contributing power of tax education to older taxpayers. Findings from this study should help identify the areas of focus for developing the Hong Kong-specific tax compliance framework for the interests of the Hong Kong Government as well as the general public in the territory.

Moreover, the negative result from this study on the relationship between perception of tax system fairness and tax compliance should offer another interesting and worth-exploring area for the policy makers to investigate further.

6.5 Limitations of the Study

Unavoidably, this research is subject to several limitations. First, as the focus of this study is geographically constrained to Hong Kong, the relevance of its findings, as well as their generalisation, may not be equally applicable to other jurisdictions. Second, the defined scope of ‘tax education’ for this study is specific tax knowledge acquired through formal curricular education. This is particularly focused in this study so that student samples with relevant characteristics could be easily identified and accessed. While the researcher believed that findings from this study may possibly also apply to tax education attained through other channels, such as publicly released interpretation notes by the tax authority and professional tax advice by tax agents, there could be other aspects which have not been addressed in this study but relevant to other means of tax
education. The use of student samples for this study is another limitation although the sample selection was driven by the desire to evaluate the most immediate impact of tax education on compliance behaviour without being biased by other influences such as work experience. When findings are to be adopted or generalised, care should be exercised that these findings were obtained from students rather than the general taxpayer population in Hong Kong. Moreover, this study targeted individual taxpayers rather than corporate taxpayers. There remains a gap which is worth taking further by future researchers in the context of compliance behaviour of corporate taxpayers. Last but not least, given the time and resource constraints for this study, a cross-sectional survey at one particular point of time was adopted. Should resources be more adequate, a longitudinal type of research could be conducted for a longer span of time, at various points in time throughout the lifecycle of a taxpayer, from the point of receiving tax education (or no-tax education), to the points of entering the workforce, progressing into post-graduate education (if applicable), walking through changes in personal status (such as family, social, work achievement), and encountering various interactions with the tax authority. This should prove to be an interesting topic for future research to investigate how compliance behaviour changes over time and how the impact of tax education changes over the taxpayer lifecycle. Finally, it is worth noting that the three-step approach used for testing the indirect impact of tax education on tax compliance is only a preliminary analysis to understand the path of the impact of tax education on tax compliance. A future study with appropriate framework and analytical methodology may be beneficial to reaffirm the findings.
6.6 Future Research

A few areas that have evolved throughout the process of this study are recommended for future research as follows:

(a) The scope of ‘tax education’ may be extended to cover channels other than formal curricular education, such as published interpretation notes by the tax authority and advice given by tax practitioners as intermediaries.

(b) The study of impact of tax education may be extended to a broader range of taxpayers including the general public and corporate taxpayers. In doing so, the impacts of factors other than tax education can be examined. It would also be good to ascertain the relationship between the levels of tax paid by taxpayers and degree of their tax compliance. This should add further insight to the understanding of tax compliance behaviour in Hong Kong which would be useful for the tax administrator in developing public policy concerning compliance strategy.

(c) A longitudinal survey may be considered covering a longer span of time to examine the compliance behaviour before and after tax education. What’s more, with adequate resources, the longitudinal study can be conducted at various points in time throughout the taxpayer lifecycle, from the points of receiving the tax education (or no-tax education) to the points of entering the workforce, progressing into post-graduate education (if applicable), walking through changes in personal status (such as family, social, work achievement), and encountering various interactions with the tax authority. Findings should be interesting and more comprehensive.
(d) The indirect impact of tax education on tax compliance is another area for further exploration in future studies with appropriate framework and analytical methodology in order to reaffirm the preliminary findings from this study.

6.7 A Synopsis of Research Questions and Findings

A synopsis is provided in Table 6.7-1 below summarizing the research questions, previous research findings, findings from this study and contributions:
Table 6.7-1 Synopsis of Research Questions, Findings and Contributions

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Previous Research</th>
<th>Findings from this Study</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RQ1:</strong> Does TE directly increase TC in Hong Kong?</td>
<td>Limited studies focused on ‘tax education’</td>
<td>Specific focus on ‘tax education’ by comparing tax-studied samples with non-tax-studied samples</td>
<td>Fill the research gap of TE’s impact on TC.</td>
</tr>
<tr>
<td></td>
<td>Prior studies proved higher education leading to higher TC, but not clear about direct or indirect impacts</td>
<td>-Direct and indirect impacts separately hypothesized. -Direct impact was supported for total group and UG. -Indirect impact was supported via AbR for total group and UG.</td>
<td>Additional empirical evidence on positive impact, and reveal intermediate factors for indirect impact.</td>
</tr>
<tr>
<td></td>
<td>Limited studies distinguished undergraduate (UG) from postgraduate (PG) education</td>
<td>This study compares TE impact between UG and PG. -Varying findings: direct and indirect impacts found only in total group and UG; but not for PG</td>
<td>Different findings for UG and PG raised questions for further research.</td>
</tr>
<tr>
<td><strong>RQ2:</strong> Does TE increase taxpayers’ AbR, which in turn increases TC?</td>
<td>Prior studies supported more tax knowledge increasing taxpayers’ ability to comply.</td>
<td>This study also proved TE improves AbR which in turn improves TC. -AbR was found the greatest contributor to the indirect impact of TE on TC, though only for UG.</td>
<td>Additional empirical evidence that TE’s impact on TC is through AbR.</td>
</tr>
<tr>
<td></td>
<td>Prior studies supported TC driving perception of TSF, despite inconsistent findings in some studies</td>
<td>This study found negative indirect impact of TE on TC via TSF for UG -No impact was found for PG -Expanded study found the main contributor for negative impact was dissatisfaction against government.</td>
<td>Offer a new perspective for future research to study the role of government in TC; especially for policy-maker</td>
</tr>
<tr>
<td><strong>RQ3:</strong> Does TE increase taxpayers’ TSF, which in turn increases TC?</td>
<td>Prior studies supported moral development increasing TC</td>
<td>This study also proved that TE improved MR which in turn improved TC. -Apart from AbR, MR was another great contributor to the indirect impact of TE on TC, though only for UG. -Interesting findings for PG: MR was found significantly associated with TC but not influenced by TE.</td>
<td>-Additional empirical evidence for TE’s impact on TC through MR. -Varying findings between UG and PG raised a question whether TE’s impact on MR was wearing off.</td>
</tr>
<tr>
<td><strong>RQ4:</strong> Does TE increase taxpayers’ MR, which in turn increases TC?</td>
<td>Prior studies proved higher education leading to higher tax compliance, but not clear about direct or indirect impacts</td>
<td>Indirect impact was only found in total group and UG, but not in PG.</td>
<td>-Additional empirical evidence on TE’s indirect impact on TC. -Offer research question on the wearing off effect of TE’s impact for PG</td>
</tr>
</tbody>
</table>

**TE:** Tax Education; **TC:** Tax Compliance; **AbR:** Ability/readiness to comply; **TSF:** Tax System Fairness; **MR:** Moral Reasoning; **UG:** Undergraduate Group; **PG:** Postgraduate Group
6.8 Summary

This final chapter started with the key rationale leading to this study and its importance to Hong Kong. This was followed by a synopsis of what has been done in this study, the research methodologies used and the hypotheses developed. The key findings of the study were then summarised in Section 6.3 supporting the proposition that tax education directly and indirectly improves tax compliance. There are a few aspects of unique contributions of this study to literature on tax compliance and a brief comparison with most relevant and recent prior studies was provided in Table 6.4.1-1 of Section 6.4.1 above. Other contributions to Hong Kong policy-makers were discussed in Section 6.4. This study is also subject to certain limitations as highlighted in Section 6.5 and a few areas evolving from this study that are worth taking further in future research are highlighted in Section 6.6.

End of Paper
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