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JEL Classification: F13, C14

Keywords: Export Promotion, Impact Evaluation

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Export Promotion: what works?*

Marcelo Olarreaga† Stefan Sperlich‡ Virginie Trachsel§

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Abstract

A recent literature has argued that resources spent on export promotion help export growth (Van Biesebroeck, Konings and Volpe, 2016). In this paper we build on this work and examine the heterogeneity in returns across countries to disentangle which are the characteristics of Trade Promotion Organizations (TPOs) that are more likely to generate higher returns. Results suggest that on average a one percent increase in export promotion budgets increases exports by 0.074 percent, confirming results in the earlier literature. Our results also suggest that these export gains translate into very large GDP per capita gains. Indeed, a one percent increase in export budgets generates a 0.065 percent increase in GDP per capita. More interestingly, our results show which TPO characteristics generate large increases in exports, and which generate large gains in terms of GDP per capita.

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1 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 percent in Portugal to 0.15 percent in Chile and Colombia and 0.03 percent 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 while 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 developing and developed countries with information on TPO budget, funding sources and activities. Results suggest that a one percent increase in the TPOs budget generates a 0.074 percent increase in exports.[1] At the sample median, this implies that a one dollar increase in the export promotion budget generates an 87 dollar increase in exports.[2]

It is important to note that these are not 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 one percent increase in the TPOs budget generates a 0.065 percent increase in GDP per capita.[3] At the sample median, and keeping population constant, this implies that a one dollar increase in the export promotion generates a 384 dollar increase in GDP.[4] 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 inefficiencies as they face

[1] The 95 percent confidence interval suggest an elasticity of exports with respect to the budget in the [0.052-0.096] range, which includes previous estimates obtained in in the literature, see e.g. Lederman et al. (2010).

[2] 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 one 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 95 percent confidence interval yields a return in the 37 to 139 dollar range.

[3] The 95 percent confidence interval of this elasticity is: [0.050-0.080].

[4] 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 one percent increase in the median export promotion budget yields a 384 return on the dollar, with a 95 percent confidence interval in the 209 to 555 dollar range.

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.[5] 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), 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 lot 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 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 several 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.[6] 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.[7]

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 exports 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, exports (or GDP per capita) and TPO's budget may be jointly determined, which may lead to omitted variable bias. This was an important problem with earlier cross-section studies where addressing omitted variable bias

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

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

[7] 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).

relied on adding as many controls as possible and instrumental variable strategies, which required modeling self-selection. 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 the rank of the budget as an instrument, which is widely accepted as a correction for measurement problems. 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 first address this using an instrumental variable estimator. We use as instruments 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 or GDP per capita.[8] A Hansen over-identification test suggests that this may be valid for the GDP per capita equation, but not for exports.

The use of these instruments certainly changes the interpretation of the coefficients. They now identify the average returns associated with variations in export promotion budgets that are caused by variations in the instrumental variables. Note that the larger is the unexplained heterogeneity in the returns to TPO budgets, the larger the difference between the returns identified by altering IVs (the so-called local average treatment effects, or LATE, which vary with the choice and values of IVs), and the larger their difference with respect to the average returns over the entire population (the so-called average treatment effect, or ATE). An alternative identification strategy is offered by our semi-parametric varying coefficient model that directly captures the heterogeneity in returns. By reducing the extent of unexplained heterogeneity, it reduces the variation of the LATE (and thus its distance to the ATE). It also makes the exogeneity assumptions needed by the IV estimator more credible.[9]

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 being inadequately funded, suffering from government involvement, and hiring staff that was not client oriented. 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

[8] In fact to reduce the reverse causality bias we would only need that the correlation of the instrument with exports or GDP per capita is smaller than the reverse causality effect. It might, however, increase the mean squared error in finite samples.

[9] For details on why and how varying coefficient models have these two properties see Sperlich and Theler (2015) or Benini, Sperlich, and Theler (2016).

evaluated twenty years later, quantitative assessments of the role of export promotion were more positive. Rose (2005) stated that the presence of a diplomatic representation (i.e., a consulate) can increase bilateral exports by 6 to 10 percent. Lederman, Olarreaga and Payton (2010) estimated that on average a 1 percent increase in export promotion budgets leads to a 0.05 percent increase in exports.

While the more recent literature tends to conclude that TPO activities tend to increase exports, it only focuses on the average impact. None explored 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. These are important unanswered questions for policy makers. 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 Carvallo (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 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 (2016) 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 (2016) 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 percent 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 benefits 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 better identify 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. 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 type of questions.

Section 2 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. Section 3 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. Section 4 presents the results and section 5 concludes.

2 Data sources and summary statistics

We merged information from 3 rounds of TPOs' surveys. The first survey was conducted in the fall of 2005 by the World Bank and the data was used in Lederman et al. (2010). The second round was conducted in the fall of 2010 also by the World Bank, and the final round was conducted in the fall 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 percent declined. In 2010, the same 116 TPOs were contacted, and 93 answered positively.[10] In the fall of 2014 the ITC survey concentrated in TPOs in fourteen European countries, which all responded positively.[11] This leaves with an unbalanced panel containing information on TPOs' budget, sources of funding, governance, and activities for 94 countries.

The survey contains 19 questions to better understand the budget, sources of funding, governance, and activities of TPOs around the world.[12] Table 1 provides summary statistics for the variables used in this paper. It is important to note that this is an unbalanced panel so the average are not necessarily for the same time period for each variable. Also, for non-European countries the sample stops in 2010, whereas for some European countries the sample only starts in 2010.[13] The unbalanced nature of the panel is addressed using country and year fixed-effects in our econometric specifications.

[10] 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.

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

[12] The survey is available from the authors upon request.

[13] The survey contains other variables not reported in Table 1 but available upon request. These include: the number of years the TPO existed and the number of employees.

Also 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 percent, the value 3 if the share is between 10 and 25 percent, the value 4 if the share is between 25 and 50 percent, the value 5 if the share is between 50 and 75 percent and the value 6 if the share is between 75 and 100 percent.

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 increase the focus of the agency in export promotion is diluted.

Whether the strategy of the agency is to target all sectors and destinations ranks from 1 to 8 the importance of this strategy relative to strategies that focus on certain types of products, destinations or firms. The higher is the value of these variables, the more targeted by sector and destination are the agency's interventions.

The numbers in Table 1 suggest that TPOs have an average budget of USD 8 million (exponential of 15.904), but there is a lot variance behind these averages with a budget of USD 60 thousands for SLEDIC in Sierra Leone and USD 500 million for UKTI in the United Kingdom. If we distinguish between developed and developing countries using the World Bank threshold of a GNP per capita above and below USD 12'736, the budget of TPOs in developed countries is twice as large as the budget of TPOs in developing countries. We can also see from the averages reported in Table 1 that the average share of executive board seats in the hands of the private sector is 48 percent. But this varies between 0 and 100 percent. In fact, as can be seen in Table 1 all the variables that have to do with TPO characteristics span from their minimum possible value to their maximum possible value. For example if the share of public fuding in the TPO budget is close to 5 (meaning that the share is on average somewhere between 50 to 75 percent), it spans from 0 (meaning a share of 0 percent) to 6 (meaning a share of 100 percent).

To better illustrate the variance behind some of these average numbers, Figures 1 to 5 provide boxplots with the distribution of some of variables in Table 1.[14] Figure 1 focuses on sources of funding. The distributions in the boxplots suggest that most agencies are financed by public funding and the source of private funding is much smaller, but there are a few agencies that are exclusively financed by private funding.

Figure 2 provides the distribution of TPO budgets to exports in different regions. The first important point is that the export promotion budget represents a very small share of exports. The sample median is below 0.05 percent. But there is quite a bit of heterogeneity and in a country like Rwanda the TPO budget

[14]The bottom of the boxplot 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 wiskers, the outliers.

represents as much as 4.7 percent of exports. Importantly, the differences within regions are often larger than the differences across regions, which suggests that the heterogeneity may not be associated with geographic factors or the level of development in different countries.

Figure 3 shows the relative importance of the budget spent on export support services versus marketing services. As suggested in Table 1 on average TPO spend a larger share of their budget on marketing. More importantly, Figure 2 tends to suggest that this is the case in a large share of countries as the distribution of the share spent on marketing tends to be above the distribution of the share spend on export support services.

Figure 4 illustrates the share of budget spent on small, medium and large firms. If the distribution of the share spent on small or medimum size firms are quite similar, the share spent on large firms tends to have a distribution with values that are much smaller, suggesting that most TPOs tend to focus on either small or medium size firms. Note however that in the top 10 percent of the distribution for shares spent on large firms there are some TPOs that spend more than half of their budget on large firms.

Figure 5 provides the distribution of the share of the budget spent on exporters, occasional exporters, and non-exporters. The priority seems to be given to established exporters, and then on new or occasional exporters. The budget spent on non-exporters tends to be significantly smaller, but there are a few TPOs that spend all their budget on non-exporters.

An important message to take away from these Figures and the summary statistics is that there are important differences in TPOs characteristics in our sample. In our empirical exercise we we will exploit these differences to examine the impact that they have on the export and GDP per capita returns associated with export promotion.

3 Empirical strategy

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

3.1 Standard linear fixed effects panel models

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

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

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(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; $\epsilon_{c,t}^x$ $\epsilon_{c,t}^y$ are independent mean zero error terms with finite variances.

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:

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

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.

As discussed earlier, measurement error of the export promotion budget is a potential problem. Indeed, 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.

Reverse causality and time varying omitted variables correlated with the export promotion budget might 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. One typically chooses instruments that are correlated with the size of the budget, but are less likely to be correlated with the error term. 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. 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. A larger share of the budget being funded by the government may indicate a more strategic importance given to export promotion. However, note that in these parametric specifications we either need the assumption of constant returns (which ignores

the heterogeneity of TPOs and their policies)[15] or accept that we can only estimate a LATE.

3.2 Modeling heterogeneous impact across TPO characteristics

The econometric methodology described above allow us to provide an average return to export promotion across countries. Yet, as we discussed in section 2, TPOs differ 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. Understanding what type of TPO characteristic yields higher export and GDP per capita returns can help design better functioning TPOs.

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 of how these characteristics affect the returns to export promotion budget would be to use a linear model with interactions between budget and different group of countries and/or TPOs' characteristics. However, the estimation of such a model implies strong assumptions regarding the linearity of the relationship between returns and TPOs' characteristics. It also assumes that the interaction can be captured by a simple product *budget* $\times$ *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* effects of $\ln(budget)$ with an instrumental variable as proposed above would then require to assume (among other things) that the instruments exhibit no correlation with the un-modeled TPO characteristics or their interaction with the export promotion budget, while having a strong correlation with the budget itself. Such an instrument is very unlikely to exist, which may explain why in the export equation, the instruments we used did not pass the Hansen overidentification test.

To circumvent this and allow the impact of export promotion budgets on exports to vary across TPO

[15] It is important to note that to correctly interpret the estimates of the returns we crucially assume that the returns to $\ln(\text{budget})$ are constant across countries and time. If this assumption is violated, neither the standard least squares methods, nor the standard instrumental variable estimation methods are valid.

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 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 visualized 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 for varying coefficients is also a restriction, it is nonetheless one of the most accepted simplifications in empirical economics.

The equation to be estimated then becomes:

$$\begin{aligned}
\ln(\text{outcome})_{c,t} \quad = \quad & \{b_f(fees_{c,t}) + b_g(public - funding_{c,t}) + b_h(marketing_{c,t}) + b_j(ESS_{c,t}) \\
& + b_k(non - exporters_{c,t}) + b_l(established - exporters_{c,t}) + b_m(small_{c,t}) + b_n(medium_{c,t}) \\
& + b_o(private - board_{c,t}) + b_p(strategy_{c,t}) + b_q(matching - grants_{c,t}) \\
& + b_r(responsibility_{c,t})\}\ln(\text{budget})_{c,t} + \delta\ \ln(\text{population})_{c,t} + \gamma_c + \gamma_t + \epsilon_{c,t} \qquad (3)
\end{aligned}$$

where *outcome* is either in terms of exports or GDP per capita; $b_f, \ldots, b_r$ are unknown smooth functions. We approximate them by penalized cubic polynomials (so-called P-splines). We select the varying components of the model based on null space penalization. That is by adding a penalty for 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. 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 in the export equation). 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 $\ln(budget)$ (at least as long as the other characteristics are included).

We re-estimate the model without the fully penalized terms and report results for the characteristics that remain in 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. More specifically, we use a two-stage procedure, where in the first stage we regress the instrumental variables and other exogenous variables on the endogenous one

$$ln(budget) = \sum_j f_j(z_j) + \xi \ , \tag{4}$$

where z_j are the instruments and other exogenous variables. ξ contains the endogenous variation. After calculating $\hat{\xi} := ln(budget) - \sum_j \hat{f}_j(z_j)$, we include it in the second stage to control for the endogeneity of ln(budget) :

$$\begin{aligned}
\ln(\text{output})_{c,t} \quad = \quad & \{b^u_f(fees_{c,t}) + b^u_g(public - funding_{c,t}) + b^u_h(marketing_{c,t}) + b^u_j(ESS_{c,t}) \\
& + b^u_k(non - exporters_{c,t}) + b^u_l(established - exporters_{c,t}) + b^u_m(small_{c,t}) + b^u_n(medium_{c,t}) \\
& + b^u_o(private - board_{c,t}) + b^u_p(strategy_{c,t}) + b^u_q(matching - grants_{c,t}) \\
& + b^u_r(responsibility_{c,t})\}\ln(\text{budget})_{c,t} + \delta^u \ \ln(\text{population})_{c,t} + \gamma^u_c + \gamma^u_t + b^u_c(\hat{\xi}) \\
& + e^u_{c,t} \ , \quad u = x, y \ .
\end{aligned} \tag{5}$$

Note that the variables that are penalized out of the estimated equation are not necessarily the same in the export and GDP per capita equations. In other words, 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.[16]

While the figures we obtain for the non-linear impacts b^u_i, $u = x, y$, $i = f, g, h, j, k, l, m, n, o, p, q, r$ on budget-returns to exports and GDP/capita are quite informative, we are interested in the marginal impacts of ln(budget) on the respective outcome variables. Thus, we need to compute the derivatives of these nonlinear functions. This is somewhat easier for parametric models where we get analytic expressions for the marginal impact functions. We therefore take $\hat{b}^x_i$, $\hat{b}^y_i$ to guide us on how to properly specify the regression models parametrically. We end up with the following models:

[16] Recall that the variable selection for the varying coefficient specifications (i.e. the penalization tests) were run on a model without any control for endogeneity. As this could potentially bias the results, we rerun them including the control function $b^u_c(\hat{\xi})$ to address potential endogeneity. Note that this corresponds to an overidentification test of the exclusion restriction of instruments. We found that the same variables were penalized out of the export and GDP per capita models, i.e., the exclusion restrictions hold.

$$
\begin{aligned}
\ln(\text{exports})_{c,t} &= \{b_f^x(fees_{c,t}) + b_g^x(fees_{c,t}^2) + b_h^x(marketing_{c,t}) + b_i^x(marketing_{c,t}^2) + b_j^x(marketing_{c,t}^3) \\
&\quad + b_k^u(non-exporters_{c,t}) + b_l^u(non-exporters_{c,t}^2) + b_m^x(established-exporters_{c,t}) + b_n^x(small_{c,t}) \\
&\quad + b_o^x(private-board_{c,t}) + b_p^x(strategy_{c,t})\}\ln(\text{budget})_{c,t} \\
&\quad + \delta^x \ln(\text{population})_{c,t} + \zeta^x \ln(\text{population})_{c,t}^2 + \kappa^x \ \ln(\text{population})_{c,t}^3 + \gamma_c^x + \gamma_t^x + b_c^x(\hat{\xi}) + e_{c,t}^x \qquad (6) \\
\ln(\text{GDP/capita})_{c,t} &= \{b_f^y(public-funding_{c,t}) + b_g^y(marketing_{c,t}) + b_h^y(ESS_{c,t}) \\
&\quad + b_i^y(established-exporters_{c,t}) \\
&\quad + b_j^y(medium_{c,t})\}\ln(\text{budget})_{c,t} + \delta^y \ \ln(\text{population})_{c,t} + \zeta^y \ln(\text{population})_{c,t}^2 \\
&\quad + \kappa^y \ln(\text{population})_{c,t}^3 + \gamma_c^y + \gamma_t^y + b_c^y(\hat{\xi}) + e_{c,t}^y \ . \qquad (7)
\end{aligned}
$$

Finally, to estimate marginal returns by country, we take the derivative of (6) and 7 with respect to the log of the budget and calculate the average marginal returns over the sample period for each country separately as a function of TPO characteristics.

4 Results

Table 2 presents the results of the estimation of (1) and (2). Columns (1) to (4) provide the estimation of the export equation and columns (5) to (8) the estimation of the GDP per capita equation. Columns (1), (2), (5) and (6) use an ordinary least square estimator and columns (3), (4), (7) and (8) an instrumental variable estimator. Columns (3) and (7) correct for measurement error using the rank of the budget as an instrument and columns (4) and (8) use TPO characteristics as instruments (share of public funding and share of private seats in the board as well as their interaction) to address endogeneity concerns.

The ordinary least square estimates suggest that a 1 percent increase in the export budget leads to an increase in exports between 0.046 and 0.051 percent and an increase in GDP per capita between 0.049 and 0.057 percent, depending on whether we control for population size. The coefficients on the export promotion budget are always statistically significant at least at the 5 percent level. The instrumental variable estimates suggest larger returns after controlling for measurement error and endogeneity. Our preferred specification in columns (4) and (8) which uses as instruments TPO characteristics suggests a return to exports of 0.074 percent and a return to GDP per capita around 0.065 percent.

The Anderson canonical correlation test suggest that the instruments are relevant, whereas the Hansen overidentification test suggests that the instruments are valid in the GDP per capita equation, but they do not pass the test in the exports equation. This puts some doubt on the causal interpretation of the estimates in the export equation. Part of the problem could be that the TPO characteristics help explain TPO's budget, but also the impact of the TPO's budget on exports, which invalidates them as instruments in the

export equation.

The potential for TPOs characteristics to directly affect exports and GDP per capita will be directly addressed by the semi-parametric estimates in the next section. The heterogeneity in returns will be directly modeled and we will only use as instruments variables that are penalized out of the export and GDP per capita model.

4.1 What works?

In order to disentangle which are the TPO characteristic that affect the export and GDP per capita returns to export promotion, we start with the estimation of the full non-parametric model in (3) and perform null space penalization tests to select the TPO characteristics that are relevant in the 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 importance of export promotion in the objectives of the TPO as can be seen from table 3. These variables do not to 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 through their impact on the size of the export promotion budget. They simply do not explain the heterogeneous returns to changes in export promotion budgets across countries.

The results of the non-parametric instrumental variable estimation of the final models for exports and GDP per capita 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.[17]

The regression plots in Figure 9 suggest that a higher share of funding from public sources (sou_pub)

[17]Recall that a higher value in this variable indicates that the agency tends to target only a few sectors or markets.

reduces the impact of export promotion budgets 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.

4.2 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 TPO characteristics kept in the final non-parametric model.

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. Table 5 provides these marginal export and

GDP per capita returns by TPO, as well as their wild bootstrapped standard errors.[18] Note that all returns are positive and statistically significant at least at the 95% level.

Figure 10 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 on 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 two distributions seem to be distributed around a common mean. This suggests that the average marginal returns to exports is similar to the average marginal returns to 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.

There is a weak but positive correlation between export and GDP per capita returns as illustrated in Figure 11. Because the correlation is quite weak, this does not imply that high returns in terms of exports necessarily lead to 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. For example while Malawi and Portugal have a similar return in terms of exports, the difference in TPO characteristics between AICEP Portugal and MEPC Malawi lead to much larger return in terms of GDP per capita in Portugal.[19]

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 12 presents the correlation between returns and the log of GDP per capita. There is a slightly downwards sloping relationship for both export and GDP per capita returns. But the relationships are not statistically significant, which suggests that there is no clear relationship between returns to export promotion and the level of development.

5 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 move 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

[18] We are using the so-called wild bootstrap version introduced in this version by Mammen (1992) for non-linear cross-sectional regression models, and studied in Franke, Kreiss and Mammen (2002) for non-linear time series data. A main advantage in our case is that it automatically accounts for the presence of unknown heteroscedasticity and autocorrelation. The procedure is actually quite simple; for a sample $\{(V_{c,t}, W_{c,t})\}_{t,c=1}^{T,n_t}$ with n_t countries in year t, and estimates $\widehat{E}[V_{,ct}|W_{c,t}]$ we generate bootstrap samples

$$V^*_{,ct} = \widehat{E}[V_{c,t}|W_{c,t}] + \Big(V_{c,t} - \widehat{E}[V_{c,t}|W_{c,t}]\Big) \cdot \epsilon \ , \qquad \epsilon \sim N(0,1).$$

Note that for each bootstrap sample the exogeneous variables are kept unchanged from the original data. That is, we generate $B = 1000$ bootstrap samples $\{(V^*_{c,t}, W_{c,t})\}_{t,c=1}^{T,n_t}$ and re-estimate the parameter of interest, say β. From the original sample we have $\hat{\beta}$, and the $\{\hat{\beta}^*_b\}_{b=1}^{B}$ can now be used to estimate the confidence intervals. Note that the same can be done to get a confidence band for $\widehat{E}[V_{c,t}|W_{c,t}]$.

[19] Countries to the left of the red line in Figure 11 have larger returns in terms of GDP per capita, and countries to the right of the red line have larger returns in terms of exports.

objective of export promotion policies is not exports per se, but social and economic growth. We use 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 TPOs' 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 GDP per capita. However, what works in terms of export revenue may not necessarily work in terms of GDP per capita. This has two important implications. First, it is important that TPOs clearly define their objective: is it export or GDP per capita growth? 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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Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
Log of non oil exports of goods and services (USD)	22.910	2.427	16.251	28.51
Log of EPA budget (USD)	15.904	2.121	11.512	20.22
Log of GDP per capita (USD)	8.469	1.570	4.968	12.18
Log of population	15.924	1.726	11.123	21.01
Budget coming from fees from services	1.940	1.197	1	6.00
Public source of funding	4.924	1.656	1	6.00
Budget spent on marketing	3.512	1.087	1	6.00
Budget spent on export support services	2.658	0.976	1	6.00
Budget on non exporters	2.166	1.130	1	6.00
Budget on established exporters	4.309	1.241	1	6.00
Budget on small firms	3.759	1.020	1	6.00
Budget on medium size firms	3.807	0.982	1	6.00
Share of private sector over total at board	0.477	0.295	0	1.00
Rank of TPO responsability	2.532	1.094	1	5.00
Strategy targets exports in all sectors and destinations	1.665	1.245	1	7.00

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

	Exports				GDP per capita			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log of TPO budget	0.046*	0.051*	0.079**	0.074**	0.049**	0.057**	0.073**	0.065**
	(0.018)	(0.022)	(0.024)	(0.022)	(0.013)	(0.014)	(0.016)	(0.016)
Log of population		2.119**	2.392**	2.194**		0.661*	0.681**	0.552*
		(0.507)	(0.502)	(0.450)		(0.282)	(0.254)	(0.249)
Intercept	25.339**	-5.719	-5.914	-6.888	9.458**	-4.819	-5.432	-1.400
	(0.340)	(5.674)	(5.647)	(5.071)	(0.240)	(5.137)	(4.640)	(2.828)
N	533	530	530	505	552	549	549	524
R^2	0.997	0.997	0.997	0.997	0.997	0.996	0.997	0.999
Anderson 1st stage p-value:	NA	NA	0.000	0.000	NA	NA	0.000	0.000
Hansen over-id p-value:	NA	NA	NA	0.000	NA	NA	NA	0.147

[a]All regressions include country and year fixed effects. Robust standard errors are provided in parenthesis. Significance levels are as follows: † stands for 10 percent statistical significance; * for 5 percent, and ** for 1 percent. The first four columns explain the log of non oil exports of goods and services. The last four columns explain GDP per capita. Columns (1), (2), (5) and (6) use an OLS estimator. Columns (3), (4), (7) and (8) an instrumental variable estimator. Columns (3) and (7) use the rank of the budget as instrument, and columns (4) and (8) instrument 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: Non parametric model selection for exports and GDP per capita models (panel data 2005-2013)[a]

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 TPO responsibility	0.000	0.000

[a]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 4: What works?
(functional form is based on non-parametric estimates)[a]

Variables	Exports	GDP per capita
Log of TPO budget in USD	0.131**	0.050**
	(0.033)	(0.012)
Budget x share of public funding		-0.000
		(0.000)
Budget x share of fees	0.011**	
	(0.003)	
Budget x share of fees squared	-0.002**	
	(0.001)	
Budget x share of marketing activ.	-0.085**	0.002**
	(0.023)	(0.001)
Budget x share of marketing activ. squared	0.024**	
	(0.007)	
Budget x share of marketing activ. cube	-0.002**	
	(0.001)	
Budget x share of export support services		-0.001*
		(0.001)
Budget x share of non exporters	0.013†	
	(0.007)	
Budget x share of non exporters squared	-0.003	
	(0.002)	
Budget x established exporters	0.002*	0.001
	(0.001)	(0.001)
Budget x small size firms	-0.002*	
	(0.001)	
Budget x medium size firms		0.002*
		(0.001)
Budget x share of private seats	-0.000	
	(0.003)	
Budget x targeting few sectors	-0.004	
	(0.015)	
Log of population	-79.918**	-28.299*
	(23.782)	(13.957)
Log of population squared	5.237**	1.666†
	(1.606)	(0.936)
Log of population cube	-0.111**	-0.032
	(0.036)	(0.021)
Control function exports[b]	-0.000**	
	(0.000)	
Control function GDP per capita		-0.000†
		(0.000)
Intercept	411.002**	159.847*
	(117.088)	(69.466)
N	368	381
R^2	0.998	0.998

[a]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 percent statistical significance; * for 5 percent, and ** for 1 percent.

[b]Note that the control functions have no direct interpretability. They are the "error" term of a first stage regression to control for endogeneity as described in the methodology.

Table 5: Exports and GDP per capita returns to export promotion

Country	Exports	Wild Boot. SE	GDP/capita	Wild Boot. SE
Albania	0.058	0.019	0.060	0.014
Armenia	0.061	0.020	0.064	0.015
Australia	0.065	0.019	0.060	0.014
Austria	0.062	0.019	0.062	0.014
Bangladesh	0.078	0.019	0.067	0.015
Barbados	0.063	0.019	0.060	0.014
Belgium	0.059	0.019	0.061	0.014
Belize	0.064	0.018	0.058	0.014
Bosnia and Herze	0.045	0.017	0.058	0.014
Botswana	0.050	0.019	0.056	0.014
Brazil	0.060	0.039	0.064	0.015
Bulgaria	0.047	0.020	0.065	0.015
Burkina Faso	0.068	0.019	0.060	0.014
Costa Rica	0.067	0.019	0.061	0.014
Cote d'Ivoire	0.059	0.020	0.059	0.014
Croatia	0.057	0.019	0.054	0.013
Cyprus	0.063	0.019	0.065	0.015
Denmark	0.063	0.019	0.060	0.014
Dominica	0.056	0.020	0.056	0.013
Dominican Republ	0.074	0.018	0.063	0.015
Ecuador	0.069	0.019	0.064	0.015
Egypt, Arab Rep.	0.070	0.019	0.073	0.016
El Salvador	0.056	0.019	0.056	0.014
Estonia	0.050	0.017	0.059	0.014
Finland	0.065	0.026	0.058	0.014
France	0.047	0.078	0.064	0.015
Germany	0.065	0.019	0.063	0.015
Guatemala	0.058	0.018	0.064	0.015
Guyana	0.047	0.021	0.061	0.014
Honduras	0.063	0.026	0.058	0.014
Hungary	0.054	0.026	0.059	0.014
Iceland	0.062	0.019	0.060	0.014
Indonesia	0.059	0.027	0.066	0.015
Ireland	0.061	0.018	0.062	0.015
Israel	0.063	0.019	0.061	0.014
Italy	0.066	0.018	0.062	0.015
Jamaica	0.067	0.019	0.060	0.014
Jordan	0.029	0.024	0.061	0.014
Kenya	0.072	0.019	0.063	0.015
Korea, Rep.	0.059	0.017	0.061	0.014
Lao PDR	0.047	0.017	0.060	0.014

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... table 5 continued

Country	Exports	Wild Boot. SE	GDP/capita	Wild Boot. SE
Lebanon	0.053	0.019	0.058	0.014
Lithuania	0.068	0.018	0.064	0.015
Macedonia, FYR	0.056	0.019	0.054	0.014
Malawi	0.062	0.020	0.053	0.013
Malaysia	0.061	0.037	0.061	0.014
Malta	0.052	0.044	0.057	0.014
Mexico	0.071	0.016	0.064	0.015
Moldova	0.061	0.019	0.063	0.015
Nepal	0.069	0.019	0.063	0.015
Netherlands	0.058	0.019	0.064	0.015
Nicaragua	0.057	0.040	0.065	0.015
Norway	0.068	0.018	0.056	0.014
Oman	0.057	0.020	0.059	0.014
Panama	0.043	0.038	0.062	0.014
Paraguay	0.065	0.019	0.061	0.014
Peru	0.070	0.026	0.064	0.015
Philippines	0.074	0.019	0.064	0.015
Portugal	0.061	0.051	0.068	0.015
Rwanda	0.057	0.020	0.059	0.014
Senegal	0.055	0.019	0.061	0.014
Serbia	0.058	0.026	0.062	0.015
Sierra Leone	0.073	0.019	0.056	0.014
Slovenia	0.054	0.022	0.059	0.014
Spain	0.069	0.020	0.066	0.015
Sweden	0.072	0.019	0.057	0.014
Switzerland	0.064	0.019	0.062	0.015
Syrian Arab Repu	0.072	0.020	0.058	0.014
Tanzania	0.063	0.018	0.057	0.014
Trinidad and Tob	0.048	0.018	0.063	0.015
Turkey	0.043	0.025	0.060	0.014
Uganda	0.042	0.051	0.061	0.014
United Kingdom	0.065	0.019	0.060	0.014
Uruguay	0.059	0.016	0.062	0.014
Vietnam	0.061	0.019	0.063	0.015
West Bank and Ga	0.078	0.018	0.066	0.015
Yemen, Rep.	0.065	0.018	0.062	0.015
Zambia	0.070	0.018	0.061	0.014
Average	0.061	0.022	0.061	0.014

Figure 1: Sources of funding

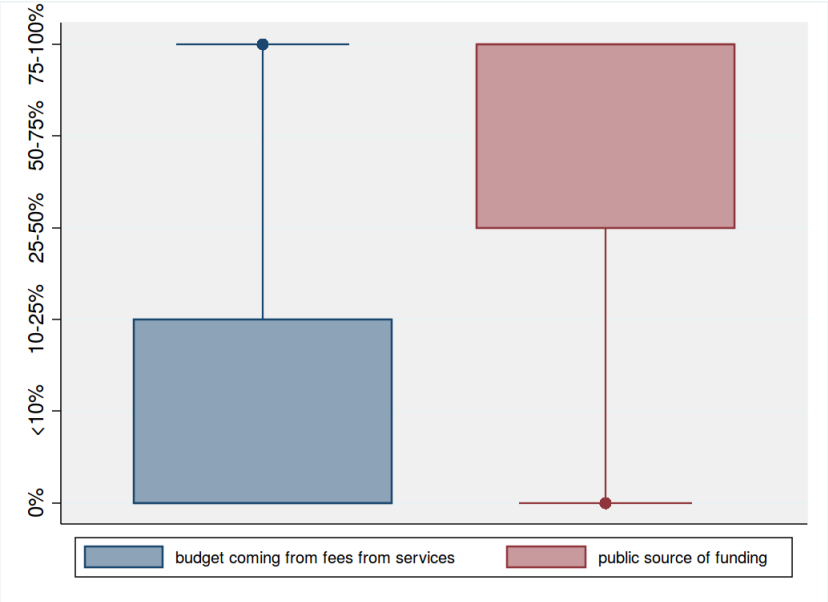


Figure 2: Budget to export ratio by region

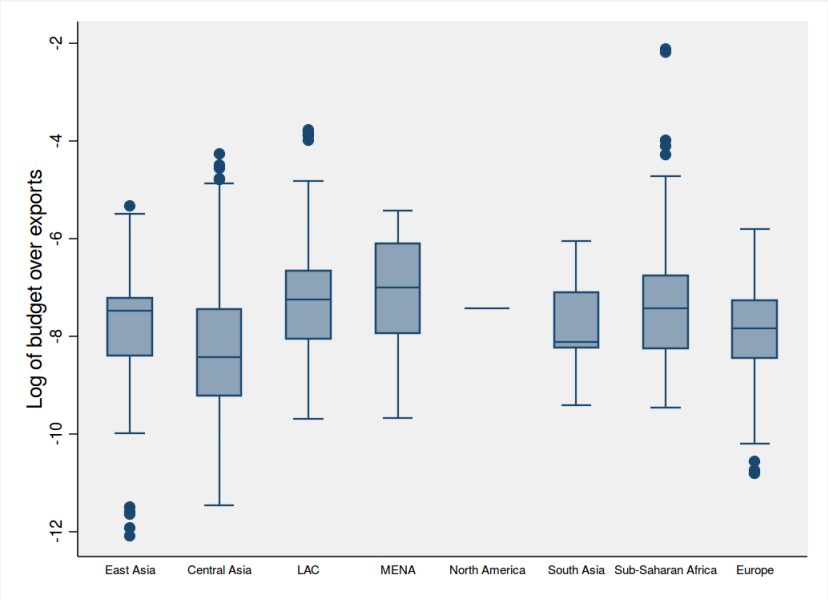


Figure 3: Share of Budget in export support services and marketing

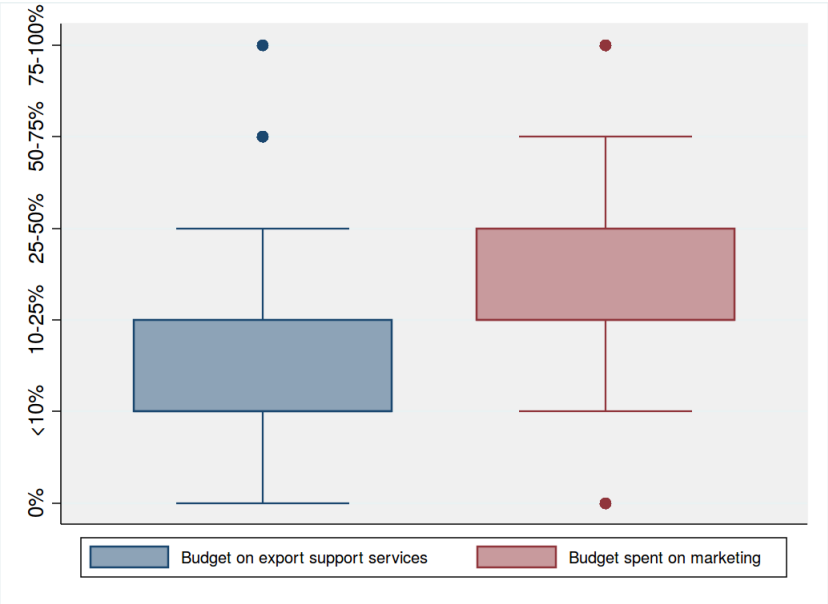


Figure 4: Share of budget spent on small, medium and large firms

Figure 5: Share of budget spent by type of exporter

Figure 6: IV Regression plots of the penalized model on exports

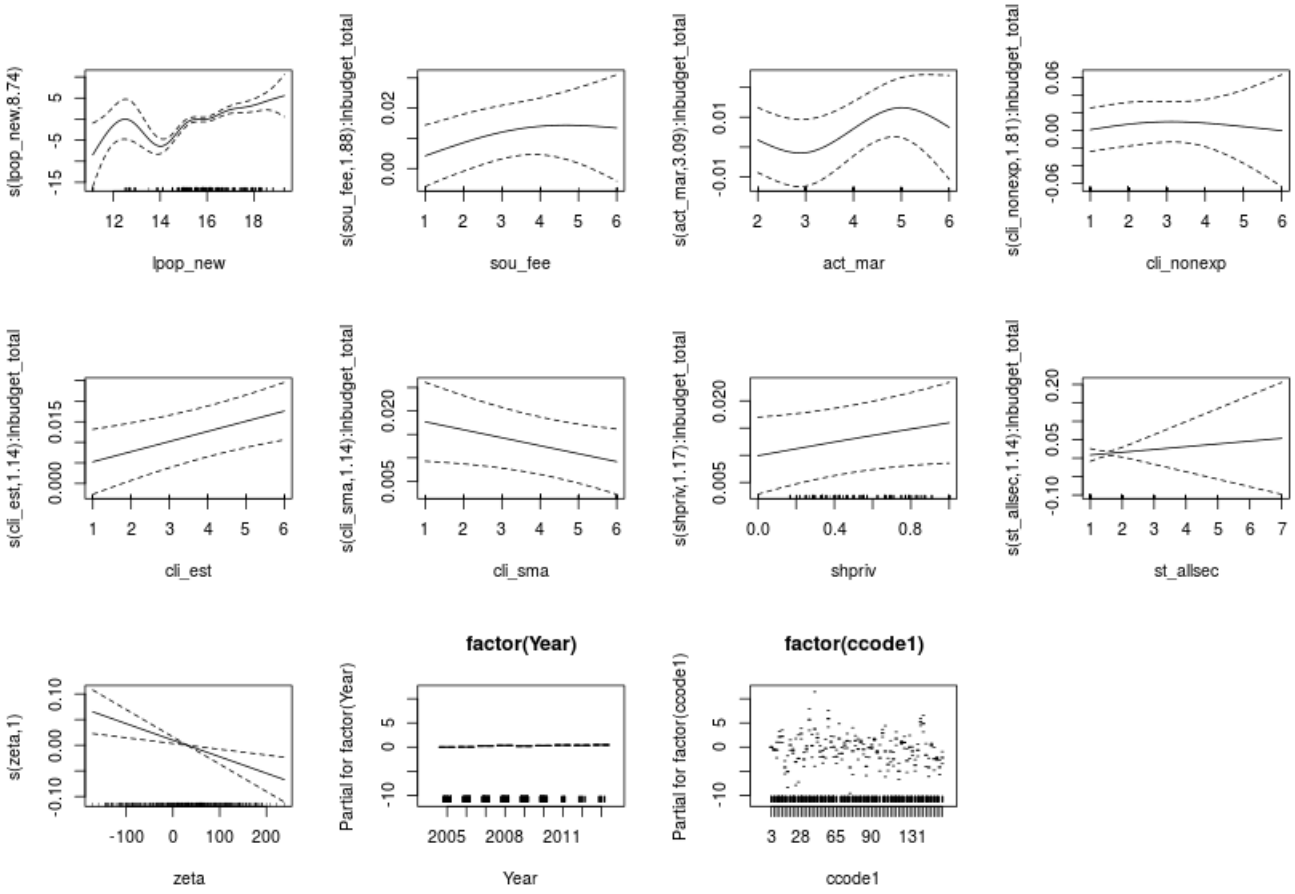


Figure 7: Postestimation plots of penalized IV regression on exports

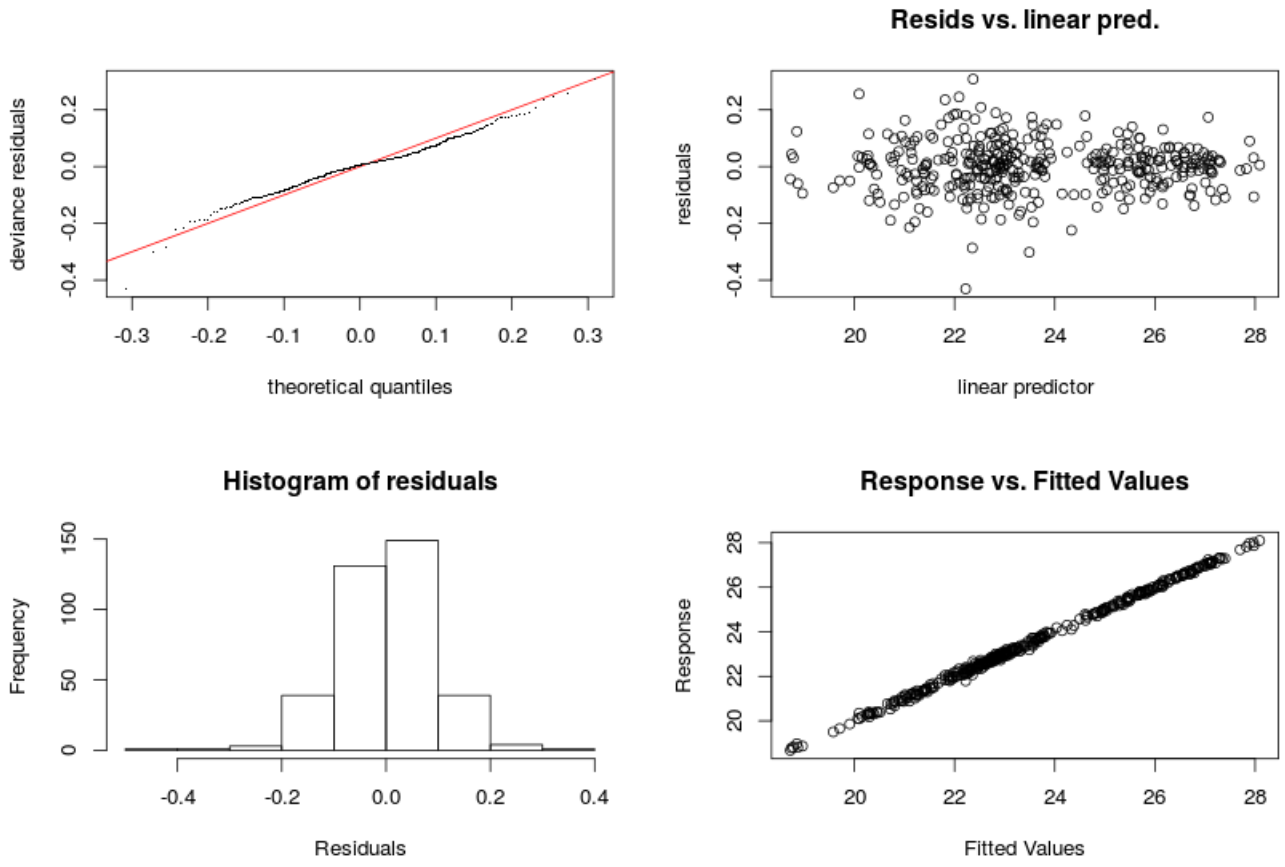


Figure 8: IV Regression plots of the penalized regression on GDP per capita

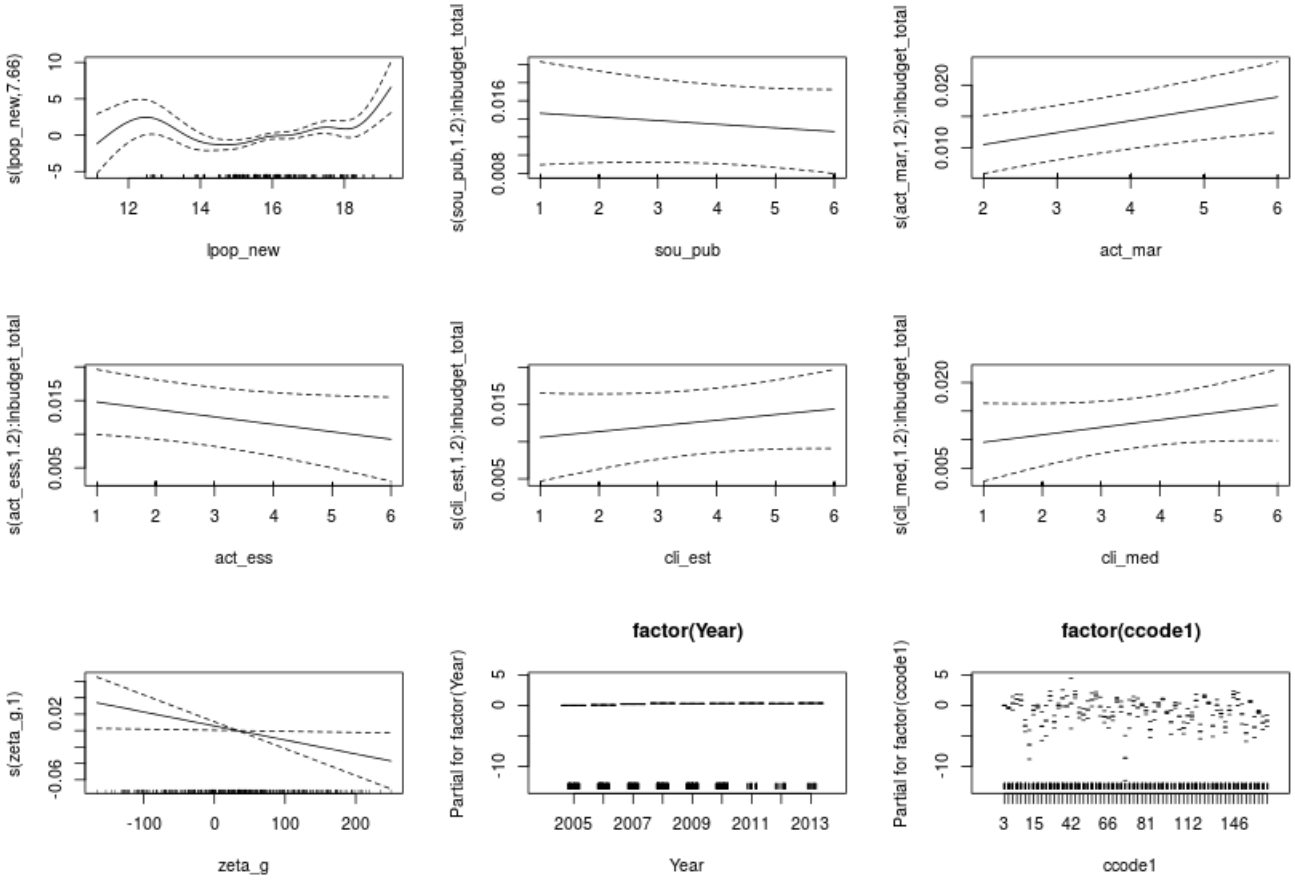


Figure 9: Postestimation plots of the penalized IV regression on GDP per capita

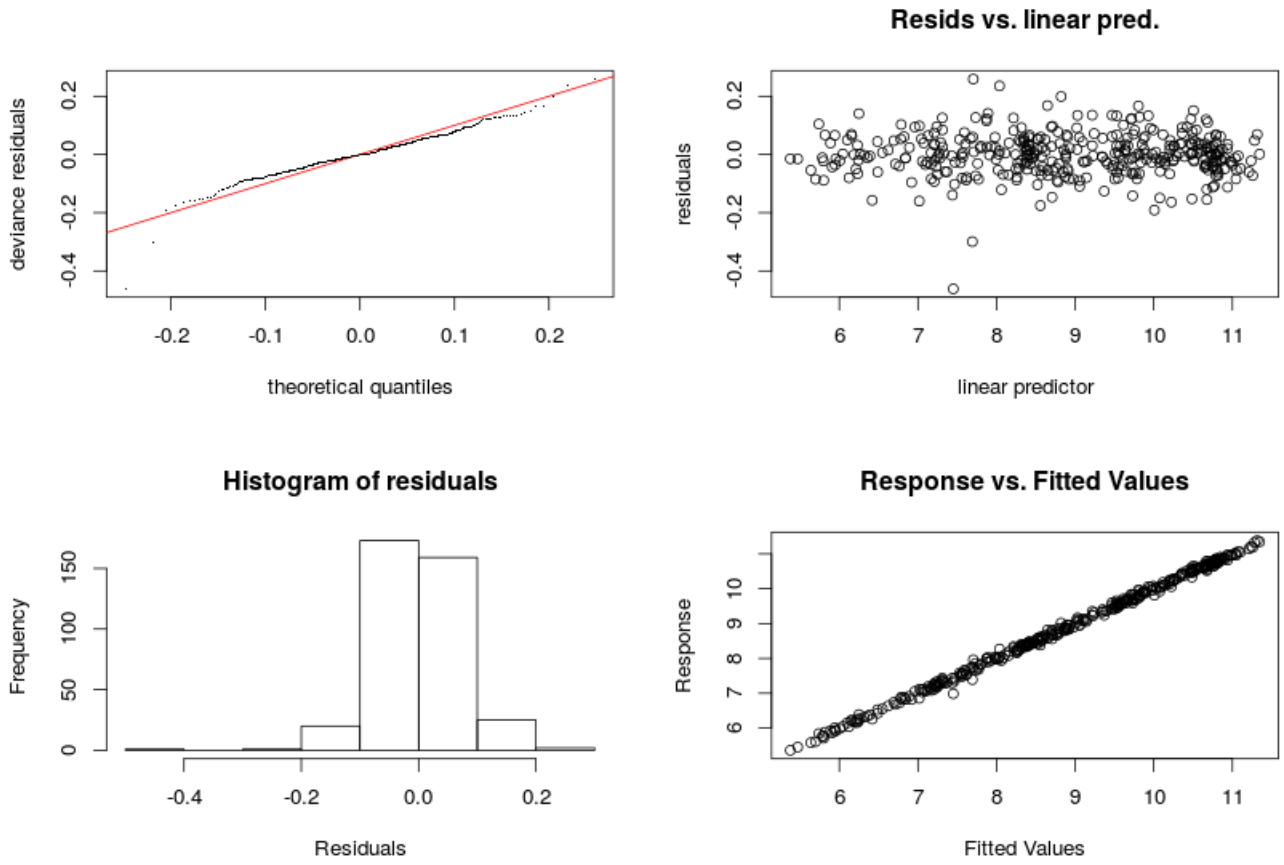
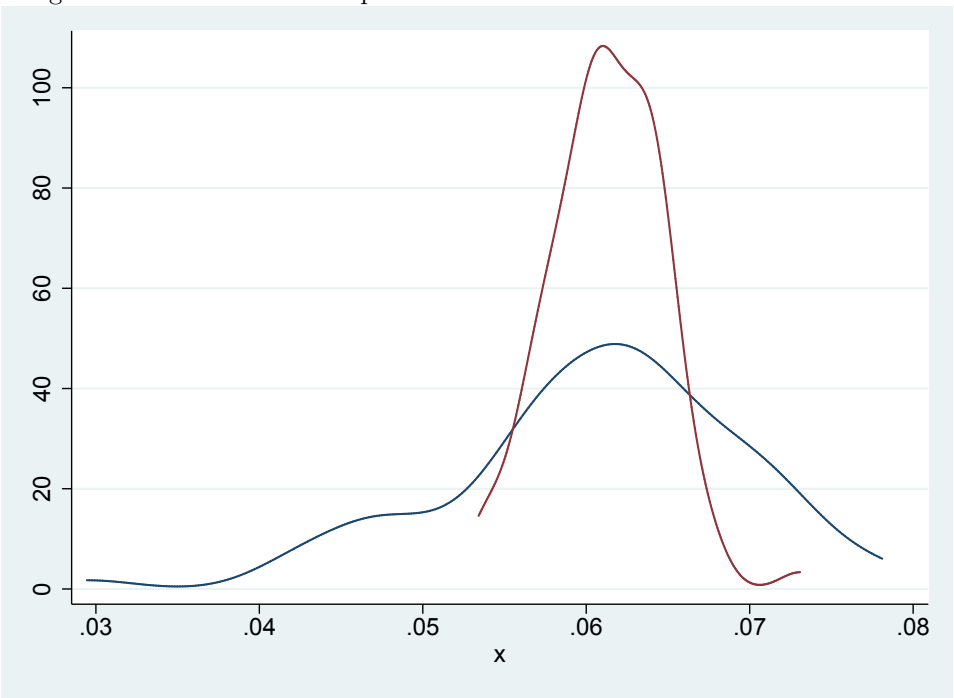
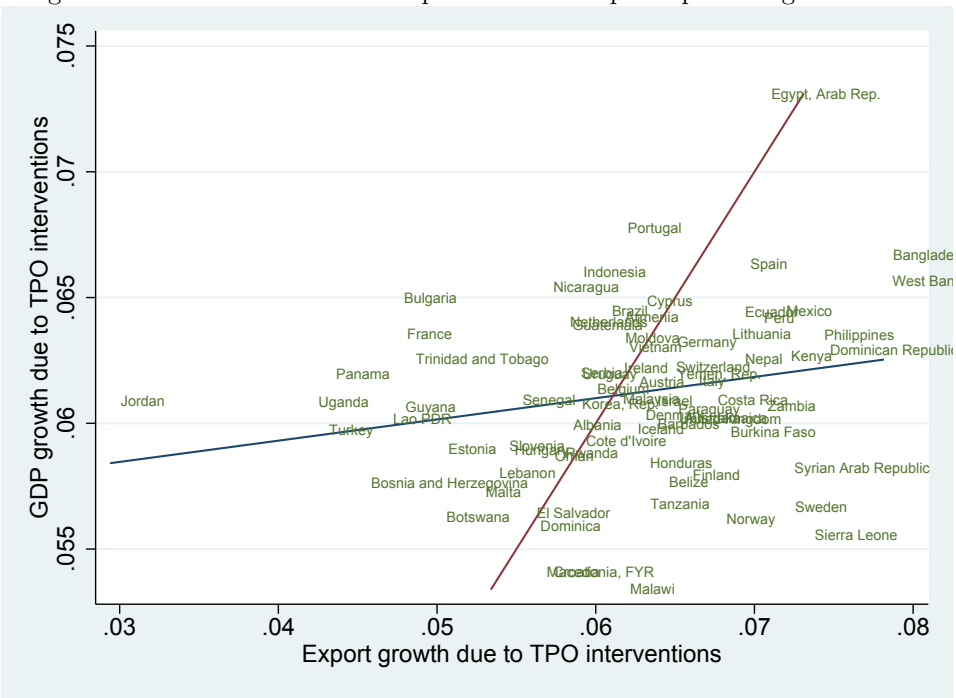


Figure 10: Distribution of export and GDP returns due to TPO interventions



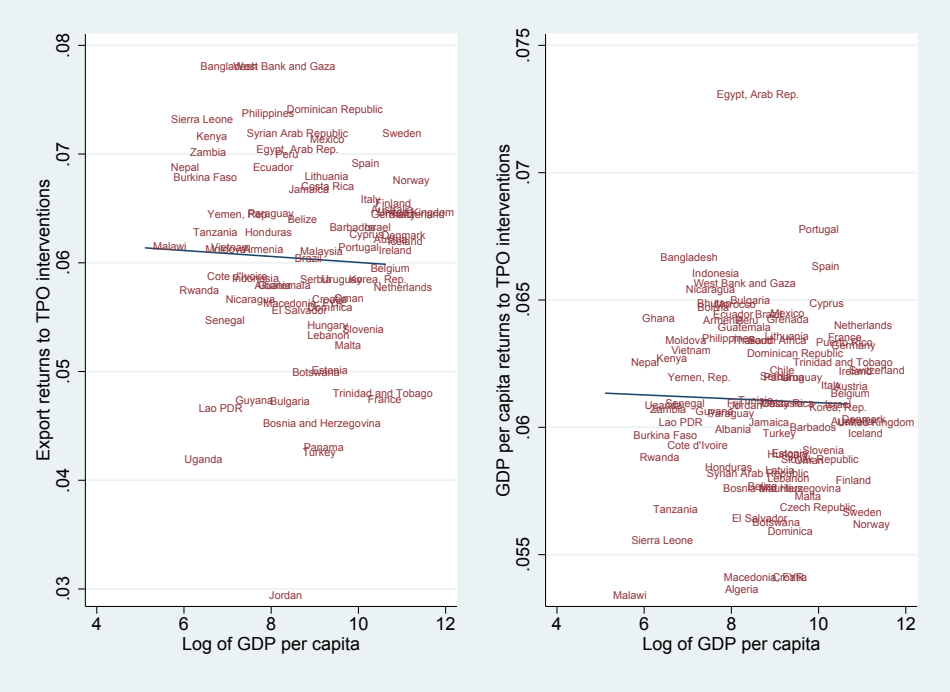
Note: The blue line is the density of export returns and the red line the density of GDP per capita returns.

Figure 11: 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 and the red line is a 45°line.

Figure 12: 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.