



**Marginal Effective Tax Rates and
Investment Decisions in Egypt**
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Abstract

Recognizing the bearing of taxation on the cost of capital and investment behavior, this paper attempts to measure the overall impact of business income taxation on domestic marginal investments in Egypt. The paper uses a computerized model developed by Dunn and Pellechio (1990) to measure the Marginal Effective Tax Rate (METR) on capital. The study shows that METRs in Egypt are relatively high compared with statutory income tax rates and METR levels in some Latin American countries. Furthermore, the analysis indicates that the tax system favors joint stock companies listed on the Stock Exchange over other legal forms of companies, manufacturing over services, debt over equity financing and land over other capital assets. Although export activities face lower METR compared to inward oriented ones, they are insufficient to offset other tax-induced biases against exports. The study concludes by offering broad recommendations consistent with investment promotion, efficient allocation of resources and equity. These recommendations include reducing the effective tax burden on investment, phasing out and rationalizing the biases induced by the tax regime, and finally reforming tax administration.

ملخص

إدراكاً لأهمية تأثير الضرائب على السلوك الاستثماري، عنيت هذه الدراسة بتقدير العبء الفعال أو الكلى للنظام الضريبي على الاستثمارات الحدية أو الجديدة في مصر. ونظراً لقصور المعدل الإسمي للضريبة على الدخل عن التعبير عن هذا العبء، أعتمدت الدراسة على نموذج قياسي أعده للحاسب الآلي كل من دون و بليكيو Dunn and Pellechio عام ١٩٩٠، لتقدير المعدل الفعال للضريبة (Marginal Effective Tax Rate) في مصر. وقد توصلت الدراسة الى ارتفاع المعدل الفعال للضريبة في مصر مقارنة بالمعدل الأسمي للضريبة على الدخل في مصر، وكذلك بالمقارنة بالمعدل الفعال للضريبة في بعض دول أمريكا اللاتينية. كما أوضح التحليل أن النظام الضريبي في مصر يميز في المعاملة الضريبية لصالح الشركات المساهمة المسجلة بالبورصة مقارنة بالأشكال القانونية الأخرى، والصناعة على حساب الخدمات، كما يشجع على التمويل عن طريق الإقتراض في مقابل التمويل الذاتي، ويميز التصدير مقارنة بالإنتاج للسوق المحلي وإن كان هذا التمييز محدوداً، وأخيراً يميز الاستثمار في الأراضي والمباني على حساب الآلات والمعدات ووسائل النقل. وقد انتهت الدراسة الى مجموعة من المقترحات العامة التي من شأنها تشجيع الاستثمار، ورفع مستوى كفاءته، مع مراعاة تحقيق العدالة. وتشير تلك المقترحات الى أهمية العمل على تخفيض العبء الفعال للضريبة على الاستثمار، ومراجعة وترشيد المعاملة الضريبية التمييزية مع قصر الحوافز الضريبية على مجالات محدودة و مستهدفة، فضلاً عن ضرورة التركيز على تطوير واصلاح الإدارة الضريبية.

I. Introduction

Although business income taxation is only one of several determinants of investment decisions, it often has an important impact on marginal investment. When a country's tax rate is relatively high, investment is discouraged and competitiveness is eroded. Likewise, if the tax system fails to treat alternative investment opportunities in a neutral way, distortions are introduced in investment decisions. In a globalized world characterized by increased capital mobility, a well-designed and neutral national corporate tax system has a strong bearing on attracting foreign direct investment. Thus, this paper attempts to measure the overall impact of the Egyptian tax regime on domestic marginal (i.e. additional or new) investments. To this end, it investigates the extent to which taxation in Egypt imposes additional cost on capital and hence discourages investment; it also assesses the distortionary effects of the regime on investment allocation.

Because the statutory tax rate¹ is not an accurate indicator of the overall impact of the tax system on investment decisions, the paper measures the marginal effective tax rate (METR) on capital. This measure is marginal in the sense that it is only concerned with incremental capital investment. METR on capital captures all direct and indirect taxes imposed on capital,² the different aspects of tax related incentives (depreciation allowances, tax credits, tax holidays) and tax compliance, as well as the industry-specific and economy-wide parameters (asset structure, interest rates, inflation rate, etc.) that interact with these taxes. METR on capital, as a concept, is different from the average effective tax rate, which is the ratio of tax liabilities to taxable income. The latter is less indicative given that it is sensitive to taxpayers' performance and does not capture all aspects of the tax system and is therefore less useful for policy simulations.

Specifically, the study addresses the following questions:

- Does the prevailing tax system in Egypt encourage new investment?

¹ The measure commonly used in similar studies.

² Note: METR on capital is different from METR on cost of production, which is a wider measure of tax burden on a marginal investment that incorporates the taxes on other factors of production in addition to taxes on capital.

- Does this system distort investment decisions by discriminating between different organizational forms, economic activities, sources of finance, and types of assets?
- What happens to METRs when tax incentives and tax compliance are taken into account?

The paper is organized as follows: Section II identifies the basic characteristics of business income taxation in Egypt. Section III discusses the concept of METR and summarizes the methodology used in METR calculations. It also specifies the parameters of the METR model in the Egyptian context. METR estimates are then presented in the following two sections. Section IV presents METR estimates for marginal investments according to their legal form, economic activity, source of finance, and type of asset investments. Section V discusses the impact of tax incentives and compliance on METR estimates. Section VI concludes the study by offering broad policy implications.

II. Business Income Taxation in Egypt

The Egyptian system of business taxation is multifaceted. It involves direct taxes such as income and property taxes, as well as indirect taxes including customs duties, sales taxes, stamp duties and surcharges. The tax system also provides special incentives, under different income and investment laws, to encourage investment. Beside tax-related provisions and exemptions, other factors such as tax administration and compliance affect the burden of taxation on the cost of capital. In this section, we highlight the main features of business (corporate and non-corporate) income taxation in Egypt.

Tax Rates

Egypt applies relatively high and non-uniform profit tax rates. As shown in Table 1, the maximum corporate income tax rate in Egypt (40 percent) is the highest in the sample of developing countries listed therein. While it is true that the lower bound of the tax rate (32 percent) is less than the rate in Turkey, Morocco, Brazil and Mexico, it remains higher than the rates for such fast growing economies as Hong Kong, Singapore, Indonesia and Chile.

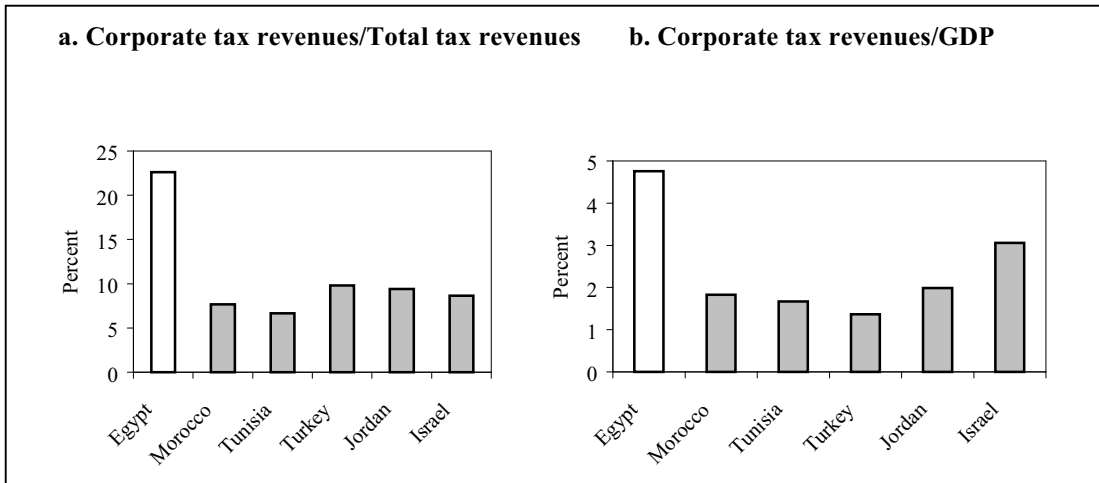
Table 1. Corporate Tax Rates in Selected Developing Countries, 2000 (%)

Country	Corporate Tax Rate
Egypt	32-40
Turkey	33
Morocco	35
Tunisia	35
Israel	36
Argentina	35
Brazil	37
Chile	15
Mexico	35
Peru	30
Indonesia	30
Singapore	26
Hong Kong	16
Korea	31

Source: KPMG (2000), KPMG Corporate Tax Rate Survey.

Tax rates vary according to the nature of the activity. For corporate firms engaged in services, the rate is 40 percent, whereas the rate for corporate firms undertaking manufacturing and exporting activities is only 32 percent. Profits of non-corporate firms are subject to personal income tax rates ranging between 20 and 40 percent depending on the income bracket.

In terms of revenues, corporate taxes are an important source of revenue. Figure 1a shows that corporate taxes in Egypt in 1995 generated 23 percent of total tax revenues, which is much higher than the average of 9 percent for a selected sample of countries in the MENA region. Similarly, the share of revenues from corporate taxation to GDP in Egypt for the same year was higher than the corresponding average for the same sample (Figure 1b). It should be noted, however, that revenues from corporate taxation in Egypt are dominated by taxes from the government economic authorities: the Suez Canal, the oil sector, and the Central Bank of Egypt. Nearly 60 percent of corporate tax yield is attributable to these economic authorities (Abdel Rahman, 1998).

Figure 1. Importance of Corporate Taxation in Egypt and Selected MENA Countries, 1995

Source: IMF, *Government Finance Statistics*, 1998 and *International Financial Statistics*, March 2000.

Direct versus Indirect Taxation

While corporate and non-corporate tax revenues account for about 32 percent of total tax revenues, indirect taxation revenues account for more than 50 percent of the total (See Table 2). Within the category of indirect taxation, the importance of import duties is declining over time and this trend is expected to continue in the years ahead with further liberalization and possible free trade agreements (FTAs) with the EU and other regional economic blocks. Sales tax and stamp duties, on the other hand, are gaining new grounds, as they are becoming a principal source of tax revenues (Abdel Rahman 1998).

Table 2. Revenues as a Percent of Total Government and Tax Revenue (Avg. 1995/96-1998/99)

	% of total governmental revenues	% of tax revenues
Total revenues	100.0	-----
Tax revenue	59.7	100.0
Corporate taxes	16.5	27.7
Unified personal tax revenues	5.5	9.2
<i>of which</i>		
Commercial and industrial profits	2.8	4.7
Property taxes	0.0	0.1
Sales taxes	16.5	27.6
Import duties	12.4	20.9
Stamp taxes	4.4	7.3
Others	4.4	7.3

Source: Ministry of Finance, *Government Budget for 1998/99*, 1988.

Tax Deductions and Allowances

Like corporate taxation regimes elsewhere, the tax law in Egypt provides different forms of deductions and allowances. These include annual depreciation deductions to compensate for assets deterioration, as well as initial deductions granted to investment in new machinery. In addition, the tax law allows for the deduction of interest on debt from taxable income. There are also special allowances granted to certain organizational forms, such as the paid-up capital allowances granted to joint stock companies listed on the stock exchange. These differential treatments across assets, sources of finance, and organizational forms clearly affect the pattern of investment decisions, as will be discussed later.

Incentive Schemes

Investment incentives are a prominent feature of the Egyptian tax policy, where the preferred form is tax holidays. Egypt uses tax holidays to promote certain activities and to encourage new industries to locate outside Cairo and Alexandria. Tax holidays vary between 5 and 20 years and extend to lifetime exemptions from taxes in the case of free zone investments. Several laws³ govern the exemption pattern in addition to exemptions contained in the tax legislation itself.

Tax Compliance

High and non-uniform income tax rates coupled with generous incentive schemes and a multiplicity of tax deductions and allowances tend to complicate tax administration and hence weaken tax compliance. The 250,000 pending tax cases in Egyptian courts are a good illustration of the cumbersome nature of the tax administration. Although accurate estimates for tax compliance in Egypt are not available, it is estimated that annual tax evasion ranges between L.E. 14 billion and L.E. 17 billion, of which L.E. 6 billion applies specifically to income tax evasion (Atta, 1999). However, more systematic analysis shows that tax evasion in Egypt is similar to the level observed in other countries after taking into account the country's level of economic development and the structure of its tax base (i.e., GDP per capita, the relative importance of economic sectors in GDP, the shares of exports and imports to GDP, and the profit tax rates) (Tohamy 1998).

² Law No. 8 of 1997 (The Investment Incentives and Guarantees Law), Law No. 159 of 1981 as amended (The Companies law) and Law No. 59 of 1979 the (New urban Communities Law).

Collectively, these features of the tax regime make it difficult to evaluate the net effect of taxation on marginal investment in Egypt. On one hand, the generous tax incentive schemes and tax evasion have the effect of reducing the cost of capital. On the other hand, high statutory tax rate, extensive use of indirect taxation and cumbersome tax administration procedures have the effect of increasing the burden of taxation. Further complicating factors for measuring the effective cost of capital include the multiple tax rates, as well as different allowances and incentives across legal forms of firms, activities, assets and sources of finance. Accordingly, it is only by relying on such a summary measure as METR that we can say something useful about the overall effect of the different aspects of the tax system on the cost of capital and investment decisions in Egypt. The next section highlights the rationale and merits of this indicator.

III. METR On Capital: A Conceptual Framework

This section discusses the concept of METR on capital and describes briefly the methodology of its calculation. Further details of the methodology are available in Appendix A for interested readers.

The Concept

METR is the tax rate imposed on income generated by a marginal investment undertaken in a particular economic setting. METR is a summary measure that incorporates the effects of statutory tax rates, tax related incentives (as depreciation deductions, interest expense deduction, investment tax credits and specific allowances, etc.) as well as various non-tax variables such as industry-specific and economy wide parameters (e.g. capital structure, inflation, financial structure etc.) interacting with these taxes. METR on capital incorporates only capital-related taxes. Integrating taxes on other inputs such as labor and intermediates produces a wider measure termed “METR on cost of production”, which is beyond the scope of this paper. The economic reasoning behind measuring the tax burden on the incremental unit of capital investment has is that marginal rather than average factors drive economic decisions (Chen and Reinikka 1999).

In addition to METR, several other indicators are used to gauge the tax burden. However, these measures are less indicative than METR and thus were not used in this study. One such measure is the statutory income tax rate on profits, referred to

hereafter as the nominal tax rate. This is an easy and straightforward measure, yet it ignores all other elements of the tax regime such as indirect taxation, tax holidays and tax administration. Another measure is the average effective tax rate, which is the ratio of tax liabilities to taxable income. This measure is unreliable for policy simulations as it is sensitive to taxpayers' performance and does not capture the incentive effects of the tax system.

In METR calculations, the interaction between the tax and non-tax parameters can produce different tax rates for different industries, assets, and sources of finance. METR has the advantage of quantifying this tax bias at the margin. Inflation rate is a traditional example of the interaction between tax and non-tax parameters. In systems that do not apply indexation (like the case of Egypt), inflation can affect METR significantly. For example, deducting interest payments at their nominal values in the presence of high inflation lowers real financing cost and where debt is important, METR tends to be low. On the other hand, the non-indexation of depreciation deductions (via underestimating the replacement costs of depreciable assets) and of capital gains (through overvaluing these gains) tends to overestimate taxable income and thus raises METRs (Chen and Reinikka, 1999).

In this paper, METR on capital is calculated using a computerized model developed by Dunn and Pellechio (1990). The model assumes a typical project with a definite operating period and a specific before-tax internal rate of return (Details are available in Appendix A). The model generates a cash flow for the project. Given the appropriate information on tax and non-tax parameters, it applies this information to the cash flow and derives the internal rate of return for the after-tax cash flow. METR is the difference between the before and after-tax rates of return expressed as a percentage of the before-tax rate of return. For example, if the before-tax rate of return is 16 percent and the after-tax rate of return is 12 percent, then the marginal effective tax rate on capital is 25 percent. Formally, METR on capital can be defined as:

$$\text{METR} = \frac{\text{BTROR} - \text{ATROR}}{\text{BTROR}} \times 100$$

Where: BTROR is the before-tax rate of return on investment, and
ATROR is the after-tax rate of return on investment.

The difference between BTROR and ATROR, known as the tax wedge, gives an indication of the extent to which taxation creates a disincentive to new investment. Suppose, for example, that investors will only invest if the after-tax rate of return is equal to 10 percent, i.e. the return they can get on bank deposits. If the BTROR that guarantees this return is 20 percent, then all projects that earn a return below 20 percent are excluded from the investment decision.

While taxes raise the rate of return on the investment required to yield a certain rate of return on savings, different tax incentives work in the opposite direction. The net effect of these two forces determines the real burden on the investor. Given this, a higher statutory tax rate does not necessarily mean a higher tax burden.

Tax Parameters of the Model

Tax parameters include all direct and indirect taxes that affect the cost of capital under different legal forms and in all economic activities.⁴

Profit Taxes

In general, corporate firms (Joint stock companies, limited liabilities, and partnership limited by shares) are subject to a corporate tax rate of 40 percent. Corporate firms undertaking manufacturing and exporting activities are subject to a lower rate of 32 percent. In the case of non-corporate firms (sole proprietorships and limited and general partnerships), no income tax is imposed at the firm level. Shares of partners in taxable profits (known as profits from commercial and industrial activities) are included in their unified income tax base and are subjected to progressive tax rates ranging between 20 percent and 40 percent.⁵ For non-corporate undertakings in the manufacturing and exporting activities, the first L.E. 8,000 of profit is taxed at the statutory rate, while 80 percent (industrial) and 70 percent (exporting) of remaining profits are subject to the statutory rate. Both corporate and non-corporate projects are subject to an additional 2 percent development duty on profits exceeding L.E.18,000.

⁴ Stamp duties – specific and proportional – are not accounted for in METR calculations. On the one hand, specific stamp taxes on capital are considered to be insignificant (interviews). On the other hand, proportional stamp duties on loans and credits are irrelevant in this study. Stamp duties on loans are paid by banks and not by the borrower and credit is excluded as a source of finance for the new investment.

⁵ 20 percent is applied on the first L.E.2,500 of profits; 27 percent on the following L.E.45,00; 35 percent on the next L.E.9,000; and 40 percent on profits in excess of L.E.16,000.

Taxable income equals revenues minus deductible costs. Revenues include incomes from the main activities of the firm, in addition to any other incomes as capital gains from the sale of capital assets⁶ and interest income.⁷ The deductible costs permitted in the METR calculations include wages, materials, depreciation, interest payments on debt and property taxes.⁸

Property Tax

Real estate tax is calculated for nonresidential buildings and land. The basic tax rate of 10 percent is applied on the net rental value, which is 80 percent of gross rental value⁹ (20 percent of the gross rental value is deducted for maintenance and expenses). Besides the basic tax rate, there is a complementary tax called guards tax (*khafar* tax) set at the rate a 20 percent of the original tax. Additional local taxes and duties are also imposed by the governorates of Egypt (KPMG 2000).

Sales Taxes

This is the main commodity tax in Egypt. It is levied on the sales of goods and services. Both domestic and imported goods are taxed (the sales tax is applied on the value of imports including customs duties). The sales tax rate varies by commodity and type of service. For machinery the standard rate is 10 percent, which is applied in METR calculations on purchases of machinery and transport vehicles.

Customs Duties and Surcharges

Customs duties in Egypt have been reduced to range between 5 and 40 percent, with few exceptions. There is also an additional surcharge of 3 percent if the import tax is less than or equal to 30 percent, and of 4 percent if the import tax exceeds 30 percent. METR calculations assume import duties on machinery imports equal to 5 percent for corporate firms and 10 percent for non-corporate firms operating under Law 157. A

⁶ If proceeds from the sale of capital assets are utilized within two years to purchase new capital assets, the part of the corporate tax related to such capital gains from the resale of assets shall be reimbursed or deducted from the corporate tax due for payment in following years.

⁷ Only a small proportion of about 10 percent of interest income is taxed.

⁸ Income tax law provides for other deductions.

⁹ Gross rental value for buildings and land are 8 and 5 percent of the value of buildings and land, respectively (Interviews with tax experts).

rate of 5 percent is applied to all organizational forms operating under Law 8.¹⁰ A tariff rate of 40 percent is assumed for transport vehicles.

Non-tax Parameters of the Model

Non-tax parameters are the economy and industry parameters that affect the cost of capital. These parameters include the asset structure, depreciation rates, inflation rate, and retained earnings.

Asset structure

Four types of assets are considered: one non-depreciable asset (land) and three depreciable assets (buildings, machinery, and vehicles). The share of each asset in total physical investment for each activity has been derived from the 1996/97 Economic Census (CAPMAS, 1998). Manufacturing asset structure is calculated as 4.8 percent for land, 25.2 percent for buildings, 64.6 percent for machinery and equipment, and 5.4 percent for vehicles. Services asset structure is 18.3 percent, 37.8 percent, 29.9 percent and 14 percent for land, buildings, machinery and equipment, and vehicles respectively. Similar asset structure for corporate and non-corporate firms operating in the same sector is assumed.

Depreciation

Fixed depreciable assets are depreciated using the straight-line method. Applied rates of yearly depreciation for buildings are 2 percent for services and 3 percent for industry. For vehicles and machinery, the rates are 20 and 10 percent, respectively. New machines and equipment used by firms in productive activities (mostly interpreted as manufacturing activities) are granted an initial allowance of 25 percent and the remaining 75 percent is depreciated over a 10 year period.

Inflation rate

The annual inflation rate of 2.9 percent (April 1999/April 2000) is used as a deflator (CBE July 2000). The Egyptian taxation system is a non-indexed system.

¹⁰ According to Law 8/1997, machinery imported by corporate entities are subject to 5 percent custom duty. Non-corporate firms do not enjoy this reduced rate and thus, a rate of 10 percent is assumed for their imports of machinery.

Retained earnings

Retained earnings are assumed to equal 5 percent of distributable profits for corporate firms (legal reserve) and 0 percent for non-corporate firms.¹¹

IV. METR on Capital in Egypt: The Base Case

Relying on METR estimates, this section assesses the impact of the Egyptian tax system on the cost of capital. It also attempts to study the tax-induced distortions across legal forms of business, economic activities, inward-oriented versus exporting firms, sources of finance, and assets.

Assumptions of the Base Case

Estimates of the base case assume the following:

- A marginal private investment project that is subject to Income Tax Law 157/1981.
- Two sectors are considered: the manufacturing and the services sectors. No disaggregation of these sectors is attempted. The services sector includes trade, hotels and restaurants, financial mediation, education, health, and other social and personal services. Transport and communications have been excluded as their machinery intensive asset structure distorts results.¹²
- The project is assumed to be purely equity financed.
- The project does not benefit from the incentives of Investment Law 8/1997.
- Tax administration is not accounted for in METR calculations due to unavailability of an estimate for it.

The tax parameters used in METR calculations in the base case are summarized in Table 3 below.

¹¹ Another element that reduces the return to capital in corporate firms, besides the legal obligation to retain 5 percent of profits, is the employees' profit sharing of 10 percent of total distributions.

¹² The high share of machinery in the asset structure of the transport and communication sectors, which is given 25 percent initial depreciation allowance, unrealistically reduces METR on capital in the services sector.

Table 3. Data for Computation of Egyptian METR: The Base Case

Parameter	Value in the base case
<u>Direct taxes</u>	
Profit taxes*	
Corporate	
Manufacturing	32%
Services	40%
Non-corporate**	Progressive rates (20%-40%)
Property taxes	
Buildings	1.248%***
Land	0.780%
Personal taxes on	
Dividends	0
Capital gains	0
<u>Indirect taxes</u>	
Sales taxes	10%
Import tariffs	
Machinery and equipment	5% and 10% (80% imported)****
Vehicles	40% (60% imported)
Surcharges	
If import duties less than 30%	3%
If import duties more than 30%	4%
<u>Depreciation deductions</u>	
Initial deductions for machinery	25% of value of new machinery used in productive purposes
Annual Depreciation	
Buildings	
Manufacturing	3%
Services	2%
Machinery & equipment	
Manufacturing	7.5% (over 10 years)*****
Services	10% (over 10 years)
Vehicles	20% (over 5 years)

* An additional 2 % development duty is applied to profits exceeding L.E.18,000.

** For non-corporate firms there are 2 basic assumptions. First, there is only one owner for the firm and second, this owner has no other source of income.

***This rate is the product of $(8\% \times 80\% \times 12\%) + (8\% \times 6\%)$

where:

8% (of the value of buildings) is a rough estimate of the gross rental value of buildings

$8\% \times 80\%$ is the net rental value of buildings

12% the original tax rate of 10% plus 2% guards tax both imposed on the net rental value of buildings

6% are additional duties on the gross rental value of buildings.

The property tax on land is estimated the same way except that the gross rental value of land is estimated at 5 percent of its value.

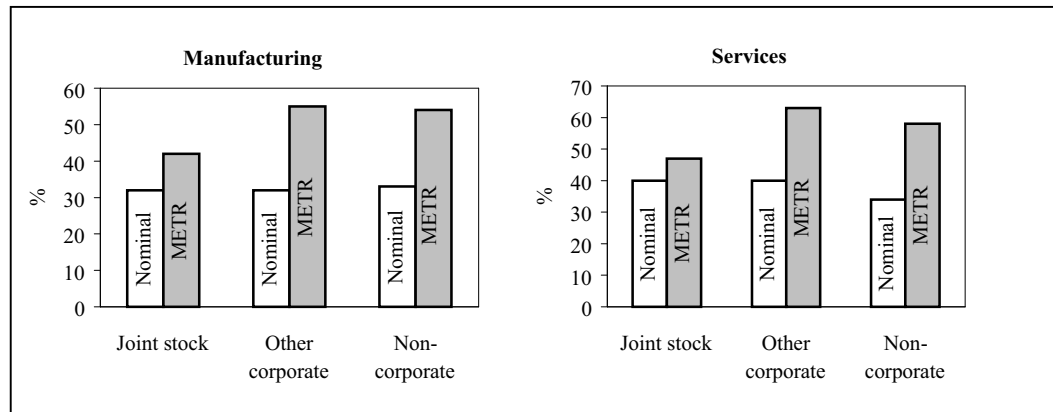
**** 5 % is applied on corporate firms and 10 percent on non-corporate firms.

***** The remaining 75% of the value of machines and equipment after deduction of initial allowance are depreciated over 10 years at the rate of 7.5%.

METR: The Relative Tax Burden

METR estimates in Figure 2 point out that the Egyptian tax system imposes more cost on capital than what is revealed by statutory tax rates. This applies to all firms regardless of their legal forms or activities. Indirect taxation in the form of tariff duties, sales taxes, and surcharges are considered an important component of this additional cost. Table 4, which compares two sets of METR (with and without indirect taxation), illustrates this point. If an investor requires an after tax rate of return of 9.25 percent (the nominal deposit rate of Egyptian banks in September 2000), then a marginal joint stock investment in the manufacturing sector should at least earn a before-tax rate of return of 16.45 percent compared to only 12.47 percent in the absence of indirect taxation.

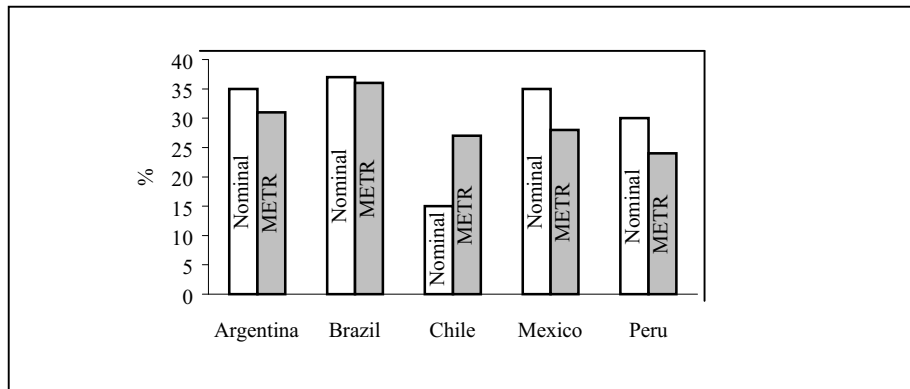
Figure 2. Nominal Tax Rates and METRs in Egypt



Source: Authors' calculations.

The observed relationship between METRs and statutory tax rates appear intuitively acceptable given that indirect taxes are added in METR calculations. In fact, the relation between nominal and effective tax rates is not straightforward. The outcome depends on the different aspects of the tax system that vary substantially from one country to another. Examining this relation in some Latin American countries supports this argument. Figure 3 shows that, with the exception of Chile, METRs are below the statutory tax rates. Various reasons explain this: Peru, for example, applies generous depreciation rates of 20 percent for machinery and equipment; Chile allows for the carry over of losses indefinitely; and Argentina imposes no import duties on capital goods. In addition, most of these countries allow for crediting sales taxes on capital goods (Bird, R. Duanjie Chen et al 1999).

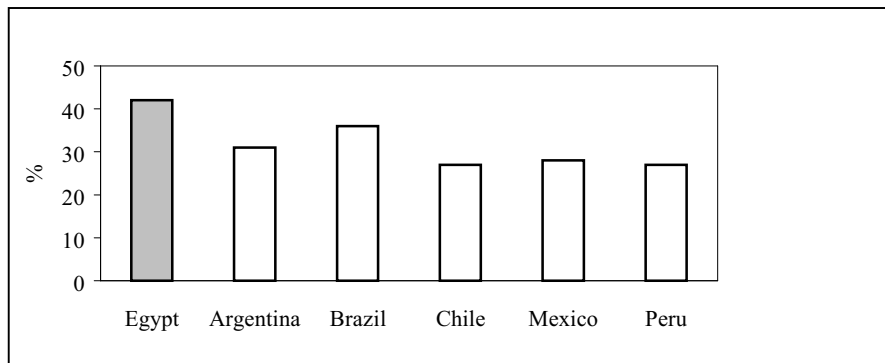
Figure 3. Nominal Tax Rates and METRs in some Latin American Countries: Manufacturing Sector and no Tax Holiday



Source: Bird, R. Duanjie Chen and Joseph L. Rotman (1999).

Comparing METRs in Egypt to those in the selected Latin American countries reveals that METR on corporate firms operating in the manufacturing sector in Egypt is higher than the corresponding rates in all of the Latin American countries (Figure 4). This is the case despite the fact that corporate tax rate in the manufacturing sector in Egypt is below the rates prevailing in most of these countries (Table 1). Again, the other features of the tax system and the different economic and financial settings play an important role in determining the effective tax burden on marginal investment.

Figure 4. METR in Egypt and Some Selected Latin American Countries: Manufacturing Sector and no Tax Holiday



Source: For Egypt: Authors' calculations; all other countries: Bird, R. Duanjie Chen and Joseph L. Rotman (1999).

METR and Investment Decisions

In the analysis below, METR is used to investigate whether capital income taxation in Egypt introduces any distortions in investment decisions. In particular, we examine the impact of the tax system on business decisions regarding the choice of legal form of firms, activity, production strategy (inward or outward-oriented), financing and

asset structure. Estimates of METRs are expected to be affected by the assumed non-tax parameters. The sensitivity of the results to changes in some macroeconomic indicators has been considered and results are presented in Appendix B.

METR across organizational forms

Table 4 provides two sets of METR estimates; the first models direct taxation only, while the second incorporates both direct and indirect taxation.¹³ Based on these estimates, it is evident that the effective taxation of capital differs between firms according to their legal forms.¹⁴ Joint stock companies listed on the stock market and financed by equity bear the least METR followed by non-corporate firms, and finally limited liabilities and partnerships limited by shares (Other corporate). This result holds for the two sets of estimates, as well as across economic activities. In the manufacturing sector, for example, METR estimates based on direct and indirect taxation show that joint stock companies face the least METR estimated at 41.6 percent compared to 53.6 percent for non-corporate firms and 54.5 percent for corporate firms other than joint stock.

Table 4. METR across Organizational Forms and Economic Activities: The Base Case (%)

	METR: Direct Taxation			METR: Direct and Indirect Taxation		
	Manufacturing	Services	Exports	Manufacturing	Services	Exports
<i>Corporate</i>						
Joint Stock	22.9	29.6	22.9	41.6	47.2	41.6
Other Corporate	36.80	46.6	36.8	54.5	63.2	54.5
<i>Non-corporate</i>						
	31.2	39.2	28.3	53.6	58.4	50.9

Source: Authors' calculations.

This advantageous position of joint stock companies reflects the preferential treatment they receive. The most important is the annual paid-up capital allowance

¹³ It is worth noting that the effective tax rates based on direct taxation as reported in Table 4 vary from the statutory tax rates. Sources of variations are mainly special tax allowances such as those granted to joint stock companies and to non-corporate firms undertaking manufacturing and exporting activities, followed by the non-indexed tax system in Egypt, and finally property taxes. Special allowances work on reducing METRs, while non-indexed depreciation and capital gains raise METRs, and property taxes increase METRs.

¹⁴ Joint stock companies are assumed to be listed on the stock market and are thus eligible to the paid-up capital allowance.

(equal to the product of their paid-up capital and the interest rate on bank deposits) granted for listing on the Egyptian Stock Exchange.¹⁵ Although listed companies tend to be closely held with little “free float”, there is evidence to suggest that firms attempt to get listed in order to receive tax benefits (EFG-Hermes, 2000).

METR figures in Table 4 also reflect the 1997 revision of the unified personal income tax schedule (which entailed the simplification of the schedule from six to four categories and the reduction of its upper limit from 48 to 40 percent). This revision has had the effect of correcting an obvious bias against non-corporate firms in the past (World Bank, 1995). The results even point to a more favorable treatment for non-corporate firms compared to corporate firms other than joint stock. This is mainly due to the lower average tax rate paid by non-corporate firms in comparison to corporate firms (in this particular case, rates of 33, 34 and 32 percent are paid by non-corporate firms in the manufacturing, services and exporting activities compared to 32, 40 and 32 percent for corporate firms, respectively). The gap between corporate and non-corporate firms of course declines as non-corporate firms realize higher profits and thus become eligible for higher average tax rates.

METR across economic activities

The METR estimates in Table 4 also reveal that manufacturing activities are favored over services, regardless of the legal form. For example, METR (including indirect taxation) for joint stock companies operating in manufacturing is 41.6 percent, compared with 47.2 percent for firms engaged in services. The discrimination against services is clearer in the case of corporate firms other than joint stock; METR for firms in manufacturing is estimated at 54.5 percent, compared with 63.2 percent in the services sector.

The favorable treatment of corporate firms engaged in manufacturing is mainly due to the lower tax rate of 32 percent (exclusive of the 2 percent development duty) applied on manufacturing as compared with 40 percent (exclusive of the 2 percent development duty) for services. As for non-corporate firms engaged in manufacturing, after the first L.E.8,000 of taxable profits (which is totally subject to income taxes),

¹⁵ This is a restricted deduction that is only allowed to the extent that there is positive income to offset.

then only 80 percent of the remaining profits are subject to taxes.¹⁶ Moreover, depreciation deductions are more generous to manufacturing activities compared to services. Only new machinery used for productive purposes (usually interpreted by tax men as manufacturing activities) is entitled to an initial depreciation of 25 percent of the value of the new machine. Also, buildings used for manufacturing activity are depreciated at a rate of 3 percent compared to only 2 percent for services activities. However, other tax aspects work against manufacturing such as the high tax rates applied on services, and the failure to allow for input crediting of the sales tax on capital goods.

METR on exporting versus non-exporting activities

Without modeling tax rebates and drawbacks provided to exporting firms, Table 4 shows that corporate exporting firms in the manufacturing sector do not receive any favorable treatment compared to corporate firms producing for the domestic market; both are taxed at 41.6 percent as joint stock firms and 54.5 percent as limited liability companies. It is only when firms take the non-corporate form that exporting entities receive better taxation treatment (50.9 percent) than firms producing for local markets (53.6 percent). Of course, tax rebate and drawback schemes provide exporting firms with a better treatment than reported above, but these arrangements do not impact directly on the cost of capital, which is the subject discussed in this paper.

The above findings can be explained largely by the fact that the tax law does not differentiate between corporate manufacturing firms producing for domestic markets or international markets. Both receive an equal concessional tax rate of 32 percent (exclusive of the 2 percent development duty). As for non-corporate firms engaged in exporting, the unified personal tax code offers added incentives to exporters by allowing a 30 percent profit deduction (compared with 20 percent for manufacturing) from the tax base after paying taxes on the first L.E.8,000 of profit.

The relatively high METR on services and high tariff rates indirectly discriminate against exports. This point is supported by a recent study that estimated the economy-

¹⁶ In addition, the income tax law discriminates among manufacturing firms themselves. It grants corporate manufacturing companies employing fifty or more workers a 5 years tax holiday. This is an unjustified discrimination in tax treatment against small firms, which account for more than two thirds of manufacturing firms (CAPMAS, 1995/1996). It may also partially explain why small firms choose to be informal (even if they become formal they will not enjoy such incentive unless they are incorporated). More importantly, if the purpose is to encourage manufacturing and job creation, this preferential tax treatment should not be linked with the legal form of the company.

wide tariff induced bias against exports to be nearly 19.7 percent in 1998 (Nathan Associates, 1998). This may partially explain the relatively low level of merchandise exports in Egypt, which accounts for only 5 percent to GDP compared with an average of 21 percent for some developing countries (World Bank 1999).

METR across sources of finance

Generally speaking, METRs tend to fall when the initial investment is partially financed by debt and the tax system allows for the deductibility of non-indexed interest payments. METRs estimates in Table 5 are consistent with this predication for all legal forms other than joint stock companies.

For corporate firms other than joint stock, METR falls from 36.8 percent to 34.4 percent when the firm relies on a 3:1 debt equity ratio compared to 100 percent equity finance. A similar conclusion holds for non-corporate firms. The relatively limited decline in METR as shown in Table 5 is due to the fact that the impact of debt finance is mitigated by the non-indexation of capital gains and depreciation deductions that tend to raise METRs as discussed earlier.

For joint stock companies, METRs in manufacturing activities, for example, increase from 22.9 percent in the case of all equity finance to 27.9 percent in the case of 3:1 debt/equity finance. The reasons behind this anomaly are the partial loss of benefits of the paid-up capital allowance granted to joint stock companies in addition to the above-mentioned factors that lead to higher METR.

Table 5. METR on Capital According to Sources of Finance (%)

	Joint Stock	Other Corporate	Non-Corporate
<i>Manufacturing</i>			
All equity	22.9	36.8	31.2
Debt/equity finance 3:1	27.9	34.4	28.3
<i>Services</i>			
All equity	29.6	46.6	39.2
Debt/equity finance 3:1	36.3	45.6	34.6

Source: Authors' calculations.

METRs on different assets

Capital income taxation in Egypt discriminates against depreciable assets such as vehicles and machinery, and favors land (Table 6). METR calculations (inclusive of indirect taxation) indicate that vehicles are the most heavily taxed assets (ranging between 95.1 and 113.3 percent), followed by machinery and equipment (ranging

between 43.6 and 64.0 percent), buildings (ranging between 26.4 and 48.8 percent), and finally land (ranging between 24.6 and 46.0 percent). This pattern holds across different organizational forms and across all activities.¹⁷ For instance, in the case of joint stock companies operating in manufacturing, vehicles are taxed at 95.1 percent, while land is taxed at 24.6 percent.

The relatively high METR on vehicles and machinery is due to the high tariff rates and the fact that sales tax is imposed on the value of imported goods inclusive of tariffs. At the same time, there is no credit for the sales tax on imported capital goods to reduce the bias against investment in vehicles and machinery. These conclusions become clear when we compare the figures reported in Table 6 with METR estimates exclusive of indirect taxation (shown in Table C.1 in Appendix C).

Table 6. Asset Specific METRs: Impact of Direct and Indirect Taxation (%)

	Land	Building	Machinery	Vehicles
<i>Corporate Firms</i>				
Manufacturing				
Joint stock companies	24.6	26.4	43.6	95.1
Other corporate	38.3	40.1	56.1	105.9
Services				
Joint stock companies	28.9	31.8	48.4	98.5
Other corporate	46.0	48.8	64.0	113.3
<i>Non-Corporate Firms</i>				
Manufacturing				
	32.6	34.6	57.2	102.2
Services				
	38.5	41.5	63.1	107.9

Source: Authors' calculations.

Based on the above analysis, one may conclude that the taxation regime in Egypt increases the cost of capital and may work as a deterrent to new investment. It also indicates that the regime favors joint stock companies listed in the stock exchange, manufacturing, exporting firms, debt financing, and land. These results lead us to pose the next question in the sequence: how would these results differ if tax holidays and transaction costs related to tax compliance are taken into account?

V. The Impact of Tax Incentives and Compliance on METR Calculations

Besides direct and indirect taxation, tax exemptions and compliance affect the cost of capital. The main concern in this section is to examine how these two aspects of

¹⁷ To calculate the METR on a specific asset, 100 percent of investment expenditure is assumed to be allocated to that asset with no investment in the other assets.

taxation affect METRs calculated in the base case. Do they significantly reduce the tax burden on investors? Do they deepen the existing biases or do they reverse them?

The Impact of Tax Holidays

According to the Investment Incentives and Guarantees Law (Law No. 8 for 1997), companies falling under this law, regardless of their legal form, are exempted from taxes for a period of 5 years starting from the first year of activity. For enterprises located in new industrial zones, new urban communities, or remote areas, tax exemption is extended to 10 years. The exemption period increases to 20 years for activities located outside the Old Valley. As for companies operating in free zones, they are exempt from all direct and indirect taxes for an unlimited period. They are only subject to an annual duty of 1 percent of the value of goods manufactured or of total annual revenues for services projects.

The impact of tax holidays granted under Law 8/1997 to inland projects and of lifetime tax and duty exemptions granted to projects located in free zones has been assessed. As tax holidays vary in length, the analysis was primarily carried out for 5 years holiday, although METRs were also estimated for projects enjoying 10 and 20 years tax exemptions.¹⁸ Tables 7 and 8 show that inland projects enjoying a 5 year tax holiday face lower METRs across all legal forms, economic activities, and all types of assets than in the case of no incentives. Estimated METR for manufacturing, for example, declines by 10.8 percentage points for joint stock companies, 18.3 for other corporate entities and 20.6 for non-corporate projects. Virtually more than half of the burden of taxation on projects operating under Law 8/1997 can be attributed to indirect taxation. For what concerns inland projects, Law 8/1997 cuts down the burden of direct taxation (namely the impact of profits tax), but touches very lightly on indirect taxation. In the case of free zone projects, because the law deals effectively with direct as well as indirect taxation, METRs are very low.

¹⁸ The simulations for 10 and 20 years tax holidays are presented in Table C.2 in Appendix C.

Table 7. METRs under Law 8/1997: Impact of Direct and Indirect Taxation (%)

	Manufacturing	Services
<i>No-incentive case</i>		
Joint stock	41.6	47.2
Other corporate	54.5	63.2
Non-corporate	53.6	58.4
<i>Tax holidays inland</i>		
Joint stock	30.8	32.0
Other corporate	36.2	38.9
Non-corporate	33.0	35.5
<i>Tax exemptions in free zones</i>		
Corporate	3.8	3.7
Non-corporate	1.5	1.5

Source: Authors' calculations.

Table 7 also shows that tax holidays mitigate the effect of the preferential tax treatment granted under corporate income tax law to joint stock companies listed on the stock exchange and to manufacturing activities. Differences in METRs across legal forms become less pronounced, and the bias in favor of joint stock companies (in the base case) is reduced due to the partial erosion of the paid-up capital allowance incentive as a result of tax holidays. METR estimates also show that the favorable treatment of manufacturing over services is less apparent in case of inland projects and even slightly reversed for free zone investments. The 0.1 percent bias against manufacturing in the free zone is due to the higher share of depreciable assets in the capital structure of manufacturing compared to services (95 percent for manufacturing compared to 82 percent services).

However, as revealed from Table 8, METR variations by asset persist under Law 8/1997 for inland projects. This is largely because inland tax holidays deal only with direct taxation, and do not affect indirect taxation, which is responsible for high and different METRs across assets. As regards sources of finance, equity turns out to be a more favorable option to investment finance compared to debt for all legal forms. Inland projects resorting to debt are deprived of interest deductibility during the tax holiday, while other factors pushing METRs upwards such as the non-indexed capital gains and depreciation persist, and lower rights for investors in case of debt finance (See Table C.3 in Appendix C).

Table 8. Asset Specific METRs under Law 8/1997: Impact of Direct and Indirect Taxation (%)

	Land	Buildings	Machinery & Equipment	Vehicles
<i>No incentives case</i>				
<i>Corporate Firms</i>				
<i>Manufacturing</i>				
Joint stock companies	24.6	26.4	43.6	95.1
Other corporate	38.3	40.1	56.1	105.9
<i>Services</i>				
Joint stock companies	28.9	31.8	48.4	98.5
Other corporate	46.0	48.8	64.0	113.3
<i>Non-corporate firms</i>				
Manufacturing	32.6	34.6	57.2	102.2
Services	38.5	41.5	63.1	107.9
<i>Inland investment</i>				
<i>Corporate firms</i>				
<i>Manufacturing</i>				
Joint stock companies	12.6	14.2	33.0	84.4
Other corporate	17.7	19.4	38.3	91.1
<i>Services</i>				
Joint stock companies	13.8	15.3	33.4	86.4
Other corporate	20.3	21.9	40.0	95.0
<i>Non-corporate firms</i>				
Manufacturing	13.8	15.75	35.2	89.2
Services	16.2	17.9	36.6	92.6
<i>Free zone</i>				
Corporate	3.3	3.5	3.9	4.7
Non-corporate	1.0	1.2	1.6	2.5

Source: Authors' calculations.

The main conclusion is that Law 8/1997 reduces the cost of capital for inland projects across all legal forms, economic activities, and assets. As for the impact of tax holidays on differential tax treatment, the analysis illustrates that while it reduces the biases across legal forms and activities, it maintains the biases between assets. In free zones, METRs decline drastically relative to inland companies.

On the question of effectiveness of tax incentives in free zones, there is clearly a revenue loss for the government. More importantly, some studies show that nearly 77 percent of the shipments from the free zones go to Egypt and only 23 percent go to foreign markets (Marks et al., 1999). To the extent that these numbers are accurate, they indicate that free zones' incentives are mainly directed to importing operations rather than exporting activities, as was supposed to be the real *raison-d'etre* of these zones.

The Impact of Tax Compliance

It is well recognized that tax compliance in general depends on tax rate and the effectiveness of tax administration in detecting and penalizing non-compliance. People evade taxes when, at the margin, the expected benefits (lower tax payments) are higher than the expected costs (penalties) (Chen and Reinikka 1999). In Egypt, it seems that the incentives for compliance are relatively low. On the one hand, the statutory rates are high and tax administration is time and cost consuming. On the other hand, both financial and criminal penalties are not sufficiently deterring since the magnitude of the financial penalties is relatively low and criminal penalty is seldom imposed.¹⁹

However, because there are neither accurate estimates of transaction costs related to tax compliance, nor of the magnitude of tax evasion in Egypt, METR calculations could not capture this phenomenon. Nevertheless, it is important to note that tax compliance is likely to raise the value of METR and because the magnitude of transaction costs and tax evasion differ from one firm to another, tax compliance is expected to affect taxpayers differently. Furthermore, firms that do comply with the tax system acknowledge difficulty with informal practices and an unfair competition situation compared with their non-compliant competitors.

VI. Conclusion and Policy Implications

Although taxation is not the only determinant of investment, it has a significant bearing on investment decisions through its impact on the net profitability of projects. Moreover, differential tax treatment may very well distort investment allocation. Recognizing the bearing of taxation on the cost of capital and investment behavior, this paper attempted to measure the overall impact of business income taxation in Egypt on domestic marginal (i.e. additional or new) investments. Besides the issue of whether a project that is viable in the absence of tax will still earn a sufficient return when tax is applicable, the study attempts to answer the equally important question of whether the tax system distorts investment decision. The analysis relied on the

¹⁹ Financial penalty is equal to 10 percent of the tax due with a maximum of L.E.1,000. Criminal penalties are vague, citing "punishment by imprisoning" as a possible penalty for failing to register with the tax authority, withhold and pay third-party taxes, or submitting inaccurate records to hide taxable income (Tohamy 1998).

marginal effective tax rate (METR) on capital, which is a summary measure that captures all aspects of the tax regime, as well as the industry-specific and economy-wide characteristics. This section sums up the main findings of the study, and then concludes with some broad policy implications.

METR estimates point out that the effective tax burden on capital in Egypt is much higher than what is reflected by the statutory business income (corporate and non-corporate) tax rates due to the excessive use of indirect taxation. Furthermore, the study reveals that METRs for Egypt exceed the corresponding levels in some Latin American countries such as Argentina, Brazil, Mexico, Chile and Peru.

Capital taxation in Egypt proved to have different impacts on different investments. The tax regime favors joint stock companies listed on the Stock Exchange over firms under other legal forms, manufacturing over services, debt over equity financing and land over other depreciable capital assets. Although export activities face lower METR compared to inward oriented ones, they are insufficient to offset other biases against exports.

Taking tax holidays into account lowers METRs and reduces biases. However, the cost effectiveness of these incentives is questionable. Inland incentives are costly for the budget, and a number of studies indicate that free zone incentives are not very effective in promoting exports, as most of the production in these zones is primarily directed to local markets.

To translate these findings into concrete policy actions requires further detailed analysis. What is clear nevertheless is that serious reform is needed to reduce the level of business income taxation on the cost of capital in Egypt, and to dampen the differentiation in tax treatment across types of firms, activities, sources of finance and assets. Generally, a clear policy implication arising from the study is that lower and uniform tax rates associated with limited recourse to incentives is more effective in stimulating new investment and, at the same time, results in minimal tax-induced distortions. The following two specific groups of recommendations may help in this regard.

First, reducing the relatively high tax burden on new investment:

Lowering the effective tax burden requires dealing with the statutory income tax rates as well as indirect taxation. Lower corporate tax rates are a good sign of a country's openness to investment. Lower rates can also encourage investment, enlarge the tax base, reduce the motive of tax evasion and facilitate tax administration procedures. In

this regard, corporate tax rates in other developing countries can be used as benchmark to guarantee the competitiveness of Egypt's tax regime.

Such reduction should be based on studies of the elasticity of tax proceeds to tax rate reductions. The tax measures may well indicate a positive response when viewed in a dynamic perspective in the medium and long terms.

Another approach to reducing the tax burden on marginal investment is to deal with indirect taxation. In this regard, the experiences of some Latin American countries may be indicative. Most of these countries allow for crediting of the sales tax on capital goods. Argentina, for example, exempts capital goods from import duties.

Second, phasing out the tax-induced biases:

This requires unifying multiple income tax rates, and revising preferential tax treatments to ensure that investment decisions would depend more on efficiency rather than on tax considerations. Adopting a uniform tax rate across economic activities and legal forms of projects would remove an important source of distortions and would also facilitate tax administration. In addition, eliminating some tax provisions such as the paid-up capital deduction granted to joint stock companies listed on the Stock Exchange would remove the tax discrimination between different legal forms.

Equally important is the rationalization of the tax holidays regime applied in Egypt. Empirical evidence suggests that tax incentives and holidays in Egypt are not well designed or targeted, and their effectiveness in attracting new investments is questionable while their revenue cost is high. Revising tax holidays can help offset revenue losses from the reduction of direct and indirect taxes, and may also simplify tax administration. It would be useful to consider limiting these incentives to selected targets, notably those involving externalities. An obvious example would be incentives targeted for improving high-technology industries, which are likely to confer significant positive externalities to the rest of the economy.

Moreover, evidence shows that investment tax allowances and credits as well as accelerated depreciation are more cost effective in stimulating additional long-term investment than are tax holidays. Recently, countries in Eastern Europe that used to rely heavily on tax holidays to attract FDI are introducing more transparent and automatic forms of incentives such as accelerated depreciation. This trend is also

apparent in Chile and Peru, which offer accelerated depreciation rates for machinery and equipment.

Finally, it goes without saying that these measures will be of limited impact if not accompanied with serious tax administration reform, and if tax reform is not dealt with as an integral part of a more comprehensive institutional reform.

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Appendix A

The METR Model

The methodology used in this study to calculate METR is based on the approach developed by King and Fullerton (1984). This methodology has been followed by OECD (1991) and the World Bank. It was later developed by Dunn and Pellechio (1990) into a computerized METR model, which they used for their analysis of the taxation of business income in developing countries. This study uses this specific model to measure METR on capital in Egypt.

The model is concerned mainly with marginal or new investment rather than an existing investment. This is why effective tax rate calculations did not rely on actual data from accounts of existing firms. The METR model assumes a typical project with a particular asset and financing structure and a specific before-tax internal rate of return. Other parameters of the model include economy-wide parameters such as inflation rate and interest rates, and tax parameters. The parameters introduced into the model are extracted from actual data as will be described later in the data sources section. The model does not account explicitly for the risk involved in investment decisions, but this can be dealt with by adding a risk factor to the discount rate or the before-tax internal rate of return.

The model first generates a before-tax cash flow (BTCF) for the project, then, given the information on tax parameters, it generates after-tax cash flow (ATCF). Effective tax rates are derived from the rates of return for BTCF (BTROR) and ATCF (ATROR) adjusted for inflation according to the formula:

$$METR = \frac{BTROR - ATROR}{BTROR} \times 100$$

BTCF for any year t is calculated as:

$$BTCF_t = InvInc_t - InvExp_t - Int_t - Princ_t + Net\ Sales\ of\ Assets_t$$

Where:

InvInc _t =	Revenue from investment net of wages and materials in year t.
InvExp _t =	Investment expenditure in year t.
IntP _t =	Interest payments in year t.
Princ _t =	Principal payments in year t.
Net Sales of Assets _t =	Net sales proceeds of assets in the sale year t.

ATCF_t reflects actual payments to investors and is calculated as:

$$ATCF_t = BTCF_t - t_i(InvInc_t + Capgain_t + IntR_t - Dep_t - IntP_t - Carryover_t - Oth TaxDed_t) - Oth Taxes_t - RE_t$$

where:

t _i =	Income tax rate (including any complementary taxes whenever applicable)
IntR _t =	Taxable interest income in year t.
Capgain _s =	Capital gains from sale of depreciable fixed assets in year t.
Dep _t =	Depreciation allowances.
Carryover _t =	Prior years' corporate losses deductible from taxable income.
Oth tax _t =	Taxes other than income tax.
Oth taxDed _t =	Taxes (other than income tax) deductible from taxable income.
RE _t =	Retained earnings in year t.

The model is based on generating cashflows of a potential project in a particular sector for a period of up to 30 years under assumptions of constant inflation rate, interest rates and tax system parameters at the levels and conditions prevailing at the time of the study. This approach will provide close estimates of effective tax burden on new investments as long as these assumptions hold. Despite this dependence, the approach remains a good guide to the potential distortions caused by taxation on various investment undertakings.

Data Sources:

Data	Source
<u>Tax parameters</u>	
<ul style="list-style-type: none"> Profit tax rates, taxable income, deductible costs, allowances and tax incentives 	Income Tax Law 157 /1981 and its amendments & Law of Investment Guarantees and Incentives 8/1997
<ul style="list-style-type: none"> Sales tax 	Law 111/1992
<ul style="list-style-type: none"> Import duties 	Law 66/1963 and its amendements
<u>Non-tax parameters</u>	
<i>Economy Parameters</i>	
Interest rates and inflation rate	Central Bank of Egypt, Monthly Statistical Bulletin, July 2000.
<i>Project parameters</i>	
<ul style="list-style-type: none"> Asset structure 	Consolidated balance sheets of 178 private investment companies (Law 230/1989) and of 776 organized private sector companies (Law 159/1981) from: CAPMAS, The Economic Census for ARE 1996/97: <i>Financial Statistics and Indicators for Private Investment companies and for Organized Private companies</i>
<ul style="list-style-type: none"> Debt/equity ratio 	Interviews with tax experts

Appendix B

METR Sensitivity Analysis

Sensitivity of METR Estimates

This section provides three different sets of experiments to test the sensitivity of the base case results with respect to changes in non-tax parameters. These parameters are the inflation rate, interest rates on deposits and the before-tax rate of return. Changes in before-tax rate of return are a proxy to changes in the degree of risk facing new investments. The results are summarized in the following tables:

B.1. The Effect of Inflation on Overall METR

	Zero inflation	2.9% Inflation	6% Inflation
<i>Manufacturing</i>			
Joint stock	36.8	41.6	46.1
Other corporate	50.9	54.5	57.7
Non-corporate	50.3	53.6	56.6
<i>Services</i>			
Joint stock	41.5	47.2	52.4
Other corporate	59.1	63.2	66.9
Non-corporate	53.8	58.4	62.6

B.2. The Effect of Interest Rate Variations on Overall METR

	7% Deposit rate	9.61% Deposit rate	13% Deposit rate
<i>Manufacturing</i>			
Joint stock	45.3	41.6	36.8
Other corporate	54.8	54.5	54.2
Non-corporate	53.6	53.6	53.6
<i>Services</i>			
Joint stock	51.7	47.2	41.2
Other corporate	63.5	63.2	62.9
Non-corporate	58.4	58.4	58.4

B.3. The Effect of Risk on Overall METR

	15% BTROR	20% BTROR	25% BTROR
<i>Manufacturing</i>			
Joint stock	43.7	41.6	41.0
Other corporate	60.1	54.5	51.4
Non-corporate	59.3	53.6	50.3
<i>Services</i>			
Joint stock	48.1	47.2	46.8
Other corporate	69.3	63.2	59.8
Non-corporate	63.1	58.4	55.7

As anticipated, higher inflation rates are associated with heavier tax burden, as reflected by higher METRs. This is partly explained by non-indexation of depreciation deductions and of capital gains, which lead to overestimation of taxable income, thus raising the estimated METR with higher inflation.

Changes in interest rate on deposits do not affect METR significantly except in case of joint stock companies. With higher interest rate on deposits, paid-up capital allowance granted only to joint stock companies become more valuable in reducing tax burden and thus METR. Other forms of companies are deprived of this allowance. Moreover, their gains from higher interest income (from depositing their retained earnings in banks) are limited or equal to zero for corporate and non-corporate firms, respectively. This is mainly due to the assumption that corporate firms retain 5 percent of their after-tax profits, while non-corporate firms distribute 100 percent of their profits.

Changes in the degree of risk have been assumed to affect the anticipated before-tax rate of return such that higher risk would be reflected in higher METR. This representation of risk leads to a decline in METRs, given the prevailing tax system.

Note that, although assumed changes in non-tax parameters have affected METRs estimates significantly in some cases (by up to 26.3 percent when inflation is assumed to be 6 percent as compared to no inflation), the previously derived conclusions remain basically the same. The burden of business income taxation in Egypt remains higher than what is reflected by statutory business income tax rates. It is also higher than the corresponding levels in Latin American countries of comparison. The tax system continues to favor joint stock companies listed on the stock exchange over other firms under other legal forms. It also continues to favor manufacturing over services.

Appendix C
Additional METR Calculations

Table C.1. Asset Specific METRs exclusive of Indirect Taxation (%)

	Land	Buildings	Machinery & Equipment	Vehicles
<i>Corporate Firms</i>				
<i>Manufacturing</i>				
Joint stock	24.6	26.4	21.6	24.3
Other corporate	38.3	40.1	35.3	37.9
<i>Services</i>				
Joint stock	28.9	31.8	27.30	29.5
Other corporate	46.0	48.8	44.3	46.3
<i>Non-corporate firms</i>				
<i>Manufacturing</i>				
	32.6	34.6	29.7	32.7
<i>Services</i>				
	38.5	41.5	36.8	39.1

Table C.2. METR for Inland Investments under Different Durations of Tax Holidays (%)

	METR: Inclusive of direct and indirect taxation	
	Tax holiday	
	10 year	20 year*
<i>Manufacturing</i>		
Joint stock	28.7	22.5
Other corporate	29.7	22.5
Non-corporate	25.7	19.9
<i>Services</i>		
Joint stock	31.6	23.0
Other corporate	32.6	23.0
Non-corporate	28.3	20.5

* Operation period for investment is 20 years.

Table C.3. METRs by Source of Finance under Law 8/1997 (%)

	Joint Stock	Other Corporate	Non-Corporate
<i>Manufacturing</i>			
All equity	10.9	16.0	12.1
Debt/equity 3:1	20.9	24.0	19.9
<i>Services</i>			
All equity	12.8	19.3	15.15
Debt/Equity 3:1	25.5	29.5	24.4