One more thought on the issue of tax compliance cost burden for large enterprises in New Zealand: application of rational choice model to tax compliance administration

Abstract

Tax compliance burden represents additional costs incurred by business when complying with tax obligations, imposed by tax revenue authority. Given the regressive nature of tax compliance costs the majority of studies has traditionally focused on SMEs and largely ignored large enterprises as the object of their analysis. As the result, there are very few studies that consider the issue of tax compliance costs among large enterprises and even fewer of them chose to look at the situation with large enterprises in New Zealand. Another important aspect regarding the previous literature on tax compliance costs burden of large enterprises is the fact that tax compliance costs are seen as "exogenously" determined in previous studies and, therefore the magnitude of tax compliance burden has been considered to depend only on the complexity of tax code. In fact, being one type of operating expenses, tax compliance costs can also be reduced through the optimal tax compliance costs administration and thus it is more appropriate to view them as "endogenous" costs.

This article presents an analysis of optimal tax compliance cost administration employing the rational choice model. The purpose of the model is to demonstrate what the optimal mix of resources that large enterprises use in order to comply with tax obligations should be, so that the burden from tax compliance costs would be minimal. Though the model is not empirically tested in this article, it nonetheless offers some valuable insights into the tax compliance costs minimization administration that "rationally behaving" large enterprise would be expected to adopt.

Key words: tax compliance costs, large –enterprises, rational choice model

1 Introduction

Tax compliance costs represent additional burden that business incurs in order to comply with various tasks and requirements imposed on it by tax code. Empirical studies conducted in the past indicate, that these tasks, also known as "tax compliance", come at considerable costs for business and divert resources, which could have been used more productively. From the standpoint of economic theory these costs are no more than the "dead weight losses", in other words, pure losses for the society and business, as they only increase effective tax burden without increasing tax revenue (Eichfelder and Vaillancourt 2014). High costs of tax compliance could distort economic decision-making creating disincentive to produce and invest. The consequence of high tax compliance costs is the diminished ability to compete in the global economy (Laffer, Winegraden and Childs, 2011) and negative effect on the general investment climate.

Studies into the issue of tax compliance costs have progressed significantly over the last 40 years since the seminal studies by Sandford in UK (1973) and Slemrod in US (1984). Despite the use of the different research methodologies and data collection strategies, according to Evans (2007), empirical studies have made a number of consistent and important findings (Tran-Nam, 2015 and Evans, 2007). These findings can be summarized as follows.

1) Tax compliance costs are large around the world whether in absolute monetary terms or in relation to collected tax revenue or GDP. According to Evans (2007), tax compliance costs range from 2% to 10% of collected tax revenue and up to 2.5% of GDP

2) Tax compliance costs are regressive, which means that as the size of business taxpayer annual turnover becomes smaller, the burden of tax compliance costs increases. By contrast, tax compliance costs tend to decline with the increase in the size of business turnover due to the economies of scale

3) In-house labour cost dominate the composition of tax compliance costs. According to Tran-Nam (2015), the share of internal labour costs is about two-thirds of the total tax compliance costs

4) Tax compliance costs are not declining relative to business income over time despite government's efforts on tax simplification

Primarily due to the regressive nature of tax compliance costs and the significant role, which small companies play in the national economies, small business sector received far more attention in the literature. According to the working paper issued by the European Commission (2013) there have been 35 studies, which focuses on SME, and only 5 studies taking a look at large enterprises (European Commission, 2013). Such a skewed interest from academic researchers toward SME has resulted in tax compliance costs of large enterprises being a largely understudied area, which in turn creates a gap in the literature, as currently very little is known about composition, size and drivers of tax compliance costs of large enterprises (Evans, 2014). This concerns, in particular multinational firms and their tax arrangements, as the area of tax laws and regulations applying to them is very complex (Evans, 2014), and the costs of this complexity are yet to be analysed and measured. In the light of the existing gap in the literature, studies into the field of tax compliance costs of large enterprises are justified and might provide a useful analysis of the tax administration performance and main drivers of the costs of tax compliance in large enterprises.

As has been mentioned earlier, few studies have focused on measurement of tax compliance costs in large enterprises. Such studies include Slemrod and Blumenthal (1996) for large US enterprises, Erard (1997) for the largest enterprises in Canada, Chan, Ariff and Loh (1997) with focus on Hong-Kong public entities, Susila and Pope (2012) for large enterprises in Indonesia and Evans, Lignier and Tran-Nam (2016) with focus on large enterprises in Australia. Applying different data collection methods, they nonetheless managed to produce consistent results, which are in line with the main empirical findings. Costs of tax compliance in each of these studies were found to be relatively large, regressive and not reducing over time. As tax compliance costs are usually seen by economists as "proxies" for measurements of complexity of tax system (Eichfelder and Vaillancourt, 2014), most of the previous studies assume that large amounts of tax compliance costs incurred by large enterprises appear to be the result of the complex tax system and that further simplification is merited on this ground. In this regard, it can be said that tax compliance costs are "implicitly" assumed to be of "exogenous" nature in previous studies and that the magnitude of tax compliance costs depends on the complexity of tax system alone[1].

However, from the perspective of tax administration applied by large enterprise, tax compliance costs are simply one type of operating costs and thus their minimization is essential for achieving the main goal of every business entity – profit maximization. Therefore, if large enterprise is behaving as a "rational" economic agent and chooses the most cost efficient tax compliance strategy, it can minimize the burden of tax compliance at least on the micro level. Consequently, tax compliance burden of a large enterprise is not only influenced by the complexity of tax system, but also by the compliance strategy of that large enterprise (Eichfelder and Schorn, 2009). If tax administration of large enterprise is not cost-efficient, then complexity of tax system alone cannot be blamed for the relatively high level of tax compliance costs among large enterprises[2].

The choice of cost efficient tax compliance administration should be especially relevant in the case of large enterprises, as they usually have sufficient resources for implementation of various tax administration strategies and often engage in complex business transactions. For example, for complying with its tax obligations large enterprise might employ in-house accountants or avail itself of the external practitioners' service. If large enterprise is "rationally behaving" economic agent, its choice of the particular resource (whether in-house accountants or external practitioners) or combination of resources should be most cost efficient and thus minimize costs of tax compliance. The complexity of business transactions, which large enterprises frequently engage in, often becomes the source of disputes and litigations with tax revenue authority due to the tax position that large enterprise takes in particular situation. According to the results of estimation of tax compliance costs incurred by large enterprises in US and Australia, expenditures on litigation and disputes with tax revenue authority account for 10.4% for US large enterprises (Slemrod and Blumenthal, 1996) and 22.9% for large Australian enterprises (Evans, Lignier and Tran-Nam, 2016) of the total expenditures on tax compliance[3]. Such a relatively high level of expenditures on litigations and disputes can be an indicator

[1] The implication of the exogeneity of tax compliance costs has, in fact, never been mentioned in any of the previous studies. This has been entirely drawn by the author from the conclusion made in each of the studies.
[2] Relatively high level of costs ensuing from tax compliance of large enterprises has been reported in previous studies. See, for example Slemrod and Blumenthal (1996), , Susila and Pope (2012) and Evans, Lignier and Tran-Nam (2016)
[3] Expenditures on litigation and disputes with tax authority can be considered as a type of tax compliance costs. As such, they should be more common with large enterprises, rather than with SMEs, due to the more complex nature of transactions, which are more typical for large enterprises to engage in.

of the complexity of tax system (Tran-Nam and Walpole, 2016) or it might also be the outcome of the cost-inefficient strategy.

This article is organized as follows. First, the literature review will be provided to introduce what has been done in the research on tax compliance costs of large enterprises. This section will be followed by the brief outline of the idea of rational choice in the economic theory. Next, analytical model of cost-efficient tax administration, based on the assumptions of rational choice, will be presented, followed by the conclusion.

2 Literature Review

Despite the existence of extensive literature on measurement of tax compliance costs there have been only few studies which specifically focus on large enterprises, where the majority of them have been undertaken in 1990's (Susila and Pope, 2014). Among those studies which were conducted in 1990's the studies by Slemrod and Blumenthal (1996) and Erard (1997) are two most recognizable studies in the literature on large enterprises. Both of these studies were concerned with the measurement of tax compliance costs of large enterprises in the North America, namely USA (Slemrod and Blumenthal, 1996) and Canada (Erard, 1997). Other significant research dealing with tax compliance costs of large enterprises include Chan, Ariff and Loh (1997), which focuses on publicly listed companies in Hong-Kong. To the author's knowledge, only two studies on measurement of tax compliance costs of large enterprises have been done recently. The first one being the research carried out by Susila and Pope (2012), where the object of study were large enterprises in Indonesia. The second study was undertaken by Evans, Lignier and Tran-Nam (2016), which examines tax compliance costs of Australian large enterprises. Each of these studies will be briefly discussed below.

2.1 Studies conducted in 1990's

Slemrod and Blumenthal (1996) undertook a mail survey among 1,329 of the largest corporation in USA with the response rate of 27.5% (equivalent to 365 completed surveys). The "smallest" large entity in the population of surveyed large corporations, accessed in terms of employees number and sales volume was the one with 2,500 employees and with USD 268 million (NZD 388 million) of annual sales volume. Further empirical estimation of the survey results revealed that large entity in USA spent on average USD 1,57 million[4] (NZD 2.26 million) per year to comply with the Federal and State corporate income taxes, which translated into USD 2,080 billion[5] (NZD 2.99 billion) of total tax

[4] USD 2,4 million (NZD 3,48 million) in 2016 after adjustment for inflation from 1996 to 2016
[5] USD 3,19 billion (NZD 4,63 billion) in 2016 after adjustment for inflation from 1996 to 2016

compliance costs for the population of 1,329 largest USA corporations. This amount of tax compliance costs for largest entities in USA constituted approximately 2.6% of the total tax revenue that the Internal Revenue Service collected from these largest enterprise at that time.

Also, the results showed that about 55% of costs goes for in-house personnel, about 30% to non-personnel costs and 15% to outside advisers. Among in-house personnel share of tax compliance costs, 70% of the costs were incurred by tax department personnel, with remainder coming from non-tax departments.

The study analysed further the effect on the magnitude of tax compliance costs of such factors as large entity's size, sector within which it operates and if it has multinational presence. It was established that the 10% increase in firm's size (expressed either by the value of assets or sales) leads to increase in the tax compliance costs between 4.1% and 6.1%, thus confirming again the effect of economies of scale for large enterprises. The fact that tax compliance costs tend to increase with the firm's size is one of the main finding in this study.

The sector effect showed that depending on the type of sector within which a large enterprise operates tax compliance costs can be higher or lower. For example, for enterprises operating in the mining or oil or gas sectors tax compliance costs were on average 71% higher compared to enterprises which do not operate in these sectors. Similarly, enterprises in wholesale or retail industries experience tax compliance costs which were 61% lower relative to enterprises from other sectors.

The factor of enterprise worldwide presence (measured by the percentage of worldwide employees, worldwide assets value or worldwide sales) also adds to increase in tax compliance costs though less than proportionately.

Erard (1997) study was focused on large enterprises in Canada and followed closely the study by Slemrod and Blumenthal (1996) in the method employed. The survey was mailed to all 250 members of Canadian Tax Executive Institute, most of whom ranked among the very largest corporation in Canada at that time. The number of responses received was 59, which was equivalent to 24% response rate. Fourteen large enterprises out of the 59 respondents were operating in financial sector. The average size of large enterprises from both non-financial and financial sectors was measured in number of employees, gross receipts and total value of assets. Thus, on average large enterprise from non-financial sector had 8,568 employees, CAD 2, 88 billion[6] (NZD 2, 2 billion) of gross receipt and assets with CAD 3, 45 billion [7](NZD 3, 66 billion) of book value. The average number of employees for the large

[6] CAD 4,171 billion (NZD 4,58 billion) in 2016 after adjusting for inflation from 1996 to 2016
[7] CAD 4,99 billon (NZD 5,48 billion) in 2016 after adjusting for inflation from 1996 to 2016

enterprise from financials sector was 13,041, average gross receipts and average book value of assets were accordingly CAD 5, 25[8] billion (NZD 5, 60 billion) and CAD 58, 4 billion[9] (NZD 62,3 billion).

The results of estimation undertaken for the largest Canadian enterprises revealed that on average costs of tax compliance incurred by the large enterprise in non-financial sector was CAD 507,000[10] (NZD 540,000), implying that an aggregate amount of tax compliance costs for the whole group of non-financial large enterprises (500 top largest non-financial enterprises) was around CAD 250 million (NZD 266 million). Average tax compliance costs turned out to be even higher if large financial enterprises were included into the estimation. Thus, the average tax compliance costs were CAD 925,000[11] (NZD 986,000) after including large enterprises from financial sector into estimation. In relation to the total tax revenue collected from these top non-financial largest enterprises, it implied a compliance burden of almost 5% of taxes paid. The ratio of tax compliance burden including financial firms to the amount of taxes paid was 2.7%.

The composition of tax compliance costs showed that in-house personnel accounted for 56.9% of the total costs, in-house non-personnel expenditures and assistance of external experts accounted for 20.6% and 22.5 % respectively. Further, the breakdown of in-house personnel costs by their activity function showed that about 46% was spent on records keeping and filing returns. Another 29% was spend on research and planning and the balance was spent on audit appeals and litigations.

As for the determinants of tax compliance costs of the top largest Canadian enterprises, it was estimated through regression of such variables as a number of filed T10 tax form (required for reporting on tax matters associated with overseas transactions), amount of gross receipts and sector dummy on the total tax compliance costs, that a 10% increase in the number of T10 forms (signifying 10% increase in the volume of overseas transactions) would result in 2.6% increase in tax compliance costs, while a 10% increase in gross receipts would result in tax compliance costs increasing by 4.1%. These results were compatible with Slemrod and Blumenthal (1996) showing that tax compliance costs increase with the business size, however less proportionately.

Chan, Ariff and Loh (1997) examined the situation with tax compliance costs among publicly listed companies in Hong-Kong using data on listed companies' tax compliance costs that they incurred during 1995-1996 tax year. The survey was mailed out to 496 listed companies with 75 companies responding to it. The total response rate was 15.1%. For facilitating the analysis, the received returns were further categorised into three groups based on size. The Group 1 contained listed enterprises with

[8] CAD 7,60 billion (NZD 8.35 billion) in 2016 after adjusting for inflation from 1996 to 2016
[9] CAD 84,58 billion (NZD 92.9 billion) in 2016 after adjusting for inflation from 1996 to 2016
[10] CAD 734,000 (NZD 806,000) in 2016 after adjusting for inflation from 1996 to 2016
[11] CAD 1,3 million (NZD 1,4 million) in 2016 after adjustment for inflation from 1996 to 2016

sales volume of less than HKD 100 million[12] (NZD 19 million), Group 2 contained listed enterprises whose annual sales were between HKD 100 million and HKD 550 million[13] (NZD 103.4 million) and Group 3 included the remaining listed enterprises with sales volume above HKD 550 million.

The overall tax compliance costs for the listed Hong-Kong enterprises were estimated to be on average HKD 346,483 (NZD 65,000) per a company. The average tax compliance costs, calculated separately for each group, were HKD 85,950[14] (NZD 16,000), HKD 272,410[15] (NZD 50,900) and HKD 465,339[16] (NZD 87,000) for enterprises in Group 1, 2 and 3 respectively. The obtained estimations of tax compliance costs for each group of enterprises shows that tax compliance costs tend to increase in absolute value as the size of enterprise increases. However, further calculation of the magnitude of tax compliance costs per HKD 1,000 of sales revealed that tax compliance costs tend to fall as sales volume increases. For example, tax compliance costs per HKD 1,000 of sales were HKD 5.41, HKD 1.17 and HKD 0.21 for enterprises in Group 1, 2 and 3 respectively. This trend is the consequence of economies of scale.

The composition of tax compliance costs revealed that the smaller listed enterprises (Group 1) were using the assistance of external advisers more often compared to larger listed enterprises (Group 3). Also, it was noted in the study that tax planning costs were 26% of the overall tax compliance costs implying that complicated tax-planning schemes were not required for the lower tax rates. In addition it pointed to the simplicity of Hong-Kong tax system.

Further, simple regression analysis was employed in the study in order to ascertain the effect of sales volume on costs of tax compliance activities. The regression results showed that on average 10% increase in sales would translate into 0,363% increase in tax compliance costs. The fact that the value of the slope parameter (0,363) was less than 1 pointed to the presence of the effect of economies of scales and was consistent with the results obtained by Slemrod and Blumenthal (1996) and Erard (1997).

2.2 Recent studies

The study by Susila and Pope (2012) examined the tax compliance costs among the population of 28, 681 large Indonesian enterprises registered in Large and Medium Taxpayer Offices. The sample consisting of 3,000 enterprises was taken by the way of random stratified sampling, using business

[12] HKD 125,3 million (NZD 23,4 million) in 2016 after adjustment for inflation from 1996 to 2016
[13] HKD 689 million (NZD 128,8 million) in 2016 after adjustment for inflation from 1996 to 2016
[14] HKD 107,729 (NZD 19,900) in 2016 after adjustment for inflation from 1996 to 2016
[15] HKD 341,000 (NZD 63,400) in 2016 after adjustment for inflation from 1996 to 2016
[16] HKD 583,000 (NZD 108,000) in 2016 after adjustment for inflation from 1996 to 2016

sector as a strata. Following the creation of the sample, the questionnaires were mailed out to potential respondents and, as the result 246 responses were received (8.2% response rate). The composition of the large enterprises in the sample measured by the amount of turnover was: below the lowest established threshold of IDR 3 billion (NZD 435,000) 6 enterprises (2%), over the highest established threshold of IDR 100 billion (NZD 14.5 million) 97 enterprises (39%). The rest of the enterprises were between these two thresholds.

The estimation of the tax compliance costs, based on the results of the survey showed that in 2010 weighted average of tax compliance cost per an enterprise were IDR 420,9 million[17] (NZD 64,402). The largest tax compliance costs per an enterprise were found in retail and wholesale sector (IDR 506 million[18] (NZD 77,421)) followed by manufacture sector with the overall tax compliance burden per manufacturing enterprise of IDR 488,8 million[19] (NZD 74,795). The sector featuring the smallest tax compliance costs according to authors' estimation was a mining and extraction sector, where costs of tax compliance per an enterprise were estimated to be on average IRD 51,4 million[20] (NZD 7,860)

Overall tax compliance costs were further broken down by the components. The largest component of tax compliance costs among Indonesian large enterprises was routine tax compliance activity performed by staff (47.9%) followed by the cost of time spent by management on routine operations (16.93%) and costs related to tax audit (10.33%). External tax compliance costs accounted for 26.85% of the total amount of tax compliance costs, where the largest component of external costs were costs associated with tax audit (9.66%).

It was also established that tax compliance costs were increasing with the size of an enterprise measured in terms of turnover amount, though less proportionately due to the well established in the literature effect of economies of scale. Thus, total tax compliance per 1 IRD were IDR 0.112 for enterprises with annual turnover less than IRD 3 billion (NZD 435,000) and IDR 0, 004 for enterprises with an annual turnover above IRD 100 billion (NZD 14.5 million).

Further, the authors performed a calculation in order to demonstrate the percentage share of overall tax compliance costs relative to such indicator as GDP and National Tax Revenue from large enterprises. To this end, mean tax compliance costs that had been estimated for each sector were multiplied by the number of large entities in the population of each sector. In the result, overall tax compliance costs for the whole population of the registered large enterprises turned out to be equal to IRD 12.3 trillion (NZD 1.88 billion) which in percentage terms was equivalent to 0.19% of Indonesian GDP in 2010 and 3.6 % of the total tax revenue collected from large enterprises in 2010.

[17] IDR 523,6 million (NZD 57,000) in 2016 after adjustment for inflation from 2010 to 2016
[18] IDR 629,4 million (NZD 67,979) in 2016 after adjustment for inflation from 2010 to 2016
[19] IDR 608 million (NZD 65,674) in 2016 after adjustment for inflation from 2010 to 2016
[20] IDR 63,9 million (NZD 6,901) in2016 after adjustment for inflation from 2010 to 2016

Finally, in the study by Evans, Lignier and Tran-Nam (2016) costs of tax compliance incurred by large enterprises in Australia were analysed and measured. Their study revealed several distinguishing features of the compliance costs profile of large enterprises in Australia. First, large enterprises in Australia show a propensity to rely more heavily on assistance of law firms (and less on accounting firms) for their external service in comparison with SMEs (Evans, Lignier and Tran-Nam , 2016). Second, by the type of external tax service, "record keeping and tax filing" was only 37% of the total external expenditure by large enterprises (whereas this service accounted for 80% of the total external costs incurred by SMEs in Australia). External services related to "tax planning" and "audit and litigations" make up 27% and 23% accordingly of the total external expenses by large Australian enterprises. According to Evans, Lignier and Tran-Nam (2016) such costs profile of large enterprises suggests that external services for large enterprises have a fundamentally different character (Evans, Lignier and Tran-Nam, 2016) than in case of SMEs. It is obvious that large enterprises have to spend more on "tax planning, audit and litigation" due to the complexity of their operations. Third, an analysis of the costs related to internal staff tax activities indicates that, though 56% of the total internal staff costs is dedicated to "record keeping and tax filing" (which is very close in pattern to that of SMEs), almost 19% of the total internal costs were related to "tax planning" and 14% were related to "audit and litigation", once again confirming significant difference in the tax compliance costs profile of large enterprises from that of SMEs.

Tax compliance costs structure of large Australian enterprises was also compared to the results obtained in previous studies for US and Canada. The comparison indicates that Australian large enterprises had a greater exposure in 2012 to the external services as opposed to US and Canadian firms (34.2% in the case of Australian large enterprises against 19.8% and 24.6% in the case of US and Australian enterprises). In relation to internal costs of tax compliance, Australian large enterprises on the opposite spend less on this category of costs as compared to US and Canadian cases (45.7% in the case of Australia and 60.7% in the case of US and 55.1% in the case of Canada). According to the authors, greater reliance of Australian large enterprises on external services rather than on internal, might be a pattern of international shift toward outsourcing tax compliance exhibited by large enterprises. Perhaps, US and Canadian large enterprises would show the similar trend if the studies were undertaken today (Evans, Lignier and Tran-Nam, 2016).

All the five studies introduced above deal specifically with the measurement of tax compliance costs of large enterprises. Overall, they all find that tax compliance costs of large enterprises are large, not diminishing over time and regressive. Also, some studies revealed different nature of tax compliance costs of large enterprises in comparison to the tax compliance costs profile of SMEs. Large enterprises spend more on such services as "tax planning", "audit and litigation" and this composition of costs is true for both external and internal tax compliance services. Furthermore, apparently shift toward outsourcing of tax compliance activities has become a global trend among large enterprises, however due to the scarcity of recent studies it cannot be verified.

The studies also have some limitations. For example, more analysis of determinants of tax compliance costs of large enterprises is required, particularly in regard to the overseas business operations. Given that most of studies on large enterprises (except for Susila and Pope 2012) were conducted 20 years ago, the expansion of large enterprises beyond the border of a single jurisdiction and increased complexity of cross-border transactions merit a more thorough investigation into effect of cross-border transactions on tax compliance costs of large enterprises.

One more limitation of the previous studies, which motivated this research is related to the following aspect. While empirical analysis of the tax compliance costs faced by large enterprises allows to estimate the magnitude of the overall tax compliance costs, their composition and determinants, as has been done in above five studies, it nonetheless provides little insight into the rationale behind the choice of resources mix that large enterprises expend in compliance with their tax obligations. Ideally, according to the theory of rational choice, which will be elaborated in the third chapter, firms are expected to choose the optimal mix of their resources so that their profit is maximised (or costs are minimized). Applying this assumption to the issue of tax compliance costs burden, large enterprises should act rationally when deciding how to distribute their resources among tax compliance activities in order to minimize their onerous burden. For example, the choice made by large enterprise to avail itself of the external tax advisor's service might help to avoid the possible large penalties, which can be viewed as the rational choice made in this kind of situation. Since, costs related to tax audit, appeals and litigation types of tax compliance activities account for quite substantial part of overall tax compliance costs (21.5% in Slemrod and Blumenthal (1996), 25% in Erard (1997), 12.8% in Susila and Pope (2012)), analysis of whether large enterprises rationally make a choice of their resources when complying with tax obligations can aid in better understanding of the sources of tax compliance costs (whether it is complexity of tax code or simply failure to properly optimize resources).

3 Tax Compliance Costs Burden from the Perspective of Rational Choice Model

The issue of tax compliance costs, an additional burden imposed on business by tax regulations, has been considered in the literature as "unavoidable" costs in case of operational tax compliance activity or "avoidable" costs in case of tax planning. In other words, it has been tacitly assumed that the size of the burden of tax compliance activity has been solely determined by the design, implementation and complexity of the tax system alone and that large enterprises have been passively carrying the burden of tax compliance costs.

In reality, as has already been mentioned in the Introduction part, from a business administration perspective the tax compliance costs burden is not determined by the tax system alone, but also by the compliance strategy of the business taxpayer (Eichfelder and Schorn, 2009). Therefore, the adoption of an optimal strategy on choosing the most cost minimizing vector of inputs under the condition of the available information on market price of inputs, should assist in minimizing the costs of tax compliance. Speaking in terms of the theory of rational choice, every large enterprise is assumed to pursue the optimal choice, which in this context is seen as a cost minimizing tax compliance strategy.

Next we will take a brief look at the content of the rational choice theory in order to be familiar with its basic tenets, as they lie in the heart of the modern economic theory and therefore are expected to explain the behaviour of large enterprises as a cost-optimizing economic agent.

3.1 Rational Choice Theory

Theory of rational choice is at the heart of modern economic theory (Ulen, 1994:791) and other disciplines contiguous to economics, such as history and law, which have adopted this theory for their models of decision making. An informal definition of the rational choice states that "the choice is said to be rational when it is deliberative and consistent" (Ulen, 1999:791). According to this definition the decision maker has thought what he/she is going to do and his/her actions that are based on choices he/she makes exhibit consistency. In other words, there should be no unexpected and inexplicable swings in his/her choices over time and that the means he/she chooses are well-suited for attainment of his goals (Nozick, 1993). This informal definition lacks preciseness and does not seem to allow us to separate rational behaviour from irrational as almost every action would seem to be "deliberative" and "consistent" (Ulen, 1999:792).

The formal definition of rational choice is better explained by referring to the example of consumers who have transitive preferences and who strive to maximize their utility subject to various constraints. Transitive preferences are those preferences, for which the following statement is true: if consumer prefers good A over good B and B is preferred to good C, then for that consumer good A is preferable over good C (Ulen, 1999:793). Similarly, economists assume that utility maximization by consumer is an obvious thing and they are puzzled if someone does not do so (Ulen, 1999:793).

Economists found rational choice theory to be a very useful and strong tool for modelling firms' behaviour. As an example, economic theory predicts that when wages increase, the demand for labour decreases while the supply increases. Similarly, when the price of good or services rises, all other things equal, the production will shift toward the supply of that good or service. When the price of input increases relative to its substitute, a rational producer will use more of substitute and less of that input which has become more expensive.

Deviations from the results predicted by the rational choice theory are largely attributed to market failures, such as monopoly or monopsony, asymmetry of information, public goods, which prevent rational economic agent from making rational and optimal decision (Ulen, 1999:794). Even if a consumer exhibits behaviour that is thought to be anomalous to the predictions of the theory, economist still can explain it by making a slight amendment to the theory (Ulen, 1999:794). For example, if consumers react to the increase in a price of a good by increasing a demand for that good, the economist might describe such seemingly irrational phenomenon, when consumer responds to the increased price by increasing the consumption of this good instead of switching to the relatively cheap substitutes, as a "snob" effect (Ulen, 1999:794).

There is a presumption among economists that rational consumer will prosper, while irrational consumer will waste their resources. Rational profit-maximizing business will outperform those businesses that do not operate according to the rational plan (Ulen, 1999:794).

Nobel Prize winner Garry Becker has shown that even if there is a large number of consumers with intransitive preferences and who behave irrationally due to this fact, their irrational behaviour does not affect much the prediction of the theory of rational choice (Becker 1962) and it is not an issue for the market aggregate behaviour and thus the presence of "irrational" consumers can be ignored.

The point of the foregoing discussion is to suggest that the theory of rational choice is extremely useful and powerful. It can serve as a valuable guide for the public policy and it is quite flexible in explaining anomalous phenomena without the necessity of abandoning the theory (Ulen, 1999:794).

In the next section we will introduce mathematical model of the tax compliance strategy undertaken by the rationally behaving business entity.

3.2 Tax Compliance Costs Optimization Model

The following model, which demonstrates how rational decision making taxpayer adopts the strategy that minimizes his tax compliance costs, has been taken from (Eichfelder and Schorn, 2009). In line with rational choice theory and Slemrod (2001) rational decision taxpayer (large enterprise) strives to maximize net income for which he/she has to take into account taxes as well as tax compliance costs. For the reason of simplicity this model doesn't consider such exceptions to the theory of rational choice as "bounded" rationality[21] or "limited information" (Eichfelder and Schorn, 2009).

We can denote the net income that rational business taxpayer strives to maximize with Y, which is obtained by reducing gross earnings E by tax payments T as well as by the costs of tax compliance C (Eichfelder and Schorn, 2009). These costs of tax compliance C also include costs of tax planning as it is suggested in the research literature (Sandford et al. 1989; Evans 2007).

Tax burden T rises with gross earnings E and is reduced by the deductibility of tax compliance costs C. For simplicity, it is assumed that all tax compliance costs are deducted at the same tax rate. Business taxpayer also resorts to some specific tax planning options, denoted with O_k, as income shifting or use of an optimal depreciation method (for example diminishing value method). This tax planning option usually results in a lower tax payment, but higher costs of tax compliance due to the fact that tax planning costs are considered as a part of tax compliance costs C. Taking into consideration the above assumptions, the net income of the business taxpayer can be written as:

$$Y = E - T(E,C,O_k) - C \tag{1}$$

Three different types of compliance costs are considered in this model. These costs are:

- Personnel costs (C_p) that result from using efforts of in-house personnel R_p. In-house personnel is assumed to perform such functions as recordkeeping, tax-filing, tax-planning and other tax related activities

- Capital costs (C_c) that result from using capital R_c by which a business taxpayer can substitute personnel resources

[21] The assumption that when individuals make decision their rationality is "bounded" by the amount of only available information, meaning that individual cannot be fully rational in his/her choice due to the limited information. In addition, not only information appears to be limited, but also the time, required to make decision, is limited as well. Consequently, decision-maker seeks rather "satisfactory" solution, then optimal solution. The term "bounded rationality" was first coined by Herbert Saimon (1957).

- Costs of outsourcing tax activities to external tax adviser (C_e), where the usage of external resources (external tax adviser) we denote by R_e.

For simplicity reasons, it is postulated in the model that the marginal cost of external tax activities $C_e'(R_e)$ is constant and equal to the market price p_e, i.e. $C_e'(R_e) = p_e$. Furthermore, it is assumed that simple tax activities are first executed by in-house personnel and business taxpayer turns for the assistance of external adviser regarding more complex and sophisticated tax activities. Hence, we can presume that the marginal costs of in-house tax compliance activities increase as the range of tax compliance activities grows. This relationship can be shown as:

$$C_p''(R_p) > 0\,, \qquad C_c''(R_c) > 0$$

These assumptions should allow us to obtain interior solution (a point where isocost[22] line is tangent to isoquant[23] curve. This point of tangency gives the most optimal combination of resources used for fulfilling tax compliance obligations). The total tax compliance burden is therefore defined as:

$$\mathrm{C} = C_p + C_c + C_e \tag{2}$$

Since the sum of resources expended on tax compliance should be enough to fulfil the amount of tax compliance obligation, business taxpayer faces the following constraint:

$$A\,(E, O_k) \leq \Theta \bullet R_p + \omega \bullet R_c + R_e \tag{3}$$

Here $A\,(E, O_k)$ is the quantity of the necessary compliance activity, which in turn depends on the size of earnings E and tax planning option O_k. Θ is the efficiency parameter of the personnel-intensive tax

[22] A line that represents all the combinations of firm's inputs that have the same total costs.
[23] A contour line that is drawn through all the possible combinations of input factors' amounts that generate the same level of output

compliance strategy and ω is the capital intensive tax compliance strategy. For simplicity, the production efficiency of external tax advisers is postulated to be equal to 1.

According to empirical literature (Tran-Nam et. al, 2000) the quantity of the tax compliance activity $A (E, O_k)$, which we can consider as the burden of tax compliance, is positively correlated with the size of business. This in turn implies the positive correlation between A and pre-tax earnings E, which can be expressed mathematically as ($\frac{\partial A}{\partial E} > 0$) . Due to economies of scale the relative compliance costs burden decreases as pre-tax earnings increases, i.e. ($\frac{\partial A^2}{\partial^2 E} < 0$).

Therefore, tax compliance costs burden can be interpreted in this model as some kind of additional and regressive tax payment being deductible from the accessible income (Eichfelder and Schorn, 2009). Furthermore, planning option O_k (for example income-shifting) entails more tax compliance activity which implies a positive derivative ($\frac{\partial A}{\partial O_k} > 0$).

Equipped with all these assumptions and having determined target function (1) and administration constraint (3), we can now move to obtaining the optimum solution by using the following Lagrangian function:

$$L = E - T(E,C,O_k) - C_p - C_c - C_e - \lambda \bullet (A(E, O_k) - \Theta \bullet R_p - \omega \bullet R_c - R_e) \quad (4)$$

Here λ denotes the Lagrange multiplier[24].

[24] Lagrange multiplier (named after Joseph Langrage) is the mathematical method of finding local maxima and minima of function (points where function is "locally" maximum or minimum) subject to equality constraint.
For example: maximize *f(x,y)*
subject to *g(x,y)* = 0
λ is Lagrange multiplier
Therefore, Lagrange function or Lagrangian can be written as:
$L(x,y,\lambda) = f(x,y) - \lambda * g(x,y)$
We need to find such (x_0,y_0,λ_0), where this Lagrangian is maximized or minimized (partial derivatives of L on x_0,y_0,λ_0 are equal 0)

The first order conditions with respect to resources R_p, R_c and R_e as well as to specific tax option O_k will be as follows:

$$\partial L/\partial R_p = -C'_p \bullet (1+\frac{\partial T}{\partial C}) + \lambda \bullet \Theta = 0 \quad (5)$$

$$\partial L/\partial R_c = -C'_c \bullet (1+\frac{\partial T}{\partial C}) + \lambda \bullet \omega = 0 \quad (6)$$

$$\partial L/\partial R_e = -p_e \bullet (1+\frac{\partial T}{\partial C}) + \lambda = 0 \quad (7)$$

$$\partial L/\partial O_k = -\partial L/\partial O_k - \lambda \bullet \partial A/\partial O_k \geq 0 \quad (8)$$

Obtained first order conditioned allow us to make the following conclusions regarding the optimal mix of resources used for compliance with tax rules:

1. The optimal resource mix will be attained where the gross marginal cost of in-house resource unit will be equal market price of the external tax adviser:

$$\frac{C'_c}{\omega} = \frac{c'_p}{\theta} = p_e$$

Therefore, under the assumption of rational choice a business taxpayer will choose the cost-optimal mix of resources according to this condition

2. Using (7) and (8) we can obtain the following relationship between tax compliance A, tax option O_k and the size of tax payment T

$$p_e \bullet (1+\frac{\partial T}{\partial C}) \bullet \partial A/\partial O_k + \partial T/\partial O_k \leq 0$$

Hence this relationship implies that cost minimizing business taxpayer will use tax option until the moment when marginal increase in tax compliance burden (∂A) will be greater than the marginal decrease in tax payment (∂T) caused by this tax option strategy.

The model outlined above demonstrates the optimal tax compliance administration, which the rationally behaving business entity is expected to adopt. This administration ensures the optimal resource mix for compliance with tax obligations, thereby minimizing overall tax compliance costs. Testing this model empirically, using data from large enterprises in New Zealand, would reveal if New Zealand large enterprises are indeed behaving rationally, as the model predicts, by choosing the optimal mix of resources, which are available to them for compliance with their tax duties. Therefore, if New Zealand large enterprises are indeed acting rationally, then regressing various factors, for example external costs of outsourcing tax compliance activities, on the total costs of tax compliance should have no effect on the latter. Thus, empirical analysis performed in New Zealand context would provide a useful insight into tax compliance administration, that large New Zealand enterprises implement and how optimal it is in minimizing the costs of tax compliance. This in turn would help to better understand the origin of the tax compliance costs among large enterprises in New Zealand, whether they are triggered mostly by the complexity of tax system alone or the failure to optimize the use of resources adds to their burden as well.

4 Conclusion

In this article the author made an attempt to take a look at the tax compliance burden in large enterprises from the perspective of their rational behaviour. The main idea underlying the forgoing discussion is that tax compliance burden in large enterprises is affected not only by the complexity of tax system alone, but also by the action of a large enterprise. Due to the complexity of transactions and the availability of various resources to comply with tax obligations, large enterprises need to take a decision regarding which resource to employ for dealing with tax compliance. Therefore, if large enterprise acts according to the prediction of the rational choice model and therefore strives to use the most costs efficient strategy, tax compliance burden would be minimized at least on the micro level.

This view on the issue of tax compliance burden appears to be a relatively new approach to studying and measuring tax compliance costs in large enterprises. Prior studies on the tax compliance costs of large enterprises implicitly assumed that tax compliance costs were exogenous and thus high compliance costs, being taken as the proxy of complexity of the tax system, were indicative of the complex tax system that required further simplification in order to alleviate tax compliance costs burden. However, as we have seen above without empirical analysis of the optimality of tax compliance costs strategy that large enterprises are expected to adopt, blaming tax system alone for the heavy burden of compliance costs does not seem hundred percent correct.

In the light of the fact, that studies on large enterprises in New Zealand similar to the ones done in US, Canada, Indonesia and Australia, have yet to be done, measurement of the magnitude of tax compliance burden born by large enterprises in New Zealand and testing empirically, if large enterprises in New Zealand choose on average cost minimizing strategy in relation to their tax compliance duties, would be a useful research providing insight into the scope of tax compliance burden among large enterprises in New Zealand and into the sources of this burden.

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