

INVESTING IN TRADE PROMOTION GENERATES REVENUE



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Recent analytical literature has concluded that money spent on export promotion tends to foster export growth. This technical paper discusses the findings of recent work by a team of consultants that find that a 1% increase in export promotion budgets increases exports by 0.074%, confirming results in the earlier literature. Their work also suggests that these export gains translate into very large GDP per capita gains. Indeed, a 1% increase in export budgets generates a 0.065% increase in GDP per capita. Trade Promotion Organizations characteristics that tend to generate large export growth do not necessarily generate large gains in terms of GDP per capita growth.

Descriptors: **Export Promotion, Trade Promotion, Trade Promotion Organizations, Evaluation**

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Mention of firms, products and product brands does not imply the endorsement of ITC.

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Foreword

This study follows the successful completion of a joint workshop on Impact Assessment by the International Trade Centre (ITC) and the network of European Trade Promotion Organizations (ETPO) in Vienna in January 2014. Financed by the network, for the network, it aimed to deliver practical assessment solutions for its members. Following the workshop, a group of ETPO members requested that ITC coordinate a European-wide study on their impact on trade and GDP in their respective countries.

For over 50 years, ITC¹ has worked across the globe with Trade Promotion Organizations (TPOs) and other Trade and Investment Support Institutions to build institutional capacity and to support the process of internationalization. All TPOs share certain challenges:

- how to demonstrate to stakeholders that they are delivering a satisfactory return on the investment made by governments, donors, and customers;
- how to make strategic choices about the allocation of resources to the types of exporters or potential exporters, and to different sectors and activities in order to maximize impact;
- what type of governance structure will best support the objectives of the TPO.

The best TPOs have measurement systems that allow them to partly answer these questions, but it is very difficult to provide proof beyond simple anecdote that the TPO intervention has been at the root of export performance improvements at the firm level, let alone at aggregate economic and social level. Given the time frame to grow new export markets, this is particularly difficult if successful impact needs to be demonstrated within the timeframe of budget cycles.

A broad-based macroeconomic study, therefore, that confirms the relationship between the investment in a TPO and economic growth is very welcome. The insights about critical success factors are also valuable. It is always tempting for TPOs to target large businesses that are export-ready, have high growth potential and can generate exports in a relatively short timeframe. This study reminds us that if aggregate economic and social impacts are the ultimate goals, then this choice might need to be reviewed.

It is our hope that TPOs in the developed and the developing world use the insights from this paper to:

- support their resource mobilization efforts with further evidence of the return on investment of a well-resourced and effective TPO;
- seek clarity on the expected impact from stakeholders – if economic and social impacts are the primary goal, then success measures and strategic choices need to take this into account;
- shape their thinking about which types of companies, sectors and markets to focus on to maximize both export growth and longer term social impact;
- analyse the most appropriate mix of services and delivery options to maximize the intended results.

This paper is likely to have a wide audience of TPO leaders, academics, policymakers, donors and project evaluators. If the results of this study resonate with the difficulties and decisions that you have been facing in your TPO or your project, we would love to hear your feedback and your practical insights about how this econometric pattern plays out in reality. Please contact the ITC Trade Support Institutions Strengthening Section on tradesupportnews@intracen.org, or join the conversation on our benchmarking site: <http://www.tisibenchmarking.org/>.

¹ ITC is a United Nations agency jointly supported by the World Trade Organization and the UN Conference on Trade and Development. The Trade Support Institutions Strengthening Section of ITC intervenes to build the capacity of Trade Support Institutions globally, so that internationalizing businesses receive more effective support, including advocacy to policymakers and buyers. <http://www.intracen.org/itc/trade-support/> <http://www.tisibenchmarking.org/benchmarkredesign/>

Acknowledgements

This study has been made possible through the financial contribution of 14 members of the ETPO network². The Trade Support Institutions Strengthening Section of ITC coordinated the overall study, working closely with each participating TPO to assemble and control the validity of the data that was used in the research.

The research was carried out and drafted by Professors Marcelo Olarreaga³, Stefan Sperlich⁴ and Virginie Trachsel⁵ from the School of Economics and Management of the University of Geneva in Switzerland. The research included obtaining the databases and information used in similar studies by other organizations, as well as adjusting the econometric model, processing the information and producing the technical paper that underlies this document.

The Trade Support Institutions Strengthening section, the Office of the Chief Economist, and the Communications and Events section of ITC provided support in the preparation of the executive summary and the production of this paper.

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Acronyms and Abbreviations

The following abbreviations are used:

ETPO	European Trade Promotion Organization
GDP	Gross domestic product
ITC	International Trade Centre
R&D	Research and development
TPO	Trade Promotion Organization
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

Note: Unless otherwise specified, dollar denominations refer to US dollars.

Executive Summary

Trade Promotion Organizations (TPOs) are present in most countries. They provide vital services and expertise to help firms develop and improve their exports.

The growing interest of policymakers in programme evaluation, combined with greater attention from academics, has triggered studies that aim to quantify the impact of TPO activities on national trade performance.

Previous studies demonstrate that trade promotion has an impact on exports. These studies, however, have not fully explored how impact varies, based on governance funding sources or activities. Moreover, no studies have systematically explored whether the impact of export promotion on exports differs from the impact on gross domestic product (GDP).

This study fills these gaps by building on unique data and comprehensive assessment to show the returns on growth in exports and GDP per capita for TPO activities. It is based on data from 94 countries, with a special focus on 14 members of the European TPO network⁶.

The study, commissioned by the International Trade Centre (ITC) and prepared by a team from the University of Geneva, uses data from three rounds of TPO surveys. The World Bank conducted the first global survey in autumn 2005, and the data was used in Lederman et al. (2010). The World Bank conducted a second global survey in autumn 2010. ITC conducted the final round in autumn 2014, centred on the 14 European TPO agencies (ETPOs). The survey contains 19 questions that probe budgets, funding sources, governance and activities of TPOs worldwide. The result is a rich set of new findings.

One dollar spent on export promotion generates \$87 dollars of additional exports

Export promotion spending can generate significant benefits. The study concludes that a 1% increase in export promotion budgets increases overall exports by 0.074%. This implies that one dollar spent on export promotion generates \$87 of additional exports for the median country, confirming the results of earlier literature.

One dollar spent on export promotion generates a \$384 increase in GDP

This study confirms previous research that export promotion has spin-off effects on the domestic economy. Firms that benefit from export promotion generate indirect effects. These spin-offs positively affect the productivity and competitiveness of non-exporting sectors.

The study further concludes that GDP returns are larger than export returns: a 1% increase in export budgets generates a 0.065% increase in GDP. This is equivalent to a \$384 increase in GDP for every extra dollar spent in export promotion in the median country.



⁶ Austria, Belgium, Bosnia and Herzegovina, Cyprus, Denmark, Estonia, Iceland, Italy, Lithuania, Malta, the Netherlands, Slovenia, Switzerland and United Kingdom.

TPOs contribute to a 5%–6% rise in GDP per capita and 7%–8% rise in exports

The study provides information on the specific returns of TPO interventions in terms of export and GDP per capita for 77 countries, including the 14 European TPO countries. On average, TPO interventions contribute to gains in competitiveness and productivity that spill over to firms beyond those it assists directly.

On average, the aggregate direct and indirect effects of TPO interventions contribute to increases in GDP per capita of 5%–6% while the average increase on exports is around 7%–8%. A number of countries show increases of over 10%. France stands out, as export returns are estimated to be 18.8% higher, thanks to TPO intervention. Results for the 14 European TPOs follow a similar pattern.

Trade Promotion Organizations vary widely

Trade Promotion Organizations differ in size, governance, and the type of activities in which they engage. For instance, the export promotion budget-to-exports ratio varies from 0.22% in Portugal to 0.15% in Chile and Colombia, and 0.03% in Bolivia and the United Republic of Tanzania. The budgets vary from \$60,000 in Sierra Leone to \$500 million in the United Kingdom.

Funding, governance, activities affect results

Different export promotion strategies and TPO characteristics affect the return on export promotion spending. This study finds that the origin of funding, the composition of the board, the mix of services and the spread of activities among exporters or non-exporters all have an impact on how much export growth occurs as a result of TPO intervention.

While a few TPOs are fully privately financed (Hong Kong SAR), most are fully government financed. Some spend half their budget on offices abroad (UK), while others are present only in the home country (Uruguay).

While some agencies report directly to a government authority, a sizeable proportion of TPOs report to a board of directors. These boards have different shares of private sector members in its composition.

TPO budget allocations vary, too. Some spend more on large firms, others on small and medium-sized enterprises (SMEs). Different budget splits exist among established exporters, non-exporters or occasional exporters.

Activities range from providing financial assistance (credit, insurance) and market intelligence (firms and products) to assisting with transport logistics, product certification, and participation in trade promotion events. Some promote exports across all sectors; others focus on a limited range of non-traditional exports.

Focusing TPO activities on a reduced number of sectors and/or markets yields higher returns than spreading existing and limited resources thinly to cover all sectors and markets. ITC experience in working with many trade and investment promotion institutions confirms that TPOs that have a clear, focused strategy for their limited resources tend to achieve better results.

The survey explored whether charging for services has an impact. For the 14 European TPOs, charging fees for client services has, up to a certain level, a positive impact on export revenues. There are at least two reasons. First, fees filter out requests from companies which do not have real commitment to exporting. Second, companies that pay for services demand more quality from TPOs. This effect, however, seems valid up to a certain point. As the level of fees rises, SME clients may be discouraged to take up services, reducing marginal returns on export revenues.

The study shows better results for TPO executive boards with a higher proportion of private sector seats. This holds true both for exports and for GDP. Private sector participation in TPO stewardship builds credibility. It informs and confirms the needs of companies – and helps to orient services and resource allocations. Broad representation of sectors and company sizes leads to a comprehensive view of the national industry. Private sector participation in boards also contributes to highlighting linkages and supply chain dynamics to inform TPO service design and provision.

Focusing on established exporters yields higher export growth is another finding. This confirms findings from previous studies that export promotion is most effective at increasing market and/or product diversification.

While focusing on large companies may generate faster and larger export returns, focusing on medium to small companies generates larger GDP per capita growth. The effect on GDP growth is fairly clear in the case of medium-sized firms, but it is less evident for small firms. More research is necessary to analyse the effects for small business.

Somewhat surprisingly, the work of TPOs in country branding and other marketing efforts appears to have less impact on export growth. Country branding and related marketing efforts seek to improve perception abroad. This is not always directly related to exports, especially when these are part of a complex value chain. These efforts are likely to have a more direct influence on tourism and investment attraction. Additional research is required to shed more light on this.

Country branding and general marketing activities do, however, have a positive impact on higher GDP per capita growth.

Strategies for success at a glance



Implications for policymakers

Put together, the results suggest that export promotion has a strong positive impact on export revenue and an even larger impact on GDP per capita. They also suggest that differences in the way TPOs are set up and oriented will influence whether and how much they are able to affect exports or GDP per capita growth.

For policymakers, based on the existing evidence, the study has several preliminary policy implications:

- **The voice of the private sector is important for TPOs.** Private-sector representation on TPO boards ensures greater influence on strategic decision-making. This leads to better export outcomes and also has important spill-over effects on GDP growth.
- **Charging fees for services contributes to better export and GDP growth outcomes.** Fees keep clients focused and agencies in “shape” to remain productive and provide real value for money.
- **Focusing export promotion support on export-ready firms accelerates exports.** Established exporters are better able to take advantage of TPO support that improves impact on exports as well as GDP growth.

- **Narrow strategic focus yields better export growth.** TPOs that concentrate on larger companies that already export, on a restricted number of target markets and mostly on export promotion activities tend to achieve faster export growth.
- **Special strategies are needed for the best impact on GDP growth.** A focus on mid-size firms, country branding and general marketing efforts leads to relatively more impact on GDP growth.
- **Objectives affect portfolio development.** Last but not least, it is important to recognize that to establish a portfolio of priority clients and activities, TPOs need a clear definition of their main objectives. First and foremost, their objectives should clarify whether they will be directed at maximizing export impact or GDP impact.

The size, governance, funding sources and activities of trade promotion agencies will ultimately depend on the strategic needs of each country and government. This study has provided interesting insights into the potential impact of different alternatives. Further research is necessary to deepen the understanding of TPO impact on trade and GDP, particularly for SME clients.

Introduction

Trade Promotion Organizations (TPOs) are present in most countries. They differ in their economic size, their governance, and on the type of activities they engage in. For instance, the export promotion budget to export ratio varies from 0.22% in Portugal to 0.15% in Chile and Colombia and 0.03% in Bolivia and Tanzania. The budgets vary from 500 million dollars in the United Kingdom to 60 thousand dollars in Sierra Leone. Few are fully financed by the private sector (Hong Kong), while most are fully financed by the government (Chile). Some TPOs spend half their budget on offices abroad (United Kingdom); others are only present in the home country (Uruguay). TPOs' activities range from providing financial assistance (credit, insurance) to market intelligence (firms and products), technical assistance for transport logistics, product certification, and participation in trade fairs. Some promote exports across all sectors; others focus on a more limited range of non-traditional exports. The objective of this project is to find out which of these different characteristics of TPOs are more effective at promoting exports, and ultimately, GDP per capita growth.

Merging data from three rounds of surveys of TPOs conducted between 2005 and 2014, we obtain an unbalanced panel across European and non-European countries which spans from 2005 to 2014 with information on TPO budget, funding sources and activities. Results suggest that a 1% increase in the TPOs budget generates a 0.074% increase in exports.⁷ At the sample median, this implies that a 1 dollar increase in the export promotion budget generates an 87 dollar increase in exports.⁸

It is important to note that these are not the social welfare returns because part of the increase in exports is associated with the cost needed to produce those exports. Also, exports may have positive or negative externalities on non-exporters which are not taken into account. In order to partly correct for this and get closer to a welfare measure, which after all is the ultimate goal of policy makers funding TPOs, we provide an extension of our empirical model in which we estimate the impact of export promotion on GDP per capita. We found very large increases in GDP per capita associated with export promotion. A 1% increase in the TPOs budget generates a 0.065% increase in GDP per capita.⁹ At the sample median, and keeping population constant, this implies that a 1 dollar increase in the export promotion generates a 384 dollar increase in GDP.¹⁰ These larger gains in terms of GDP per capita suggest that export promotion generates positive externalities that go beyond the exporters and positively affect the productivity of non-exporting sectors, which may invest more in physical and human capital and reduce x-inefficiencies as they face stronger competition from exporting firms in factor and input markets (de Melo and Robinson, 1992). This may lead some of the non-exporting firms which do not directly benefit from export promotion programs to become exporters.¹¹ Also policies distortions in import-competing sectors and the associated inefficiencies may be endogenously reduced as the export sector booms, which may lead to gains in terms of real income (Baldwin and Robert-Nicoud, 2015).

We then explore the heterogeneity in export returns as a function of TPOs' characteristics with the help of varying coefficient models (see Park et al., 2013, for a recent review) and generalized additive models (see Wood, 2006, for the here implemented methods), which allow us to explore non-linearities in the way TPOs' characteristics and their budgets affect export and GDP per capita growth. There is quite a bit of heterogeneity across countries in export returns in particular. TPOs' characteristics matter. TPOs that have a larger share of their executive board in the hands of the private sector, target only a few sectors and

⁷ The 5 percent confidence interval suggests an elasticity of exports with respect to the budget in the [0.052-0.096] range, which includes previous estimates obtained in the literature, see e.g. Lederman et al. (2010).

⁸ To see this, note that the median export promotion budget in the sample is 6.6 million dollars. The median exports across countries and years is 7.8 billion dollars. Thus a 1 percent increase in the export promotion budget implies a 0.066 million increase. This leads to a 0.074 percent increase in exports, which is equivalent to 5.8 millions dollars. Thus, the dollar return is given by $5.8/0.066=87$. Using the estimated 5 percent confidence interval yields a return in the 37 to 139 dollar range.

⁹ The 5 percent confidence interval of this elasticity is: [0.050-0.080].

¹⁰ To see this, note that the median GDP in the sample is around 39 billion dollars. Thus a 0.065 percent increase implies a 25.35 million dollars increase in GDP, which when compared to the 0.066 million increase implied by a 1 percent increase in the median export promotion budget yields a 384 return on the dollar, with a 5 percent confidence interval in the 209 to 555 dollar range.

¹¹ See Cruz (2014) for evidence of externalities helping non-exporting firms become exporters as nearby firms benefit from export promotion programs.

markets, spend a smaller share of their budget on small firms, and a larger share on established exporters have higher export returns. Some of these characteristics also tend to matter for GDP per capita returns, as for example the focus on established exporters, but there are also some new findings. Focusing on medium size firms, rather than large firms, yields higher GDP per capita returns. Also, a larger share of the budget spent on country image and other marketing activities seem to generate larger gains in terms of GDP per capita, whereas we did not observe any clear relationship for export returns.¹² A larger share of the budget coming from public sources and a larger share of the budget spent on export support services yields lower returns in terms of GDP per capita.¹³

These results are important for at least three reasons. First, they help identify the export promotion strategies and TPOs' characteristics that provide higher returns. They are therefore a valuable guide to TPOs that want to improve their governance and toolkit to help exporters. Second, we also measure returns in terms of GDP per capita. This is important because export growth cannot be the ultimate goal of export promotion policies, but rather an instrument to achieve social and economic growth. Interestingly, our results highlight that what may be good for export growth may not necessarily be good for GDP per capita growth due to the externalities of export promotion on non-exporting firms. This is crucial and suggests that the focus on export growth in the evaluation of TPOs may be misleading. Some interventions, such as expenditure in country image and market activities, may not generate much export growth, but they lead to important GDP per capita growth. Third, the results are based on stronger identification strategies than existing cross-country studies (e.g., Lederman et al. 2010) and therefore help validate statistically less robust results regarding the desirability of export promotion.

We face several econometric challenges when estimating the returns of export promotion. First, there may be omitted variable bias as exports and budget per capita may be jointly determined. This was an important limitation of earlier cross-section studies where omitted variable bias relied on adding as many controls as possible and instrumental variable strategies. The panel data structure of our dataset allows us to partly circumvent this problem using country-specific and year-specific fixed effects to control for unobserved heterogeneity. We can then identify the impact of increases in export promotion budgets within countries rather than across countries, which largely circumvents the concerns regarding omitted variable bias in cross-country studies. A second problem is measurement error in the size of the export promotion budget. In many countries the budget is part of a larger institutional budget (export and investment promotion for example) and disentangling what belongs to export promotion may be tricky. The country-specific fixed effects partly help us address this, but we also use an instrumental variable approach where the rank of the budget is used as an instrument. A third problem is reverse causality. Indeed, economic policies and programs are endogenous and subject to lobbying. In such an environment large sectors are more likely to obtain government assistance. Thus, it may well be that the causality runs from larger exports to larger export promotion programs. We follow two strategies to address this. First, we use lagged variables of export promotion budgets rather than current values. This is consistent with the observation by export promotion experts that the impact of export promotion would be observed one to three years later depending on whether programs target exporting or non-exporting firms or aim at market diversification which may take some time. The second strategy relies on the use of an instrumental variable estimator. We use different strategies to instrument export promotion budgets. In the parametric estimation we use TPOs' characteristics, such as the share of the budget coming from public funding, and the share of the seats in the TPO's board which are in the hands of the private sector. The identifying assumption is that they are correlated with the size of the budget, but otherwise uncorrelated with exports. The use of these instruments certainly changes the interpretation of the coefficients as they are identified assuming that there is no heterogeneity on the impact of export promotion budgets on exports across different agencies, and with the variation in agencies characteristics. In the non-parametric estimation we first test which are the agencies characteristics that do not explain the heterogeneity, and then use those characteristics as instruments. Fourth, sample selection bias is also an issue, as the only countries for which we have 10 years of data are the fourteen European Trade Promotion Organizations that were surveyed by the ITC.¹⁴

¹² In the survey, we explicitly define marketing activities as including trade fairs, trade missions, follow-up services offered by representatives abroad and importer missions.

¹³ In the survey, we explicitly define export support services as including export training, technical assistance and capacity building (regulatory compliance, information on trade finance, logistics, customs, packaging, pricing).

¹⁴ These are Austria, Belgium, Bosnia, Cyprus, Denmark, Estonia, Iceland, Italy, Lithuania, Malta, Netherlands, Slovenia, Switzerland, and the United Kingdom.

For most other countries surveyed, we only have five years of data which stop in 2010. There is also a large number of countries that we did not survey because we could not find any information regarding a national TPO or there were simply too many (the United States being an example with TPOs in several States). The instrumental variable approach is a solution to this. Note that the parametric estimates rely on an homogeneity assumption of the impact of export promotion on exports (and GDP per capita) for countries in and outside the sample. The semi-parametric identification strategy provides an alternative identification strategy that directly models the heterogeneity in returns (via varying coefficient models).

Early assessments of the impact of TPOs (Keesing and Singer, 1991, 1991a) were quite critical of their performance in developing countries. TPOs in those countries were criticized for lacking strong leadership, being inadequately funded, hiring staff which was bureaucratic and not client oriented, and suffering from government involvement. As a result, many development institutions withdrew their support to TPOs. These criticisms of early TPOs led to important reforms in the way TPOs operate in most countries. Moreover the anti-export bias due to protectionist policies in most developing countries up to the 1980s has been significantly reduced. When TPOs were evaluated twenty years later, quantitative assessments of the role of export promotion were more positive. Rose (2005) found that the presence of a diplomatic representation (i.e., a consulate) can increase bilateral exports by 6 to 10%. Lederman, Olarreaga and Payton (2010) estimated that on average a 1% increase in export promotion budgets leads to a 0.05% increase in exports. None of these papers explores the heterogeneity of the impact on exports of different types of governance, funding sources or activities of TPOs, or the returns in terms of GDP per capita. Our paper fills this gap.

There is also a large and growing literature using firm level data that explores which are the types of firms that benefit the most from export promotion. Volpe and Carballo (2008) found that export promotion affects exports mainly along firm's extensive margin in terms of both new export markets and products, but has little impact on the intensive margins of exports in a sample of Peruvian firms. Volpe and Carballo (2010) found that smaller firms are more likely to benefit from export promotion services in Chile. Schminke and Van Biesebroeck (2013) confirm that export promotion works mainly through the extensive margin in a sample of Belgian firms, but experienced exporters do observe increases in their intensive margin. Vargas da Cruz (2014) provides evidence of export promotion services helping Brazilian medium size firms enter the export market, as well as new exporting firms in terms of their managerial organization. Lederman, Olarreaga and Zavala (2015) show in a sample of Latin American firms that export promotion helps firms enter into and survive in export markets, but has little impact on the intensive margin. Van Biesebroeck, Konings and Volpe (2015) show the export promotion has helped Belgian and Peruvian firms survive in export markets during the great recession.

More recently, randomized experiments at the firm level have shown that the returns to export promotion can be large. Atkin, Khandelwal and Osman (2014) conduct an experiment where they offer to a random set of firms the opportunity to export high quality carpets to retailers in the United States and Europe. They found that treated firms had an increase in profits of around 20% and larger increases in the quality of goods they produced, which is consistent with learning-by-exporting. Breinlich, Donaldson, Nole and Wright (2015) also conduct a controlled trial by providing targeted information to a randomly selected set of firms regarding the benefits and costs of exporting. Their objective is to assess the role that information plays on the perceptions that firms have about costs and benefit of selling in international markets. They found that treated non-exporters become less likely to export, whereas treated exporters become more likely to export, suggesting that the provision of information can have an impact on firms' behavior.

The advantage of the literature using firm level data is that it can identify better the type of firm or worker that is benefiting from the program, and the channels through which export promotion affects export growth (e.g., extensive versus intensive margins). The disadvantage of micro-data is that it is not clear how to aggregate results from individual firms or workers to obtain an impact on total exports or GDP. This is important, because the case for export promotion is often based on externalities (positive and negative). By simply observing that firms benefitting from export promotion export larger amounts than firms that do not benefit from the program, we have no indication of how big is the aggregate impact and even the sign of that impact. It is potentially conceivable that badly designed export promotion schemes will lead to a larger fall in exports of firms not benefitting from the program than the increase in exports of firms that benefit from the program. Another, obvious problem is that the problem of sample selection bias is even more severe for various reasons. In this paper we take the alternative route which is to work with aggregate data directly. But it should be clear that these two types of analysis complement each other as they allow to address different types of questions.

Chapter 1 discusses the surveys of TPOs used to construct our dataset, and provides some descriptive statistics regarding the budget, sources of funding, governance and activities of TPOs. Chapter 2 presents the empirical strategy we follow to estimate the determinants of the export and GDP per capita returns to export promotion, as well as the heterogeneity of these returns across TPOs' characteristics. Chapter 3 presents the results and Chapter 4 concludes.

Chapter 1 Data sources and summary statistics

We merged information from three rounds of TPOs' surveys. The first survey was conducted in the autumn of 2005 by the World Bank and the data was used in Lederman et al. (2010). The second round was conducted in the autumn of 2010 also by the World Bank, and the final round was conducted in the autumn of 2014 by the International Trade Center (ITC).

The initial survey contacted all TPOs in the ITC's contact information database available in the ITC's web page in 2005. The list was complemented with the help of World Bank country economists who provided contact information on national TPOs that were not listed in the ITC database. A total of 116 TPOs were contacted by email; 92 answered of which only 4% declined. In 2010, the same 116 TPOs were contacted, and 93 answered positively.¹⁵ In the autumn of 2014 the ITC survey concentrated in TPOs in 14 European countries, which all responded positively.¹⁶ This leaves an unbalanced panel containing information on TPOs' budget, sources of funding, governance, and activities for 94 countries.

The survey contains 19 questions to understand better the budget, sources of funding, governance, and activities of TPOs around the world.¹⁷ Table 1 provides summary statistics for the variables used in these papers for three different samples: one containing all countries surveyed, the second one focusing on all European countries in the sample, and the third on the fourteen European trade promotion organizations surveyed by the ITC in 2014 that we labeled the ETPO sample. It is important to note that this is an unbalanced panel so the averages are not necessarily for the same time period in each country. For non-European countries the sample stops in 2010, whereas for some European countries the sample only starts in 2010.¹⁸

It is important to note that all questions regarding the share of the budget spent on different activities or type of firms, or coming from different sources vary in a scale from 1 to 6. It takes the value 1 if this share is 0, the value 2 if the share is between 0 and 10%, the value 3 if the share is between 10 and 25%, the value 4 if the share is between 25 and 50%, the value 5 if the share is between 50 and 75% and the value 6 if the share is between 75 and 100%.

The share of the private sector seats in the executive board is measured in percentage points by simply taking the number of seats in the hands of the private sector and dividing them by the number of total seats in the executive board.

The rank of TPO responsibility takes the value 1 if export promotion is the only responsibility of the agency; 2 if it is the top two priorities, 3 if it is one of the two top priorities, 4 if it is one of three or more top priorities and 5 if it is secondary to other priorities. Thus as its number increases the focus of the agency in export promotion is diluted.

The strategy of targeting all sectors and destinations by the agency ranks from 1 to 8 relative to strategies that focus on certain types of products, destinations or firms. The higher the value of these variables, the less important it is to target all sectors and destinations in the agency.

The figures in Table 1 suggest that ETPO and other European TPOs have on average a similar budget around 20 million dollars, whereas TPOs in the rest of the world have a smaller budget around 8 million dollars. Figure 1 provides a boxplot with the budget to export ratio of the TPOs in each of the ETPO countries across time.¹⁹ The first important thing to notice is that the export promotion budget represents a

¹⁵ The response rates is around 80 percent, which is astonishing for an email survey. The high response rate is probably explained by the numerous follow-ups done by phone.

¹⁶ These are Austria, Belgium, Bosnia, Cyprus, Denmark, Estonia, Iceland, Italy, Lithuania, Malta, Netherlands, Slovenia, Switzerland, and the United Kingdom.

¹⁷ The survey is available from the authors upon request.

¹⁸ The survey contains other variables not reported in Table 1 but available upon request. These include: the number of years the TPO have existed and the number of their employees, from where it can learnt for example that ETPO agencies are older and have more employees than their counterparts in the rest of the world. They also seem to spend a larger share of their budget in the service sector.

¹⁹ The bottom of the box gives the value at the 25 percentile, the top of the box the value at the 75 percentile. The line in the middle of the box provides median value. The whiskers provide the top and bottom 90 percentile, and the dots above and below the whiskers, the outliers.

very small share of exports. The sample median is marginally above 0.1%. Estonia, Iceland and Malta are the countries with the largest median budget to exports ratios, and Lithuania, Slovenia and Switzerland are the countries with the lowest median export promotion budget to exports ratio. There is quite a bit of variance across time among the fourteen ETPOs in terms of their budget to export ratios with Estonia, Lithuania and Slovenia having the largest variance as illustrated by their larger boxes, and Belgium, Denmark and Bosnia having the smallest variance.

We can also see from the averages reported in Table 1 that ETPO tend to have a smaller share of their board in the hands of the private sector than other European TPOs, but have a larger share of their budget that comes from user fees and public funding (rather than private sector contributions or bilateral and multilateral donors). They spend a smaller share of their budget than other European or rest of the world TPOs on small firms that are established exporters. They spend a smaller share of their budget on marketing than other European TPOs and definitely less than TPOs in the rest of the world. The importance of export promotion among the different responsibilities of the agency is also a bit smaller on average than in other European or rest of the world TPOs. They tend to focus less than European and rest of the world TPOs in promoting exports in all sectors and to all markets.

Because these are simple averages, we also provide a series of boxplots that illustrate the different distribution of some of these characteristics within the ETPO group and in the rest of the world TPOs. Figure 2 shows the relative importance of the budget spent on export support services versus marketing in the ETPO group and in the rest of the world. In both groups the distributions are very similar with a larger share of the budget spent on marketing than on export support services. The similarities of the distributions in the importance of marketing in the ETPO group and in the rest of the world illustrates the importance of looking at these distributions rather than the simple averages provided in Table 1, where we earlier concluded that ETPO spend a smaller share of their budget on marketing than agencies in the rest of the world. Indeed, the average provided for ETPO in Table 1 is smaller than for the rest of the world, but this difference in average seem to be driven by a few outliers.

Figure 3 illustrates the share of budget spent on small, medium and large firms in the two samples. It is quite clear that ETPO tend to spend a relatively larger share on small firms rather than medium and large size firms. There is clear decline in the share of the budget spent by ETPO as a function of firm size. In the rest of the world the largest share of the budget seems to be spent on medium-sized firms.

Figure 4 provides the distribution of the share of the budget spent on exporters, occasional exporters, and non-exporters. ETPO tend to focus primarily on established exporters, and then on occasional exporters, whereas in the rest of the world the differences between these two groups is more blurred, and there seems to be a stronger emphasis on non-exporters.

Figure 5 focuses on sources of funding and again partially contradicts the averages in Table 1. The distributions in the boxplots suggest that ETPO tend to source a lower share of their budget from user fees, and a larger share of their budget from public funding than TPOs in the rest of the world, whereas a quick look at the averages provided in Table 1 would have led to a different conclusion. Again, simple averages may be strongly influenced by a few outliers, whereas observing the distributions provided by boxplots gives a more complete and accurate description of the differences between these different groups of TPOs.

Finally, let us take a first shot at the question of returns to export promotion. Figure 6 provides the unconditional correlation between exports and export promotion budgets. No causal interpretation should be given to this figure, but it simply illustrates that exports increase as export promotion budgets increase. The 14 ETPO agencies are highlighted in red in this figure. For countries above the lowest smoothing line exports tend to be above the average level for countries with similar export promotion budgets, and for those below the lowest line exports are below the average level for countries with similar export promotion budgets.

Chapter 2 Empirical strategy

Our objective is to measure the impact of changes in export promotion budgets on exports and GDP per capita and determine which are the types of TPO characteristics (governance, activities, funding) that lead to higher returns. For the sake of presentation we split the introduction and discussion of the models we have looked at in two steps: first the standard linear fixed effects panel model, then its extension towards a semiparametric varying coefficient model with fixed effects.

2.1. Standard linear fixed effects panel models

The basic specification of fixed effects panel models is the following:

$$\begin{aligned}\ln(\text{exports})_{c,t} &= \beta^x \ln(\text{budget})_{c,t} + \gamma_c^x + \gamma_t^x + \varepsilon_{c,t}^x \\ \ln(\text{GDP/capita})_{c,t} &= \beta^y \ln(\text{budget})_{c,t} + \gamma_c^y + \gamma_t^y + \varepsilon_{c,t}^y\end{aligned}\quad (1)$$

where $\ln(\text{exports})_{c,t}$ is log of exports of goods and services in country c at time t ; $\ln(\text{GDP/capita})_{c,t}$ is log of GDP per capita in country c at time t ; $\ln(\text{budget})$ is the log of the budget of the TPO in country c at time t ; β^x and β^y are our coefficient of interest that capture the export and GDP per capita returns associated with export promotion (defined as the percentage increase in exports following a 1% increase in the export promotion budget); γ_c^x , γ_c^y , γ_t^x and γ_t^y are country-specific and year-specific fixed effects in the export and GDP equations, respectively; $\varepsilon_{c,t}^x$, $\varepsilon_{c,t}^y$ are i.i.d error term.

The country fixed effects control partly for the size of the country among other unobserved time invariant country characteristics. As size is time variant the country fixed effect may not perfectly control for it. We prefer not to include GDP as a control because (a) it is clearly endogenous as exports are part of GDP, and (b) it has a (mutually causal) relation with the export promotion budget that could blur the measurement of the total impact of budget on exports. However, population is unlikely to be endogenous (over the relatively short time span of our dataset: 2005-2014) or affected by budget so that we use it as a control. Equation (1) becomes:

$$\begin{aligned}\ln(\text{exports})_{c,t} &= \beta^x \ln(\text{budget})_{c,t} + \delta^x \ln(\text{pop})_{c,t} + \gamma_c^x + \gamma_t^x + \varepsilon_{c,t}^x \\ \ln(\text{GDP/capita})_{c,t} &= \beta^y \ln(\text{budget})_{c,t} + \delta^y \ln(\text{pop})_{c,t} + \gamma_c^y + \gamma_t^y + \varepsilon_{c,t}^y\end{aligned}\quad (2)$$

where $\ln(\text{pop})_{c,t}$ is the population in country c at time t , and δ^x and δ^y are parameters to be estimated.

Because we have a particular interest in the performance of European TPOs, we also ran the above equation on a sample containing observations only for European countries. To be able to determine whether the returns of European TPOs are statistically different from the returns in the rest of the sample we also estimate equation (2) and add an interaction term between the budget and a dummy that takes the value 1 for all European countries (ETPO) and zero otherwise:

$$\begin{aligned}\ln(\text{exports})_{c,t} &= \beta^x \ln(\text{budget})_{c,t} + \delta^x \ln(\text{pop})_{c,t} + \pi^x \text{ETPO} \ln(\text{budget})_{c,t} + \gamma_c^x + \gamma_t^x + \varepsilon_{c,t}^x \\ \ln(\text{GDP/capita})_{c,t} &= \beta^y \ln(\text{budget})_{c,t} + \delta^y \ln(\text{pop})_{c,t} + \pi^y \text{ETPO} \ln(\text{budget})_{c,t} + \gamma_c^y + \gamma_t^y + \varepsilon_{c,t}^y\end{aligned}\quad (3)$$

The sign and statistical significance of π^x and π^y address the questions of whether the returns are statistically larger or smaller in Europe than in the rest of the sample. To preempt our discussion below on the heterogeneity of the impact, it is important to note that to correctly interpret these estimates it is crucial to assume that the returns to $\ln(\text{budget})$ are constant across countries and time within the ETPO and rest of the world group. Then β^x , and β^y respectively, can be interpreted as the *average impact in the rest of the world* of $\ln(\text{budget})$ on $\ln(\text{exports})$, and $\ln(\text{GDP/capita})$, respectively; $\beta^x + \pi^x$, and $\beta^y + \pi^y$ measure the *average impact in Europe*. In case this assumption is violated, neither the standard least squares methods, nor the standard instrumental variable estimation methods are valid.

Measurement error is a potential problem in the variable capturing the export promotion budget, as with any survey data. Moreover in the case of export promotion budgets the problem may be larger, as many TPOs are embedded in larger institutions with larger budgets, and it is not always easy to assess the share of the budget granted to export promotion rather than other activities. For instance many TPOs are part of trade and investment promotion agencies, where it is not always possible to disentangle the share allocated to export promotion from the one given to investment promotion. The country fixed effects partly solve this problem, as we are identifying the coefficients with the within country variation. But measurement error remains a problem that we address with an instrumental variable estimator. As it is standard in the literature we use the rank of the export promotion budget within a country as an instrument for the export budget measured in dollars. The idea is that the rank is less subject to measurement error.

Because export promotion can impact exports with a time delay, we also estimate equation (2) using the first, second and third lag of the export promotion budget. Interviews with experts suggest that the impact of export promotion programs can be delayed by as much as three years when aiming at helping non-exporting firms to become exporters or when entering new markets.

Reverse causality and time varying omitted variables correlated with the export promotion budget might still cause endogeneity problems. For example, in a political economy setting where larger firms tend to have more political clout, it is likely that as exports grow, more lobbying by exporting firms may lead to stronger export promotion programs. Also export growth is likely to lead to GDP growth, which in turn will affect the size of governments' programs. In order to correct for this, we will use a series of instruments based on TPOs characteristics. We need these instruments to be correlated with the size of the budget, but uncorrelated with the error term of the export equation. We propose two instruments: the share of the budget that comes from public funding and the share of the executive board seats in the hands of the private sector. The identifying assumption is that they are correlated with the size of the export promotion budget, but uncorrelated with exports apart from their effect through the budget. For example, a larger number of seats in the hands of the private sector may lead to more trust by public authorities than if the agency is run by public officials, and therefore a larger budget. However, note that in these specifications we still need the assumption of constant returns, which ignores the heterogeneity of TPOs and their policies.

2.2. Modelling heterogeneous impact across TPOs characteristics

The econometric methodology described above allows us to provide an average return to export promotion across countries. In model (3) we started to explore the potential heterogeneity in returns to export promotion budgets between European and rest of the world TPOs. Yet, as we discussed in section 2, TPOs are very different from each other in terms of governance, funding, and priorities given to different activities. It is unlikely that the impact of the budget on exports is not sensitive to these characteristics, and even within ETPO the returns may significantly differ. More importantly, these differences in TPO characteristics provides us with enough variation to try to understand what type of governance, funding and priorities seem to yield higher returns.

The TPO characteristics we are interested in can be divided into three broad categories (summary statistics are provided for all these variables in Table 1). First, characteristics regarding the sources and allocation of the export promotion budget: share of public funding (*public-funding*); share of budget coming from user fees (*fees*); share of budget allocated to marketing activities (*marketing*) and share of budget allocated to export support services (*ESS*). Second, characteristics associated with the targeting of

certain types of firms in export promotion programs: share of budget spent on established exporters (*established – exporters*); share of budget spent on non-exporters (*non – exporters*); share of budget spent on small firms (*small*); and share of budget spent on medium size firms (*medium*). Finally, characteristics regarding the structure and governance of TPOs: share of the executive board in the hands of the private sector (*private – board*); the extent to which export promotion is the main responsibility of the TPO (*responsibility*); the importance of the use of matching grants (*matching – grants*), and the extent to which its strategy involves targeting all sectors and destinations versus only some sectors and destinations (*strategy*).

A possibility to answer the question as to how each of these characteristics affects the returns of the export promotion budget would be to continue along the lines started with the model in (3) and use a linear varying coefficient model with interactions between budget and different group of countries and/or TPOs' characteristics. However, the estimation of such a model implies strong assumptions in terms of the linearity between returns and TPO characteristics. It also assumes that the interaction can be captured by a simple product like *budget* × *characteristics* - which is hard to justify. If functional misspecifications are present, they lead automatically to an endogeneity bias due to this un-modeled heterogeneity. Estimating and interpreting β^x and β^y as *average effect of ln(budget)* with an instrumental variable estimator would then require to assume (among other things) that the instruments exhibit no correlation with the un-modeled TPO characteristics nor their interaction with the export promotion budget, while having a strong correlation with the budget itself. Such an instrument is very unlikely to exist.

To circumvent this and allow the impact of export promotion budgets on exports to vary across TPO characteristics, we use a semi-parametric varying coefficient model. That is, instead of trying to manage the endogeneity problem caused by heterogeneity in returns using instruments based on untestable assumptions, we directly model this heterogeneity. This gives not only more credible results but also makes it much easier to see and understand the heterogeneous returns to export promotion. Furthermore, it is precisely the latter that provides useful guidance to policy makers. Moreover, because we can test which of the TPO characteristics explain the heterogeneity of the impact of export promotion budgets on exports, we can use those that do not explain the heterogeneity as instruments of the budget with the help of an instrumental variable estimator.

The most general varying coefficient model version would imply letting the coefficients on the export budget to arbitrarily vary over a set of TPO characteristics that we consider to be interesting or important. While this requires a few assumptions, and can help us identify returns that vary by country, it will be difficult to draw any further conclusions regarding the type of characteristic that leads to higher or lower returns with the large number of TPO characteristics we are considering. Indeed, if the number of characteristics is equal to three, then the coefficient on the export budget would be a three dimensional surface which could only be made visible with 3D contour plots, and will be difficult to interpret. But the number of characteristics we are interested in is twelve. It then becomes impossible to visualize how TPO characteristics affect returns. Because our objective is to understand how different characteristics affect returns, we need to simplify the problem by excluding interactions between the different TPO characteristics. While it is true that the assumption of additive separability is also a strong assumption, it is nonetheless one of the most accepted simplifications in empirical economics.

The equation to be estimated then becomes:

$$\begin{aligned} \ln(\text{exports})_{c,t} = & \{b_f(\text{fees}_{c,t}) + b_g(\text{public – funding}_{c,t}) + b_h(\text{marketing}_{c,t}) + b_j(\text{ESS}_{c,t}) \\ & + b_k(\text{non – exporters}_{c,t}) + b_l(\text{establishe d – exporters}_{c,t}) + b_m(\text{small}_{c,t}) + b_n(\text{medium}_{c,t}) \\ & + b_o(\text{private – board}_{c,t}) + b_p(\text{strategy}_{c,t}) + b_q(\text{matching – grants}_{c,t}) \\ & + b_r(\text{responsibi lity}_{c,t})\} \ln(\text{budget})_{c,t} + \delta \ln(\text{populat ion})_{c,t} + \gamma_c + \gamma_t + \varepsilon_{c,t} \end{aligned} \quad (4)$$

where b_f, \dots, b_r are unknown smooth functions. We approximate them by piece-wise cubic polynomials (so-called Penalized cubic splines). We select the varying components of the model based on null space penalization. That is by adding a penalty for the un-penalized space of each term. Adding such a penalty to all the smooth terms in the model allows for parameter selection which removes terms from the model altogether. And as we will see in the results section some variables are penalized out (such as the share of public funding, the share of the budget spent on export support services, etc.). In simple words, if you consider all b_j as polynomials, this is a method of parameter selection. When *fees* is penalized out of the model, it implies that *fees* does not help explain the heterogeneity in returns to $\ln(\text{budget})$ (at least as long as the other characteristics are included).

We then re-estimate the model without the fully penalized terms and report results for the characteristics that were not penalized out of the model, using an instrumental variable estimator following Marra and Radice (2011), where the variables that were penalized out of the equation are used as instruments. We use a two-stage GAM procedure. In the first stage we regress the instrumental variables and other exogenous variables on the endogenous one

$$x_p^e = g^{-1}\left\{\sum_j f_j(z_{jp})\right\} + \xi_p^u \quad (5)$$

where x_p^e is the endogenous variable (i.e., $\ln(\text{budget})$), g^{-1} the inverse link function, z_{jp} is a matrix of instrumental and other exogenous variables. ξ_p^u contains informations about the unobservable variables. After calculating $\hat{\xi}_p^u$, we use it as a control variable in the second stage to control for endogeneity:

$$y = g^{-1}\left\{\sum_j f_j(x_j^{eo}) + \sum_p f_p(\hat{\xi}_p^u)\right\} + \varepsilon \quad (6)$$

with y the outcome variable of interest (e.g., $\ln(\text{exports})$), x_j^{eo} being the set of endogenous and exogenous variables.

To estimate the impact of different characteristics on the returns in terms of GDP per capita we use a similar approach. Note that the variables that are penalized out of the estimated equation are not necessarily the same as for exports. Thus the determinants of the heterogeneity of the impact of export promotion budgets on exports are not necessarily the same as those for GDP per capita.

Finally, our objective is to estimate returns by country. In order to do so, we go back to a parametric specification where we use information from the non-parametric estimates regarding the type of non-linearity that exist for each TPO characteristic, and then add the corresponding quadratic and cubic terms to the interactions of the parametric specification, as well as corresponding $\hat{\xi}_p^u$ which is estimated parametrically using the polynomials to approach the non-parametric estimates. The marginal impact on exports of increases in export promotion budgets are then calculated for each country as a function of their TPO characteristics.

Chapter 3 Results

Table 2 presents the results of the estimation of the elasticity of exports with respect to export promotion budgets. Columns (1) to (3) show the results of the estimation of equations (1), (2), and (3) for exports. These ordinary least square estimates suggest that a 1% increase in the export budget leads to an increase in exports between 0.046 and 0.074%, depending on whether we control for population size, and the heterogeneity between European TPOs and TPOs in other regions. The coefficient on the export promotion budget is always statistically significant at least at the 5% level. A very large share of the variation in exports is explained by our fixed effect models with an adjusted R^2 of 0.997. Note that the interaction of the TPO budget with a dummy for European countries does not have a statistically significant impact on exports, although the returns to export promotion seem to be smaller in Europe than in the rest of the sample. This is something that we will explore in more detail in our semi-parametric exercise.

Column (4) of Table 2 presents the results of the estimation of (2) but using the rank of the budget as an instrument to correct for potential measurement error. The marginal effect is larger after controlling for measurement error.

We also run equation (2) with one, two and three years lag of the export promotion budget jointly and independently to see whether export promotion affects exports and GDP per capita only after a certain period of time. None of the regressions yields statistically significant results and we do not report them here. However, because the lag budget was not statistically significant in the export or GDP per capita equation we use it as an instrument to correct for the potential endogeneity of the export budget. Results using the lagged budget and the rank of the budget as instruments are reported in column (5).

Finally column (6) presents our preferred specification, where we use TPO characteristics as instruments. Both the share of public funding and the share of seats in the executive board of the TPO which are in the hands of the private sector, as well as their interaction are used as instruments in column (6). Again results suggest a large impact of export promotion on exports, and the point estimate is not statistically different from the ones reported in the other columns. A 1% increase in the export promotion budget leads on average to a 0.074% increase in exports. This is the point estimate that we use as benchmark.

Table 3 presents the results of the estimation of the elasticity of GDP per capita with respect to export promotion budgets. The columns are structured in the same order as in Table 2. The first three columns provide ordinary least square estimates, and the last three columns provide instrumental variable estimates. Column (6) provides our preferred specification where we use the same instruments as in column (6) of Table 2 to control for the endogeneity of export promotion budgets. A 1% increase in the export promotion budget leads on average to a 0.065% increase in GDP per capita. Holding the population constant (as export promotion is unlikely to affect fertility), this implies a 0.065% increase in GDP. Thus at the margin there is a much larger impact of export promotion budgets on GDP than on exports. To see this note that the elasticity of GDP is only 12% smaller than the elasticity of exports, whereas exports only represent 40% of GDP in our sample. Given these estimates a 1% increase in export promotion budgets will have an impact measured in US dollars that is on average 3% larger. This provides indirect evidence that there are important positive externalities from firms that benefit from export promotion towards non-exporting firms.²⁰

3.1. What works?

Based on the estimation of the full non-parametric model we perform null space penalization tests to select the TPO characteristics of the final export and GDP per capita models. The share of public funding, the share of budget spent on export support services, the share of budget spent on medium size firms, the share of budget spent on non-matching grants for exporters, and the importance of export promotion in the objectives of the TPO are penalized out from the export equation as can be seen from the results in table 3. The variables that are penalized out of the GDP per capita equation are the share of user fees, the share of the budget spent on non-exporters, the share of the budget spent on small exporters, the share of the executive boards seats in the hands of the private sector, the targeting of certain sectors, and the

²⁰ For more direct evidence using firm level data in Brazil, see Cruz (2014).

importance of export promotion in the objectives of the TPO as can be seen from table 3. These variables do not add further heterogeneity to the returns, and are therefore suppressed from each of the corresponding full models. Note that this does not imply that they are not important determinants of the average returns, as they can be important determinants of the size of the export promotion budget. They simply do not explain the heterogeneity across countries.

The results of the non-parametric instrumental variable estimation of the final models for exports and GDP per capita using the variables that have been penalized out as instruments are reported in Figures 7 and 9, respectively. Regarding exports, the plots suggest that increases in the share of TPOs' funding coming from user fees (*sou_fee*) tend to initially increase the impact of export promotion on exports, but when the share of funding from user fees is very high, further increases seem to marginally decline export returns as indicated by the inverted u-shape form of the regression plot. For the share of the budget spent on marketing activities (*act_mar*), there are some important non-linearities which do not really allow to have a clear view of how it affects returns on exports. A larger share of the budget spent on non-exporters (*cli_nonexp*) initially increases marginal export returns and then it reduces them. A larger focus on established exporters (*cli_est*) relative to occasional exporters increases marginal export returns. Targeting small firms (*cli_sma*) rather than large and medium size firms declines the marginal returns in terms of exports. Having a larger share of the executive board seats in the hands of the private sector (*shpriv*) also increases marginal export returns. Targeting of a few sectors, firms or destinations rather than promoting all sectors and destinations (*st_allsec*) increases marginal export returns.²¹

The regression plots in Figure 9 suggest that a higher share of funding from public sources (*sou_pub*) reduces the impact of export promotion on GDP per capita. Increases in the share of the budget spent on marketing activities (*act_mar*) increases the marginal returns of export promotion budgets in terms of GDP per capita. Increases in the share of the budget spent on export support services (*act_ees*) reduces GDP per capita returns. A larger share of the budget spent on established exporters (*cli_est*) tends to increase GDP per capita returns as for the case of export returns. Targeting medium size firms (*cli_med*) rather than large and small size firms increases the marginal returns in terms of GDP per capita.

Figures 8 and 10 contain the postestimation plots of the residuals, and further goodness of fit analysis. They confirm that we cannot find any anomalies in the residuals (no indication of model mis-specification, outliers, poor fit, etc.); they even exhibit normality.

The results provided in Figure 7 and 9 can help design more effective TPOs. More importantly, it is clear from figures 7 and 9 that what may be effective in promoting exports (focusing in a few sectors and destinations or in large firms for example) may be less effective in increasing GDP per capita. Similarly, what works for GDP per capita, such as increases in the share spent on marketing activities may be less effective in promoting exports. One important message that comes out of this is that trying to evaluate the performance of TPOs by looking at increases in exports may create the wrong incentives when the ultimate goal of the TPOs is social and economic growth proxied by GDP per capita.

3.2. Marginal export and GDP per capita returns by country

The information on the heterogeneity of returns across TPO characteristics can then be summarized by looking at the marginal returns of each TPO in terms of exports and GDP per capita. The returns vary depending on the combination of characteristics of each TPO. We compute these returns parametrically, but using the information provided by the non-parametric regression plots regarding the shape of the relationship between each characteristic and exports or GDP per capita. Figure 7 suggests that in the export equation the share of funding coming from user fees and the importance given to non-exporters interacted with the export promotion budget should enter with a quadratic term, whereas the share of budget spent on marketing activities interacted with the budget should enter with a cubic term. Similarly, Figure 9 suggests that all of the interactions only enter linearly. Table 4 provides the results of the estimation of the export and GDP per capita equations where we allow for these parametric non-linearities. They largely confirm the results of the non-parametric exercise in terms of the signs of the interaction terms between the export promotion budget and each of the TPOs' characteristics kept in the final non-parametric model.

²¹ Here recall that a higher value in this variable indicates that the agency tends to target only a few sectors or markets.

In order to compute the marginal export and GDP per capita returns to increases in the export promotion budget, we take the derivative of the export and GDP per capita equation with respect to the log of the export promotion budget and simply calculate the corresponding elasticities at the average values of each promotion agency. In other words, the marginal returns are simply given by the sum of the products of coefficients and TPOs' average characteristics in each country.

Figure 11 provides the distribution of marginal export and GDP per capita returns. There is a larger variance in the distribution of export returns across countries than in the distribution of GDP returns (as before GDP or GDP per capita returns are identical as long as we are willing to accept that export promotion does not affect fertility). Interestingly, the distribution of GDP per capita returns is clearly to the left of the distribution of export returns, which also tends to have a longer right tail. This suggests that the marginal returns to exports are larger than the marginal returns to GDP per capita, as we also found in our earlier estimates where we did not allow for any heterogeneity of export promotion budgets on exports or GDP per capita. Note however, that as signalled earlier, because exports are generally only a fraction of GDP, dollar returns in terms of GDP are likely to be larger.

Table 5 provides the marginal export and GDP per capita returns by TPO. ETPO are signaled with red font. All returns are positive and export returns are generally larger than GDP per capita returns, except in six countries (Botswana, Bulgaria, Cyprus, Dominica, Egypt and Senegal). On average across all countries the marginal returns to exports are 38% larger than the marginal returns to GDP per capita (0.076 versus 0.055), but the returns to exports can be more than three times the returns to GDP per capita (France).

There is a weak but positive correlation between export and GDP per capita returns as illustrated in Figure 12. This suggests that high returns in terms of exports do not necessarily imply high returns in terms of GDP per capita. This matters because if the ultimate objective is GDP per capita growth, benchmarking policies, institutional setups or interventions against export growth could be misleading. Indeed, the correlation between the two types of returns is only 0.2.

We also explore whether the heterogeneity in returns to export promotion in terms of aggregate exports and GDP per capita can be partly explained by the level of development in different countries. Figure 13 presents the correlation between returns and the log of GDP per capita. There is a slightly upwards sloping relationship for export returns, suggesting that richer countries have higher export returns, but the relationship is statistically insignificant. For GDP per capita returns, there is no clear relationship with the log of GDP per capita.

Finally, we explore the role played by each TPO characteristic in explaining the marginal returns from export promotion for the European TPOs. This is done by simply computing the product of the estimated coefficients reported in Table 4 and the average value of each characteristics within each country, while taking into account the non-linear terms. The sum of each of these marginal returns by characteristic naturally adds up to the total returns reports in Table 5.

Table 6 provides the contribution of each characteristic to the export gains reported in Table 5. The first column of Table 6 labeled "Budget" provides the marginal export return from increasing the export promotion budget without taking any interaction. It is equal to the coefficient reported in the first row and the first column of Table 5. It does not vary across countries because it is not interacted with any TPO characteristic. All the other columns provide the marginal contribution of each TPO characteristic to the total marginal export returns. On average most of the positive gains come from "Fees" and "Strategy". The former captures the share of the budget that comes from user fees. We saw in Figure 7 that the impact of the export promotion budget increases monotonically with this share. We also saw in Table 1 that ETPOs tend to have on average a larger share of their budget coming from user fees. This suggest that the funding of the budget by user fees in the fourteen ETPO contributes significantly to their export returns. We saw in Figure 7 that the effectiveness of the export promotion budget increases when the agency gives a lower priority to the strategy of promoting all sectors and destinations. We also saw in Table 1 that this is the case for the fourteen ETPO which explains the large positive contribution of this characteristic to the overall export gains. On the other hand the largest negative contribution to the export returns comes from the extent to which ETPO focus on marketing activities ("Marketing"). Figure 7 suggests that there are some important non-linearities for the returns to export promotion associated with the share of the budget spent on marketing. The minimum impact is reached for values around 2.5 (equivalent to around a 10% share). As reported in Table ETPO are on average closer to this number than other European or rest of the world TPOs. Figure 7 also suggests that the efficiency of export promotion budgets in increasing exports

declines as TPOs target small firms, calling for a reduction on the resources spent on small firms if the objective is to maximize export returns.

Table 7 provides the contribution of each characteristic to the GDP per capita returns reported in Table 5. The first column of Table 19 labeled "Budget" provides the direct impact of the export promotion budget without any interaction, and therefore does not vary across countries. The rest of the columns provide the interaction with each of the TPO characteristics that determine GDP per capita return. On average the largest gains come from expenditures on marketing activities, which is at odds with the results we found for export returns. However, it does illustrate that strategies that may work for export returns, may not be very profitable when the objective is to maximize GDP per capita returns. Note also that if GDP per capita returns are to be maximized, all ETPO seem to have a share of public funding that is a bit too high, as well as too much focus on export support services.

Chapter 4 Concluding remarks

The literature on export promotion using both firm and country level data has focused on estimating the impact that export promotion programs have on average. While most of the literature tends to suggest that export promotion helps increase exports, we moved further in two important dimensions. First, we examine not only the impact of export promotion on exports, but also on GDP per capita. Indeed, the ultimate objective of export promotion policies is not exports per se, but social and economic growth. We used GDP per capita as a proxy for social and economic growth and found that the returns in terms of GDP per capita are larger than the export returns, which suggests the presence of positive externalities associated with export promotion.

Second, we explore which export promotion policies or TPO characteristics are likely to generate higher returns in terms of export and GDP per capita. We found that TPO characteristics matter. TPOs that have a larger share of their executive board in the hands of the private sector, spend a smaller share of their budget on small firms, a larger share on established exporters, and target a few sectors, firms or markets have higher export returns. Some of these characteristics also tend to matter for GDP per capita returns: a larger share of the budget spent on established exporters seem to generate larger GDP per capita returns. But there are also some differences: a larger share of the budget spent on country image and other marketing activities seem to generate larger gains in terms of GDP per capita. Similarly, a larger focus on medium size firms, a smaller share of public funding and smaller focus on export support services generate higher GDP per capita returns.

These results put together suggest that export promotion has a strong and positive impact on export revenue, but an even larger impact on GDP per capita. However, what works in terms of maximizing export revenue may not necessarily work in terms of maximizing GDP per capita. This has two important implications. First, it is important that TPOs understand whether their objective is to promote exports or GDP per capita, as this has implications for the type of policies and strategies that should be pursued. Second, when evaluating the performance of these agencies and recommending institutional or policy changes, it is important to use the correct benchmark. If agencies are evaluated against increases in export revenue, this may create the wrong incentives when the objective of the TPO is social and economic growth.

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Annex I

Table 1: Summary statistics (standard deviation in parenthesis)

	(1) World	(2) Europe	(3) ETPO
Log of exports (USD)	22.910 (2.43)	24.920 (1.87)	25.082 (1.68)
Log of TPO budget (USD)	15.904 (2.12)	16.776 (1.88)	17.015 (1.84)
Log of GDP per capita (USD)	8.469 (1.57)	10.271 (0.75)	10.100 (0.85)
Log of population	15.924 (1.94)	15.685 (1.58)	15.326 (2.37)
Budget coming from fees from services	1.940 (1.20)	1.8928 (0.74)	2.170 (1.06)
Public source of funding	4.924 (1.66)	5.007 (1.75)	5.253 (1.38)
Budget spent on marketing	3.512 (1.09)	3.285 (0.98)	3.141 (1.06)
Budget spent on export support services	2.658 (0.98)	2.278 (0.81)	2.460 (1.07)
Budget on non-exporters	2.166 (1.13)	2.200 (1.18)	2.053 (1.03)
Budget on new / occasional exporters	3.220 (1.00)	3.357 (0.76)	3.376 (0.96)
Budget on small firms	3.759 (1.02)	4.271 (1.15)	3.862 (1.12)
Budget on medium size firms	3.807 (0.98)	3.614 (0.88)	3.818 (0.98)
Share of private sector over total at board	0.477 (0.30)	0.541 (0.32)	0.469 (0.30)
Rank of TPOs responsibility	2.532 (1.09)	2.528 (1.06)	2.786 (1.23)
Strategy targets exports in all sectors and destinations	1.665 (1.25)	1.542 (1.37)	1.962 (1.62)
N	1883	140	288

Table 2: Average impact of TPO budgets on exports (panel data 2005-2013)

	(1)	(2)	(3)	(4)	(5)	(6)
Log of TPO budget	0.046* (0.018)	0.051* (0.022)	0.074* (0.031)	0.079** (0.024)	0.05 (0.02)	0.074** (0.022)
Log of population		2.119** (0.507)	2.009** (0.532)	2.099** (0.501)	2.694** (0.541)	2.194** (0.450)
Log budget x Europe			-0.037 (0.041)			
Intercept	25.339** (0.340)	-5.719 (5.674)	-4.840 (5.840)	-5.914 (5.647)	-24.596* (10.117)	-6.888 (5.071)
N	533	530	530	530	436	505
R ²	0.997	0.997	0.997	0.997	0.998	0.997

Note: All regressions include country and year fixed effects. Standard errors are provided in parenthesis. Significance levels are as follows: † stands for 10% statistical significance; * for 5%, and ** for 1%. The first three columns use an OLS estimator. The last three columns use an instrumental variable estimator. The fourth column instruments using the rank of the budget. The fifth column instruments using the rank of the budget and the lagged budget. The sixth column instruments using the rank of the budget, the share of private seats in the executive board of the TPO, the share of public funding, and the interaction of these two agencies characteristics.

Table 3: Average impact of export promotion budgets on GDP per capita (panel data 2005-2013)

	(1)	(2)	(3)	(4)	(5)	(6)
Log of TPO budget	0.049** (0.013)	0.057** (0.014)	0.093** (0.021)	0.073** (0.016)	0.065** (0.016)	0.065** (0.016)
Log of population		0.661* (0.282)	0.481 (0.308)	0.681** (0.254)	0.946** (0.244)	0.552* (0.249)
Log budget x Europe			-0.056** (0.027)			
Intercept	9.458** (0.240)	-4.819 (5.137)	-2.195 (5.437)	-5.432 (4.640)	-2.674 (2.742)	-1.400 (2.828)
N	552	549	549	549	454	524
R ²	0.997	0.996	0.997	0.997	0.999	0.999

Note: All regressions include country and year fixed effects. Standard errors are provided in parenthesis. Significance levels are as follows: † stands for 10% statistical significance; * for 5%, and ** for 1%. The first three columns use an OLS estimator. The last three columns use an instrumental variable estimator. The fourth column instruments using the rank of the budget. The fifth column instruments using the rank of the budget and the lagged budget. The sixth column instruments using the rank of the budget, the share of private seats in the executive board of the TPO, the share of public funding, and the interaction of these two agencies characteristics.

Table 4: Non-parametric model selection for exports and GDP per capita models (panel data 2005-2013)

Variables	Exports	GDP per capita
Log of population	7.486	9.814
Budget coming from fees from services	1.662	0.000
Public source of funding	0.000	2.000
Budget spent on marketing	2.886	0.849
Budget spent on export support services	0.000	0.902
Budget on non-exporters	0.983	0.000
Budget on established exporters	0.926	1.108
Budget on small exporters	0.839	0.000
Budget on medium exporters	0.000	0.196
Share of private sector over total at board	0.695	0.000
Budget spent on non-matching grants to exporters	0.000	0.000
Rank of strategy targeting all sectors and destinations	2.000	0.000
Rank of TPOs responsibility	0.000	0.000

Note: We report degrees of freedom statistics for each variable of both full models. A value of zero means that the variable is penalized out of the model.

Table 5: What works? (functional form is based on non-parametric estimates)

Variables	Exports	GDP per capita
Log of TPO budget in USD	0.055 (0.036)	0.049 ** (0.012)
Budget x share of public funding		-0.001 † (0.000)
Budget x share of fees	0.010 ** (0.003)	
Budget x share of fees squared	-0.001 ** (0.001)	
Budget x share of marketing activ.	-0.040 † (0.023)	0.002 * (0.001)
Budget x share of marketing activ. squared	0.012 † (0.007)	
Budget x share of marketing activ. cube	-0.001 (0.001)	
Budget x share of export support services		-0.001 * (0.001)
Budget x share of non-exporters	0.007	

Variables	Exports	GDP per capita
	(0.007)	
Budget x share of non-exporters squared	-0.001 (0.002)	
Budget x established exporters	0.002 * * (0.001)	0.001 (0.001)
Budget x small size firms	-0.001 (0.001)	
Budget x medium size firms		0.001 (0.001)
Budget x share of private seats	0.01 (0.003)	
Budget x targeting few sectors	0.020 (0.015)	
Log of population	-60.192 * * (19.436)	9.102 (16.092)
Log of population squared	3.744 * * (1.309)	- 0.844 (1.044)
Log of population cube	-0.074 * (0.029)	0.024 (0.022)
Intercept	-326.006 * * (95.350)	-22.143 (81.002)
N	434	507
R ²	0.998	0.997

Note: All regressions include country and year fixed effects as well as the error term of a first stage regression which also includes quadratic and cubic terms of instrumental and exogenous variables to control for endogeneity. The missing variables were penalized out of the non-parametric models. Standard errors are provided in parenthesis. Significance levels are as follows: † stands for 10% statistical significance; * for 5%, and ** for 1%.

Table 6: Exports and GDP per capita returns on TPO interventions (ratio of exports and GDP per capita with and without TPOs)

Country	Exports	GDP/capita
Albania	0.056	0.054
Armenia	0.061	0.057
Australia	0.089	0.053
Austria	0.062	0.057
Bangladesh	0.069	0.059
Barbados	0.066	0.053
Belgium	0.083	0.055
Belize	0.066	0.052
Bosnia and Herzegovina	0.064	0.054
Botswana	0.049	0.050
Brazil	0.128	0.059
Bulgaria	0.044	0.056
Burkina Faso	0.065	0.053
Costa Rica	0.063	0.056
Cote d'Ivoire	0.058	0.053
Croatia	0.074	0.048
Cyprus	0.058	0.058
Denmark	0.062	0.054
Dominica	0.050	0.053
Dominican Republic (the)	0.073	0.056
Ecuador	0.067	0.059
Egypt	0.066	0.067
El Salvador	0.059	0.051
Estonia	0.068	0.053
Finland	0.108	0.052
France	0.188	0.057
Germany	0.084	0.056
Guatemala	0.078	0.059
Guyana	0.081	0.054
Honduras	0.107	0.055
Hungary	0.098	0.053
Iceland	0.060	0.055
Indonesia	0.099	0.058
Ireland	0.064	0.055
Israel	0.061	0.055
Italy	0.087	0.055
Jamaica	0.063	0.053

Country	Exports	GDP/capita
Jordan	0.062	0.054
Kenya	0.092	0.055
Korea, Republic of (the)	0.068	0.054
Lao People's Democratic Republic (the)	0.056	0.053
Lebanon	0.052	0.052
Lithuania	0.068	0.057
the former Yugoslav Republic of Macedonia	0.074	0.049
Malawi	0.056	0.048
Malaysia	0.126	0.054
Malta	0.134	0.051
Mexico	0.076	0.059
Moldova	0.057	0.056
Nepal	0.062	0.055
Netherlands (the)	0.058	0.057
Nicaragua	0.127	0.060
Norway	0.066	0.050
Oman	0.053	0.052
Panama	0.112	0.054
Paraguay	0.062	0.054
Peru	0.110	0.057
Philippines (the)	0.066	0.057
Portugal	0.148	0.060
Rwanda	0.056	0.053
Senegal	0.056	0.056
Serbia	0.104	0.055
Sierra Leone	0.084	0.051
Slovenia	0.089	0.053
Spain	0.065	0.058
Sweden	0.067	0.052
Switzerland	0.064	0.056
Syrian Arab Republic	0.067	0.053
United Republic of Tanzania (the)	0.062	0.052
Turkey	0.085	0.053
Uganda	0.140	0.054
United Kingdom of Great Britain and Northern Ireland (the)	0.063	0.053

Country	Exports	GDP/capita
Uruguay	0.066	0.055
Vietnam	0.060	0.056
West Bank and Gaza	0.070	0.060
Yemen	0.065	0.055
Zambia	0.068	0.054
Average	0.076	0.055

Table 7: Contribution of ETPO characteristics to export gains (% of total gains)

Country	Budget	Fees	Seats	Non exp.	Est. exp.	Marketing	Small	Strategy
Austria	0.055	0.014	0.001	0.010	0.010	-0.043	-0.004	0.020
Belgium	0.055	0.014	0.000	0.010	0.012	-0.043	-0.005	0.039
Bosnia and Herzegovina	0.055	0.017	0.001	0.012	0.005	-0.043	-0.002	0.020
Cyprus	0.055	0.008	0.000	0.006	0.012	-0.038	-0.006	0.020
Denmark	0.055	0.013	0.001	0.009	0.011	-0.043	-0.004	0.020
Estonia	0.055	0.011	0.000	0.012	0.009	-0.042	-0.004	0.028
Iceland	0.055	0.017	0.001	0.006	0.008	-0.042	-0.004	0.020
Italy	0.055	0.014	0.001	0.010	0.012	-0.040	-0.005	0.039
Lithuania	0.055	0.011	0.000	0.013	0.013	-0.041	-0.004	0.020
Malta	0.055	0.014	0.001	0.010	0.010	-0.042	-0.005	0.091
Netherlands (the)	0.055	0.008	0.000	0.009	0.011	-0.041	-0.005	0.020
Slovenia	0.055	0.008	0.000	0.010	0.010	-0.042	-0.004	0.051
Switzerland	0.055	0.015	0.001	0.008	0.013	-0.043	-0.005	0.020
United Kingdom	0.055	0.013	0.000	0.010	0.010	-0.042	-0.005	0.020
Total	0.055	0.013	0.001	0.010	0.011	-0.042	-0.004	0.030

Note: The numbers are computed as the marginal effect of an increase in the TPO's budget on exports (denoted "Total"). Then for each of the ETPO characteristics we compute its contribution to the total elasticity. The difference between the sum of each characteristic contribution and the total elasticity by country is the contribution of the budget without any interaction to the total elasticity.

Table 8: Contribution of ETPO characteristics to GDP gains (% of total gains)

Country	Budget	Public	Marketing	ESS.	Est. exp.	Medium
Austria	0.049	-0.002	0.005	-0.003	0.004	0.004
Belgium	0.049	-0.005	0.005	-0.002	0.005	0.004
Bosnia and Herzegovina	0.049	-0.002	0.005	-0.002	0.002	0.002
Cyprus	0.049	-0.005	0.008	-0.001	0.005	0.003
Denmark	0.049	-0.005	0.004	-0.002	0.004	0.004
Estonia	0.049	-0.005	0.006	-0.003	0.004	0.003
Iceland	0.049	-0.003	0.006	-0.003	0.003	0.003
Italy	0.049	-0.005	0.006	-0.002	0.005	0.003
Lithuania	0.049	-0.004	0.006	-0.004	0.005	0.005
Malta	0.049	-0.005	0.003	-0.003	0.004	0.003
Netherlands	0.049	-0.005	0.006	-0.002	0.004	0.004
Slovenia	0.049	-0.005	0.004	-0.002	0.004	0.003
Switzerland	0.049	-0.005	0.005	-0.002	0.005	0.004
United Kingdom	0.049	-0.005	0.006	-0.004	0.004	0.004
Average	0.049	-0.005	0.005	-0.003	0.004	0.004

Note: The numbers are computed as the marginal effect of an increase in the TPO's budget on GDP per capita (denote "Total"). Then for each of the ETPO characteristics we compute its contribution to the total elasticity. The difference between the sum of each characteristic contribution and the total elasticity by country is the contribution of the budget without any interaction to the total elasticity.

Figure 1 Budget to export ratio for ETPO participating countries

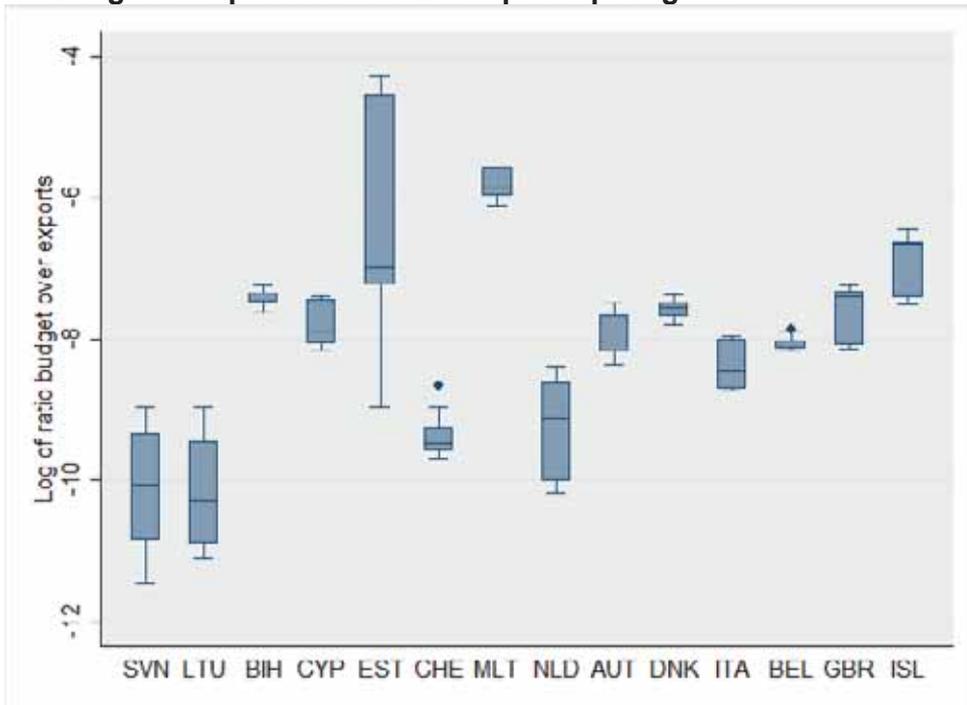


Figure 2 Share of Budget in export support services and marketing

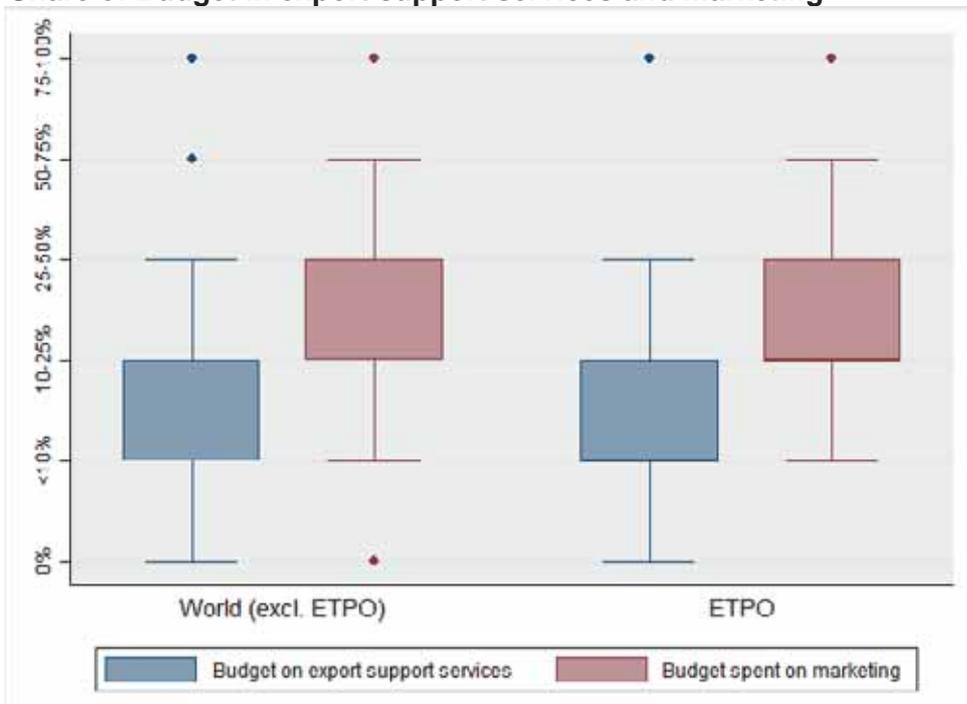


Figure 3 Share of budget spent on small, medium and large firms

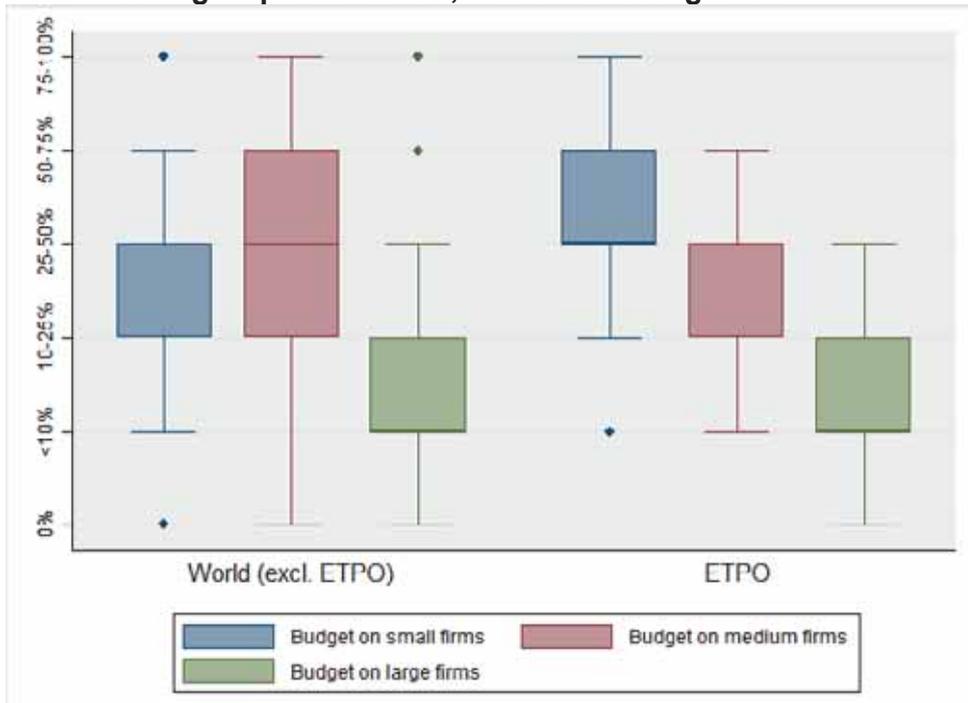


Figure 4 Share of budget spent by type of exporter

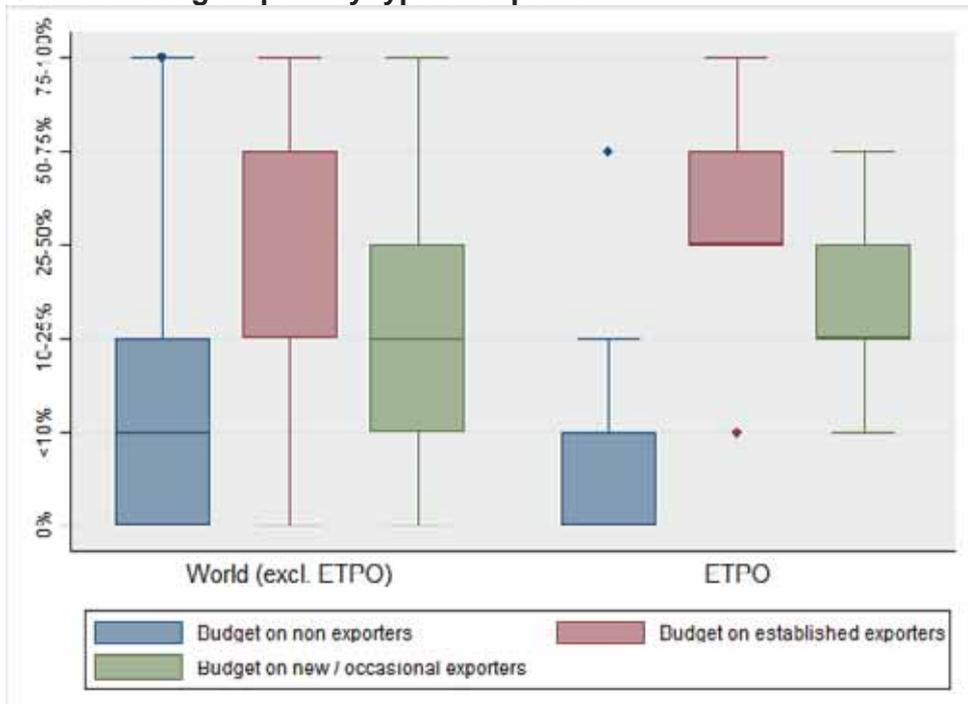


Figure 5 Sources of funding

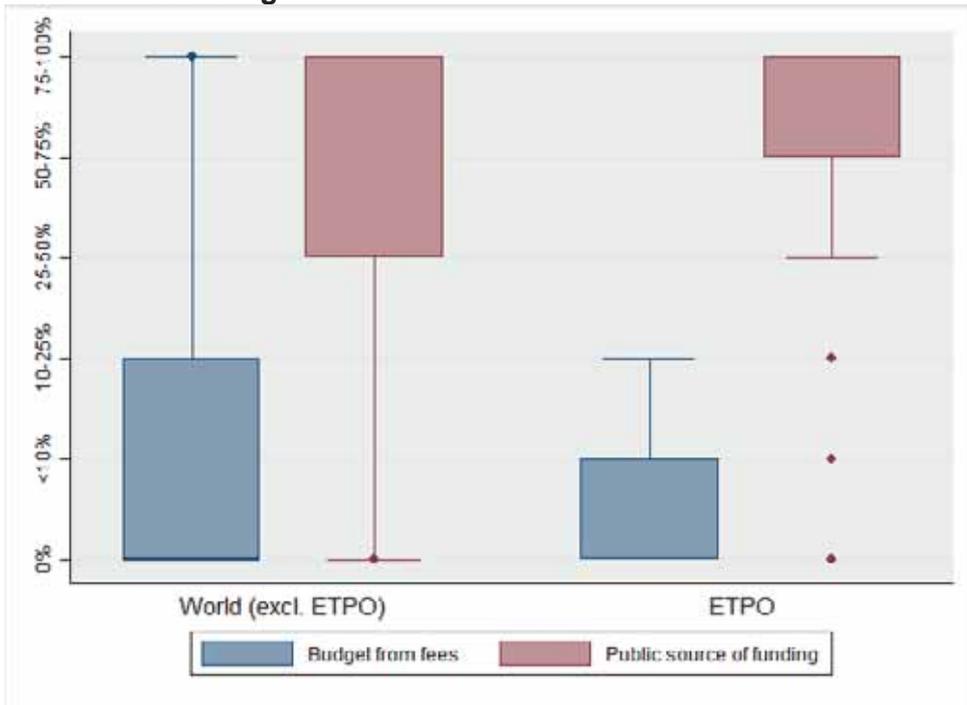


Figure 6 Correlation between exports and export promotion budget (lowess)

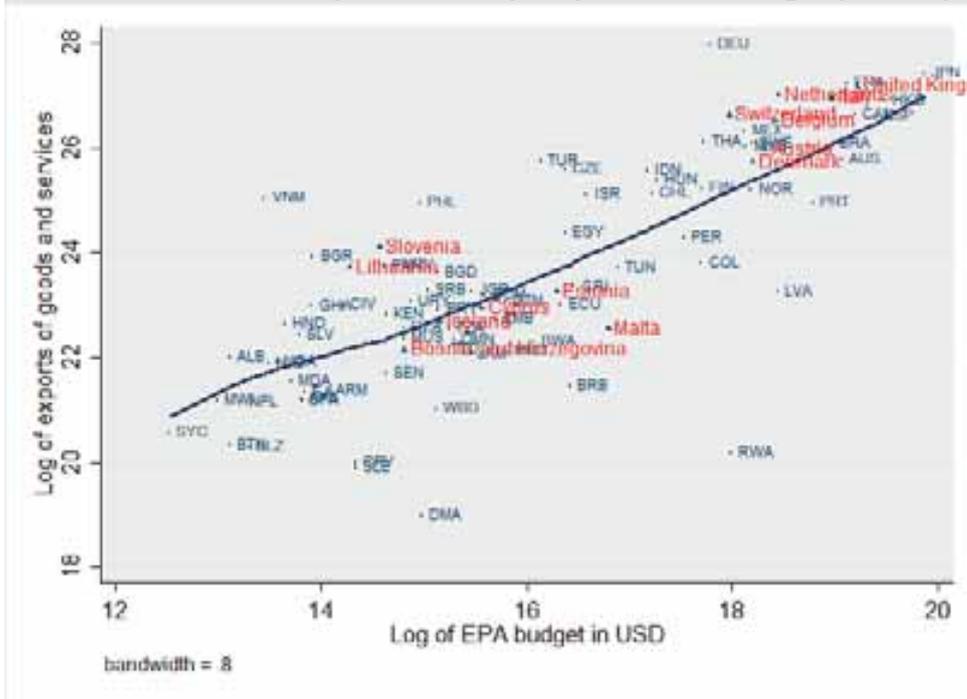


Figure 7 IV Regression plots of the penalized model on exports

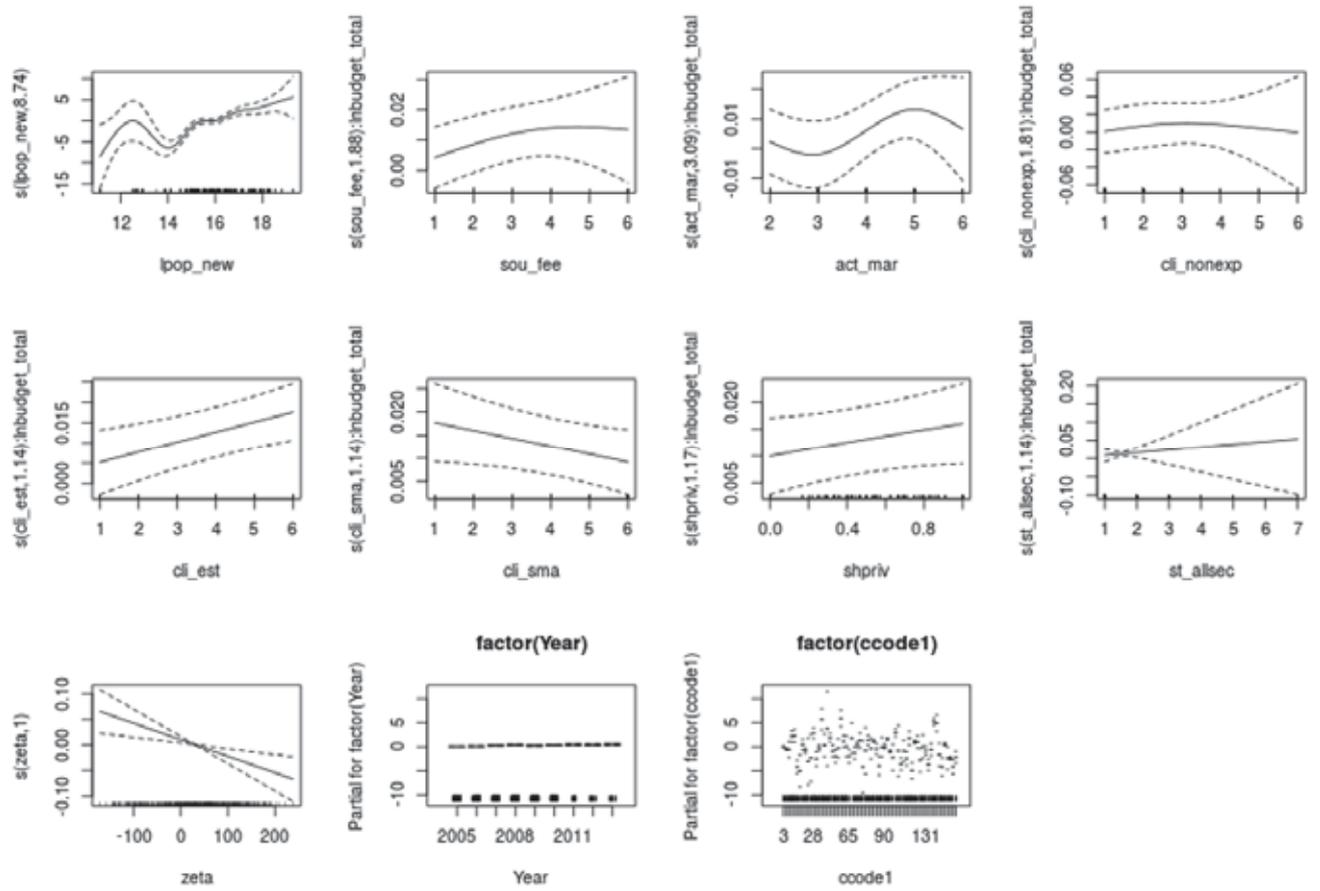


Figure 8 Postestimation plots of penalized IV regression on exports

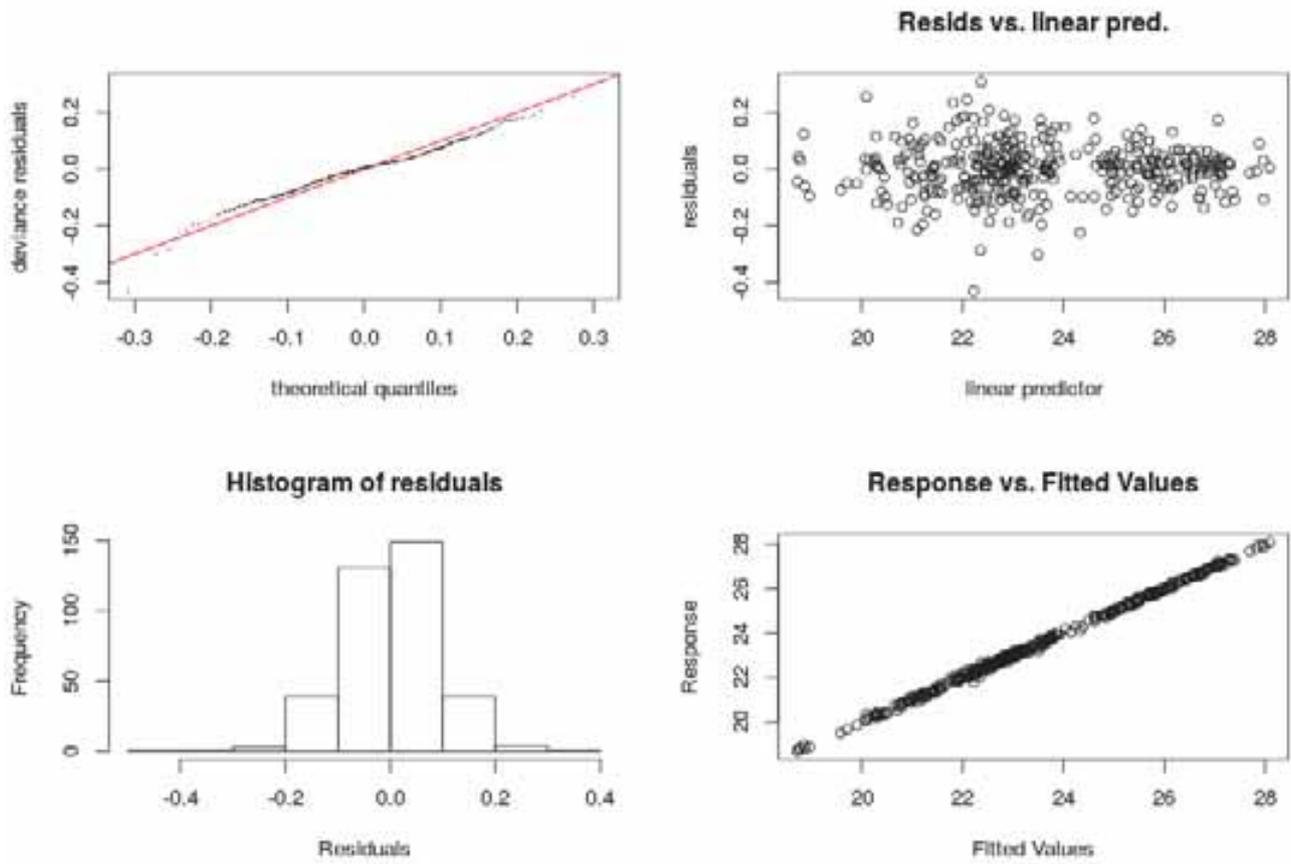


Figure 9 IV Regression plots of the penalized regression on GDP per capita

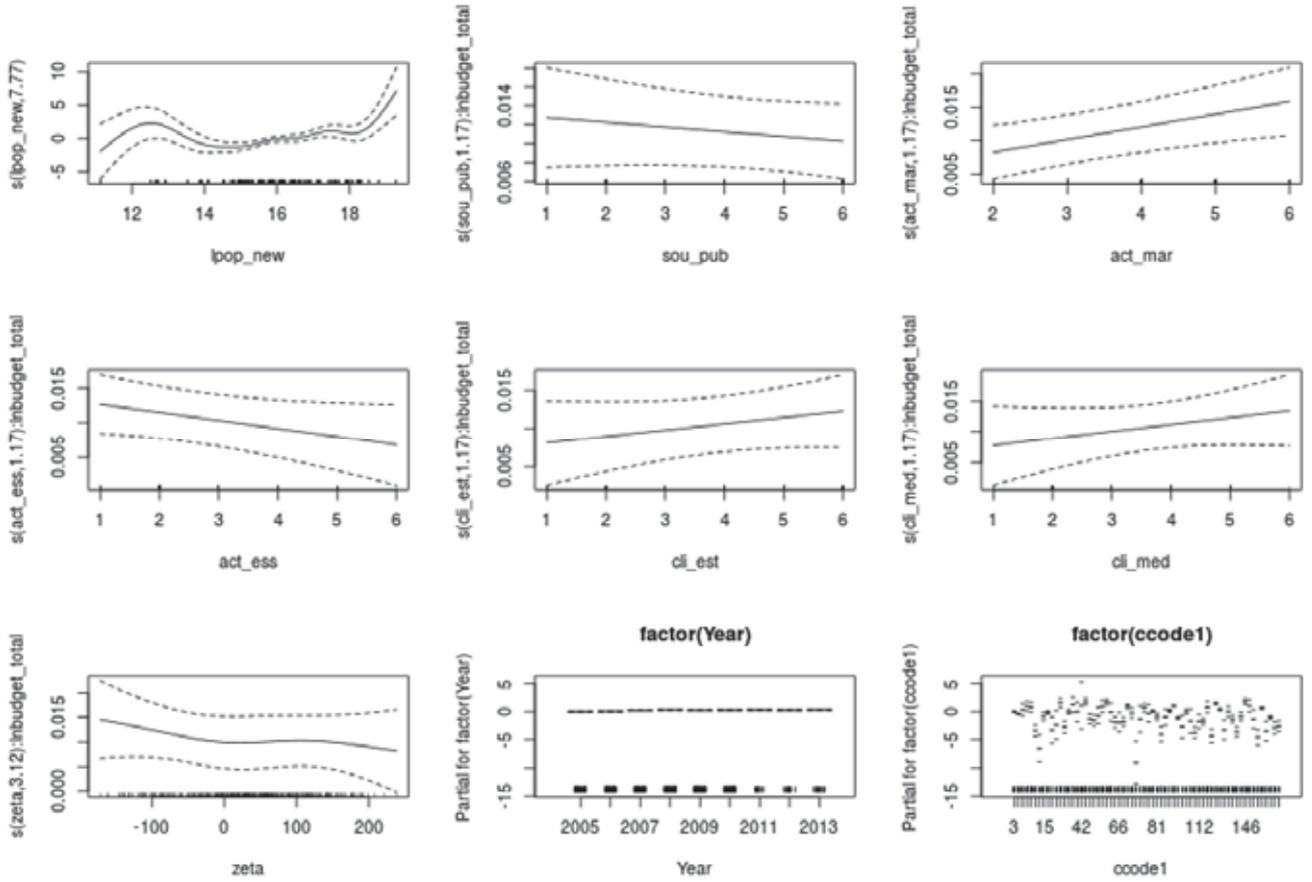


Figure 10 Postestimation plots of the penalized IV regression on GDP per capita

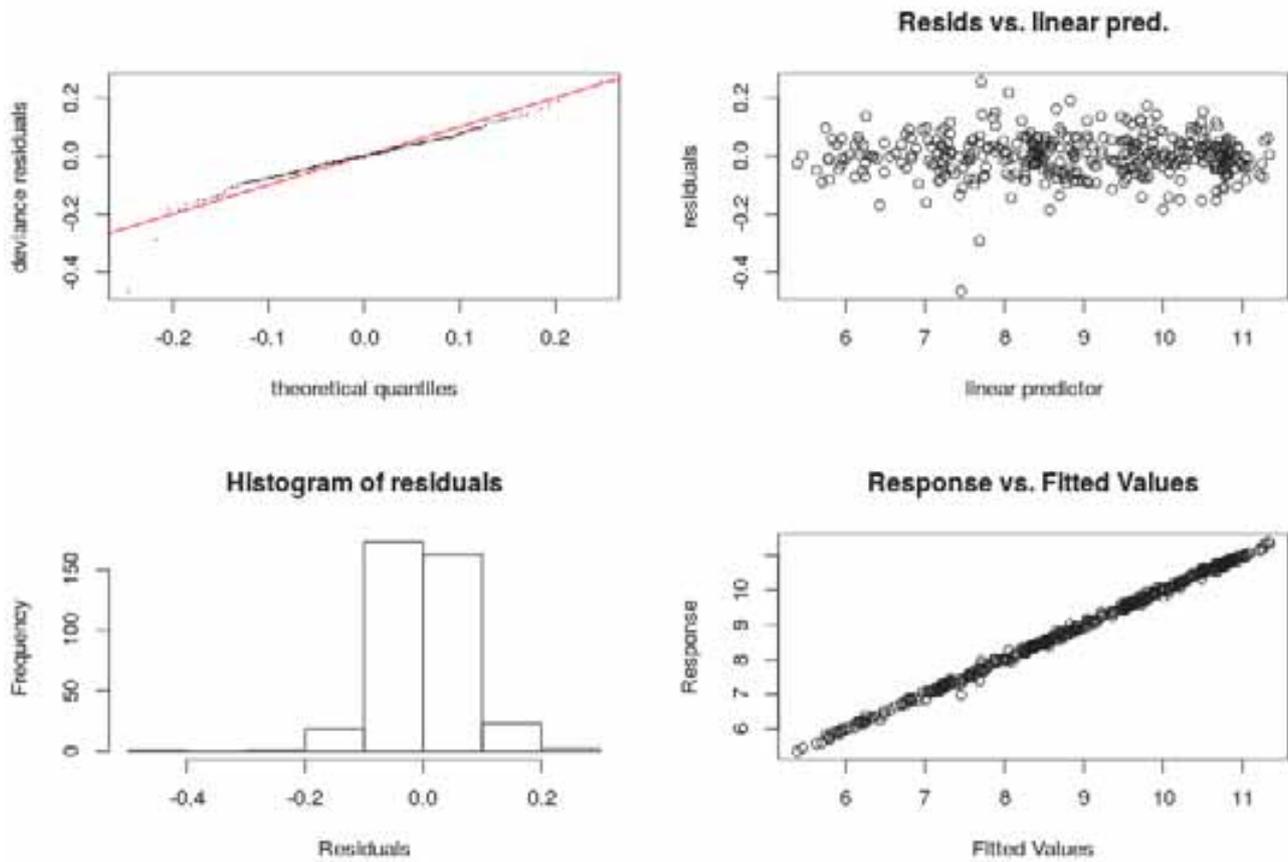


Figure 11 Distribution of export and GDP returns due to TPO interventions

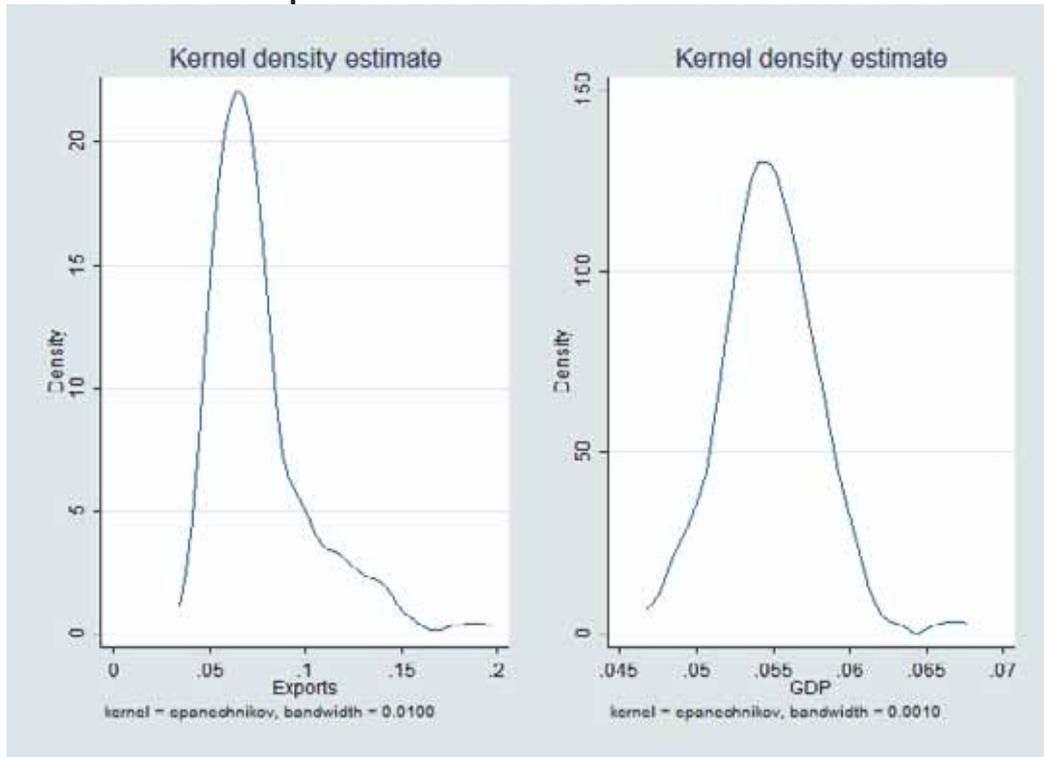
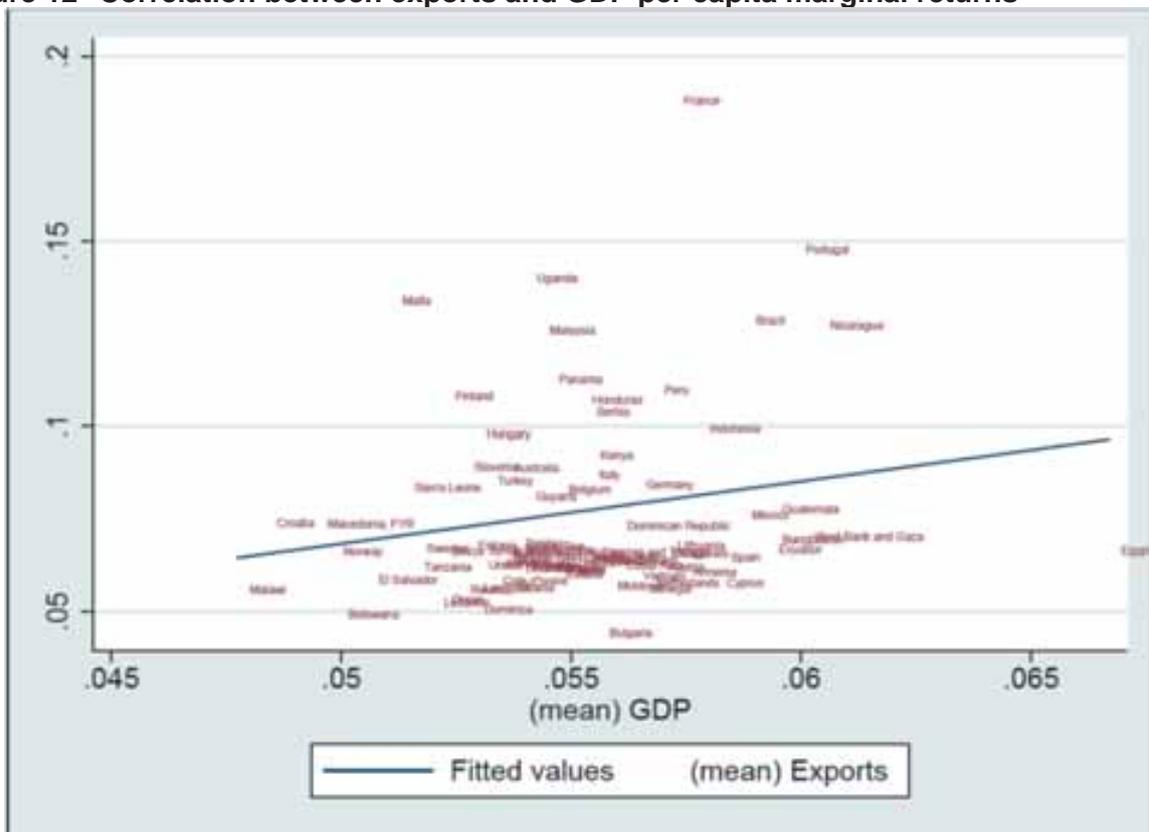
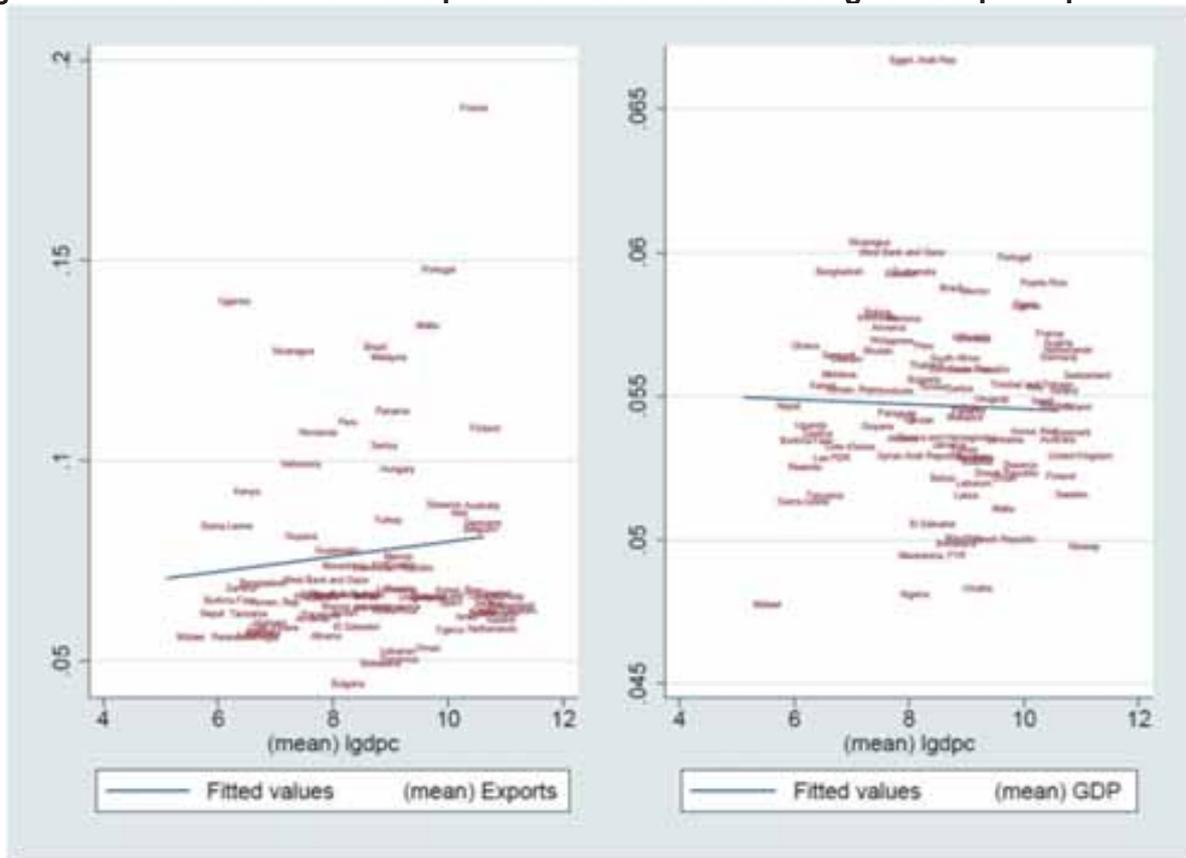


Figure 12 Correlation between exports and GDP per capita marginal returns



Note: The blue line is the linear fit between export and GDP per capita marginal returns.

Figure 13 Correlation between export and GDP returns with log of GDP per capita



Note: The blue line is the linear fit between marginal returns and the log of GDP per capita.

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