

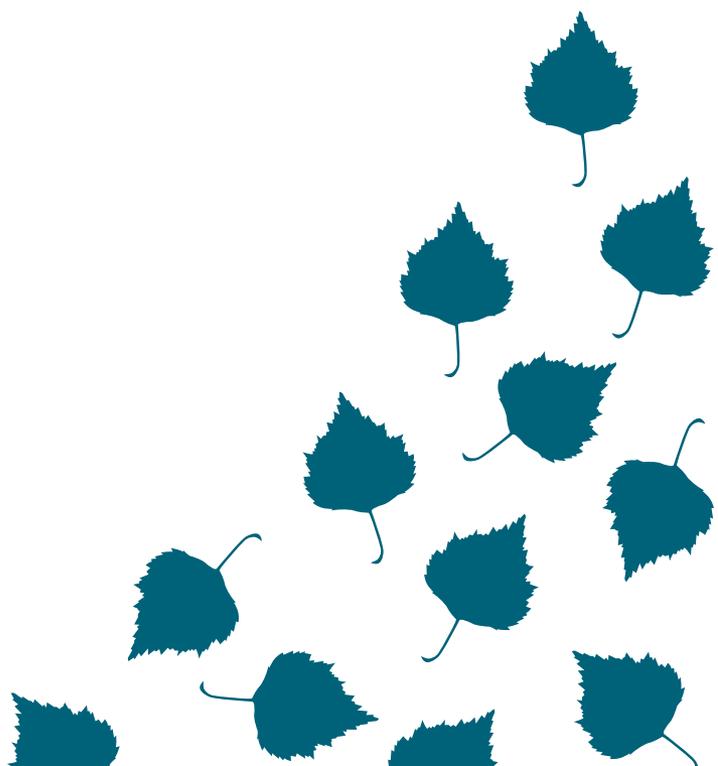
EKONOMI OCH SAMHÄLLE
ECONOMICS AND SOCIETY



HANKEN

TAX REVENUE AND LABOUR MARKET CHALLENGES OF DEVELOPING COUNTRIES

CAROLINE SCHIMANSKI



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Tax Revenue and Labour Market Challenges of Developing Countries

Key words: domestic resource mobilization, multinational companies, profit-shifting, informality, racial segregation, racial wage gaps

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Caroline Schimanski
Hanken School of Economics
Department of Economics
P.O.Box 479, 00101 Helsinki, Finland

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PREFACE

After many many hours of studying for the course work and working on my thesis articles at Economicum, at UNU-WIDER, in Berkeley, at home and from many other places around the world, indoors and outdoors, in rooms without windows or with an inspiring view ... this thesis is now completed and the end of my time as a doctoral student in Economics at the Hanken School of Economics is approaching. From starting the PhD till submitting the thesis 4.5 years have passed and another almost 8 months have passed till the public defence. Little did I realize what all the PhD process would entail when I started writing my initial PhD proposal draft in autumn 2011. The PhD has been a challenging and intense but enriching process and I have learnt a lot on academic, professional and personal fronts. Looking back the counterfactual and the effective opportunity costs of me pursuing a PhD and more specifically a PhD at the Hanken School of Economics will of course remain forever unknown, but in the end I am very happy I decided in favour of doing a PhD in Economics and am also very happy I am able to successfully conclude this chapter of my life now.

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I am very thankful to Finn Tarp and Jukka Pirttilä for hiring me as a research assistant at UNU-WIDER just after completing my first year courses till finishing my PhD and giving me the opportunity to stay closely connected to the development economic research frontier, while allowing me to work next to my research assistant tasks also partly on some articles of my PhD. I would like to express special thanks to my PhD thesis supervisor Jukka Pirttilä, who has also served as my supervisor at UNU-WIDER and co-author of my third thesis article for his support and guidance throughout the PhD process and giving me the opportunity to visit Copenhagen University for one week and the University of California Berkeley for one academic year. Many thanks also go to the many current and former colleagues, PhD interns and visiting researchers at UNU-WIDER for their support and fruitful discussions. I also thank Andy McKay, who is also a co-author of the third thesis article.

I am grateful to Emmanuel Saez for hosting me at UC Berkeley and his comments. Also, I want to express my sincere thanks to various members of the UC Berkeley faculty, in

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My special thanks go to Tulio Cravo for his encouragement and support in pushing me to finish my PhD faster and keeping me motivated by working jointly on other papers and opening up new opportunities for me by convincing the Latin-American colleagues at UNU-WIDER to switch to Spanish in communicating with me. My special thanks also go to Antonio Currais for encouraging and supporting me, for his non-economist perspective questions about my research and pushing me to take some real breaks from the PhD and work, meaning sometimes not touching my laptop for a few days. I also want to thank Averi Chakrabarti and Naveen Sunder, who with their continuous encouragements and discussions about research and other challenges in the process supported me throughout the PhD. I am also thankful to Supawan Saelim and Jerilene Creado for their encouragements during the PhD process, especially while staying in Helsinki for a few months and in California at the same time, respectively.

My thanks also go to my friends from my Finnish course Marianna Dominijanni, Mario Costa, Marilia Susana Morgado and Leyla Nasib, and my friends all around the world, who each in their own way have been helping me along or at different points of the way, making daily life in Helsinki more enjoyable, came to visit me in Helsinki, discussed research ideas and challenges and believed in me and my plan to pursue a PhD in Economics. My thanks also go to the PhD students and faculty at Economicum and to the many others all around the world, who provided guidance on settling in Helsinki, commented on my articles and at various conferences, motivated me and supported me in various ways at different stages in the journey of completing the PhD.

Finally, I want to thank my family and in particular my parents Marjan and Klaus Schimanski and my siblings Theresa and Adrian Schimanski for their support, visits in Helsinki and Berkeley and stimulating my curiosity to always want to learn something new. I also want to thank my grandfather Gerard Zijlstra for inspiring me to work on development issues and for international organizations.

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I. INTRODUCTION

1. General Motivation for PhD Thesis Research

Decades of efforts in reducing poverty have resulted in noticeable progress, in more than halving the number of people living in absolute poverty since 1990¹ and reducing the number of countries classified by the World Bank as low income countries from 63 in 2000 to 31 in 2017.² Nevertheless, there still remain numerous challenges for developing countries in catching up with the developed countries. To address these challenges the international community has starting with the millennium development goals (MDGs) over the period from 2000-2015 and followed up by the sustainable development goals (SDGs) set itself clear development targets to be achieved by 2030.

This composite doctoral thesis consists of four independent articles relating to two broad development challenges, the need for domestic resource mobilization and reducing discrimination based on race. The first three articles relate to the concern that developing countries suffer from low fiscal capacity as discussed in (Besley and Pearson, 2013) and thereby forgo potential tax revenues from corporate and private income tax. Forgone tax revenues from corporate taxation are predicted to be of much larger dimensions than are now received in the form of aid. Reports using estimates based on national accounts and trade flow data claim that developing country governments lose potential tax revenues ranging around 800 billion US Dollar per year and 50 billion US Dollar per year just in Africa through profit-shifting³ by MNCs and other illicit financial outflows (Kar and Spanjers, 2015; UNECA, n.d.). This creates according to Kar and Spanjers (2015) a 10:1 ratio with aid inflows in these countries, which stresses the immense potential combating these outflows could have. However, these figures have been heavily criticized as there is large variation in the estimates as a comparison by Pirttilä and Johannsen (2016) shows.

As developing countries' economies are largely characterized by informal employment, developing countries depend much more than developed countries on corporate tax revenue. While the estimates of corporate tax revenue as share of total tax revenues

¹ <http://www.un.org/millenniumgoals/poverty.shtml>

² Based on estimates from databank.worldbank.org/data/download/site-content/OGHIST.xls and databank.worldbank.org/data/download/site-content/CLASS.xls

³ Profit-shifting refers to the movement of profits between firms located in different countries, which are part of the same MNC group. The assumption is that firms move their profits to keep their earnings in a secure destination and to benefit from favourable tax arrangement in a particular country with the ultimate goal to maximize the MNCs worldwide group after tax profit.

vary, ranging from over 80% of Nigeria's total government tax revenue coming from MNCs, reported by Steyn (2015), to between 13-18% coming from corporate income taxes in other African countries estimated by the OECD (2016), these numbers are clearly higher than the estimates for developed countries. According to OECD (2016) corporate tax revenues make up only about 8.5% of total government revenues in an OECD country average.

This henceforth highlights the importance of corporate tax revenues for developing countries. Further evidence, in particular evidence on the existence and extent of systematic profit-shifting is therefore of special concern and importance for developing countries to be able to identify and close potential loopholes in their legislation and to find the optimal balance between maximizing government tax revenue and attracting foreign direct investment (FDI), which can be welfare enhancing through job creation and knowledge spillovers. However, the profit-shifting literature has largely been focused on the US and European countries, whereas those developing countries claimed to be most affected have until recently been left out from the analyses. This negligence can be attributed to a lack of data from developing countries. With the expansion of the global firm-level dataset Orbis this is now changing. Therefore, the first two articles contribute to closing this gap in the literature by taking a firm-level perspective and investigating the existence and extent of systematic tax and by other means incentivized profit-shifting by multinational companies (MNCs) out of developing countries, which is considered a main component of illicit financial flows.

The first article re-estimates the results of an influential paper in the profit-shifting literature by Dharmapala and Riedel (2013) using a more recent and global sample as well as effective tax rates. This article can only confirm the earlier evidence on a European sample and statutory corporate tax rates, when using average effective corporate tax rates. The second article further expands on the first article's results and methodology, by considering more complex and multi-directional profit-shifting structures and additional incentivizing measures and specifically focuses on shifts out of developing countries. However, the results cannot provide any robust causal evidence for profit-shifting out of developing countries, neither tax motivated nor incentivized by moving profits to more developed locations with lower credit risk and lower risk of expropriation. While these results are surprising in the light of the recent scandals such as the "Panama Papers" and the existing non-causal evidence, the findings should not necessarily be regarded as evidence for the absence of profit-

shifting or a lower than expected scale of profit-shifting. Instead these results stress the shortcomings of the available incomplete and non-representative datasets and highlight the complexity of the profit-shifting schemes that may not be systematically identifiable. Moreover, the current results may be characterized by measurement error due to the sizeable standard errors that result in imprecise null results.

While the third article still relates to forgone tax revenue in developing countries, it links at the same time to the fourth article in terms of both addressing development challenges in the labour market. The third article moves beyond potentially lost government revenues from the corporate sector and focuses instead on private persons and estimates the elasticity of formal work in sub-Saharan Africa. As developing countries' economies are characterized by shares of informality of around 70%, formal employment is the precondition for being tax liable and creating the opportunity for the government to collect personal income taxes. Findings from four countries suggest, that the formality status is not significantly affected by tax induced variation between formal and informal net income and that while mean net incomes in the formal sector are generally higher than in the informal sector, this difference is not significant when controlling for other demographic characteristics. Just the additional benefits that a formal sector job may bring along in these countries may thus be an insufficient incentive to formalize. Hence, there is still a long way to go for these countries to increase their tax base from personal income taxes.

The fourth article, like the previous one concerns challenges in the labour market and relates to the second specific development challenge addressed in this composite thesis, namely race-based labour market segregation and wage inequality. While a development challenge this topic not only concerns developing countries but also still many developed countries. The fourth article therein takes the small Caribbean island country Trinidad and Tobago, which is marked by its colonial history of racial segregation, as an example to estimate the evolution and extent of educational, occupational and industry sector segregation and wage gaps between the two major ethnic groups Indian and African origin Trinidadians and Tobagonians (Trinbagonians). Results suggests that even more than 50 years after independence the colonial history has still a lasting impact measured in a small though notable persistent level of race-based educational, occupational and industry segregation. Nevertheless, race-based segregation plays a smaller role than gender segregation in this country. Interestingly, wage gaps have until the early 2000s been favouring African origin

Trinbagonians where after they shifted in favour of Indian origin Trinbagonians, but are generally small. Moreover, findings suggest a shift in the wage gap over the income distribution. Over time wage gaps move to favour to a larger extent Indian origin Trinbagonians not only at the top but also at the middle of the income distribution. Finally, finding with require further research suggest that wage gaps are higher in the public than in the private sector and wage gaps in the public sector as well as public sector employment shares appear potentially moderated by the political party in power.

Overall the two broad development challenges addressed in the four articles of this composite thesis can be related to specific subsections of the SDGs and the specific challenges in achieving these goals in greater detail. The first two articles address SDG 16.4 and SDG 17.1 to “significantly reduce illicit financial flows [...]” and “strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection” (UN, 2015a, b) whereas the third is closer related to SDG 17.1. Moreover, these articles relate to a surge in research projects by international organizations, such as UNU-WIDER’s⁴ work programme ‘The economics and politics of taxation and social protection’ and the OEDC’s⁵ Base Erosion and Profit-shifting (BEPS) project and the African Tax Administrative Forum.

Secondly, the challenges concerning race-based segregation and wage inequality addressed in the fourth article relate to SDG 10.2 and 10.3 that specifically address equal opportunities and outcomes and economic inclusion irrespective of race and ethnicity and the elimination of all discriminatory laws (UN, 2015c).

The remainder of this thesis is structured as follows: The following section motivates the two development challenges addressed in this thesis with a broader discussion of the literature on these topics. More specifically, it firstly provides an overview of the literature concerning domestic revenue mobilization in developing countries, distinguishing between challenges related to revenues stemming from corporations and those from individual tax payers and secondly discusses previous research in the area of race-based labour market segregation and wage gaps in general and specifically in Trinidad and Tobago. Section 3 provides a brief summary of each of the studies. Section 4 collects the four articles.

⁴ United Nations World Institute for Development Economics Research (UNU-WIDER)

⁵ Organization for Economic Co-operation and Development (OECD)

2. Overall Literature Review

2.1 *Domestic Revenue Mobilization in Developing Countries*

Especially since domestic revenue mobilization has been a key action point of the Third International Conference on Financing for Development's Addis Ababa post-2015 action agenda and has been included in the SDGs, it receives increasing attention in development cooperation from donors, international organizations, national governments and academics. Domestic Revenue mobilization, measured as government revenue as percentage of GDP in developing countries is currently very low and lacks far behind that in developed countries. Its median ranged in 2000 between 10% and 15% for low income and middle income countries respectively and in the meantime rose to 15% and 20%, whereas the median government revenue as percentage of GDP represents around 23% in developed countries (IMF and World Bank Group, 2016). An IMF report identifies multiple distinct challenges to raise domestic revenues in developing countries, namely, hard to tax sectors, in particular the large informal sector, and non-compliance in others and multinational companies and state owned firms that limit revenue collection through tax planning or non-payment of taxes. Moreover, these countries are challenged by the low capacity of revenue authorities, poor governance and weak tax morale of tax payers as well as increasing tax competition between countries driving down tax rates and trade agreements that further reduce tax revenues (IMF, 2011).

Given developing countries' higher dependence on corporate tax revenues due to the largely informal economies and informal employment rates as reported in Charmes (2012) and published by the World Bank of over 90%⁶ for instance in Uganda, Tanzania and Cote d'Ivoire, the focus of much of this literature has been on firms. However, taxes of goods and services (VAT and excise tax) result for several African countries in larger revenues than the corporate tax revenue, as OECD (2016) shows. Nevertheless, one can distinguish between three streams of the literature: First, there is a rising number of randomized control trials and other field experiments to evaluate the impact of various interventions targeted at stimulating tax compliance and tax moral in developing

⁶Informal employment (% of total non-agricultural employment). Defined as share of informal workers among all those working in non-subsistence agriculture. Retrieved from: <https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS?locations=UG-TZ-CI&view=chart>

countries, such as experiments in Rwanda, Colombia, Israel and Ecuador by Mascagni et al. (2017), Ortega and Scartascini, (2016a, b), Ariel (2012) and Carrillo et al. (2016). Others evaluate incentives for tax collectors, such as in an experiment in Pakistan by Khan et al. (2016). Again others have conducted experiments on whether information provision and reducing red tape and the costs of formalizing a business can increase the share of formal businesses (De Mel et al., 2013).

A second stream focuses on estimating the status quo. More specifically such studies aim at measuring the extent of tax non-compliance and illicit financial outflows, of which profit-shifting is one means to be able to map existing loopholes through which potential domestic revenues are lost and design appropriate policies to combat this. Firm-level data for developing countries data recently becoming increasingly available through the commercial database Orbis, provided by Bureau van Dijk and governments allowing administrative data⁷ to be used by researchers for tax research, has spurred research on this matter and international organizations incorporating domestic resource mobilization into their work programs. In particular the OECD's BEPS project has received a lot of attention. More geared towards general domestic revenue mobilization and capacity building, rather than primarily on profit-shifting, this topic has also gotten onto the agendas of for instance the IMF, World Bank, UNU-WIDER and European Commission.

A third stream aims at estimating the elasticity of formal work, meaning the impact of tax rate changes on the probability to formalize and pay taxes. What constitutes formal work is a matter of definition and as discussed in Henley et al. (2009) these definitions do not necessarily overlap in the people they cover. Whereas some distinguish based on employment relations, such as contracts, others do so based on the type of work (salaried versus self-employed) and firm size and again others combine the two and differentiate between formality status based on social security contributions. While there exist numerous studies looking at the impact of interventions aimed at reducing red tape and costs of registering a business as formal business, such as Bruhn and McKenzie (2013, 2014); Benhassine et al. (2018); De Mel et al. (2013); McKenzie and Sakho (2010) and Anrande et al. (2014), work on how tax rate changes, exogenously affecting the sectoral pay premium, can more passively affect the share of informal workers is limited. Here the only available studies on developing countries are studies

⁷ See Reynolds and Wier (2016)

by Fernandez and Villar (2017); Kugler et al. (2017) and Morales and Medina (2017) exploiting a tax rate change of 13.5% in Colombia. From these a consensus arises despite using different datasets that a reduction in the tax rate can indeed raise the probability of being a formal worker. Similar evidence is provided for Russia and Serbia by Gorodnichenko et al. (2009) and Žarković Rakić et al. (2016). Other work on the tax elasticity of labour supply exists only for developed countries, such as Jäntti et al. (2015). To date, the only existing empirical study on African countries is one by Auriol and Warlters (2012), who simulated the marginal costs of public funds for various tax measures considering also the informal economy, but did not address how the tax burden moderates the extent of informality in these countries. While characterized by even larger rates of informality than in Latin-America and thus highly policy relevant, evidence on the responsiveness of the share of informality to the tax burden in African countries, is still lacking. Hence, the third article aims at contributing to closing this gap.

While the second stream is clearly addressing domestic revenues lost to multinational companies, the first and third, concern both businesses and private persons.

2.2 Race-based Labour Market Segregation and Wage Gaps in Developing Countries and Trinidad and Tobago in particular

Most of today's race-based discrimination in developing countries has its roots in the countries' colonial history, which came in many countries along with slave trade and the use of Africans as slaves to work on plantations (Wage, 2010). While slaves were freed in 1838 with the official abolishment of slavery, there is large literature on the US (Hegewisch and Hartmann, 2014; Card and Krueger, 1993; Chandra, 2000) documenting the lasting, but over time decreasing labour market inequalities between individuals of African origin and whites. Such inequalities have generally been measured in terms of educational and occupational segregation, referring to the extent of over (under-) representation of particular racial groups in certain education levels and occupations, and wage differences between the two groups. Much less is known however concerning the actual extent and evolution of racial segregation in developing countries in the Americas and the Caribbean as well as in the rest of the world with relatively more recent discriminatory (colonial) regimes. Of the few existent on developing countries most focus on Brazil (e.g. Salardi, 2013; Bourguignon, 2007; Garcia et al., 2009; Lovel, 2000; Pinto, 2014; Chadarevian, 2011; Campante et al.,

2004) and South Africa (e.g. Burger and Jafta, 2006; Gardin, 2014, 2017; Mwabu and Schulz, 2000) and generally use whites as the racial reference category for labour market discrimination and wage gaps. Another string of the literature focuses on minorities, indigenous groups, different casts or immigrants.

An analysis on Trinidad and Tobago poses a different case. Nowadays individuals of African and Indian origin represent together about 80% of the population. The remaining are mostly mixed (18%) and only a very small fraction classifies itself as white. It is in that respect especially interesting and adding to the literature as discrimination in developing countries is recently increasingly observed to occur between various non-white racial groups and various non-minority groups. Moreover, Trinidad and Tobago is one of the classic examples in the literature on ethnic politics, such as discussed in Horowitz (1985), Brown (1999) and Sriskandarajah (2005). As the abolishment of race-based discrimination is part of the sustainable development goals it is therefore important for the design of targeted policies, to combat this, to better understand the extent and evolution of racial educational, occupational and industry segregation and wage gaps in a developing country context.

Racial segregation, meaning the over or underrepresentation of a particular group in a respective educational level, occupation or industry, has also in Trinidad and Tobago its origin in the country's colonial history and was strictly enforced over several centuries. Initially the colonial powers let Africans work as slaves on Trinidad and Tobago's sugar plantations but after the abolishment of slavery Africans were not regarded suitable to work on or own sugar plantations. To replace the former slaves, instead Indian labourers were brought into the country to work as indented labour on the plantations, without the right to work elsewhere till the expiration of their contract. Besides, though in much smaller scales also Syrian, Lebanese, Portuguese and French were brought to work in Trinidad and Tobago, all separated into different occupations whereby any government and higher positions were reserved for the British colonial and Commonwealth rulers (Williams, 1962). Despite intermarriage and large within-group differences, the colonial rulers continued the racial segregation into three broad groups, Whites, Creoles and Indians, which had become common practice and distinguished political movements identifying with a particular group and their causes. This was also the case when granting restricted and universal adult suffrage in 1925 and 1946 conditional on literacy. In particular, the People's National Movement (PNM) addressed largely the causes of those of African origin whereas the Democratic Labour

Party (DLP) those of the people of Indian origin. By that time the racial classification did not solely distinguish on cultural background, but given the history also distinguished those of African descent as largely urban, living in the northern parts of the island and the Indians working on the plantations or having fled the plantation but nevertheless settled in the rural surroundings associated with agriculture and spatially based in the central and southern regions. Still today those of Indian origin are slightly more likely to live in rural areas, but even more visible, individuals of different races live in different parts of the country.

In fear to lose their cultural ties those of Indian origin furthermore initially largely rejected state and the oftentimes catholic schools. This resulted in those of African origin being initially much more likely to be literate, better educated and representing a larger share in public service positions. Over time thus African descendants filled public sector jobs, while the remaining white population continued to be in control of the business world, while Indian descendants remained in the rural agricultural sector (Bissessar and Gaffar la Guerre, 2013). While political parties were initially associated with particular racial groups, the intra race ethnic rivalries, occupational and geographical factors and intermarriage have over time gained importance and developed Trinidad and Tobago into a more plural society (Bissessar and Gaffar la Guerre, 2013; Farrell, 2012). Since independence in 1962 all people have been free and all races regarded equal as embedded in the national anthem “Here ev’ry creed and race find an equal place” (p.284) (Williams, 1962). In 1963 Trinidad and Tobago joined the ILO and ratified nineteen conventions on good labour practices and more recently the government initiated a variety of social programs aiming at stimulating equality and aiming at reducing discrimination at the work place.⁸

Even though there is no open racial conflict but peaceful coexistence of the two races, nonetheless, the races remain geographically segregated and debates regarding persisting race-based outcomes often flare up during general elections. There is an extensive anecdotal literature on how Trinidad and Tobago has faced a latent ethnic rivalry over political power and ethnic representation in government between these two

⁸ E.g. Dollar per Dollar (2001), Gate (2004) and HELP program that aimed at reducing university fees as well as technical training costs and free tertiary training, employment support and training as well as unemployment relief programs (URP, in 1992), a Community Environment Protection and Enhancement Program (CEPEP in 2002) providing beneficiaries with temporary jobs, a Maternity Protection Act (1998), the Equal Opportunity Act (in 2000, amended in 2001) and an Occupational Safety and Health Act (enacted in 2004, amended in 2006)

major racial groups since independence (Premdas, 2007; Bissessar and Gaffar Le Guerre, 2013). Moreover, Bissessar and Gaffar la Guerre (2013) point out that electoral outcomes have oftentimes been influenced by the interests of other countries. However, these debates have largely been dominated by assertions of discrimination that draw upon anecdotes, as empirical evidence on race-based segregation and wage gaps for Trinidad and Tobago to guide policies is so far, apart from one snapshot study on race-based wage gaps in 1993, provided by Coppin and Olsen (1998), non-existent. Therefore, the fourth chapter aims to provide empirical evidence regarding the existence of segregation and wage gaps in more recent years.

3. Summaries of Articles

3.1 *'Earnings shocks and tax-motivated income shifting: evidence from European multinationals' – Revisited*

The first article of this doctoral thesis, titled “Earnings shocks and tax-motivated income shifting: evidence from European multinationals’ – Revisited”, published as Schimanski, C. (2017). ‘Earnings shocks and tax-motivated income-shifting: evidence from European multinationals’–revisited. *Applied Economics Letters* (24) 21, 1558-156, re-estimates the findings of the study “Earnings shocks and tax-motivated income shifting: evidence from European multinationals” published in 2013 by Dharmapala and Riedel in the *Journal of Public Economics*. The original article has been an influential study in the literature, based on a new, more causal methodology, which assumes that earnings shocks to a parent firm are forwarded to subsidiaries located in countries with lower but not to subsidiaries in countries with higher taxes. This way this study does unlike other studies in the literature not rely on infrequent and potentially endogenous changes and differences in tax rates. Therefore, it can for the first time control for country-pair-year fixed effects. Using a more recent 10 year panel from 2006-2015 and a global sample this article aims at testing the robustness of the original findings over time and in a broader geographic context as profit-shifting is claimed to happen on a global scale and is not restricted to European MNCs and their subsidiaries in Europe. In addition, this study contributes to the literature by re-estimating the results not solely using statutory corporate income tax rates but also average effective tax rates, which may provide a more realistic picture on the profit-shifting incentives a firm has. Irrespective of the sample, whether restricted to European parent firms and their subsidiaries in Europe as in the original study or on a global scale, this study can only confirm the positive significant evidence of the original

study for profit-shifting from parent firms to subsidiaries with lower average effective tax rates. Estimations based on lower statutory tax rates as profit-shifting incentive cannot confirm the original results. This highlights the importance of considering average effective tax rates.

3.2 Do Multinational Companies Shift Profit out of Developing Countries? - How data availability may hide the evidence

The second article of this thesis, titled “Do Multinationals Shift Profit out of Developing Countries? - How data availability may hide the evidence” is a slightly adjusted version of Schimanski, C. (2018). Do multinational companies shift profits out of developing countries? How data availability may hide the evidence. *WIDER Working Paper 2018/52*. Helsinki: UNU-WIDER. It uses the previous article and dataset as a basis for further extensions of the methodology to provide causal evidence on the extent of profit-shifting out of developing countries. Even though developing countries are hypothesized to be the most affected by profit-shifting, the literature has until recently neglected developing countries and focused mainly on Europe and the US. This study therefore adds to the literature apart from its methodological contribution regarding the ability to control for country-pair-year fixed effects and the wider geographic scope discussed before, in terms of complexity by allowing multi-directional profit-shifting flows among any affiliate not previously analysed in the literature. Moreover, this study includes additional measures other than lower tax rates, such as the countries’ credit rating, corruption level, development and tax haven status that are potentially playing an important role in incentivizing profit-shifting. Unlike the expectations raised based on anecdotal and recent initial evidence, which cannot control for country-pair-year fixed effects, this study cannot find any robust significant evidence for tax-motivated profit-shifting out of developing country affiliates to their parent firm or any other affiliate in a lower tax and or more developed, better credit rated, less corrupt country or tax haven. These results are robust to development status, industry and economic region of the potential profit-shifting origin. Nevertheless, these results should not necessarily be regarded as evidence for the absence of systematic profit-shifting. As the estimates have sizeable standard errors and might thus be plagued by measurement error, these results rather raise concerns about quality of the available data and highlight the need for global requirements to publish unconsolidated financial accounts data.

3.3 *The Elasticity of Formal Work in African Countries*

The in this thesis included article “The Elasticity of Formal Work in African Countries” is a more recent version of McKay, A., Pirttilä, J. & Schimanski, C. (2018). The Elasticity of Formal Work in African Countries. *Tampere Economic Working Papers April 2018/120*. Tampere, Finland: University of Tampere. It addresses the trade-off between the need of African countries to increase domestic revenues from personal income taxes in predominantly informal economies and the risk that formal sector workers may revert to informal work in response to an increase in the tax rate. As little is known about the responsiveness of workers regarding this trade-off in developing countries and in Africa in particular, this study aims at contributing to this literature. Using repeated cross-sectional household survey data from Ghana, Rwanda, Uganda and Tanzania between 1991-2014 this study provides comparative evidence of a very low elasticity of formal work, meaning an on average insignificant probability of informal workers to move into formal sector jobs in response to a reduction in the personal income tax rate. Rwandese women and Ugandan women form in some model specifications an exception. For these groups there is limited significant evidence of an increase, in the share of formal workers if the pay premium of formal sector work rises. Besides, this study provides a descriptive analysis on the (in)formal labour market in these countries and finds very similar income distributions and mean incomes in both sectors. There are various potential explanations for these results. The, if existent, small formal sector pay premiums may not provide sufficient incentive for people to formalize, in particular if there might additionally be a lack of knowledge on how to formalize and or a lack of availability of formal sector jobs. Hence, this highlights the need for further research.

3.4 *Race-based Educational, Occupational and Industry Segregation and Wages Gaps in Trinidad and Tobago*

The fourth thesis article is an older draft of an article, which is in a revised version published as Schimanski, C., Chagalj, C. & Ruprah, I. (2018). Race-based Educational, Occupational and Industry Segregation and Wages Gaps in Trinidad and Tobago. Inter-American Development Bank (IDB) Working Paper Series No.955. This article estimates the extent and evolution of race-based segregation and wage gaps for the two main ethnic groups African and Indian origin Trinbagonians, at the mean and over the income distribution in the private and public sector between 1999-2015. Various segregation indices (Karmel-Maclachan, Duncan-Duncan and Gini) are estimated in

aggregate terms as well as by category and find robust evidence of low but persistent segregation, whereby occupational and industrial sector segregation exceeds educational segregation. Educational segregation however seems to have a strong impact on the subsequent occupational and industrial sector segregation for the most segregated industries and occupations. Mean wage gaps are similarly very small but persistent with large heterogeneity and more notable wage gaps in the public sector. Interestingly, the wage gap shifted over time and over the income distribution in favour of Indian origin Trinbagonians. Moreover, there is some indicative evidence that the share of public employees of the two major races and the wage gaps in the public sector seem to be moderated by the party in power at the national government. These findings however require further research as these results might be biased by some unobserved factors that this study could not control for.

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II. ARTICLES

Article 1: Schimanski, C. (2017). 'Earnings shocks and tax-motivated income-shifting: evidence from European multinationals' - revisited. *Applied Economics Letters*, 24(21), 1558-1566.

Article 2: Thesis article is a revised version of: Schimanski, C. (2018). Do multinational companies shift profits out of developing countries? How data availability may hide the evidence. WIDER Working paper 2018/52

Article 3: Thesis article is a revised version of: McKay, A., Pirttilä, J., & Schimanski, C. (2018). The Elasticity of Formal Work in African Countries. *Tampere Economic Working Papers*. University of Tampere: Tampere, Finland

Article 4: A more recent revised version of the thesis article is published as: Schimanski, C., Chagalj, C. & Ruprah, I. (2018). Race based Educational, Occupational and Industry Segregation and Wages Gaps in Trinidad and Tobago. Inter-American Development Bank Working Paper Series No. 955

CAROLINE SCHIMANSKI

TAX REVENUE AND LABOUR MARKET CHALLENGES OF DEVELOPING COUNTRIES

This doctoral thesis addresses in four articles two broad challenges in the field of development economics. The first two articles aim at providing causal evidence for the existence of systematic profit-shifting by multinational companies (MNCs) with a special focus on shifting out of developing countries as these are claimed to particularly suffer in terms of forgone tax revenue from profit-shifting. The first article re-estimates the results of Dharmapala and Riedel (2013), an influential paper in the literature, using more recent data, expanding its geographic scope and comparing between statutory and effective tax rate incentivized profit-shifting from parent firms to subsidiaries. The second article expands on this by looking into more complex potentially multi-directional profit-shifting flows between any affiliate of the group and other incentivizing factors, apart

from lower statutory or effective corporate income tax rates, such as development status, credit rating, corruption and tax haven status of the country. The remaining chapters three and four address labour market challenges in developing countries, whereby the third article still links to the former through the topic of taxation. More specifically, the third article estimates the elasticity of formal work in sub-Saharan Africa, as the transition into formal employment, in economies largely characterized by informal labour markets, is the precondition for domestic resource mobilization from personal income taxes. The fourth article estimates the extent and evolution of race-based labour market segregation and wage inequality in Trinidad and Tobago, in the light of its colonial history characterized by racial segregation.



HANKEN
SCHOOL OF ECONOMICS

HELSINKI
ARKADIANKATU 22, P.O. BOX 479
00101 HELSINKI, FINLAND
PHONE +358 (0)29 431 331

VAASA
KIRJASTONKATU 16, P.O. BOX 287
65101 VAASA, FINLAND
PHONE +358 (0)6 3533 700

BIBLIOTEKET@HANKEN.FI
HANKEN.FI/DHANKEN

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