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## Are corporate tax incentives for investment fit for purpose? Revisiting economic principles and evidence from low- and middle-income countries

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# Review of Corporate Tax Incentives For Investment in Low- and Middle-Income Countries

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# Preface

This research was funded by the UK Department for International Development (DFID) through the IFS' Centre for Tax Analysis in Developing Countries (TAXDEV). Support from the ESRC-funded Centre for the Microeconomic Analysis of Public Policy (CPP) at IFS, grant reference ES/M010147/1, is also gratefully acknowledged. The views expressed in this report are, however, those of the authors and do not necessarily reflect the views of those of the funders nor of the other individuals or institutions mentioned here, including IFS, which has no corporate view.

The case study about Ghana has been prepared by Edward Abrokwah and India Keable-Elliott, who are based at the Tax Policy Unit of the Ministry of Finance of Ghana. The case study about Ethiopia has been prepared by Yohannes Abrha Beyene and Ataklti Weldeabzgi, who are based at the Tax Policy Directorate of the Ministry of Finance and Economic Cooperation of Ethiopia.

This version is a draft. A final version will be published in April 2018.

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# Executive summary

## Introduction to the study

Corporate income tax is an important source of revenue for many low- and middle-income countries. At the same time, many such countries lose much needed revenues by providing corporate tax (and non-tax) incentives in the hope of attracting mobile business investments, incentivising specific geographic areas and industrial sectors, or addressing market failures. Many countries thus face a difficult trade-off between raising vital revenues and maintaining an attractive corporate tax environment in a world of increasingly footloose capital and international tax competition that can lead to a race to the bottom.

Against this background, there is scarce evidence about the cost and benefits of tax incentives in developing countries, which hinders evidence-based policy-making. This paper, written collaboratively by IFS researchers and policy-makers from Ethiopia and Ghana, has multiple and interlinked objectives: (i) to provide an overview of tax incentives and best practices for their design grounded in economic principles, and assess how these apply to the case studies of Ethiopia and Ghana; and (ii) to understand more broadly the causal impacts of tax incentives on economic outcomes in developing countries by reviewing the relevant methodologies to conduct rigorous quantitative analysis and the existing empirical literature. Finally, we discuss the policy implications and avenues for research given the existing literature on the causal impact of tax incentives.

## The economics and governance of tax Incentives

- The focus of this study is corporate tax incentives. These are broadly defined as all measures that provide for an unambiguously more favourable tax treatment of particular sectors, type of firms, activities or investments relative to the standard tax regime applying to general industry.
- Corporate tax incentives can take many forms, which include, but are not limited to, the following: tax holidays, special zones, investment tax credits, investment allowances, accelerated depreciation, and reduced tax rates.
- Tax incentives can be split into broadly two categories: cost-based incentives and profit-based incentives.
- Cost-based incentives include investment allowances, tax credits and accelerated depreciation, which decrease the cost of capital. Additional investment gained per unit of revenue forgone is higher for cost-based incentives, since the benefits to investors only accrued if capital investments are made.
- Profit-based incentives that reduce tax rates on taxable income or waive tax altogether, like tax holidays, apply to all profits. Profit-based incentives are better suited to attract footloose investments that generate firm-specific rents. These may also be easier to administer than cost-based initially, though not necessarily easy to monitor. Tax holidays tend to benefit short-term projects with low upfront investment costs.
- Targeted tax incentives generally: create non-neutralities, further distortions and complexities; put non-targeted firms at a disadvantage; and can induce rent-seeking

behaviour associated with corruption. However, in some cases targeting may be justified economically, e.g. when targeting more mobile investments is possible in a cost-effective way, or when it reduces the overall cost of the policy.

- The economic case for tax incentives is stronger for activities that are (i) most mobile; (ii) have positive social returns. The case for tax incentives is ambiguous for (i) investments that generate regional rents or (ii) investments that are located in disadvantaged areas. The economic case for tax incentives is weak for (i) investments that exploit location-specific rents such as natural resources (exogenous rents) or (ii) investments that exploit agglomeration benefits (endogenous rents).
- General costs associated with tax incentives include: (i) immediate revenue loss; (ii) administrative costs of implementing incentives (which are usually incurred by the tax administration); (iii) compliance costs incurred by taxpayers (possible exceptions are tax holidays or exemptions); (iv) the costs of monitoring and preventing their fraudulent use and corruption; (v) associated social costs of rent-seeking behaviour; and importantly (vi) economic distortions introduced due to differential treatment of certain investments.
- Benefits may include: (i) additional investment; (ii) additional output, employment and economic growth associated with additional investment; (iii) increased tax revenues from increased economic activity.
- Guidelines for implementing (good) governance of tax incentives emphasize the importance of: (i) granting incentives as part of the tax law in a transparent and ruled-based way; (ii) empowering a single agency (typically the Ministry of Finance) to design and grant tax incentives and to give the revenue authority the responsibility of administering them; (iii) ensuring that beneficiaries file tax returns so that the data can be used to monitor and evaluate tax incentives; (iv) conducting systematic reviews as part of the budget analysis and sharing these with the public for scrutiny.

## Worldwide prevalence

- Corporate tax incentives are found across low- middle- and high-income countries. Tax holidays and exemptions are mostly found in developing regions and are noticeably less prevalent amongst OECD countries. Both reduced tax rates and discretionary processes are noticeably more prevalent in East Asia and the Pacific and Sub-Saharan Africa (SSA). However, discretionary processes are present around the world, including among OECD countries.
- The general trend in the prevalence of tax incentives in developing countries is not clear. While some studies have found that tax holiday periods have shortened and special tax regimes have decreased in low- and middle- income countries over time, other findings point in the opposite direction. There is evidence suggesting that tax holidays have remained prominent in lower-income countries, but have decreased in upper-middle income countries. There are some indications that developing countries with higher GDP per capita are less likely to operate special regimes.
- SSA stands out from other low- and middle-income regions when it comes to the use of tax incentives, with a higher percentage of countries adopting reduced rates and



using discretionary processes. Tax holidays, reduced CIT rates, investment allowances, and free zones have all become more prevalent across the region. The increased importance over time of tax holidays in SSA contrasts with the trends in other regions.

### Case studies: Ethiopia and Ghana

- The case studies show that tax incentives can vary substantially according to firms' location, size, and economic sector, in a way that makes the tax system highly complex, opaque, and difficult to administer without always a clear economic rationale, or supportive evidence of their costs and benefits.
- In Ethiopia, the length of tax holidays varies significantly across and within very narrowly defined sectors, which is difficult to rationalise from an economic and public policy point of view. Additionally, Ethiopia offers lower CIT rates for mining and petroleum, which are industries in which firms exploit location-specific rents. Instead of the reduced rate, the government should consider additional taxes to ensure that these rents are shared between the firm and the citizens of the country.
- In Ghana, the tax rate applicable to the extractive sector is higher than the standard CIT rate, which is in line with best practices for a well designed tax system. However, fiscal concessions for large investments undermine the original objective.
- Both Ghana and Ethiopia provide incentives to firms that sell most of their output as exports. This may be justified under the grounds that firms that are export-oriented are likely to be more mobile and cost-sensitive, and thus in principle more reactive to tax incentives. However, verifying that firms in practice are exporting their outputs and not selling instead to domestic markets is hard to monitor, and entails further administrative costs in countries with growing but still limited administration capacity.

### Estimating the causal impact of tax incentives: methodological considerations

- One of the most common challenges for empirical strategies involves building a valid counterfactual using “similar” firms or areas that have no access to tax incentives and compare them to firms or areas that do. Interactions between firms that are granted tax incentives and firms that are not are likely to lead to indirect effects that can be difficult to measure. Identifying and separate the effect of tax incentives from other policies or factors that might affect the results are equally necessary.
- Both survey and administrative data sources can be used. Accurate (ideally firm-level) survey data on firms' investment, employment, outputs, prices, industry of operation, location, can be used to assign tax treatment to each firm and to measure outcomes. This can be combined with data from tax returns. Counting on both administrative and survey data before and after the policy reform will improve the quality of an empirical evaluation of tax incentives.
- Different methodologies exist for measuring how tax incentives affect investment decisions. Economic modelling using investment equations allows quantifying the mechanisms through which tax incentives affect investments more accurately, and

thus can be used for policy simulations of hypothetical tax reforms. While challenging, the returns can be higher for policy-makers. Particular econometric techniques are contingent on the structure of the data and the design of the tax incentives to be studied (i.e. eligibility criteria), including the variation over time.

- Existing studies looking at the impact of tax incentives on economic outcomes have looked at variations across countries, (sub-national) areas, and firms. Although firm-level analysis is likely to give the most accurate estimates, very few little firm-level evidence exists in developing countries due to data limitations.

### **Empirical literature on the impact of tax incentives**

- We find that the existing literature shows inconclusive evidence on the causal impact of tax incentives on investment and other economic outcomes such as employment and output. Evidence from cross-country studies using aggregate-level outcomes show that tax incentives may affect FDI levels but not necessarily total investment, suggesting the possibility of crowding out effects. Cross-country studies however suffer from some methodological limitations.
- Studies using firm-level data and variation across regions or sectors within a country show mixed results. For example, results from China and India point to positive outcomes for Special Economic Zones and regional tax incentives, respectively, however a recent study in Ethiopia shows that tax incentives have not been a cost-effective way of increasing investment or other economic outcomes.
- Despite observing positive impacts of tax incentives on outcomes in India and China, there are likely co-founding factors affecting investments and other economic outcomes. Furthermore, more generally, it is unclear whether these policies are cost-effective since most studies do not account for spillover effects, distortions to markets, or administrative costs. Questions concerning external validity should also be considered, as rolling out tax incentives to the broader economy based on results from smaller test areas should be considered very carefully.
- Recent studies on R&D tax incentives in middle-income countries have shown positive effects on levels of investment. However, the impacts observed are generally below those found in developed countries in the last two decades, perhaps suggesting that short-to-medium term supply-side constraints (e.g. supply of high-skill workers and research labs) in middle-income countries are important.

### **Summary and avenues for future work**

From our case studies in Ethiopia and Ghana, we have seen that corporate tax incentives are important components of the tax systems in both countries. In both cases their design and governance can be improved using principles of best tax design and evidence-based strategies. In particular, reduced rates for extractive industries should be removed, cost-based as opposed to profit-based incentives should be more widely considered, and the variation in preferential treatment across priority sectors and geographical areas should be reconsidered in order to reduce complexity, non-neutralities, and both compliance and administration costs. This is probably applicable to other countries that could benefit from

conducting revisions of their tax incentives schemes using principles of best tax design, and institutionalising the monitoring and evaluation of their schemes.

Given the limited empirical evidence on the impact of tax incentives in developing countries, it is clear that more quantitative and evidence-based analysis is needed for better policy-making. Increasing availability of firm-level data and tax treatment information is promising and conducive to the generation of further evidence in the future.

Analysing the impact of tax incentives in Ethiopia and Ghana would be of particular interest. The considerable variation of tax incentives across sectors and geographical areas, although not great in terms of best policy design, provides an interesting setting from a methodological point of view to evaluate how tax incentives affect economic outcomes. Going forward, TAXDEV researchers plan to work with policymakers in Ghana and Ethiopia to analyse how tax incentives affect firms' incentives to invest by calculating effective tax rates for different sectors and regions, and if possible, combine this analysis with survey and administrative firm-level data to estimate their costs and impact on actual investment and economic outcomes.

# 1 Introduction

**Corporate income tax is an important source of revenue for many low- and middle-income countries.** At the same time, **many such countries provide corporate tax (and non-tax) incentives** in the hope of attracting mobile business investments. Indeed, such incentives are a key part of many countries' response to the difficult trade-off between raising vital revenues to fund social spending, improve infrastructure and hence improve the investment climate on the one hand, and maintaining an attractive corporate tax environment in a world of increasingly footloose capital and international tax competition on the other (see, for instance, Abbas and Klemm, 2013). Governments may engage in **international tax competition that can lead to a race to the bottom** and deplete much needed revenues from all countries (Klemm and Van Parys, 2012, among others). Moreover, evidence from self-reported investor surveys have often shown that **tax incentives are not particularly relevant when making investment decisions** in developing countries, **relative to other factors such as skills and infrastructure** in terms of determinants for investment decisions (UNIDO, 2011, and World Bank, 2009). More broadly, **the general investment climate**, determined in part by good skills and infrastructure, good institutions and political stability, **seems to be a more salient factor affecting investments decisions** by foreign firms.

Tax incentives can be introduced for a range of **additional reasons** including **regional and industrial policy**, correcting **externalities** or other **market failures**, or **political economy** reasons. However, tax incentives are **very costly** – in addition to **forgone revenue** and **administration and compliance costs**, tax incentives introduce **non-neutralities and complexities** into the system – and there is **not much evidence** that suggests that their **benefits, if any, outweigh their costs** in the context of developing countries, as reviewed later in this paper.

In practice, there is a widespread use of corporate income tax incentives worldwide but the type and scope observed in each country varies significantly across region and level of development (James, 2014). **High-income economies** have moved towards the use of **more efficient and cost-effective incentives** that target incremental investments projects or investments that are known to have high social returns (e.g. investment in research and development (R&D)). They are also more likely to incorporate tax incentives into the tax law, making them **more transparent** and **easier to monitor**.

In low- and middle-income countries, less efficient incentives are more prevalent, such as tax holidays and exemptions. **These benefit profits rather than the cost of investments**, and are more likely granted by **discretionary processes** (James, 2014). This is particularly the case within sub-Saharan Africa, which has increasingly relied on tax incentives, which are likely to have the highest efficiency loss (Keen and Mansour, 2010; James, 2014).

As illustrated in the case studies of Ghana and Ethiopia discussed later in this paper, **tax incentives can vary significantly according to firms' location, size, and economic sector**, in a way that makes the tax system highly **complex, opaque, and difficult to**

**administer without always a clear economic rationale, or supportive evidence of their benefits.** For example, in Ethiopia the length of tax holidays varies significantly across very narrowly defined sectors, which is difficult to rationalise from an economic and public policy point of view. Additionally, Ethiopia offers **tax benefits for mining and petroleum**, which are industries in which firms **exploit location specific rents**, and hence governments should design additional taxes to ensure that these rents are shared between the firm and the citizens of the country. In Ghana and Ethiopia, as in many countries, **incentives subsidising firms that sell most of their output as exports are also prevalent**, and may be justified under the grounds that firms that are export-oriented are likely to be more mobile and cost-sensitive, and in principle more reactive to tax incentives.<sup>1</sup>

Against this background, there is **scarce evidence about the cost and benefits of each type of incentive in developing countries**, hindering efforts to mobilise much needed tax revenue and good policymaking more generally. It seems that policymakers in developing countries have a partial understanding about the potential costs and benefits of tax incentives. Given the prevalence of corporate income tax incentives, policymakers in these countries seem to believe that the benefits from tax incentives in terms of investment, jobs and wages and productivity spillovers outweigh the immediate costs in terms of short-term foregone revenues, efficiency losses due to the distorting of investment incentives, increased administration and compliance costs and opening greater opportunities for corruption. Survey evidence confirms this. In fact, as far back as 1961, Robinson surveyed governments and investors, and governments reported that they believed incentives strongly influenced investment decisions by firms.

**International organisations** such as the World Bank, the International Monetary Fund and the OECD **have been advocating for improving the understanding of the rationale and cost-effectiveness of tax incentives in low and middle-income countries** at least since the 1980s. Recently, the G20 Development Working Group (comprising IMF, OECD, UN and World Bank) has called again for more systematic evaluations to facilitate informed decision making, based on improved data and analytical tools.<sup>2</sup> There are a **vast number of studies that review the rationale for and prevalence of tax incentives in developing countries, and provide descriptive case studies** (recent examples include IMF OECD UN and World Bank 2015, James 2014, Klemm 2010, Tuomi 2012, and USAID 2004 among others). Several of these studies discuss methodological issues around the assessment of the costs in terms of foregone revenues in the context of a full cost-benefit analysis (James, 2014 and the G20 background paper provide great guidelines on this). Some of these papers also revise the **scarce literature** on the causal impact of tax incentives. This evidence is scarce partly due to the **methodological challenges and data requirements**, as discussed in this paper. Furthermore, the existing literature shows **inconclusive evidence on the causal impact**

<sup>1</sup> However, they may compromise agreements under the World Trade Organisation.

<sup>2</sup> See G20 report and background papers <https://www.oecd.org/tax/global/options-for-low-income-countries-effective-and-efficient-use-of-tax-incentives-for-investment.pdf>

**of tax incentives** on investment and other economic outcomes such as employment and output. Increasing **availability of firm-level data** and tax **treatment information** is promising and means that more evidence will be hopefully generated in the future.

In this paper, written collaboratively by IFS researchers and policy makers from Ethiopia and Ghana, we describe the different types of tax incentives and their rationale or lack thereof; their prevalence in low and middle income countries and how this compares with advanced economies; present two case studies looking at tax incentives and their administration in Ghana and Ethiopia; review the different approaches to measure their benefits and the challenges that come with it; and summarise the existing empirical literature that estimates their causal impact of tax incentives on investment and other economic outcomes focusing on low and middle income countries. Finally, we discuss the policy implications and avenues for research given the existing literature on the causal impact of tax incentives.

## 2 The economics and governance of tax incentives

In this section we first briefly define the type of incentives under review. Then we discuss the economic rationale behind government policies such as tax incentives, whether there is any justification at all. Finally, we summarise briefly the main components of a cost-benefit analysis and governance of tax incentives and provide references to useful toolkits for this purpose.

### 2.1 What are corporate income tax incentives?

There is an **ongoing debate** regarding **what measures should be considered** within the definition of ‘tax incentives’. Some definitions have sought to identify tax incentives as any condition that reduces the after-tax cost of capital below its pre-tax level; however, this would mean that the broad CIT system of many countries would be considered a tax incentive in-and-of-itself, given that interest deductibility and depreciation allowances regularly yield net negative marginal tax rates (Klemm, 2010).<sup>3</sup>

As proposed by Klemm (2010), we choose to define corporate income tax incentives as all the measures that provide for an unambiguously more favourable tax treatment of particular sectors, type of firms, activities or investments relative to the standard tax regime applying to general industry. These tax incentives can take many forms, which include, but are not limited to, the following: tax holidays, special zones, investment tax credits, investment allowances, accelerated depreciation, and reduced tax rates. Box 2.1 defines these tax incentives in some detail. There are also important exemptions from various taxes and financing incentives but these are not strictly related to corporate income tax, so they are excluded from the table. Tax incentives related to CIT sometimes are granted as part of bundles that include other tax exemptions, financing incentives or other non-tax benefits.

Tax incentives can be split into broadly two categories: **cost-based incentives** and **profit-based incentives**. Cost-based incentives include investment allowances, tax credits and accelerated depreciation, which decrease the cost of capital. **Potential additional investment gained per unit of revenue forgone is higher for cost-based incentives**, since the benefits to investors only accrued if capital investments are made. Profit-based reduce tax rates on taxable income or wave tax altogether, like tax holidays, and apply to all profits. Since tax holidays target total profits in the short-term, they tend to benefit short-term projects with low upfront investment costs (IMF OECD UN and World Bank, 2015, Klemm, 2010 and Tuomi, 2009; 2012, among others, discuss further challenges with reduced rates and tax holidays in more detail). Having said this, **profit-based incentives are better suited to attract footloose investments that generate firm-specific rents**, e.g. some type of

<sup>3</sup> For example, Tuomi (2012) considers tax heavens and generally low CIT rates as forms of tax incentives. We do not consider these as tax incentives. Although we acknowledge that generally low tax rates can be beneficial for investments and attracting mobile investments in the context of globalisation and international tax competition.

multinational firms' investments that are sometimes export-oriented and cost-sensitive, and can also be **easier to administer**, though not necessarily easy to monitor as discussed in detail in the case of Ghana and Ethiopia in section 4.

Tax incentives can **target** investments by firm or investment **size, sector or zones**. Targeting generates **non-neutralities, further distortions and complexities**, puts **non-targeted firms at a disadvantage**, and **induces rent-seeking behaviour associated with corruption**. However, **sometimes targeting may be justified economically**, e.g. when targeting more mobile investments is possible in a cost-effective way, or when it reduces the cost of the policy.

### Box 2.1. Typical Tax Incentives<sup>4</sup>

**Tax holidays:** Temporary exemption of a new firm or investment from certain specified taxes, typically at least corporate income tax. Sometimes administrative requirements are also waived, notably the need to file tax returns. Partial tax holidays offer reduced obligations rather than full exemption.

**Special zones:** Geographically limited areas in which qualified firms can locate and thus benefit from exemption of varying scope of taxes and/or administrative requirements. Zones are often aimed at exporters and located close to a port. In some countries, however, qualifying companies can be declared "zones" irrespective of their location.

**Reduced tax rates:** Reduction in a tax rate typically in the corporate income tax rate.

**Investment tax credits:** Deduction of a certain fraction of an investment from the tax liability. Rules differ regarding excess credits (credits in excess of tax liability) and include the possibility that they may be lost, carried forward, or (rarely) refunded.

**Investment allowance:** Deduction of a certain fraction of an investment from taxable profits (in addition to depreciation). The value of an allowance is the product of the allowance and the tax rate. Unlike a tax credit, its value will thus vary with the tax rate.

**Accelerated depreciation:** Depreciation at a faster schedule than available for the rest of the economy. This can be implemented in different ways, including a higher first year allowance, or increased depreciation rates. Total tax payments in nominal terms over time are unaffected, but their net present value is reduced and the liquidity of firms is improved.

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<sup>4</sup> Reproduced from Klemm (2010), Box 1.



## 2.2 The economic rationale for tax incentives

A variety of economic reasons may result in the implementation of tax incentives, but the most important ones are international tax competition, regional and industrial policy, and tackling externalities. Political and rent-seeking motivations can also be important but we do not delve into these here. We discuss the case for tax incentives for different types of investments using economic principles.<sup>5</sup>

**The economic case for tax incentives is stronger for activities that are (i) most mobile; (ii) have positive social returns.**

Given increasingly globalised supply chains and investment markets, there is a concern within governments that if firms are sensitive to tax (and other cost considerations), they may react to higher tax rates by diverting operations to more favourable tax locations, resulting in erosion of the domestic tax base (or lower than optimal revenue growth).

**Export-oriented processing activities** are usually one **example of mobile and potentially cost-sensitive investments**. Governments may engage in tax competition either by lowering headline tax rates or providing tax incentives that are targeted at mobile firms and investments that earn firm-specific rents.<sup>6</sup> As discussed in Klemm (2010), in these cases the **tax incentive should vary according to the type of market competition**: if the industry is perfectly competitive then investment allowances should be used; if there are firm-specific rents then permanently reduced tax rates are most appropriate.

Though tax incentives that are targeted at mobile firms and investments that earn firm-specific rents may in principle have an economic rationale, it **is not clear that such incentives would be a cost-effective way of meeting their objective**. Even if they were, their introduction could create **complexities** and result in **rent-seeking behaviour** that would be harmful in the long run. Consequently, even if there is a good economic rationale for such incentives, a comprehensive assessment should be carried out that takes into account wider potential effects.

For investments that generate **positive externalities** or **social returns**, there is a stronger economic rationale for incentives: increasing private investment to socially optimal levels. This is the justification frequently used for tax incentives targeted at **research and development (R&D) activities**. However, tax incentives are just one way of lowering the cost of R&D. For this type of activities, ideally one would implement a direct subsidy or a tax credit based on actual activity, as is done in many advanced economies and some middle-income countries nowadays.<sup>7</sup>

**The economic case for tax incentives is ambiguous for (i) investments that generate regional rents or (ii) investments that are located in disadvantaged areas.**

<sup>5</sup> We draw from Klemm (2010), which provides further discussion about these issues.

<sup>6</sup> See, for instance, Keen and Simone (2004), Klemm (2010) and Abramovsky et al (2014) among others.

<sup>7</sup> For example, see cases of Turkey, China, Argentina and Taiwan.

An example of the former could be tourist attractions that are shared by different countries. Where such **regional rents** exist, it is **better to coordinate with the different parties within a region**, than to compete to attract investment to one subsection of the region. For disadvantaged or unattractive locations, it is better to address issues directly by **improving, for example, infrastructure, skills and governance**, rather than trying to compensate for these weaknesses by providing preferential tax treatment.

**The economic case for tax incentives is weak for (i) investments that exploit location-specific rents such as natural resources (exogenous rents) or (ii) investments that exploit agglomeration benefits (endogenous rents).**

The investments are likely to be less responsive to tax and less mobile, and hence should not receive preferential tax treatment. In the case of investments exploiting exogenous rents such as natural resources, actually an additional tax could be imposed, to ensure that locational rents are shared with the host country in a sustainable way. If rents are uncertain at the beginning and, for example, there is an exploration stage, then specific accelerated depreciation could be granted as a way of sharing the risk with the firm making the investment. In the case of agglomeration economies, once investments are established and activities operational, rents can be taxed, but not excessively since that could generate the loss of the sector. The case for incentives is also weak for any other case that has not been discussed so far.

This suggests that before introducing any tax incentive, or when reassessing existing tax incentives, it is important to consider the economic rationale as part of a detailed cost-benefit analysis.

### 2.3 Cost-benefit analysis of tax incentives and their governance

There are a range of costs involved in implementing tax incentives, and potential benefits arising from tax incentives. All these factors have to be considered when conducting a cost-benefit analysis, alongside consideration of the economic rationale as discussed in the section above.

**Costs** include: **1) immediate revenue loss**; **2) administrative costs** of implementing incentives (which are usually incurred by the tax administration); **3) compliance costs** incurred by taxpayers (possible exceptions are tax holidays or exemptions); **4) the costs of monitoring** and preventing their fraudulent use and corruption; **5) associated social costs** of rent-seeking behaviour; and importantly **6) economic distortions introduced due to differential treatment** of certain investments.

Benefits include: 1) additional investment; 2) additional output, employment and economic growth associated with additional investment; 3) increased tax revenues from increased economic activity.

James (2014) and the G20 background paper present excellent **toolkits** and guiding principles to think about how to **design tax incentives** as well as how to **estimate some of the costs**. They describe different ways to calculate foregone revenues, and how to estimate the hypothetical impact of tax incentives on investment decisions (e.g. computing **effective tax rates (ETRs)** for hypothetical investments). Estimating the causal impact of tax incentives on actual investment and other economic outcomes is more challenging and data intensive. We examine these methodological considerations in section 5. However, it is worth re-emphasizing that even if there is a good economic rationale, and a cost-benefit analysis results in a positive outcome, tax **incentives make a tax system more complex, less neutral** and generate **path dependency**. Hence the case for the incentive has to be extremely strong.

Furthermore, the same papers mentioned above provide a discussion of the **political economy** around tax incentives and a **guideline for implementing (good) governance of tax incentives**. In particular, they emphasize the importance of **1) granting incentives as part of the tax law** in a transparent and ruled-base way, and **not in a discretionary way**; **2) empowering a single agency** (typically the **Ministry of Finance**) **to design and grant tax incentives** and giving the revenue authority the responsibility of administering them; **3) ensuring that beneficiaries file tax returns** so that the data can be used to monitor and evaluate tax incentives, and **4) conducting systematic reviews yearly** as part of the budget analysis and **sharing these with the public for scrutiny**. Centralising the design and evaluation of tax incentives at the Ministry of Finance is suggested because this ministry should have a better understanding of the actual costs of incentives, as well as their opportunity costs (e.g. how foregone revenues could be used improve the business climate), and other costs and benefits of tax incentives in the context of the tax system as whole.

### 3 Prevalence of corporate income tax incentives

In this section, we revise the evidence on the prevalence of tax incentives in developing countries and elsewhere. Although increasingly associated with developing countries, **corporate tax incentives are found across low- middle- and high-income countries..** Below we recreate Table 3.1 from James (2014), which provides a useful characterisation of the tax incentives that are prevalent in different regions around the world. Amongst the countries surveyed, **tax holidays and exemptions are most common in developing regions** (between 78 and 100 percent), and are noticeably **less prevalent amongst OECD countries** (12 percent). As discussed by James (2014) and others, this suggests that governments in developed countries understand that tax holidays are not cost-effective in generating additional investment. **R&D tax incentives are most common in OECD and East Asia and Pacific countries**, but less so in other regions. Meanwhile, both **reduced tax rates and discretionary processes are noticeably more prevalent in East Asia and the Pacific and Sub-Saharan Africa**. Finally, it is worth noting that **discretionary processes are present around the world**, including among OECD countries.

**Table 3.1. Prevalence of Corporate Tax Incentives around the World**

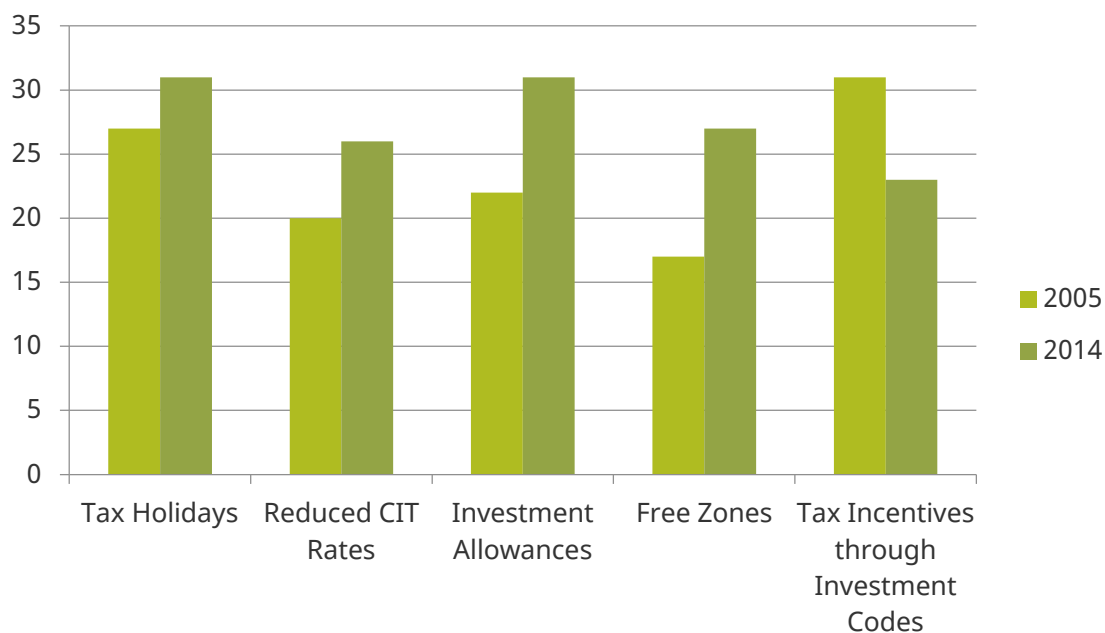
	Number of Countries Surveyed	Tax holiday/ Tax exemption	Reduced Tax rate	Investment allowance/ Tax credit	R&D Tax Incentive	Super-deductions	SEZ / Free Zones/ EPZ / Freeport	Discretionary process
East Asia and Pacific	12	92%	75%	67%	83%	33%	92%	83%
Eastern Europe and Central Asia	17	82%	35%	24%	29%	0%	94%	35%
LAC	24	92%	33%	50%	8%	4%	71%	42%
MENA	15	80%	40%	13%	0%	0%	80%	40%
OECD	34	12%	32%	65%	76%	21%	68%	35%
South Asia	8	100%	38%	75%	25%	63%	63%	38%
SSA	44	78%	62%	78%	11%	18%	64%	82%

Source: James (2014).

**The general trend in the prevalence of different tax incentives in developing countries is not clear.** Klemm and Van Parys (2012) find that tax holidays have become shorter and interest allowances smaller in a panel of 29 developing countries over the period of 1984-2004. Abbas and Klemm (2013), in their sample, show that the number of developing countries offering at least one incentive has decreased between 1996 and 2007, especially amongst lower-income countries. At the same time, tax holidays have remained prominent in lower-income countries, but have decreased in upper-middle income countries. Other studies confirm the importance of tax incentives in lower-income countries. Abramovsky et al. (2014) find that developing countries with higher GDP per capita are less likely to operate a special regime, supporting the notion that special regimes are more common in lower-income countries.

**Sub-Saharan Africa (SSA) stands out** from other low- and middle-income regions when it comes to tax incentives, with a **higher percentage of countries adopting reduced rates** and using **discretionary processes** (see Table 3.1). Keen and Mansour (2010) find that the number of countries in SSA with tax incentives – especially tax holidays and special zones – increased significantly between 1980 and 2005, and this trend has persisted in more recent times. Figure 3.1 shows the evolution of tax incentives in 40 Sub-Sahara African countries between 2005 and 2014. Tax holidays, reduced CIT rates, investment allowances, and free zones have all become more prevalent across the region. However, **tax incentives provided through investment codes have decreased**. The **increased importance over time of tax holidays** in SSA contrasts the limited prevalence of tax holidays in other regions (see James, 2014). This is **bad news for the region**. It is recommended that (if used) tax incentives should be transparent, only for marginal investments, and included in the tax code, so rules and eligibility are clear and can be monitored, none of which is usually the case for tax holidays.

**Figure 3.1. Tax Incentives in 40 Sub-Sahara African Countries (2005 and 2014)**



Source: James (2014).

## 4 Case studies: Ethiopia and Ghana

We now turn to the cases of Ethiopia and Ghana. Both countries provide **profit-based rather than cost-based incentives**. In particular, they use tax holidays and reduced rates that vary significantly according to the sector and location of the investment, as well as the market-orientation of the firm making the investment, **without always having a clear economic rationale**. As discussed in section 2.2, profit-based incentives are less efficient in terms of potential additional investment gained per unit of revenue forgone than cost-based incentives. However, profit-based incentives are in theory more effective in attracting investments that earn firm-specific rents, and are sometimes easier to administer. The two countries **notably differ in how they tax the extractive sector**. While the tax rate applicable to the extractive sector in Ghana is *de jure* above the standard CIT rate, **Ethiopia taxes the extractive sector at a reduced rate**. More generally, in both countries there is **ample room to improve the monitoring and evaluation** of the incentives, using an **evidence-based approach**, to support a **better design**. There are also opportunities to **improve the governance of incentives**. Below we illustrate the different tax incentives prevalent in each country and question their rationale, while also discussing in some detail areas for improvement around their governance, monitoring and evaluation.

### 4.1 Ethiopia

#### 4.1.1 Types of corporate income tax incentives and their objectives

Corporate income tax is levied at a uniform rate of 30% in Ethiopia.<sup>8</sup> However, the Government of Ethiopia **provides significant corporate income tax incentives to selected economic sectors and geographic areas**. The stated objectives of these incentives (as set out in the preamble of the 769/2012 Investment Proclamation) are: 1) encouraging both foreign and domestic investment; 2) promoting technological transfers; and 3) supporting an equitable distribution of investment among regions.

Incentives include **both tax holidays and reduced rates, and apply equally to foreign and domestic firms**.<sup>9</sup> These are provided by the Federal Income Tax Proclamation (979/2016), the Investment Incentives and Investment Areas Reserved for Domestic investors Regulation 270/2012 (as amended in 2014).<sup>10</sup>

#### Tax holidays

**Tax holiday periods vary excessively depending on the specific location and industry of the investment.** Industries that qualify for preferential treatment can actually get

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<sup>8</sup> Taxable business income of unincorporated business is taxed using a progressive schedule with a minimum rate of 10% and a maximum rate of 35%.

<sup>9</sup> As long as domestic and foreign firms meet eligibility requirements, see Investment Proclamation 269/2012.

<sup>10</sup> These incentives operate alongside other type of incentives such as VAT and duty exemptions, which are granted by law as well as discretionary decisions made by different agencies. There is also a loss carry forward scheme, which allows companies that suffer losses during the tax exemption period to carry losses for half of the original exemption period.

different tax holidays' periods.<sup>11</sup> These industries include: (Agriculture) crop production; animal production; forestry; (Manufacturing) food; beverages; textiles and related products; leather and related products; wood products; paper and related products, chemicals and related products; basic pharmaceutical products and pharmaceutical preparations; rubber and plastics; other non-metallic mineral products; basic metals; fabricated metal products; computer, electronic and optical products; electrical products; machinery and equipment; integrated manufacturing with agriculture; vehicles, trailers, and semi-trailers; office and household furniture; other equipment; (Energy) generation, transmission and supply of electrical energy; (Services) star-designated hotel and resort, motel, lodges and restaurant; grade one tour operations.

**While most tax holidays are between 1 and 5 years, they can go up to 15 years depending on the industry of investment and geographical area of investment.**

For example, exemption periods for investments in the food (beverage) industry in Addis Ababa and in the special zone of Oromia surrounding Addis Ababa vary between 1 and 5 years (1 to 3 years), depending on the type of food (beverage) being invested in, but between 2 and 6 years (2 to 4 years) in other areas of the country. There can be **significant variation in exemption periods within specific industries**. Considering again the food industry, sugar has a 5-year (6-year outside Addis) exemption period from income tax, while chocolate cookies and other sweets have a 1-year (2-year) exemption period.<sup>12</sup>

**In addition, there are extra provisions for exporters and underdeveloped regions, as follows:**

- Additional 2 years exemption for investors who export, or supply exporters, 60% of their products and/or services.
- Additional 2 years (in Addis Ababa) or 4 years (outside Addis Ababa) exemption for investors located within industrial development zones, who also export 80% or more of their production.
- 30% deduction for 3 consecutive years after the expiry of tax holidays if investment is in underdeveloped regions.<sup>13</sup>

### Extractive industries

The **mining and petroleum** industry is the only sector entitled to a **reduced income tax rate**. The CIT rate is 25% for large-scale mining projects (Proclamation 979/2016, art 37(3)).

<sup>11</sup> The range of CIT exemption periods offered by sector and location is so large that covering it in detail would be too long for this report. For more detailed information CIT exemption periods, go to:

<http://www.investethiopia.gov.et/images/pdf/incentives.pdf>

<sup>12</sup> See Regulation 270/2012 (as amended) for details.

<sup>13</sup> These include: Gambella, Benshangul Gumuz, Afar (except in areas within 15 kilometers right and left of the Awash River), Somali, Guji and Borena zones in Oromia, Southern Omo zone, Segen (Derash, Amaro, Konso and Burji) zone, Bench Maji zone, Sheka zone, Dawro zone, Kaffa zone or Konta and Basketo, and special woredas in the SNNP region.

### 4.1.2 Analysis of policy and implementation of tax incentives

While tax holidays have been an important tool for the government to promote industrial development in priority industries and geographical areas, **the economic rationale behind the level of differentiation both across and within industries is unclear**. Not only is there **evidence that these incentives generate no extra investment<sup>14</sup>**, but this kind of differentiation can provide ample opportunities for **rent-seeking and the relabeling of activities, generate economic distortions and increase the cost of administering incentives**.

Regarding the incentives for extractive industries, as discussed in section 2, investments in sectors that exhibit **exogenous locational rents** like natural resources, i.e. mining and petroleum, **should not be given preferential tax treatment** but rather they should, in principle, be tax at the standard corporate income rate and potentially have a special additional tax to ensure the sharing of rents with the host country.

In terms of governance, administration, monitoring and evaluation there are many areas that can be improved. For example, **various bodies** can issue **directives for other types of tax incentives** such as **exemptions for specific imported goods** (though not CIT incentives).<sup>15</sup> This can be a problem since the Ethiopian Revenue and Customs Authority (ERCA) **is not always informed about new directives**. Regional bodies also have certain power in offering tax incentives, although CIT generally follows federal statutes. Having so many bodies being able to grant tax incentives has led to a general **lack of transparency**, and has **complicated the rules and eligibility criteria for incentives**.

In addition to the different laws that provide tax incentives, **discretionary power is given to the Ethiopian Investment Board (EIB)<sup>16</sup>** to authorise the granting of new or additional incentives other than those provided for under existing regulations (Proclamation 849/2014, art 29(6)). For example, the EIB has passed **unilateral decisions** on business income tax exemptions, as well as Personal Income Tax (PIT) exemptions for expatriate employees.<sup>17</sup> Furthermore, the lack of a transparent monitoring process well supported by data, which we touch on again below, is **likely to lead to encourage abuse of incentives by beneficiaries**.

As discussed in section 2 **centralising the design of tax incentives and the ability to grant them power within the Ministry of Finance**, embedding them in the **tax code** and

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<sup>14</sup> As found in the paper by Gebrewolde and Rockey (2016).

<sup>15</sup> These include the Ethiopian Investment Commission (EIC); the Ministry of Mines, Petroleum and Natural Gas (MMPNG); the Ministry of Industry; and Ministry of Finance and Economic Cooperation (MoFEC).

<sup>16</sup> The EIB is a legally established entity chaired by the Prime Minister, a government official designated by the PM as vice chairperson, and two further government officials designated by the PM serving as members. Regulation 313/2014 legally establishes the EIB and EIC. Current members of the Board include representatives from MoFEC, EDRI, Ministry of Trade, Ministry of Industry, as well as the President of Oromia region, the Mayor of Addis Ababa City, and the Special Advisor to the Prime Minister.

<sup>17</sup> EIB decisions on Business Income Tax exemptions include hotel and tour service providers in non-traditional tourism destinations for up to five years (Investment Board Decision, 7 January 2016) and the pharmaceutical sector in industrial parks (Investment Board Decision, 15 June 2017). The EIB decided to grant exemptions to expatriates from Personal Income Tax (PIT) in June 2017.



**removing discretionary power** to grant incentives, has been rightly advocated as **good practice** by many international organisations and economic advisers.

The task of administering tax incentives is left to ERCA, which does not have a central coordinating unit for tax incentives, except for customs duties. This **fragmented policy function makes the administration of incentives highly complex and costly to implement and oversee**, especially considering the large and different number of tax treatments offered.<sup>18</sup>

Another bottleneck is the **lack of monitoring, auditing and evaluation of incentives** to assess their performance relative to their objectives, and their impact on the economy. Having a skilled team and suitable data to enable regular monitoring and evaluation of the costs and benefits of these policies should become a priority for tax policy makers and administrators. Having said this, there has been **some recent progress**. Since late of 2017, a comprehensive study on the rationale and costs of CIT tax incentives has been undertaken by the International Monetary Fund (IMF).

## 4.2 Ghana

### 4.2.1 Types of corporate income tax incentives and their objectives

Over the last five years, Ghana has embarked on an ambitious programme of tax reform, which culminated in the enactment of new Excise, Customs, VAT and Income Tax laws. These Acts have sought to consolidate, simplify and modernise Ghana's tax system, and crucially, to broaden the tax base by removing or restricting concessions. While progress has been made, **numerous reliefs remain embedded in Ghana's tax laws and in negotiated contracts with companies**.

The main provisions for CIT are set out in the 2015 Income Tax Act (Act 896) as amended, with key parameters including a standard rate of 25%, and deductions for capital allowances, interest, and losses. Other important legislation includes the 1995 Ghana Free Zones Act (Act 504), as well as the various laws and agreements governing mining and petroleum operations. CIT incentives can be roughly divided into the following three categories:<sup>19</sup>

#### Reduced rates

**Reduced rates** are available on **either a temporary or a permanent basis, and vary by both sector and location**. They include:

<sup>18</sup> For instance, in June 2017 the EIB passed a decision to exempt services provided by the Industrial Park Development Corporation from Value Added Tax. Following this decision, ERCA has faced significant difficulties in implementing this decision. This is because under the Investment Proclamation, the EIB is authorized to amend or grant new incentives. On the other hand, only MOFEC is authorized to exempt transactions from VAT Proclamation 285/2002, article 8(4). Another example concerns PIT exemptions for expatriates, as previously mentioned. There is also a perception that different agencies may compete with each in granting preferential tax treatment.

<sup>19</sup> It should be noted that Ghana also provides exemptions from VAT, excise, import duties, levies and fees, as well as offering generous incentive packages to selected firms, alongside CIT incentives.

- *Sectoral incentives* targeted at cocoa farming (0% rate of CIT), other farming activities e.g. cash crops and livestock (1%), waste processing (1%), exports of non-traditional goods (8%), education (0%), construction of low cost housing (1%), and hotels (22%).
- *Location-based incentives* for businesses located in regional capitals other than Accra or Tema (18.75%), and in other areas of the country (12.5%).
- *Banking incentives* targeted at rural banking businesses (1%), and commercial bank loans to farming enterprises or leasing companies (20%).
- *Saving / financing incentives* aimed at mutual funds and unit trusts (1%), and venture capital financing companies (1%).

### Special zones (or 'free zones')

Free zone (FZ) enterprises granted a licence under the Free Zone Act are **exempt from CIT, VAT, customs duties, excise taxes, levies and fees on imports for the first 10 years of operation, and their shareholders are exempt from dividend taxation**. They are also granted a **post-holiday CIT rate of 15% on exports**. The policy is **targeted at exporters**, so only firms that export a minimum of 70% of their production are granted a licence, and their sales to the domestic market are subject to VAT, import duties and fees.

The main objective of FZs is to **reduce transaction costs for export-oriented firms**. More broadly, they are also intended to stimulate investment, employment and growth by **attracting foreign direct investors** to set up FZ companies, as well as through trade links between FZ and domestic firms.

### Incentives for extractive industries

Companies in the extractive industry face a **CIT rate of 35%**, which is **higher than the standard rate** of 25% and aligned with **principles of best tax design**. However, mining companies investing over US\$500 million in mineral operations and petroleum companies can negotiate **concessionary fiscal terms on a project-by-project basis**. The terms apply for the **duration of the agreement (up to a maximum of 15 years for mining companies)**. The main fiscal instruments **include CIT, royalties, and state participation interest, as well as withholding taxes, VAT, customs duties, and excise tax**. These agreements are not publicly available, but it is understood that the CIT rates larger projects negotiate are likely to be below 35% and may also include larger investment allowances. The aim of these concessional agreements is to **secure foreign direct investment the extractive industries**.

#### 4.2.2 Analysis of policy and implementation of tax incentives

Ultimately tax incentives can only be **granted by law by one body – Parliament** – and not by discretionary processes. The **Ministry of Finance is responsible for the design** of reduced rates and FZ. However, **others may be involved in the design process that results in the laws**, which **can sometimes be discretionary** (e.g. negotiations between extractive companies and the committee). However, the **administration of tax incentives is more fragmented**. The GRA monitors standard and reduced rate companies, the FZ board monitors FZ companies and the Minerals Commission monitors mining companies.

### Reduced rates

As in Ethiopia, CIT rates vary both by sector and location. However, the economic rationale behind some reduced rates is not clear, e.g. cocoa farmers are exempt from CIT while other farmers face a rate of 1%. In general, this kind of rate differentiation **introduces complexity, increases compliance and administration costs and provides opportunities for wasteful rent-seeking activities.**

In terms of compliance and administration, a company must provide evidence that it is entitled to a reduced rate (e.g. a letter from an appropriate Ministry), and submit this when filing its annual CIT return. Since the evidence is **typically** easy to verify, the **administrative cost tends to be low**, and paying a reduced CIT rate does not make a firm more likely to be audited. However, because some reduced rates are only available during the first few years of a business' operations (e.g. the 1% rate on income from cash crops is applicable for five years), **one concern is that companies might re-label themselves as new firms so as to maintain the reduced rate**, resulting in government revenue losses. Ensuring this does not happen **may be administratively costly.**

**Monitoring and analysis of these incentives is relatively weak, but is improving as more data becomes available.** This was facilitated by Ghana's recent income tax reforms, which included increasing the reduced rate of CIT faced by many firms from 0% to 1%. As well as raising more revenue, this made clear to investors their obligation to file a corporate tax return, thereby increasing the data available for oversight.

### Free zones

In terms of economic rationale, **FZs in Ghana are more aligned with best principles, since they are primarily designed to attract mobile investment oriented to exports.** However, a **cost-benefit analysis is needed** to ascertain whether the scheme is achieving its objectives in a cost-effective way, and its operation should be considered in the context of the tax system as a whole (and the aim of keeping this as a simple, neutral and transparent system as possible).

**It is likely that the compliance, administration and enforcement costs associated with FZs are high.** To obtain a FZ licence, a prospective company must purchase an application form from the FZ Authority (which costs \$100), and submit the completed form – along with supporting documents (e.g. financial statements for the previous three years; relevant licences etc.) – to the Authority. The company must also provide evidence that it will export 70% of production, and that there is foreign demand for its products. Once submitted, the material is reviewed first by a technical officer, and then by a sub-committee of the FZ board, which assesses whether the company meets the 70% export threshold. The committee makes a recommendation to the FZ board, which has the final say. The approval process should take no more than 28 days, providing the correct documents are submitted.

Furthermore, there may be **significant scope for unintended revenue leakages** in the FZ system. First, the corporate tax holiday provided to FZ enterprises may encourage other forms of abuse, e.g. non-arm's length transfer pricing of transactions with related third parties. Second, the law is unclear about whether "production" is measured in terms of the value or the volume of the product, so companies can select the production measure that minimises their tax liability. Third, there is a risk that, once licensed, FZ companies will **choose to ignore the domestic sales cap** (i.e. sell more than 30% of their

output to the domestic market), or will not apply taxes to their domestic sales, thereby reducing government revenues and putting non-FZ companies at a competitive disadvantage. This is **facilitated by a lack of oversight**. Although FZ companies are required to submit some basic documentation about their operations (e.g. turnover, profits), many do not, and **authorities have little incentive to enforce record keeping because the opportunities for revenue collection are minimal**. This is **problematic since revenue authorities typically use information provided in tax returns to audit firms and their plants and branches**. Where records are kept, the system is largely paper-based rather than electronic, which further hinders oversight and analysis. In addition, because there is no geographical limit to FZ territories, and FZ companies are scattered throughout the country, physical surveillance is difficult.

### **Incentives for extractive industries**

Granting fiscal concessions to industries that exploit exogenous locational rents such as mining and petroleum undermines the well design CIT system that applies *de jure* to the extractive industries and is **against principles of best tax design**. This is because **firms are likely to invest regardless of the tax treatment, since they will earn excessive locational rents**. As is the case in Ethiopia, **providing a good investment climate could be a more effective way of attracting investment** than these concessions.

In Ghana, **the process for granting these incentives is highly opaque and discretionary**, and the **compliance, administration and enforcement costs are high**. For example, mining companies can negotiate concessionary fiscal terms as part of an Investment and Development Agreement (IDA) with the government. The terms apply for a maximum of 15 years and are protected by fiscal stability agreements. Prior to negotiations, a prospective company must produce evidence that its investment exceeds a minimum threshold of \$500 million (and other documentation), which is reviewed by a committee comprising representatives from the Minerals Commission, the Attorney General's Office and relevant Ministries. If the threshold is met, negotiations between the company and the committee begin. The mining company's proposed IDA forms the basis of discussions, and there is no explicit limit on the fiscal terms that can be negotiated (e.g. in the 2006 Minerals and Mining Act (Act 703), or other relevant legislation). The process takes three to eight months to complete on average. Once agreed, the IDA is sent to cabinet and then to Parliament for their amendments (if necessary) and approval. The Minerals Commission carries out periodic inspections to ensure a company's operations conform to the provisions in their agreement, but it **lacks the capacity and operational support** to do this rigorously and systematically.

## 5 Estimating the causal impact of tax incentives: Methodological considerations

Tax incentives affect both government revenues and firms' investment decisions. Investment decisions subsequently impact firm performance in terms of output and employment, which in turn affect tax bases, ultimately feeding back into government revenues. In this section, we discuss **methodological considerations** to take into account when to **design the evaluation of tax incentives to uncover their causal impact on firms' behaviour**; in particular on investment decisions and other related outcomes. These estimates are a key part of a cost-benefit analysis.<sup>20</sup> In section 6, we summarise the findings of the existing literature.

There is a wealth of **descriptive evidence on tax incentives and their likely impact** that we discuss briefly in the next section. For example, evidence from investor surveys can provide descriptive evidence on the relative importance of incentives as perceived by investors, but they are **likely to be biased** since investors are prone to answering in a way to keep tax incentives benefits, even if they are not generating additional investments or jobs. As noted in Klemm and Van Parys (2012): “the caveat of surveys is that, even if they are well designed, an objective **assessment of the effect of tax measures is not possible** since they **do not provide data on observed behaviour before and after a policy change**”. Relying on survey information to quantify the impact of tax incentives is thus problematic. Furthermore, even if the redundancy ratio is accurate, we still **do not observe the behaviour of investors at the margin** (how much they would be willing to invest). Hence survey data, while interesting, has issues when uncovering a causal effect.

**Uncovering the causal impact of tax incentives** on outcomes of interest (i.e., investment but potentially also output, employment and innovation) is **more challenging**. In addition to having **good firm-level data with investment information**, one needs to **think carefully how** to 1) **identify and model** what the performance in the absence of incentives would have been by finding a **good counterfactual** (related to the **concept of redundancy**); and 2) **include in the model** the **behaviour of non-benefitting** firms that may be affected indirectly by operating in the same market as beneficiary firms and, hence, may experience harmful competition effects (also related to the **concept of displacement and crowding out** effects).

<sup>20</sup> As mentioned in section 2.3, a recent background paper written in 2015 as a collaborative effort of the International Monetary Fund, the World Bank, the United Nations and the Organisation for Economic Cooperation and Development provides a great and practical overview of the different ways to conduct cost-benefit analyses of tax incentives. Their emphasis is on methodologies to estimate forgone revenues without accounting for behavioural response and on characterising variation in tax burdens induced by tax incentives across firms, using effective tax rates (ETR) models. See “Options for Low Income Countries’ Effective and Efficient Use of tax Incentives for Investment”, a background paper published in 2015 to the report prepared for the G-20 development working group by the IMF, OECD, UN and World Bank. <https://www.imf.org/external/np/g20/pdf/101515a.pdf>

## 5.1 Building suitable comparison groups

Arguably the main challenge to the empirical evaluation of the impact of tax incentives is the difficulty in finding a valid counterfactual. **Knowing what would have been the outcomes – e.g. the level of investment by a firm – with or without a certain tax incentive** is complex. In an ideal world, we would observe outputs for the same firm with and without tax incentives. However, this is in practice not possible, so we need to identify similar firms that are likely to behave identically and independently of each other, with the exception that one benefits from tax incentives while the other does not. Once this is achieved, we can compare their levels of investment, and the difference can be interpreted as being caused by tax incentives.

Ideally, the treatment would be assigned randomly to a representative sample of firms for the purpose of an evaluation. In practice, however, **policy assignment is not random for the case of tax incentives**. For instance, incentives can be targeted at sectors considered desirable for different reasons (e.g., positive externalities, part of state-led growth strategies) or in geographical areas with certain pre-determined characteristics (e.g. economically disadvantaged, strategically located for exporting). Furthermore, as mentioned before, sometimes tax incentives are assigned on a discretionary basis, and hence, it is difficult to even identify and characterise treated and non-treated firms.

Consequently, studies must rely on quasi-experimental techniques dealing with non-random assignment. These include natural experiments, which exploit policy variations that treat areas (regions within a country or entire countries), sectors or firms differently, in combination with relevant data on firms' investment decisions. Furthermore, a number of behavioural assumptions are needed to quantify the impact of reforms *ex facto*. There are specific econometric methods to build valid counterfactuals, which we examine in some more detail below.

One important **assumption** concerns the **interaction between treated and non-treated firms**: in particular, one has to assume there would be no **indirect effects** from tax incentives given to certain firms or sectors or regional areas onto non-treated counterparts. This can be particularly problematic if treated and untreated firms operate in the same markets, or if they are interlinked in any other way, which in practice can often happen. Therefore, a detailed analysis of the costs and benefits of tax incentives should account, if feasible, for potential positive and negative indirect effects. While these are all practically difficult to quantify, recent empirical studies have attempted to integrate these components into their analyses. For example, cross-country analyses have analysed the impact of special tax regimes on FDI in neighbouring countries (displacement effect), while place-based studies focusing on the impact of special zones have accounted for spillover effects to neighbouring treatment areas.

Hence, the best methodology to estimate the impact of tax incentives will depend on whether the incentive schemes are targeted to specific firms, activities, sectors, and/or regions, or whether they are broader firm-level reforms. Understanding the specific context and collecting the necessary data is the first step towards designing a robust and rigorous evaluation. We elaborate more on this below.

## 5.2 Economic models

Empirical studies can adopt **different methods to measure how taxes impact investment** decisions. One could compare mean levels of investments across identified treatment and control groups, and hence infer the causal effect without imposing many assumptions about how firms make investments decisions. This is known as the **reduced-form approach** in econometric terms. However, this type of exercise is **not that helpful into identifying relevant responses of firms to tax incentives** in the future and **hence, cannot be used for policy simulations of future or hypothetical tax reforms**. Another approach, known in econometrics as **structural modelling**, involves estimating investment equations that model more specifically how tax and tax incentives affect investments decisions (e.g., **the elasticity of investment to tax incentives**). This approach can be more challenging, but the returns can be higher for policy makers.

The most common way of incorporating tax incentives into firms' investment decisions is by calculating **effective tax rates (ETRs)**, and modelling how these affect the **user cost of capital (UCC)**. ETRs measure the effective tax burden paid by firms on their investment returns. These measures account for statutory rates along with other factors influencing investment decisions. While many different types of ETRs are found in the literature, the most influential measures are the effective marginal tax rate (EMTR) and the effective average tax rate (EATR).<sup>21</sup> Both these measures are **"forward-looking"**, meaning that they calculate the prospective returns to capital in the future. The formulae are transparent and flexible and can help identify the different factors that influence returns to investment, in addition to tax incentives, such as statutory rates, depreciation allowances and interest deductibility.

The EMTR calculates the tax "wedge" of an investment that breaks even, so that the post-tax rate of return exactly covers the cost of capital. It is useful for measuring incremental investment decisions, and how taxes distort the levels of investment. The EATR measures the tax burden for rent-earning investments (due to the presence of, for example, firm-level or locational advantages), and is used to assess tax effects on discrete investment choices, i.e., the location of investment.<sup>22</sup> First introduced by Hall and Jorgensen (1967), user cost of capital (UCC) calculations are similar to effective tax calculations, as the approach aims to

<sup>21</sup> Clark and Klemm (2015), among others, provide a useful review of different effective tax rates measures.

<sup>22</sup> King and Fullerton (1984) originally developed the EMTR, while Devereux and Griffith (2003) built upon the EMTR to develop the EATR. The EATR was further extended by Klemm (2008) to account for tax holidays.



calculate the price of capital.<sup>23</sup> UCCs therefore also use information from the general tax system, economic variables, and different tax treatments of capital expenditures. To account for the impact of tax incentives while using ETRs and UCCs, empirical studies first measure the impact of tax incentives on ETRs and UCCs, then the latter are commonly included in an investment equation, in which the units observed can be aggregated (country-level) or disaggregated (firm-level). **Calculations of ETRs for hypothetical investment projects** can help policy-makers **understand the potential effects of tax incentives on investment decisions** and are also a **useful input to estimate empirically the causal impact of tax incentives on investment ex-post**, when combined with data on investment.

### 5.3 Data requirements

In terms of data requirements, **both survey and administrative data** sources can be used. **Accurate (ideally firm-level)** survey data on firms' investment, employment, outputs, prices, industry of operation, location, can be used to assign tax treatment to each firm and to measure outcomes. Such data are generally harder to find in the context of developing countries, although their availability and accessibility to researchers are increasing. Data from tax returns can be used alternatively or to complement survey data. Counting on both administrative and survey data before and after the policy reform will improve the quality of an empirical evaluation of tax incentives. Sometimes only country-level data or industry-level data is available. We discuss briefly each of the different empirical strategies using different type of data below, highlighting their methodological merits and limitations.

### 5.4 Using country-level data and variation in tax incentives across countries

Some studies have attempted to measure the impact of tax incentives on economic outcomes using regression techniques where the outcomes are country-level variables that capture gross capital formation, foreign direct investment (FDI) and/or corporate income tax revenues, and the explanatory variables include measures of tax incentives. These studies exploit variation in policy and outcomes across countries and over time. For example, Klemm and Van Parys (2012) estimate the effect of tax holidays (measured in number of years) and investment allowances (percentage of total investment) on FDI and private investment.<sup>24</sup> Abbas and Klemm (2013) include the presence of tax regimes as an explanatory variable with CIT revenue as the dependent variable.<sup>25</sup> They also look at the effect of the EATR accounting for special regimes on FDI.<sup>26</sup> Van Parys and James (2010) estimate an investment equation using FDI and private gross fixed capital as dependent

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<sup>23</sup> This is done by deriving the pre-tax real rate of return on the marginal investment project that is required to earn a minimum rate of return after tax.

<sup>24</sup> Using fixed-effect and system GMM models.

<sup>25</sup> Abbas and Klemm use a dummy variable for special regimes and an interaction term between the special regime dummy and the tax rate in a panel fixed-effect model.

<sup>26</sup> Using the methodology from Klemm (2008) in a dynamic model.



variables, and the corporate income tax holiday for both regular business and exporters along with control variables.

There are a few issues that make measuring the casual impact of tax incentives across countries problematic. In the case of using a single measure at the country-level, such as the EATR to measure the impact on FDI, this is **unlikely to capture the complexity of the tax incentive system**, as there is likely to be a certain degree of noise (or inaccuracy) in using such an aggregated measure. Furthermore, as noted in Abramovsky et al. (2014), the **adoption of special regimes is intrinsic to country characteristics, some of which are likely to be unobservable, and can simultaneously affect investment levels at the country level**. For instance, adopting special tax regimes might depend in part on socio-political divisions -- which are difficult to observe, let alone quantify -- in cross-country studies, which can also determine investment levels. Feld and Heckemeyer (2011) note that even in fixed-effect models which control for time-invariant unobserved characteristics across countries (for example, being landlocked), **tax incentives can sometimes hardly be distinguished from other co-founding and unobserved factors which are time-variant (for example, trade liberalisation, or changes in other taxes)**. This makes it difficult to attribute the change in outcomes to changes in particular tax incentives. Another issue with cross-country analyses is ruling out **reverse causality**, as it could be that **investment levels influence whether tax incentives are adopted in the first place**.<sup>27</sup> Therefore, **cross-country regression should often be interpreted as measuring correlations rather than causal impacts**. However, as discussed below, cross-country variation in tax incentives can be used more effectively when combined with firm-level investment data.

## 5.5 Using firm-level data and variation in tax incentives across firms

Given the caveats of measuring the impact of tax incentives using variation across countries, we move the discussion onto studies that mostly rely on firm-level or local outcomes, and exploit policy variation within a country, or even across countries.<sup>28</sup> **The three main types of relevant policies to this section are tax incentives that are 1) sector-specific, 2) location-specific, and 3) specific for R&D.** It is worth noting that, in practice, some policies can be a combination of these categories. For instance, tax incentives may be made available to certain sectors in specific geographical areas. While going into detail about the many different methodologies used across these literatures is beyond the scope of this report, we focus on some of the more influential developments found in the empirical literature to overcome challenges in determining causality, identifying counterfactuals, and measuring spillovers and indirect effects. **Most of the strategies discussed below have been applied to evaluate tax incentives in advanced economies, due to data availability.**

**In general**, empirical studies using micro-level strategies are more likely to measure the **average treatment effect on the treated population**, instead of the average treatment

<sup>27</sup> Including lagged dependent variables can attenuate the impact of reverse causality, although this may come at the expense of the explanatory power of other independent variables.

<sup>28</sup> Some studies may use firm-level data and exploit policy variation across countries, accounting for country-level confounding factors as much as possible, and these studies are usually better than studies that use aggregate country-level data.

for the population as a whole, because there are often **significant differences between treated and untreated firms**. This means that the estimated impact is likely only valid for the specific treated group, and, therefore, is a much less reliable indicator of the effects of extending the policy to untreated firms or areas.

Perhaps the most common methodologies found in the empirical literature are **differences-in-differences (DD)**, and the closely related **boundary discontinuity (BD)** and **event-study** analyses. A commonality to these different strategies is that they all **control for time-invariant characteristics** across observations and take advantage of the “**policy shift**” for one group and not another to estimate causality<sup>29</sup>. While **DD** look at differences across units of observations, **BD** looks specifically at differences across geographical boundaries. Meanwhile, **event studies** are very similar to **DD**, only more focus is put on modelling pre- and post- reform time trends.

Another type of study **uses thresholds that determine the eligibility for certain incentives to design identification strategies, by comparing firms just below and just above the relevant threshold**, called **regression discontinuity (RD) design**. For example, a recent study by Dechezleprêtre et al. (2018) takes advantage of an exogenous and unanticipated change in threshold for small and medium firms eligible for R&D tax subsidies in the UK.<sup>30</sup> Given that there was no overlap with other tax policies, the authors use an RD design to measure the R&D price elasticity to the tax incentive, and measure the causal effect for firms benefitting from the more generous tax policy.<sup>31</sup>

Other techniques have been used to calculate the effect of tax incentives. For example, Czarnitzki et al. (2011) use a **non-parametric matching technique** to compare firms using R&D tax credits with similar firms that do not, similarity defined using their observable characteristics. This technique mitigates to some extent the effects of selection bias to estimate the average effect of tax credits and can be applied to other types of tax incentives. Yang et al. (2012) note that although matching methods can correct for selection bias to some extent, there is still **significant heterogeneity across firms that can drive the take-up of tax incentives and investments**, which often cannot be accounted for, and they implement more **complex econometric techniques exploiting variation in outcomes over time within firms**. Lokshin and Mohnen (2012) estimate **dynamic factor-demand models based on a specific type of production function** (constant elasticity of substitution) to measure the responsiveness of a firm’s R&D capital accumulation to changes in its user cost due to changes in R&D tax incentives.

The literature focusing on the effects of place-based policies has increased substantially in the last decade and is relevant to analysing **location-specific tax incentives**. Literature reviews by Kline and Moretti (2014) and Neumark and Simpson (2015) already provide extensive information on the methodological issues from these studies. One of the most important challenges is to correctly identify treatment and control areas as precisely as possible and to account for the fact that the eligibility criteria will also depend on regional economic performance, meaning that the estimations of the policy will likely be biased by

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<sup>29</sup> Under the assumptions of common trends, and no temporary shock associated with adopting the policy.

<sup>30</sup> This study stands out for two more reasons: it includes patents as an outcome, which allows measure to some extent actual innovation and avoids the moral hazard from firms re-labelling certain activities as R&D expenditure; it estimates spillover effects of R&D onto other firms by measuring the “technological proximity” as indicated by which technology a firm classes patents in.

<sup>31</sup> Other studies by Howell (2017) and Bronzini and Iachini (2014) also adopted RD techniques using proposal application scores by committees to estimate the effects of R&D subsidies.

regional characteristics.<sup>32</sup> Looking at tax incentives to disadvantaged areas in France, Givord et al. (2013) compare areas in pre-selected treatment zones and treated zones while controlling for different factors that may also affect investment.

The **place-based literature** is better positioned to **deal with measuring positive and negative spatial spillovers and local effects to the economy**. When the areas' gains are not offset by an equivalent loss elsewhere, this is known as 'agglomeration gains'. There are different ways to account for spillovers to neighbouring areas.<sup>33</sup> It is more difficult to account for displacement effects affecting more distant areas to the treatment zone.

Another issue is measuring whether certain spatial gains are not offset by large costs. For example, price increases at the local level might offset increases in employment and local wages, which could ultimately benefit landowners. While not easy to account for in practice, some studies have tried to measure these local gains by using spatial equilibrium models to measure the welfare effects of place-based policies. Kline and Moretti (2014) develop a theoretical model to analyse the local welfare effects following the implementation of place-based policies. Meanwhile, Chaurey (2016) estimates real earnings by measuring and comparing differences in nominal wages, prices, and net migration in treated areas to account for real earnings. Of course, detailed local-level data becomes essential when trying to control for these effects.

Another group of studies uses detailed firm-level data over a number of years on outbound FDI in a range of countries and variation in tax incentives across countries to look at the effectiveness of tax incentives in attracting FDI. For example, the U.S. Bureau of Economic Analysis (BEA) collects microdata on U.S. firms' outbound investments that have been used by Grubert and Mutti (2000) and Desai, Foley, and Hines (2004) among others to look at tax effects on investment decisions of US multinationals.

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<sup>32</sup> Busso et al. (2013) compare outcomes in communities that were awarded benefits, to matched tracts of rejected applicants, and future benefit-receiving communities.

<sup>33</sup> For example, Neumark and Kolko (2010) analyse this in enterprise zones in the US, while Chaurey (2016) focuses on tax incentives across different states in India.

## 6 Empirical literature on the impact of tax incentives

Although there is a vast literature examining the (negative) impact of general taxation on (foreign direct) investment and related outcomes, there is significantly less evidence on the impact of tax incentives, and most of it has focused on advanced economies.<sup>34</sup> This can be explained in large part due to the scarce (though increasingly available) data needed to conduct this type of studies, as discussed already.

In this section we first discuss briefly a **body of descriptive empirical studies** that have used different strategies, including calculations of ETRs, to shed light on the **costs and benefits of tax incentives in low- and middle-income countries**. We then discuss the **more rigorous econometric evidence** that attempts to estimate the **causal impact of tax incentives on investment and other economic outcomes**.

### 6.1 Descriptive empirical studies on tax incentives

An important contribution to the literature on tax incentives in developing countries can be found in the collection of works in Shah (1995) that **calculate EMTR rates across different economic sectors and geographical areas, broadly showing how the tax systems and tax incentives** in particular **distort incentives** towards certain activities and areas, and that discuss the policy implications of these distortions.<sup>35</sup>

Another body of studies that provides descriptive cost-benefit analysis have found that tax incentives are generally ineffective in attracting additional investment.<sup>36</sup> For example, in a study looking at the introduction of tax holidays in Indonesia, Wells and Allen (2001) estimate that 70 percent of investment receiving incentives would have occurred regardless of the tax incentives. Comparing the change in FDI following the reform with the estimated foregone revenues, they find that the subsidy was greater than the estimated incremental investment attracted. Similar studies in Mozambique (Bolnick, 2009) and Vietnam (Nguyen et al., 2004) develop detailed investor surveys and also find that tax incentives are generally ineffective in attracting additional investment. Many of these case studies rely on

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<sup>34</sup> Although there is a wide range of estimated elasticities, most studies find that higher tax rates (including effective average tax rates, effective marginal tax rates, and statutory tax rates) have a significant negative impact on FDI flows. But most of these studies involve investment in OECD countries. Of 47 econometric studies on FDI and taxation, just 5 include investments in developing countries. A meta-study by De Mooij and Ederveen (2003) finds that 1 percentage-point (pp) increase in the tax rate reduced FDI by 3.3 pp. Mutti and Grubert (2004) show, using firm-level data of US multinationals, that investments geared toward export markets are particularly sensitive to host country taxation, and this sensitivity appears to be greater in developing countries. Another study using the same data by Desai, Foley and Hines (2004) estimate that 10% higher income tax rates lower assets by 7.1%, while high CIT rates depress capital/labour ratios and profit rates. Conversely, Hassett and Hubbard (2002) find that tax policy has little effect on investment using country-level aggregate data.

<sup>35</sup> These included case studies by Estache and Gaspar (1995) for Brazil, Boadway et al. (1995) for Malaysia, Halvorsen (1995) for Thailand, and Mintz and Tsiopoulos (1995) for Eastern European countries.

<sup>36</sup> These studies assess benefits using the change in investment or FDI over time, while costs are reduced to foregone revenues and estimated by using the redundancy ratio from investor surveys.

redundancy ratios using survey information, and as we discussed in section 5, they are likely to give biased and subjective measures of the impact of tax incentives. They actually are likely to be biased upwards, so that the real effect of tax incentives is potentially even lower.

Other studies have used the recent developments in **calculating effective tax rates with tax holidays** (Klemm, 2008) to simulate tax reforms. For example, Botman et al. (2010) predict that replacing tax holidays with a reduced CIT rate would improve incentives to invest, and would increase government revenues in the Philippines. We next focus on empirical studies attempting to measure the causal impact of tax incentives in order to analyse in greater detail the outcomes of these policies.

## 6.2 Empirical studies on the causal impact of tax incentives

In this section we summarise the results from some of the key studies from the literature that provide estimates of **the causal impact of tax incentives** on outcomes of interest in developing countries. We **split the review of the literature between cross- and within-country studies**; the latter are further split into **1) tax incentives that vary by sector and location**, and **2) R&D tax incentives**.

### Cross-country studies using aggregate data

Starting with the cross-country analysis using aggregate data, Abbas and Klemm (2013) find that the EATR applicable to the most attractive special regime (tax incentive) has an insignificant impact on the level of country-level investment, while the general EATR has a negative impact on investment. Klemm and Van Parys (2012) find that longer tax holidays are effective in attracting FDI in Latin America and the Caribbean, but not in Africa. Moreover, neither tax holidays nor investment allowances were effective in increasing gross private capital investment. Van Parys and James (2010) find no significant effect of general tax holidays on investment; meanwhile, tax holidays targeted at exporting firms tend to have a positive, though statistically weak, impact on investment. Table 6.1 provides further details about these studies. Apart from some significant results, the general finding is that it is difficult **to account for the impact of tax incentives in a cross-country panel study**. As argued in section 5, this difficulty in observing a clear impact might be caused by the inability to control for other co-founding factors that vary across countries and across time.

**Table 6.1 Cross-country studies on the causal impact of tax incentives in developing countries**

Study	Geographical Area /Scope	Empirical strategy	Period	Main incentive	Main outcome	Key findings
Abbas & Klemm (2013)	50 emerging and developing economies	Cross-country regressions	1996-2007	Special regimes (tax holidays, temporarily reduced rates, and increased investment allowances )	CIT revenues, FDI	<ul style="list-style-type: none"> <li>Higher headline tax rates are associated with higher revenues in the short-run for developing countries, but this correlation is weaker for countries with special regimes.</li> <li>For African countries, the impact of an increase in the tax rate on revenues is significantly different from other regions, apparently having no impact.</li> <li>EMTR has no impact on investment. EATR shows a significant negative impact on investment.</li> <li>EATR applicable to the most attractive special regime is insignificant.</li> </ul>
Klemm & Van Parys (2012)	40 Latin American, Caribbean and African countries	Cross-country regressions	1985-2004	Tax holidays and investment allowances	Competition among tax incentives, FDI and private investment	<ul style="list-style-type: none"> <li>Evidence for strategic interaction in tax holidays, in addition to the CIT rate.</li> <li>Lower CIT rates and longer tax holidays are effective in attracting FDI in Latin America and the Caribbean but not in Africa.</li> <li>None of the tax incentives are effective in boosting gross private fixed capital formation.</li> </ul>
Van Parys & James (2010)	12 CFA Franc Zone countries in SSA	Cross-country regressions	1994-2006	Tax holidays, legal guarantees, complexity of the tax system	FDI	<ul style="list-style-type: none"> <li>No significant positive relationship between tax holidays and investment.</li> <li>Tax holidays targeted at exporting firms tend to have a positive impact on invest, although the statistical significance is weak.</li> <li>Increasing the number of legal guarantees for foreign investors and reducing the complexity of the tax system is positively related with investment.</li> </ul>

### Within-country studies that evaluate area- or sector-specific incentives

We turn to the literature on the impacts of **sector- and location-specific tax incentives** that exploit variation within countries (see Table 6.2). Perhaps the clearest finding from the literature is the positive impact of special economic zones (SEZs) on economic outcomes in China. It is important to note that these SEZs provide a bundle of benefits, including tax incentives, so it is not possible to identify the effect of the tax incentives from the rest of the benefits being provided. Aldler et al. (2016) and Cheng (2015) find significant positive effects on local gross domestic product (GDP) using DD across regions; Lu et al. (2016) find positive effects on capital, employment, output, and new entry from firm-level data using DD and boundary discontinuity strategies as used in Neumark and Konko (2010); meanwhile, Wang (2013) finds significant effects of SEZ on FDI with only a modest displacement effect. The general effects on welfare seem equally positive. Cheng (2015) finds no evidence of inter-regional labour reallocation, and Adler et al. (2016) find positive spillover effects in neighbouring regions, while a location's market potential and transport accessibility seem not to be important.

Similarly, Chaurey (2016) tests the effects of place-based tax differentials across different states of India (generous tax incentives have been introduced in the states of Uttarakhand and Himachal Pradesh) using firm-level data. Chaurey finds large increases in employment, total output, and both growth of existing firms and entry of new firms in the treated states. He finds no evidence of spillovers or firm relocations between treated and controls areas. At the same time, wages increased significantly while no changes in housing rents or migration across regions were observed.

Gebrewolde and Rockey (2016) frame their evaluation in a model of investment as a function of the user cost of capital to understand potential effects but then estimate the impact of place- and sector-specific tax incentives on productivity and employment in Ethiopia using a DD reduced-form approach across firms. In contrast with the previous studies on China and India, they find no significant impact of tax incentives on economic outcomes. Moreover, the authors estimate the costs and benefits in terms of tax revenues and find that the costs largely exceed the benefits.

The literature looking at the impact of sector- and place-based tax incentives show some interesting results. There seems to be **some evidence that tax incentives can have a positive effect on economic outcomes in certain contexts**. However, there are a few reasons why these results should be interpreted with caution. First, an important obstacle towards analysing a causal effect of tax incentives is the issue of simultaneity. As discussed in the last section, there are **often other policies being implemented at the same time** as tax reforms, which may bias the effect of tax incentives. In the case of Chinese SEZs, Wang (2013) explains that tax incentives were not the only benefit accruing to foreign investors in SEZs. SEZs provided private property rights and land rights that were unavailable outside of their jurisdictions. Moreover, SEZs implemented a comparatively more decentralised and autonomous structure of governance which might have led to better governance in SEZs, which has been found to be a determinant in attracting FDI in China (Du et al., 2008). Leong

(2013) also finds that liberalised Chinese regions are likely to adopt other growth-enhancing policies, such as investment in infrastructure.

Second, an important question concerning the analysis of tax incentives is whether the results can be applied more generally to other regions. As noted in Adler et al. (2016), China's SEZs were chosen based on both equity (poorer regions) and efficiency (agglomeration effects) considerations. Wang (2013) notes that the central government initially authorized municipalities to establish the SEZs based on their better geographical location, industrial condition and human capital, before gradually expanding to less industrially developed regions. Meanwhile, the Indian states analysed in the study by Chaurey were characterised by comparatively lower levels of economic development. Hence, there is little evidence that expanding these policies to regions or states with different characteristics will have similar impacts, especially considering how the policies are, at least initially, limited to relatively small areas. The results from Wang (2013) show that the impact of SEZs on economic outcomes decreases as SEZs are expanded inland, showing decreasing marginal returns of expanding the policy.

Lastly, using studies **from extremely different countries and contexts is sure to yield very different results even if similar policies are undertaken**. This can be particularly argued in the cases of China and India. Lu et al. (2016) argue that a reason explaining why they obtain similar findings in China as Chaurey (2016) in India is presumably due to the fact that the two countries share similar labour mobility and market development, as there are non-trivial barriers that prevent workers from moving from one municipality to another. Moreover, what ultimately attracts foreign investors might have little to do with particular tax incentives. In the case of Chinese SEZs, the factors most likely to attract foreign investors are market access and low labour costs, not tax incentives (Farole, 2011). These deeper factors might better explain why we observe positive effects in certain countries (China and India) and not in others (Ethiopia). Because of these reasons, generalised conclusions about the effects of tax incentives from these studies should be avoided, as further evidence is warranted.



**Table 6.2 The causal impact of place- and sector-specific tax incentives in developing countries**

Study	Geographical Area/Scope	Empirical strategy	Period	Main incentive	Main outcome	Key findings
Chaurey (2016)	India	DD of firms across regions within India	2000-2008	Location-based and sector-specific tax incentives (CIT and excise exemption, investment subsidies)	Employment, total output, fixed capital and number of firms	<ul style="list-style-type: none"> <li>Large increases in employment, total output, fixed capital, and the number of firms.</li> <li>Increases are due to both the growth of existing firms as well as the entry of new firms.</li> <li>Supporting evidence that the new firms entering the treated regions are larger and more productive.</li> <li>No evidence for relocation of firms or spillovers in industrial activity between treatment and control areas.</li> <li>Wages of workers rise but find no changes in housing rents or migration across the treated and control regions.</li> </ul>
Adler, Shao & Zilibotti (2016)	China	DD/Event study across 276 prefecture-level cities within China	1998-2010	Special Zones	Local GDP	<ul style="list-style-type: none"> <li>SEZ is associated with an increase in the level of GDP of about 20% and 9% on GDP per capita. Results are robust to controlling for local government spending.</li> <li>Increasing cumulative effect of the policy that flattens out after about 10 years.</li> <li>The main channel is a positive effect on physical capital accumulation, although SEZs also have a positive effect on total factor productivity and human capital investments.</li> <li>Positive and often significant spillover effects in neighbouring cities and regions.</li> </ul>
Cheng (2015)	China	DD/Event study with 2'280 county-level obs.	1993-2006	Special Zones	Local GDP	<ul style="list-style-type: none"> <li>A SEZ increased GDP by 1% to 2% per year over 5 years.</li> <li>No evidence that the SEZ program induced inter-regional labour reallocation.</li> <li>Acceleration in the shift of employment from the agricultural sector.</li> </ul>
Lu, Wang and Zhu (2016)	China	DD and BD of firms across 15'014 villages in 600 counties	2004-2008	Special Zones	Capital, employment, output and number of firms	<ul style="list-style-type: none"> <li>Economic zones have had a positive effect on capital, employment, and output, and have increased the number of firms. Modest displacement.</li> <li>Productivity benefits and price impacts arising from locating in an SEZ, indicating the presence of agglomeration economies.</li> <li>Capital-intensive industries benefit more than labour-intensive ones. Likely due to the reduced cost of capital in SEZs.</li> <li>Location characteristics, such as market potential and transportation accessibility, seem not to be of critical importance.</li> </ul>

Wang (2013)	China	DD/Event study across 321 prefecture-level municipalities China	1986-2008	Special Zones	FDI, exports, output from foreign-owned enterprises and domestic investment	<ul style="list-style-type: none"> <li>Significant creation of a SEZ program on municipal FDI outcomes.</li> <li>Significant and negative diversion effect of FDI on neighbouring municipalities. However, the creation effect is over three times larger than the diversion effect.</li> <li>Wages for workers increase more than the increase in the local cost of living.</li> <li>Heterogeneous effects: for zones created later the benefits are smaller while the distortions in firm location behaviour are larger than those for the early zones.</li> <li>Municipalities with multiple SEZs experience larger effects than those with only one SEZ.</li> </ul>
Gebre-wolde and Rockey (2016)	Ethiopia	DD/Event study across sectors and geographic areas	1996-2010	Place-based and sector-specific tax-breaks and subsidised loans	Productivity, productive assets and employment	<ul style="list-style-type: none"> <li>Entry of new firms lowered average productivity and new firms failed to generate agglomeration externalities.</li> <li>Diversification in existing firms, but also lowering productivity. No improvement on productive assets or employment.</li> <li>Additional capital investments in stores of value instead of productive machinery, reflecting the volatile economic environment faced by firms.</li> <li>Estimated cost of policy is very high, at 0.5% of GDP. Benefits are estimated at less than 10% of costs.</li> </ul>

Note: DD: differences-in-differences; BD: boundary discontinuity.

## R&D studies

Table 6.3 includes three studies focusing on the **effectiveness of R&D tax incentives** in developing countries. Although all studies find that R&D tax incentives led to a significant increase in R&D expenditures, the **results are generally not as strong as those found in comparable studies from developed countries**, which often find that the decrease in the user cost of R&D leads to a one-for-one increase in the amount spent on R&D by firms in the long run. This is known as the elasticity of R&D expenditure being greater than or equal to one (i.e., in the long-run, a one percentage point decrease in the cost of R&D leads to at least a one percentage point increase of R&D expenditure).

Jia and Ma (2017) find that a 10 percent reduction in R&D user costs leads to a short-run 3.97 percent increase in R&D expenditure for a sample of Chinese firms. They also find significant effects for private firms, but not for state-owned enterprises (SOEs), suggesting that firms without political connections are more likely to be credit constrained and benefit more from the policy. Yang et al. (2012) find a relatively small marginal effect for Taiwanese firms receiving tax credits (between 0.094 and 0.120), although the effects are greater as the tax credit expires. In their study of Argentinean firms, Crespi et al. (2016) find that the elasticity of the combined investment in R&D and capital goods (R&D+i) is greater than one. However, after removing investment in capital goods, the “pure” long-run elasticity of R&D with respect to the user cost is less than one (0.86).

What can be taken away from the literature on R&D tax incentives in developing countries? First, it is worth emphasising that the countries in this survey have **at least middle-income status**. Therefore, using the findings in these countries for policy recommendations in lower-income countries should be avoided, or done very carefully. There are **many constraints to the effectiveness of R&D tax incentives** linked to **tax administration capacities**, and **supply-side factors** (e.g., infrastructure and skilled workforce to conduct R&D) which are **likely to make these policies less effective in low-income contexts** (see Crespi et al., 2016). The evidence showing that impacts are more significant for technologically advanced firms further points to the importance of economic conditions in determining the importance of these policies. Moreover, the marginal value of foregone revenue is likely to be greater in **low-income countries**, making such a **policy even riskier**. Second, as argued in Jia and Ma (2017), policies such as **improving property rights and removing political interventions** are likely to be **complementary to tax incentives** in promoting R&D in developing countries. In many instances, such policies are likely to be more **important in establishing the pre-conditions** necessary to promote wider technological advancements than targeted tax incentives. Third, more evidence is needed of the effectiveness of R&D tax incentives on innovation in developing countries, especially given that firms might be incentivised to mislabel non-R&D expenditures as such. This is why further analyses should also consider other outcomes, such as patents filed, to test the robustness of more common R&D expenditures.

**Table 6.3 The causal impact of R&D tax incentives in developing countries**

Study	Geographical Area/Scope	Empirical strategy	Period	Main incentive	Main outcome	Key findings
Jia and Ma (2017)	China	Price elasticity model Firm-level panel data	2007-2013	Tax incentives for R&D (user cost)	R&D expenditures	<ul style="list-style-type: none"> <li>10% reduction in R&amp;D user costs leads to a 3.97% increase in R&amp;D expenditure.</li> <li>Significant increase amongst private firms, but little on SoEs. This could be explained by liquidity constraints for firms lacking political connections.</li> <li>Reducing political intervention is a complementary policy to R&amp;D tax incentives to promote firm innovation in developing countries.</li> </ul>
Yang, Huang and Hou (2012)	Taiwan	PSM, Panel IV, GMM Firm-level panel data	2000-2005	Tax incentives for R&D	R&D expenditures	<ul style="list-style-type: none"> <li>Positive effect of R&amp;D tax credit for R&amp;D expenditure, especially for electronics firms.</li> <li>Moderate marginal effect, ranging from 0.094 and 0.120. Results are low with respect to similar studies from developed countries.</li> </ul>
Crespi et al. (2016)	Argentina	Dynamic Firm-level panel data	1998-2004	Tax incentives for R&D (user cost)	Investments in R&D and innovation	<ul style="list-style-type: none"> <li>Elasticity of total R&amp;D and innovation investment to the user cost of capital is greater than 1.</li> <li>Effects vary depending on firm characteristics.</li> <li>The pure elasticity of R&amp;D – after removing investment in capital goods – is less than 1.</li> </ul>

Note: PSM: Propensity Score Matching; GMM: Generalised Method of Moments.

## 7 Summary and Discussion

Low- and middle-income countries often face a dilemma when it comes to corporate income tax. While these countries often rely on this source of taxation more than developed countries, many low-income countries have in recent years slashed their effective CIT through narrowing their tax bases using tax incentives (Abramovsky et al., 2014). While tax competition is an important reason for the increase in tax incentives, we have seen that it is not the only reason, as tax incentives can also be motivated by industrial development policies and other domestic considerations.

In this report, we have seen that the prevalence of tax incentives in developing countries has increased substantially in recent years, despite widespread uncertainty about their related costs and benefits. Best practices for tax incentives can provide useful guidelines for policy recommendations in the absence of evidence. While it is possible to find circumstances under which certain tax incentives are justifiable (for instance, when investment is mobile), in most cases it is doubtful that the benefits exceed the costs. Moreover, tax holidays are particularly susceptible to attract short-lived, one-off investment and should be avoided. Klemm (2010) suggests adopting lower CIT rates as being the best substitute to tax holidays for attracting FDI.

The case studies for Ethiopia and Ghana have shown that the design of tax incentives can be improved using principles of best tax design and evidence-based strategies. First, Ethiopia should consider removing the reduced rates for extractive industries. While in Ghana the tax rate applicable to the extractive sector is *de jure* above the standard CIT rate in line with best practices for a well designed tax system, fiscal concessions for large investments undermine the original objective. Second, if both countries would like to continue to have CIT incentives for other sectors, they should consider (i) cost-based as opposed to profit-based incentives, or if profit-based incentives are more desirable, Ethiopia could consider using reduced rates rather than tax holidays; and (ii) reducing the variation in preferential treatment across priority sectors and geographical areas to reduce complexity, non-neutralities, and compliance and administration costs. There are also opportunities to improve the governance of incentives in both countries. This is probably applicable to other countries that could benefit from conducting revisions of their tax incentives schemes using principles of best tax design, and institutionalising the monitoring and evaluation of their schemes.

The existing body of empirical evidence to guide the design of tax incentives is scarce and inconclusive. The few available studies show that the impacts on economic outcomes vary by context, type of tax incentive and outcome. For example, Klemm and Van Parys (2012) find that longer tax holidays are effective in attracting FDI in Latin America and the Caribbean, but not in Sub-Saharan Africa. Evidence from place-based tax incentives from India and China suggest that tax incentives can generate additional investment and economic activity; however it is difficult to establish whether results from specific context are applicable elsewhere. For example, tax incentives in China were granted as part of a

bundle of incentives, which may simultaneously affect investment and related economic outcomes, and makes identifying the causal effect of tax incentives less straightforward.

From these results it is clear that more quantitative and evidence-based analysis is needed for better policy-making. Although it is challenging and data intensive, more can be done to measure both the costs and benefits of tax incentives as more and better data becomes available. From our cases studies in Ethiopia and Ghana, we have seen that corporate tax incentives are important components of the tax systems in each country. We have also highlighted the significant variation of tax incentives across sectors and geographical areas. This provides an interesting setting for conducting new research to understand how tax incentives affect economic outcomes. In Ethiopia, digitised administrative and survey data on firms' economic activities and tax payments already exist; however, its coverage, quality, and access for research purposes could be improved. In Ghana, digitised administrative data for business tax returns is limited, and TAXDEV researchers are currently involved in a data capture exercise to digitise business' tax returns. Going forward, TAXDEV researchers will work with policymakers in Ghana and Ethiopia to characterise the effective CIT rates facing different activities, using information on tax rules and (varying) assumptions on, for instance, the profitability of activities, before exploiting administrative data to estimate the revenue and other impacts of these tax incentives.

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