

Taxing Mobile Capital in Free Trade Zones to the Detriment of Workers

Glenn P. Jenkins

Queen's University, Canada,
and Eastern Mediterranean University, Mersin 10, Turkey
Address: Department of Economics,
Queen's University, Kingston, Ontario, Canada, K7L 3N6
E-mail: jenkins@econ.queensu.ca
Corresponding author

and

Chun-Yan Kuo

Department of Economics
Queen's University, Canada
chunyankuo@gmail.com

Development Discussion Paper: 2013-04

Abstract

Many countries exempt the income of firms operating in their free trade or export processing zones from corporate income taxation. This paper examines both theoretically and empirically the incidence of removing this exemption. The empirical analysis is carried out for the Dominican Republic. The findings indicate that removal of the corporate income tax exemption would inflict a burden on relatively low-waged workers of over nine times the amount of additional tax revenue collected from the companies operating in the country's free trade zones. In turn, this loss would largely be a gain to the more advantaged groups in society.

Keywords: WTO, tax incidence, free trade zones, corporate income taxation, Dominican Republic.

JEL Classifications: F13, H22, O24, O54

Acknowledgements

A number of people assisted us greatly in the preparation of this paper. In the Dominican Republic, Magin Diaz and Hector Guiliani played a critical role in helping us to understand the operation of the free trade zones and the fiscal system of the country. Mostafa Shahee and Hasan Ulas Altiook provided outstanding research assistance. Any errors or omissions remaining are the responsibility of the authors.

Taxing Mobile Capital in Free Trade Zones to the Detriment of Workers

1. INTRODUCTION

Export processing zones (EPZ) and free trade zones (FTZ)¹ are created by governments to promote export-oriented strategies in order to create employment and growth (Haywood, 2004; Mutti, 2004). The policy objective of creating FTZs in most countries is to create employment for many relatively young laborers in light manufacturing that does not necessarily require highly skilled workers. FTZs are often of only temporary importance until a more suitable environment for export production in the whole economy is created that will encourage export production on a larger scale. Some countries, such as Taiwan, have been successful in achieving this objective, while reforming their economic policies and administrations system (Jenkins, Kuo, & Sun, 2004). Other countries are still at an early stage, in which many changes need to be made in terms of customs and trade administration to improve the general policy and administration environment for international trade. An example of such a country is the Dominican Republic (DR), the focus of the empirical investigation reported in this study.

The World Trade Organization (WTO) is the premier international organization dealing with the global rules of trade between nations. Its main function is to ensure that international trade flows as smoothly, predictably and freely as possible (WTO, 1994). This entails the promotion of regulatory policies that are in favour of non-discriminatory and fair competition. According to WTO rules, if firms operating in EPZs or FTZs are exempt from corporate income tax, this constitutes an export subsidy. Such policies, according to the WTO, are unfair interventions that

create a distortion in the market. These regulations are part of the WTO's Agreement on Subsidies and Countervailing Measures, which directly affect the operation of EPZs (Daly, 2006).

This is precisely the situation in the DR, where an exemption from corporate income tax applies only to firms operating in the FTZs (Granados, 2003). The WTO insists on the imposition of corporate tax on firms operating in the FTZs in order to create a non-discriminatory tax environment with respect to exports. However, the burden of this corporate income tax is ultimately borne by inputs (Entin, 2004; Gravelle & Smetters, 2001). While producers are obliged to employ their requisite capital from the capital market at a competitive rate, this burden is inevitably transferred to the labor force.

In the case of the DR, about 85% of the country's total exports and literally 100% of non-agricultural exports are produced in the FTZs. Hence, any policy change that affects the FTZs has the potential to significantly affect the whole economy.

2. THE MODEL

The model developed in this study to analyze the impact of extending the corporate income tax to firms in the FTZs is based on the model of the incidence of corporate income tax in an open economy developed by Harberger (1990, 1995, 2008). In this model he showed that in an open economy, the full burden of the corporate tax on the tradable goods sector is borne by the labor force in that sector through a suppression of its wage rate. The downward pressure on wage rates paid to workers in the taxed tradable sector has a further impact on wages of similar types of labor in the entire economy that increases the burden on workers. This movement of wages

in the economy will also have an impact on the domestic prices of non-traded goods, and on the distribution of income within the country.

We begin our analysis by taking the existing pattern of corporate taxes as given. In other words, we assume that a corporate income tax is already being levied on the income of some sectors in the domestic economy, but that no corporate income tax is levied on the income from capital in the FTZs. The same corporate income tax system is then extended to the income from capital of the firms operating in the FTZs that were previously exempted from the corporate income tax.

The key assumptions of this model are as follows:

- a) Capital is perfectly mobile in and out of the FTZs, and also in and out of the domestic parts of the economy; hence, the international capital markets fix its net-of-tax return.
- b) The country in which the FTZs are located, the DR, is small compared with the rest of the world with respect to its relative share of capital. It is also assumed that the amount of capital in all the FTZs in the world that are affected by the WTO rules on corporate income taxes is relatively small. Therefore, the total inflow or outflow of capital from the zones will not affect the net-of-tax return to capital in the world.
- c) The prices of the internationally traded goods exported from the FTZs are set in the international market for these items and cannot be changed by any single country.
- d) The prices of non-traded goods are determined by their demands and supplies in the domestic market.
- e) Labor supply is limited, and is not mobile across countries.

These assumptions hold true for most countries, including the DR, that are using FTZs to produce garments and textiles, and for the assembly of electronic goods.² The industries in the DR can be classified into three broad categories:

- Newly taxed traded: The traded taxed sector refers to all companies operating in the FTZs that would, under the WTO rules, have the corporate income tax levied on their profits, but who would not otherwise be subject to corporate income tax.
- Non-traded and non-taxed: The non-traded and non-taxed sector employs similar types of labor skills as the FTZs, but its output is not traded internationally. This includes domestic services, transportation, hotel, bars and restaurants, and the manufacturing of non-traded domestic goods. Some of these sectors are subject to the corporate income tax but they are not subject to any additional tax as the FTZ companies are brought out of the tax system.
- Traded and non-taxed: The traded non-taxed sector is agriculture, which does not employ the same types of labor skills as firms in the FTZs.

Under these assumptions, when a corporate tax is imposed on the FTZ corporations, there cannot be a change in these net-of-tax returns to capital because their capital is perfectly mobile. Furthermore, the prices of the tradable goods produced by these firms will not adjust to accommodate the higher cost of capital because these prices are set in the international market.³ Hence, capital (firms) will simply move out of the FTZs in the DR to operate elsewhere where they will earn a “normal” return. As the firms start to close down in the zones, they will lay off their workers. If the labor force is not internationally mobile, the reduction in the demand

for labor will result in a decrease in the wage rates for these types of labor skills across the entire labor market of the DR.⁴

This process will continue until either all the firms operating in the FTZs leave the country or wage rates fall to such an extent that the reduction in the wage bill for a firm operating in the FTZ completely offsets the amount of corporate income tax it now has to pay. In this situation the net-of-tax rate of return on capital will again be restored to its “normal” international competitive level. Thus, the full burden of the corporate income tax imposed on the FTZ firms will be borne by the workers employed by these firms. This relationship can be expressed as:

$$T_Z K_Z = \Delta P_L L_Z \quad (1)$$

where K_Z and L_Z represent the amount of capital and labor, respectively, employed in the FTZs; T_Z is the rate of corporate income tax paid per unit of capital in the zones; and ΔP_L is the change in the wage rate paid to the types of workers employed in the zones.

The non-traded non-taxed sector outside the FTZs will also employ some of the same types of worker as those whose wages have been depressed. In this case, the fall in the wage rates will lower their cost of production, thus inducing an increase in the supply of non-traded goods. This increase will lead to a fall in the price of non-traded goods (P_{NT}), and the quantity of these items consumed will rise. If the firms in the non-traded sector are competitive, we can assume that the industry is characterized by constant marginal costs. Hence, the change in the price of non-traded goods and services multiplied by the quantity supplied (Q_{NT}) must be equal to the fall in the wage bill for that sector. This relationship can be expressed as:

$$\Delta P_L L_{NT} = \Delta P_{NT} Q_{NT} \quad (2)$$

Turning to the case of the tradable goods sector operating outside the zone, we find that this mainly consists of agriculture. As the agricultural sector in the DR obtains much of its labor force from temporary workers from Haiti, the assumption is made that this labor is not substitutable for the types of labor used by the FTZs, and hence, the sector is not affected by the changes in the wage rates of the zone workers.

Therefore, over the entire economy the loss to labor can be expressed as:

$$\text{Labor's loss} = \Delta P_L (L_Z + L_{NT}) \quad (3)$$

Since the amount of incremental tax revenues collected from the FTZs is $T_Z K_Z$, the ratio of the total loss to labor in the economy to the additional tax revenues can be expressed as:

$$\text{Labor's share of burden} = \frac{\Delta P_L (L_Z + L_{NT})}{T_Z K_Z} \quad (4)$$

As $T_Z K_Z = \Delta P_L L_Z$, labor's share of the burden can be expressed as:

$$\text{Labor's share of burden} = 1 + \frac{L_{NT}}{L_Z} \quad (5)$$

It is clear from equation (5) that through the reduction in wage rates, the labor force must bear more than 100% of the burden of the corporate tax revenues collected from the firms operating in the FTZs. How much more than 100% is an empirical question that we will explore in the next section. One element that will offset to some extent the effect on workers' wages is the reduction in the prices of non-traded goods. This fall in prices will increase the real income of all consumers who purchase these items, including the workers whose wages have been depressed. The question is, how much will the lower prices of the goods purchased by workers offset the burden borne by the labor force from lower wages? Fortunately, there

exists a National Household Survey of Expenditures and Incomes (Dominican Republic Department of National Accounts and Economic Statistics, 1999) that allows us to explore this question empirically.⁵

3. EMPIRICAL ANALYSIS

The rate of income tax for taxable corporations in manufacturing, utilities and selective services in the DR is 25%. An exemption is given to firms operating inside the FTZs. We want to examine the effect on labor income and the prices of other goods and services produced in the country if this tax exemption were to be removed.

(a) Potential Taxable Income of Corporations Operating in the FTZs

No records exist on the corporate profits generated by the firms operating in the FTZs. However, an estimate can be made of the potential taxable income of FTZ firms. The first step is to estimate the net value added of capital invested by firms in the FTZs. This value must then be reduced by the amount of interest expenses allowed as an expense in the calculation of taxable income. The value added of capital (VA_K) for the firms operating in FTZs as a group is estimated by the following accounting expression for the activities carried out by FTZ firms.

$$\begin{aligned} \text{Value added of capital (VA}_K\text{) for firms in FTZs} \\ &= \text{Exports of FTZs firms} - \text{Import of inputs to FTZs} \\ &\quad - \text{Purchase of Domestic Inputs} - \text{Cost of Labor Overheads} \\ &\quad - \text{Depreciation Allowances} \end{aligned} \tag{6}$$

$$\text{Taxable income for FTZ firms} = VA_K - \text{Interest expenses} \tag{7}$$

Exports include all the sales made abroad by the FTZ firms plus the domestic sales by the firms.⁶ Imports into the FTZs include all purchases made by FTZ firms

for goods and materials from outside the country. As can be seen in Table 1, subtracting imports and purchases of domestic inputs and overheads from exports gives us the gross value added (row 7) of the firms in the FTZs. The value added of labor (row 8) is measured by the total labor compensation paid by the FTZ firms in the same year. This is then subtracted from row 7 to obtain the gross value added of capital (row 9). In order to obtain the net value added of capital (row 11), the annual depreciation expenses of the firms must be subtracted.

Interest expenses (row 12) are the interest payments made on the loans acquired to finance the business activities. They are deducted from the value added of capital to give us a measure of the taxable income of FTZ corporations (equation (7)).

From Table 1, row 13, we see that the estimated taxable income for the firms operating in the FTZ ranged from \$221.7 million in 2007 to \$77.3 million in 2010. These estimates have been made using the assumption that the depreciation expense allowed as a tax deduction is approximately 40% of the gross value added of capital.⁷

Furthermore, it is assumed that the interest expense is equal to 50% of the earnings before interest and taxes.⁸ If the normal corporate income tax rate of 25% is applied to the estimate of the taxable income of FTZ firms, the DR Treasury would have gained tax revenues of \$55.4 million in 2007, \$47.6 million in 2008, \$18.3 million in 2009 and \$19.3 million in 2010.

[Table 1 here]

(b) Labor's Share of the Burden of Corporate Tax on FTZs

From equation (1) we know that in these circumstances the workers employed in the FTZs must have their wage rates reduced by the same amount as the corporate

income taxes paid by the FTZ firms, unless all the firms operating in the zones leave the DR. If a 25% corporate tax rate was applied, the total wage bill would need to fall in 2007, 2008, 2009 and 2010 by \$55.4 million, \$47.6 million, \$18.3 million and \$19.3 million, respectively. This tax burden would need to be spread over the workers employed by the companies in the FTZs (Table 2, row 1). Using the number of employees working in 2007, 2008, 2009 and 2010, the average burden of corporate income tax borne by workers in the FTZs would be \$433.0, \$382.5, \$162.4, and \$159.7 per worker per year, respectively (Table 2, row 3).⁹

[Table 2 here]

Table 2, row 4 shows the amount of potential corporate income tax liabilities as a percentage of the value added of labor. For example, in 2007 the corporate income tax would amount to 10.31% of the value added of labor. For 2008, 2009, and 2010 the ratios would be 8.71%, 3.66% and 3.12%, respectively.

(c) Consequences of FTZ Corporate Income Tax on Firms outside the Zones

An important consequence of the fact that the FTZs employees are hired from the same pool of labor as the non-FTZs workers is that the drop in wages of those working in the FTZs will also be reflected in the wages earned by similar types of workers employed outside the FTZs. The ultimate incidence of this fall in wages will depend on whether the sector is producing traded or non-traded goods. For the purpose of this analysis, the industries in the DR can be categorized as shown in Table 3.

[Table 3 here]

Because the labor force in the commercial agricultural sector in the DR is dominated by temporary workers sourced from Haiti, it is plausible to assume that

the wage rate in this sector is not affected by the wages paid to the type of labor employed in the FTZs.

The decline in wage rates also affects the workers employed in the non-traded sectors. In this case, the prices of the non-traded goods or services produced are determined by the domestic demand and supply of the items. The impact on labor compensation in the non-traded sectors is shown in Table 4.

Services represent the largest share of this category, with 957,724 employees in 2010, while hotels, bars and restaurants are the smallest, with 104,047 workers (Table 4, row 3). The total estimated decrease in labor compensation in the non-traded sector is reported in row 15. It ranges from \$538.8 million in 2007 to \$229.5 million in 2010.

[Table 4 here]

These reductions in labor compensation are then expressed as proportions of the wage bill of each of these industries. The results are presented in Table 4, rows 16 to 20, for the years from 2007 to 2010. For example, in 2010, the reduction in wages ranges from 2.58% for transportation to 3.19% for workers in hotels, bars and restaurants.

Combining the wage reductions for workers in the zones with the reduction of wages earned in the non-taxed non-traded sectors, Table 5, row 7 shows that the wage loss ranges from 9.88% in 2007 to 3.00% in 2010, with an weighted average loss over four years of 6.13%.

[Table 5 here]

The loss in labor income throughout the DR economy can also be expressed as a ratio of the total additional corporate incomes gained from the firms operating

in the FTZs. This is the “labor’s share of burden”, as shown in equation (5). As shown in Table 5, row 8, the labor force bears an average loss of income of 12.19 times the amount of additional corporate income taxes raised in the FTZs. The overall objective of the WTO is to make people better off, in both developing and developed countries, though the effects of this policy seem to run counter to this objective. There is, however, an offsetting effect on the reduction in wage income as a result of the fall in the prices of a number of non-traded goods purchased by consumers, both wage earners and owners of capital.

4. CHANGE IN REAL INCOME OF LABOR FROM PRICE EFFECTS ON NON-TRADABLES OWING TO REDUCED LABOR COSTS

Since wages are lower, the marginal costs of the firms will fall; the firms will have an incentive to increase their supply, causing the prices of products to decline. The final consequence of the price decrease is that a portion of the wage reductions will be offset by the lower prices now paid by workers for the domestically traded goods and services they consume.

(a) Proportional Reduction in Prices

Assuming that the non-traded goods and services industries in the DR can be characterized as being a constant cost, the effect of changes in the price of labor on the price of the output of an industry can be expressed as:

$$\frac{dP_i}{P_i} = \frac{dP_L^j}{P_L^j} * C_{Li}^j \quad (8)$$

where P_i is the price of the output of sector i , P_L^j is the price of labor of type j and C_{Li}^j is the share of total cost of producing output i that makes up the wage bill of labor of type j . In this case, labor of type j refers to labor types that are similar to those being

employed in the FTZs. Once the changes in the prices of the goods have been estimated, the impact on workers' real income can be evaluated.

By definition, the total income of labor of type j , Y_L^j , will be equal to the total expenditures these wage earners make each period plus the amount of their net savings, S_L^j . Hence, the real income of labor of type j is expressed as:

$$Y_L^j = \sum_{i=1}^n P_i X_i + S_L^j \quad (9)$$

The proportionate change in workers' real income caused by the change in the prices of the goods and services they purchase can be expressed as:

$$\frac{dY_L^j}{Y_L^j} = \sum_{i=1}^n \frac{dP_i}{P_i} E_i^j + \frac{S_L^j}{Y_L^j} \quad (10)$$

Where E_i^j is the share of income spent by labor of type j on goods and services of type i . As the prices of goods and services purchased by workers decrease, the real income of the labor force will be increased. This change in real income will serve to partially offset the fall in wages caused by the reduction in the demand for labor by the FTZ firms.

To estimate equation (8) for the price reductions of non-tradable goods, we multiply the estimated changes in labor compensation reported in Table 4, rows 16–19, by the labor costs as a share of total value added in each of the sectors.¹⁰ The resulting estimates of the price reductions are presented in Table 6, rows 1–5.

[Table 6 here]

Using 2010 as the reference year, the lowest decrease in prices of non-traded goods and services would be 1.29% in the case of the transportation sector, with an average decrease over all the years of 2.68% (Table 6, row 1). The largest decrease would be 2.08% in the case of services and 1.88% for hotels, bars and restaurants,

(Table 6, rows 2 and 3), with an overall decline for the non-traded sector for that year of 1.71% (Table 6, row 5).

The decrease in the wage rate will influence only the cost, and hence the prices, of tradable goods sold because of the reduction in the costs of the retail and wholesale trade services that are needed to market tradable goods in the economy. These retail and wholesale services are considered to be part of the non-traded domestic sector in the DR. They represent approximately 30% of the value of the final sale prices of importable goods (Barbados Investment & Development Corporation, 2001). Applying the estimated decline in workers' income for domestic services, as shown in Table 4, row 17, to labor as a share of the costs of supplying retail and wholesale trade services gives us the potential decrease in the trade margins (Table 6, row 6).¹¹

Once the decline in the cost of the trade margins has been estimated, we can calculate the decrease in the prices of the tradable goods at 30% of this amount. These estimates, varying from 0.51% to 1.69% over the period 2007–2010, are shown in Table 6, row 7.

(b) Effects of Price Changes on Low Incomes

So far we have shown how the imposition of the 25% tax on the FTZ firms in the DR would lead to lower costs of labor throughout the economy for those types of worker that are employed by the FTZs. We have also shown how the lower wage costs would lead to lower prices for non-traded goods and services. The decrease in prices would raise the level of real income for consumers of these items, both wage earners and recipients of income from capital. To ascertain exactly how much benefit workers will derive from the price decreases, we need to know the amount of

expenditures consumers make on the items whose prices are decreased. Using these expenditure values, we can then estimate, using equation (10), the change in real income that arises from the decline in the prices of items in the expenditure basket.

The values for the amounts spent on various items by households of different income and expenditure levels were obtained from the 1998 National Household Survey of Expenditures and Incomes (Dominican Republic Department of National Accounts and Economic Statistics, 1999). The total number of households is divided into five quintiles, with each quintile including 20% of the households in the sample ranked according to their level of personal expenditure.¹² For the purpose of this study we classify consumption items based on the 1998 National Household Survey as traded or non-traded goods, as shown in Table 7 for 2010.

[Table 7 here]

Using equation (10), we can estimate the gain in real income that consumers of these items obtain from the lower prices of the goods and services they buy.

[Table 8 here]

As can be seen in Table 8, we found that the benefit received by consumers from the lower prices of products ranges between 0.87% and 1.31% of total expenditures of the households from the bottom quintile to the top (row 12). In order to break down the impact of the decline in prices (increase in real income) across the country for 2010, and to determine which quintile enjoys this benefit more, we need to multiply the total expenditure of each quintile (Table 7, row 10) by the corresponding increase in real income enjoyed by each quintile (Table 8, row 12), caused by the reduction in prices of goods and services. The results are shown in Table 9.

[Table 9 here]

This table clearly shows that as we move towards higher quintiles of income, the household savings that are the result of the price reduction increase, and that ultimately, inequality grows. This effect becomes more severe if we consider the fact that the burden of wage reduction (Table 5, row 3 (\$248.9 million)) falls mainly on workers who usually earn incomes that would place them within quintiles 2 and 3 of the income distribution.

The next question to be addressed is that of who benefits from the difference between the \$410.5 million gross loss of income suffered by the labor force (Table 5, row 3) and the \$35.2 million gain in tax revenues. This reconciliation is presented in Table 10.

[Table 10 here]

Table 10 shows that while workers whose wages are affected suffer an average net annual loss in real income of \$410.5 million, those who obtain their income from capital or from non-affected labor occupations will gain, as consumers of non-traded goods, a total of \$305.7 million. The amount of tax revenue gained from this policy is a modest \$35.2 million. As shown above, the burden on the labor force is 9.7 times the additional revenue collected from corporations, while the owners of capital and the groups of workers whose wages are not affected gain an amount equal to approximately 8.5 times that which the government gains in additional revenues.

5. CONCLUSION

While the motivation of the international tax policy institutions to create a level playing field for all firms might be a worthy endeavor in principle, in practice the outcome is not so attractive. In fact, the perceived evil of a country granting a corporate income tax exemption to manufacturers of exports turns into a virtue when it is understood that it is the workers of the country (often women and low-wage groups) who are the ultimate beneficiaries of the exemption policy, rather than the owners of the firms operating in the FTZs. To inflict a net burden on the labor force of over nine times the amount of the additional revenue collected through the corporate income tax on FTZ firms should be viewed by policy makers in the DR as a tragedy.

If the motivation is to produce a level playing field for exporters worldwide, the same uniform effective rate of corporate income tax should be levied on all corporations across all countries. It is only in this way that workers can potentially be shielded from the possibility of bearing a multiple burden of the additional corporate income tax revenues (Harberger, 2008). With a single universal corporate income tax rate, our analysis would revert back to the original model of Harberger (1962) for the incidence of the corporate income tax in a closed economy. In this case the available capital to the world would be fixed. The world is our closed economy. In such a situation it is possible for the owners of capital rather than workers to bear the burden of the corporate income tax. However, this is not the world in which we live. Even if an institutional attempt was made to have a uniform corporate income tax on profits, the ability of different firms to transfer prices and engage in thin capitalization would produce a very wide range of effective tax rates on capital.

The extension of the corporate income tax called for by the WTO rules fits the assumptions of the model of the incidence of the corporate income tax in an open economy (Harberger, 1995) when it is levied on the traded goods sectors in the economy and where capital is mobile. The empirical results for the DR illustrate the theoretical conclusions of that model whereby workers end up bearing multiples of any additional corporate income taxes collected by the government. Furthermore, our empirical results show not only that the labor force bears multiples of the amount of additional corporate income tax collected, but also that the distribution of incomes is adversely affected by the fall in the prices of items consumed by the better-off consumers in society.

References

- Barbados Investment & Development Corporation. (2001). *Market Research – Dominican Republic*. Research, Planning and Information Division (RPID). Caribbean Country Management Unit, Latin America and Caribbean Region.
- (2005). *Dominican Republic – Review of Trade and Labor Competitiveness*, Report No. 30542 DO, Document of the World Bank.
- Cury, H. G., Jenkins, G. P., & Kuo, C. Y. (2004). *Fiscal Adjustment for Sustainable Growth in the Dominican Republic*. Prepared for the Government of the Dominican Republic.
- Daly, M. (2006). WTO Rules on Direct Taxation. *The World Economy*, 29(5), 527–557.
- Dominican Republic Department of National Accounts and Economic Statistics. (1999). *National Household Survey of Expenditures and Incomes*, October 1997 to September 1998.
- Entin, S. J. (2004). *Tax Incidence, Tax Burden, and Tax Shifting: Who really pays the tax?* Report #04-12, Heritage Center for Data Analysis. Retrieved from <http://www.heritage.org/research/reports/2004/11/tax-incidence-tax-burden-and-tax-shifting-who-really-pays-the-tax>
- Granados, J. (2003). *Export processing Zones and Other Special Regimes in the Context of Multilateral and Regional Trade Negotiations*. Occasional Paper 20, ITAL–ITD.
- Gravelle J. G., & Smetters, K. (2001). *Who bears the burden of the corporate tax in the open economy?* NBER Working Paper 8280.
- Harberger, A. C. (1962). The Incidence of the Corporation Income Tax. *Journal of Political Economy* 10(June), 215–240.

- Harberger, A. C. (1990). Tax Policy in a Small, Open, Developing Economy. In R. Bird & O. Oldman (Eds.), *Taxation in Developing Countries* (4th ed.) (pp. 314–321). Baltimore, MD: Johns Hopkins University Press.
- Harberger, A. C. (1995). The ABCs of Corporation Tax Incidence: Insights into the Open-Economy Case. In *Tax Policy and Economic Growth* (pp. 51–73). Washington, D.C.: American Council for Capital Formation.
- Harberger, A. C. (2008). Corporation Tax Incidence: Reflections on what is Known, Unknown and Unknowable. In J. W. Diamond & G. R. Zodrow (Eds.), *Fundamental Tax Reform: Issues, Choices, and Implications* (pp. 283–305). Cambridge, MA: M.I.T. Press.
- Haywood, R. C. (2004). Using Trade Preferences to Promote EPZ Development. *Journal of Flagstaff Institute*, XXVIII(1), 3-22.
- Jenkins, G. P., Kuo, C. Y., & Sun, K. N. (2004). *Taxation and Economic Development in Taiwan*. Cambridge, MA: Harvard University Press.
- Mutti, J. (2004). Economic Processing Zones: Removing Trade and Tax obstacles to Growth. *Journal of Flagstaff Institute*, XXVIII (1), 23-42.
- National Free Zones Council of the Dominican Republic. (2012). *Statistical Report*. Retrieved from <http://www.cnzfe.gob.do/documentos/informesestadisticos/InfEst2010Ing.pdf>.
- National Free Zones Council of the Dominican Republic. (1990). LAW 8-90. Retrieved from <http://www.cnzfe.gob.do/ingles/documents/PDF/LAW890.pdf>.
- UNCTAD. (2003). *Export processing zones at risk? The WTO rules on subsidies: what option for the future?* TAD/INF/NC48.

- World Bank. (2012). *World Development Indicators*. Retrieved from <http://data.worldbank.org/data-catalog/world-development-indicators>
- World Trade Organization. (1994). *Agreement on Subsidies and Countervailing Measures*. Retrieved from <http://www.wto.org>
- World Trade Organization. (2002a). *Trade Policy Review, Dominican Republic*. Report by Secretariat, WT/TPR/S/105.
- World Trade Organization. (2002b). *Trade Policy Review of the Dominican Republic*. Trade Policy Review Body's Evaluation, WTO-PRESS/TPRB/204.
- World Trade Organization. (2005a). The Erosion of Non-discrimination. In *The Future of the WTO*, Chapter 2. Geneva@ World Trade Organization. Retrieved from http://www.wto.org/english/thewto_e/10anniv_e/future_wto_e.pdf
- World Trade Organization. (2005b). *Understanding the WTO* (3rd Ed.). Geneva: World Trade Organization. Retrieved from http://www.wto.org/english/thewto_e/whatis_e/tif_e/understanding_text_e.pdf

¹ The term EPZ will be used interchangeably with FTZ, setting aside the slight differences in these concepts. The WTO treats both of them in an identical manner in the regulations on export subsidies.

² In a subsequent paper, Harberger (2008) examined the incidence of the corporation income tax when the changes in the tax are applied on a worldwide basis or on countries that represent a large proportion of the capital stock of the world. He also considered cases where the domestically produced traded goods are not perfect substitutes for the goods of their international counterparts. Neither of these modifications to the assumptions of the basic model of the incidence of the corporation income tax on traded goods sectors (Harberger, 1995) are relevant to the case in which countries are extending the domestic corporation income taxes to apply to firms operating in their EPZs or FTZs. The goods produced in these zones are entirely internationally traded in nature and the

total amount of capital found in these zones is insignificant when compared with the total capital stock of the world.

³ The items produced in the FTZs of the DR are mainly garments and electronic goods for export.

⁴ The capital intensity of the garment and electronics-assembly firms in the DR zones is fairly similar. However, in the case in which one industry in the FTZ was more capital intensive than the other, we would expect that firms in the more capital-intensive sector might pull out of the zone entirely.

⁵ The National Household Survey of Expenditures and Incomes is from 1999, a decade earlier than the period of the analysis undertaken here. The only information from the survey that we need to use is on the proportions of the household expenditures spent by income quintile group on various types of goods and services. We do not expect these proportions to have change significantly over the intervening decade.

⁶ Domestic sales amount to not more than 2% of total exports (National Free Zones Council of the Dominican Republic, 2010).

⁷ See, for example, Cury, Jenkins and Kuo (2004).

⁸ The amount of financing cost allowed as a deduction by the foreign investors is largely a tax policy and tax administration issue. Foreign-owned companies will try to transfer as much of their income as possible out of the DR to tax haven countries such as Panama. This is often done through excessive interest expenses on non-arm's length loans from financial institutions abroad.

⁹ If imposing the corporation income tax on firms in the FTZ caused some of them to leave the DR, there would be a proportional reduction in both the total taxable income of the FTZ corporations and the size of the FTZ labor force.

¹⁰ Labor's share of value added for the non-traded non-taxed sectors in the DR is as follows: transportation 50%, services 68%, hotels, bars and restaurants 59 % and manufacturing domestic non-traded 51%.

¹¹ Labor's share in the value added of retail and wholesale trade is about 70% in the DR.

¹² People tend to try to maintain their past level of consumption over time in the face of temporary fluctuations of income caused by illness, unemployment or retirement. Thus, current household expenditures are a better measure of the permanent or long-term income of a household than the observed household income for the period.