RELATIONSHIP BETWEEN TAX PERSONNEL AND TAX STRATEGY

STUDENT NAME:	Glen Cooper
COURSE NAME:	Public Economics I
DEPARTMENT:	University of Texas at Dallas Economics Department
COURSE CODE:	ECON 6363, Fall 2019
PROFESSOR:	Dr. Seth H. Giertz
DATE OF SUBMISSION:	December 1, 2019

Abstract

The purpose of this paper is to analyze how individual countries within the Organization for Economic Co-operation and Development (OECD) deploy personal in tax collection efforts and to evaluate, using statistical regression techniques, whether there are more optimal allocations then those currently being utilized. This paper will undoubtedly leave out certain cost associated with optimization (e.g. compliance costs, dispute costs, etc.) but is should provide some direction to policy makers in reviewing country specific tax personal deployment.

Introduction

According to the most recent estimates from the International Centre for Tax and Development, total tax revenues account for more than 80% of total government revenue in about half of the countries in the world – and more than 50% in almost every country (Ortiz-Ospina & Roser, 2016). The amount of tax revenue needed by any particular country is fundamentally the result of a “collective” choice about the desired level of public expenditures. Collective preferences for public goods and services, desired level of social protection and insurance and economic wealth are the main determinants of public expenditures. There is no normative theory of desired revenues applicable to all countries (Cyan, Martinez-Vazquez, & Vulovic, V. (2013). There may be no normative theory but effective taxation, as with other public policy domains, requires a cost effective application of personnel. This has continued to be of particular interest to those responsible for tax collection (Lledo, Schneider, & Moore, 2004).

There are many factors that impact tax revenue collection. For example a legitimate and responsive state is likely an essential part of tax collection in both developing countries and high income countries (Bird, Martinez-Vazquez, & Torgler 2008). Administrative discretion tends to invites corruption (OCED, 2013). Corruption cause citizens to lose confidence (Byrne, 1995) and thus feel justified in avoiding taxation. Other detrimental factors commonly identified are lack of up-to-date equipment and facilities, ill-defined and complex tax laws, and poor information collection and taxpayer identification (Kaldor, 1955; Bird, 1989). These challenges have cause some to suggest the privatization of the tax administration (Byrne, 1995). Indeed countries have been experimenting with the privatization concept.

As in most enterprises staffing is one of the most critical factors. Too often tax administrations operate with insufficient and untrained staff (Byrne, 1995). This situation is frequently the result of an over-extended state relative to its institutional capacity (World Bank, 1997). Tax administrators often lack the human resources needed to fulfill basic revenue collection functions (e.g. keeping tax registers, processing tax returns, assessing liabilities, collecting taxes and fees), let alone perform more advanced tasks, such as auditing or processing appeals (Haldenwang, Schiller, & Garcia, 2014).

Therefore, the focus of this paper will be to understand staffing structures at the country level and evaluate those structures relative to tax collections.

Problem Statement

Given a country's allocation between potential taxing strategies, what is the optimal allocation of staffing resources?

Objectives and Aims

After controlling from country specific characteristics, this paper will review and evaluate how a country's selected taxing strategies are related to its tax staffing deployment and seek to determine whether optimal staff deployment strategies might exist.

Literature Review

Concern over cost efficiency in taxation has spawned much consideration. In general the concept of efficiency focuses on administrative costs incurred in collecting and enforcing tax laws. Several approaches have developed. One approach incorporates the cost of raising taxes into the estimated value of those taxes to the government. This approach considers taxation collection optimally efficient when the amounts raised are done so with the lowest marginal cost; also considering economic distortions and equity (Lledo, Schneider, & Moore, 2004). Other approaches consider government inefficiency as an imbalance in tax effort (i.e. actual collection performance against potential collections) (Cyan, Martinez-Vazquez, & Vulovic, 2013). Such a view incorporates a concept known as the "tax gap." The tax gap is the value of taxes not collected because of various forms of noncompliance, such as, tax evasion, taxes in arrears,

legal ambiguities, etc. This type of analysis evaluates administrative costs associated with the tax gap (Slemrod & Yitzhaki, 1996; Lledo, Schneider, & Moore, 2004). Some studies have created a Tax Optimality Index to measure how far the current tax configuration is from an optimal one to help identify the degree of efficiency in a given tax system (Raimondos-Møller & Woodland, 2006). Regression models have also been used to measure efficiency by comparing the percentage of a country's actual tax collection to its potential revenue. These methods incorporate structural economic features that are likely to affect the tax base and generate an estimation of a country's potential revenue levels. The potential revenues are then compared to actual revenues. Some contributors, as cited by Cyan, Martinez-Vazquez, & Vulovic, 2013, to this approach include Bahl (1971), Lotz and Morss (1970), Leuthold (1991), Tanzi (1992), Stotsky and WoldeMariam (1997), Ghura (1998), Piancastelli (2001), Eltony (2002), and Gupta (2007). Another strategy is the stochastic frontier analysis (SFA) approach which identifies weaknesses within taxing administration and institutional environments by developing a function to express the maximum amount of revenue a country could collect from a given bundle of country specific characteristics and then compares that to actual collections (Cyan, Martinez-Vazquez, & Vulovic, 2013).

Still other approaches focus on individual decision making units (DMUs). Charnes, Cooper, and Rhodes (1978) introduced data envelopment analysis (DEA) to measure the relative efficiency of individual taxing DMUs by analyzing multiple inputs and outputs. Inputs could including staffing, systems, etc. and outputs could include the rate at which contested cases are resolved, the number of actions that are taken against

delinquent accounts, or the number of returns that are audited (Cyan, Martinez-Vazquez, & Vulovic, 2013).

Studies have also analyzed the efficiency impact of tax reforms by evaluating the reform as a "treatment" to improve revenue. One approach applied a propensity-score matching methodology (PSM) as developed by Rosenbaum and Rubin (1983) and another applied the synthetic control method (SCM) as established by Abadie and Gardeazabal (2003). The former allowed an evaluation of synergy between tax reforms, while the latter focused on the dynamic impact of each reform (Ebeke, Mansour & Rota-Graziosi 2016).

More specific studies have analyzed the cost of collections relative to the impact from financial intermediation (e.g. financial corporations reporting citizens' transaction), the relative costs between comparatively low and high administrative cost tax sources (e.g. VAT vs. agricultural tax) (Castañeda Rodríguez, 2018), the impact from tax collection privatization (Byrne, 1995), cost associated with withholding approaches (Bunn & Asen, 2019), and the cost between revenues collected via voluntary payments and revenues collected through explicit enforcement activities (Alm & Duncan, 2014).

Some fairly straightforward advice emerges from attention to cost efficiency. Governments should minimize the number and variety of tax exemptions, tax brackets, and specific incentives (Bird 1992). Overly complex or unpredictable tax systems promote administrative discretion inviting corruption and increasing costs (Policy Framework, n.d.). In general, efficiency can be improved by simplifying the tax structure. Simple tax structures are cheaper for tax agencies to administer and for taxpayers to pay. Unfortunately, often these variables are outside the tax administrator's control

(Alm & Duncan, 2014) and are merely bureaucratic responses to the environment presented. How bureaucratic should allocate personnel will be the focus of this paper.

Research Design and Methods

In any analysis there is a need to identify a meaningful measure of cost. Following a cost measurement there is a need to develop a measure of revenue collected (Alm & Duncan, 2014). This paper proposes to evaluate staffing costs and deployment in relationship to tax collections. Revenue collected will be on a tax type specific basis(PIT, CIT, etc.). Country specific characteristics will also be included for control purposes. The simple baseline regression equation is:

$$\mathrm{T}_{i,\tau} = \beta_i^1 L_i + \beta_i^2 \mathrm{O}_i + \beta_i^3 G_i + \epsilon_i$$

Where, i indexes the countries in the sample, $\mathrm{T}\tau$ is the specific type of tax under consideration (individually or in combination), L is the labor employed for that specific tax category (individually or in combination), O is the other non-labor taxing costs, G the governmental/country specific control, and ε the error term.

Potential data includes:

(T)axes on	(L)abor	(O)ther Costs	(G)overnment
• Personal income (PIT) • Corporate profits (CIT) • Value added tax (VAT) • Social Security Collections (SSC) • Payroll • Property • Goods and services	• Registration and taxpayer services • Returns and payment processing • Audit, investigation and other verification • Enforced debt collections and related functions • Dispute and appeals • Other functions (tax) • Headquarters • Regional offices • Local/branch offices • Data processing centers • Staff allocated to various taxing categories	• Rent • IT • Equipment	• GDP per capita • Population and/or population growth • Ratio of exports plus imports to GDP • Share of manufacturing in GDP • Number of in country financial intermediaries • Scale of population density and urbanization • Government deficits • Degree of foreign aid received • Non-agriculture share of GDP • Indicators for accountability and corruption • Number of in country financial intermediaries • Female labor force participation • Education level • Democracy level • Trade restrictiveness indicator • Indicators of legal system strength • Indicators of percentage in informal sectors and occupations • Indicators of landlocked and resource-rich countries • Country development indicator (i.e. developed or developing) • Regional dummy variable that differentiates by geographic location

The paper's country list will include the 36 current members of the Organization of Economic Co-operation and Development (OECD) countries. See Appendix A for the list of countries.

Data will be obtained from several sources but the main sources will include: 1) World Bank, 2) Organization for Economic Co-operation and Development (OECD), 3) International Monetary Fund (IMF), and 4) International Country Risk Guide. See Appendix B for data sources and associated preliminary list of data elements.

Most data should be available on an annual basis from 2003 to 2017 or for a 14 year period. Missing data will be completed using simple interpolation or, if deemed necessary, through more sophisticated techniques such as Markov chain Monte Carlo iteration, multivariate imputation by chained equations (MICE) (Schafer, 1997), or similar techniques (Rubin, 1996).

Fixed (FE) and random (RE) effects are the two more common static panel data specifications, and will likely be used in this paper. The FE model assumes that certain country specific characteristics are not captured by the explanatory variables, and that these are uncorrelated with the error term. The RE specification does not make these assumptions (Gupta, 2007). To choose between RE and FE specifications several test can be deployed including the Breusch and Pagan Lagrange multiplier test, the F-test under the null hypothesis that all country dummies are zero, and the Hausman test (Castañeda Rodríguez, 2018).

Once the model specifications have been finalized several robustness analysis can be utilized. These include Panel-Corrected Standard Error Estimation, Sensitivity Analysis, Dynamic Panel Data Analysis, and Sub Sample Analysis (Gupta, 2007).

As this paper will only use publically available data and no human subjects will be directly involved, no ethics considerations are warranted.

Weaknesses of the Study

Investigations to date, have found little in specific salary cost by tax collected thus it is likely that this paper will require assumptions in this regard. Not only are salary cost of limited availability but other personal costs such as benefits and opportunity costs are limited if non-existent. In addition, there are many costs associated with taxation that will likely be unaccounted for in this model from an overall social welfare perspective. For example, there are the costs of tax payers complying with tax law (both their time and effort and/or the cost of third party assistance); the cost associated with the legislative effort to enact taxing laws and policies; court costs in enforcing tax laws, etc. (Lledo, Schneider, & Moore, 2004). None of which will be specifically evaluated in this paper but which have significant social impact.

The results of this paper's modeling may have limited public policy impact as many politicians balk at the notion of letting go government employees or otherwise making significant personnel adjustments.

Budget

Several data sources referenced in this study require purchase. A rough estimate is that these data sets ranges from $2,000 to $10,000. Depending upon whether special software is also required additional costs may be incurred.

References

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. American economic review, 93(1), 113-132.

Alm, J., & Duncan, D. (2014). Estimating tax agency efficiency. Public Budgeting & Finance, 34(3), 92-110.

Bird, R. 1989. The Administrative Dimension of Tax Reform in Developing Countries, in Gillis, M. (ed.) Tax Reform in Developing Countries. Durham: Duke University Press.

Bird, R. M., Martinez-Vazquez, J., & Torgler, B. (2008). Tax effort in developing countries and high income countries: The impact of corruption, voice and accountability. Economic analysis and policy, 38(1), 55-71.

Bunn, D., & Asen, E. (2019, October 30). International Tax Competitiveness Index 2019. Retrieved November 6, 2019, from https://taxfoundation.org/2019-international-index/

Byrne, P. D. (1995). Privatization in the area of tax administration: an overview (No. 508). Harvard Institute for International Development, Harvard University.

Castañeda Rodríguez, V. M. (2018). Tax determinants revisited. An unbalanced data panel analysis. Journal of Applied Economics, 21(1), 1-24.

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. European journal of operational research, 2(6), 429-444.

Cyan, M., Martinez-Vazquez, J., & Vulovic, V. (2013). Measuring tax effort: Does the estimation approach matter and should effort be linked to expenditure goals?.

Ebeke, C., Mansour, M., & Rota-Graziosi, G. (2016). The Power to Tax in Sub-Saharan Africa: LTUs, VATs, and SARAs.

Gupta, A. S. (2007). Determinants of tax revenue efforts in developing countries (No. 7-184). International Monetary Fund.

Haldenwang, C. V., Schiller, A. V., & Garcia, M. (2014). Tax Collection in Developing Countries – New Evidence on Semi-Autonomous Revenue Agencies (SARAs). The Journal of Development Studies, 50(4), 541–555. doi: 10.1080/00220388.2013.875534

Kaldor, N, 1955. An Expenditure Tax. London: George Allen & Unwin.

Lledo, V., Schneider, A., and Moore, M. 2004. Governance, Taxes, and Tax Reform in Latin America, IDS Working Paper 221, March.

OCED, (2013), Policy Framework for Investment User's Toolkit, Chapter 5 Tax Policy. Retrieved November 4, 2019.

Ortiz-Ospina, E., & Roser, M. (2016, September 20). Taxation. Retrieved from https://ourworldindata.org/taxation.

Policy Framework for Investment. (n.d.). Retrieved November 6, 2019, from https://www.oecd.org/investment/toolkit/.

Raimondos-Møller, P., & Woodland, A. D. (2006). Measuring tax efficiency: A tax optimality index. Journal of Public Economics, 90(10-11), 1903-1922.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. Biometrika, 70(1), 41-55.

Schafer, J. L. (1997). Analysis of incomplete multivariate data. Chapman and Hall/CRC.

Rubin, D. B. (1996). Multiple imputation after 18+ years. Journal of the American statistical Association, 91(434), 473-489.

World Bank, 1997. World Development Report: The State in a Changing World, Oxford: Oxford University Press.

APPENDIX A

List of Organization of Economic Co-operation and Development Countries

COUNTRY	YEAR OF ACCESSION	COUNTRY	YEAR OF ACCESSION
AUSTRALIA	1971	KOREA	1996
AUSTRIA	1961	LATVIA	2016
BELGIUM	1961	LITHUANIA	2018
CANADA	1961	LUXEMBOURG	1961
CHILE	2010	MEXICO	1994
CZECH REPUBLIC	1995	NETHERLANDS	1961
DENMARK	1961	NEW ZEALAND	1973
ESTONIA	2010	NORWAY	1961
FINLAND	1969	POLAND	1996
FRANCE	1961	PORTUGAL	1961
GERMANY	1961	SLOVAK REPUBLIC	2000
GREECE	1961	SLOVENIA	2010
HUNGARY	1996	SPAIN	1961
ICELAND	1961	SWEDEN	1961
IRELAND	1961	SWITZERLAND	1961
ISRAEL	2010	TURKEY	1961
ITALY	1962	UNITED KINGDOM	1961
JAPAN	1964	UNITED STATES	1961

Source: http://www.oecd.org/about/members-and-partners/#d.en.194378

APPENDIX B

Source / Category / Variable	Frequency	Date Range	No Cost / Cost
World Bank			
Taxation			
Revenue, excluding grants (% of GDP)	Yearly	1972 - 2018	No Cost
Tax payments (number)	Yearly	2009 - 2017	No Cost
Tax revenue (% of GDP)	Yearly	2009 - 2017	No Cost
Total tax and contribution rate (% of profit)	Yearly	2005 - 2018	No Cost
Taxes on exports (current LCU)	Yearly	2009 - 2017	No Cost
Taxes on goods and services (current LCU)	Yearly	2009 - 2017	No Cost
Economic			
GDP per capita, PPP (current international $)	Yearly	1960 - 2017	No Cost
Merchandise imports (current US$)	Yearly	1960 - 2017	No Cost
Inflation, consumer prices (annual %)	Yearly	1960 - 2017	No Cost
Financial Accounts (% age 15+)	Yearly	2011 - 2017	No Cost
Agriculture, value added (% of GDP)	Yearly	2009 - 2017	No Cost
Population ages 65 and above (% of total population)	Yearly	1960 - 2017	No Cost
Urban land area (sq. km)	Yearly	1960 - 2017	No Cost
Labor force, total	Yearly	1960 - 2017	No Cost
Governance			
Vital Registration	Yearly	2004 - 2018	No Cost
Strenght of legal rights index (0=weak to 12=strong)	Yearly	2013 - 2018	No Cost
Exports of goods and services (% of GDP)	Yearly	2009 - 2017	No Cost
Ease of doing business index	Yearly	2017	No Cost
Exports of goods and services (% of GDP)	Yearly	1960 - 2017	No Cost
Urban poulation (% of total population)	Yearly	1960 - 2017	No Cost
Voice and Accountability	Yearly	1996-2018	No Cost
Political Stability and Absence of Violence	Yearly	1996-2019	No Cost
Government Effectiveness	Yearly	1996-2020	No Cost
Regulatory Quality	Yearly	1996-2021	No Cost
Rule of Law	Yearly	1996-2022	No Cost
Control of Corruption	Yearly	1996-2023	No Cost

APPENDIX B (cont.)

OECD				
	Taxation			
		Revenue collected to GDP	Yearly	2003 - 2017	Cost
		Revenue collected to total government revenue	Yearly	2003 - 2017	Cost
		Tax on personal income	Yearly	1966 - 2017	Cost
		Tax on corporate profits	Yearly	1967 - 2017	Cost
		Tax on payroll	Yearly	1968 - 2017	Cost
		Tax on property	Yearly	1968 - 2017	Cost
		Tax on goods and services	Yearly	1969 - 2017	Cost
		PIT to total revenue collected	Yearly	2003 - 2017	Cost
		CIT to total revenue collected	Yearly	2003 - 2017	Cost
		VAT to total revenue collected	Yearly	2003 - 2017	Cost
		SSC to total revenue collected	Yearly	2003 - 2017	Cost
		Other taxes to total revenue collected	Yearly	2003 - 2017	Cost
		Tax Autonomy of State and Local Government	Yearly	1965 - 2016	Cost
		Personal Income Tax - OECD countries	Yearly	1965 - 2017	Cost
		Corporate Income Tax - OECD countries	Yearly	1965 - 2017	Cost
		Taxing Wages - OECD countries	Yearly	1965 - 2017	Cost
		% staff allocated to registration and taxpayer services	Yearly	2003 - 2017	Cost
		% staff allocated to returns and payment processing	Yearly	2003 - 2017	Cost
		% staff allocated to audit, investigation and other verification	Yearly	2003 - 2017	Cost
		% staff allocated in enforced debt collections and related functions	Yearly	2003 - 2017	Cost
		% staff allocated in dispute and appeals	Yearly	2003 - 2017	Cost
		% staff allocated in CIT	Yearly	2003 - 2017	Cost
		% staff allocated in other other functions (tax)	Yearly	2003 - 2017	Cost
		% staff in headquarters	Yearly	2003 - 2017	Cost
		% staff in regional offices	Yearly	2003 - 2017	Cost
		% staff in local/branch offices	Yearly	2003 - 2017	Cost
		% staff in data processing centers	Yearly	2003 - 2017	Cost
		% staff in national/regional service centers	Yearly	2003 - 2017	Cost
		% staff in other offices	Yearly	2003 - 2017	Cost
	Economic				
		Government expenditure as percentage of GDP	Yearly	1965 - 2016	Cost
		Gross exports by final destination	Yearly	2005 - 2015	No Cost
		Exports by business size (all sizes)	Yearly	2007 - 2017	No Cost
		Imports by business size (all sizes)	Yearly	2007 - 2017	No Cost
	Governance				
		Revenue Statistics - OECD countries	Yearly	1965 - 2017	Cost

APPENDIX B (cont.)

IMF				
	Coverage of Fiscal Reporting (COFR)	Yearly	2003 - 2013	No Cost
	Financial Access Survey (FAS)	Yearly	2004 - 2018	No Cost
	Financial Development Index	Yearly	1980 - 2018	No Cost
	International Finanical Statistics (IFS)	Yearly	1800 - 2018	No Cost
ICRG				
	Governance			
	Corruption	Yearly	1984 - 2018	Cost
	Bureaucracy Quality	Yearly	1984 - 2018	Cost
	Contract Viability	Yearly	1984 - 2018	Cost
	Democratic Accountability	Yearly	1984 - 2018	Cost
	Government Cohesion	Yearly	1984 - 2018	Cost
	Government Stability	Yearly	1984 - 2018	Cost
	Law & Order	Yearly	1984 - 2018	Cost
	Legislative Strenght	Yearly	1984 - 2018	Cost
	Popular Support	Yearly	1984 - 2018	Cost
WWWF				
	Governance			
	The Open Data Barometer	Yearly	2013-2018	No Cost
TI				
	Governance			
	Corruption Perceptions Index	Yearly	1995 - 2018	No Cost

Source	Website
WB	https://data.worldbank.org/indicator
OECD	https://www.oecd-ilibrary.org/taxation/data/oecd-tax-statistics_tax-data-en
IMF	https://data.imf.org/
ICRG	https://epub.prsgroup.com/available-data
WWWF	https://opendatabarometer.org/?_year=2017&indicator=ODB
TI	https://www.transparency.org/research/cpi/overview

Legend	
WB	Word Bank
OECD	Organization for Economic Co-ordination and Development
IMF	International Monetary Fund
ICRG	International Country Risk Guide
WWWF	World Wide Web Foundation
TI	Transparency Internatioal