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ACTIVE LABOR MARKET POLICY TAKE UP BY FIRMS IN PORTUGAL, 2012-2015

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Abstract: This study provides evidence on the take up of various active labor market policies (ALMP) by firms in Portugal in period 2012-2015 and compares with both official statistics and past studies. Additionally, there is a tentative approach to measure the efficiency and cost-effectiveness of “Estágio Emprego”, an ALMP, used as a case study, by analyzing the relation between firm size and sales in the sector most benefited by this program. In general, the data confirmed that “Estágio Emprego”, an employment traineeship, is used mostly by firms in the services sector with most of the hired workers being more qualified, and “Estímulo”, a hiring credit, is used mainly by manufacturing and commerce sectors to hire less qualified and/or disadvantaged workers. We also found a positive effect of log(employment) on log(sales) although differing with specification.

Keywords: Labour Economics, Active Labor Market Policies, Unemployment, Panel data methods

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1. Introduction

Following the 2008-2009 recession, active labor market policies (ALMPs) were widely used to tackle unemployment both in Europe and the U.S. ALMPs can be defined as measures to help unemployed people find and a job or provide support for employed people to maintain theirs. (Active Labour Market Policy (ALMP) - European Centre for Social Welfare Policy and Research, 2022).

ALMPs are usually divided into "counselling and job-search assistance", "subsidies to employers", "direct employment schemes" and "training" (both workplace and school-based) (European semester thematic factsheet active labour market policies, 2017)

The ILO Inventory of Labor Market Policy Measures accounted for a total of 524 ALMP measures in the European Union in the period 2008-2013, which is equivalent to an average of 19 per country. 2009 and 2010 were the years with the highest number of policy measures: about 140 and 105, respectively.

According to calculations made by Pignatti and Van Belle (2018) based on a series from 189 countries of the ILO World Economic and Social Outlook in the period 1985-2015, Northern Western and Southern Europe, and Oceania are the regions of the world that invest the most in ALMPs with values of 0,8% and 0,3% of GDP respectively. Within Northern Western and Southern Europe, around 20% and 40% are directed at employment incentives and training, respectively.

In this work we analyze different ALMP relying mostly on a dataset from the Ministry of Finance containing all transfers from public entities (including Public Employment Services) to private ones among others. A more detailed analysis will be performed in a group of 3 measures, as a case study.

Additionally, an econometric analysis will be performed for the sector which benefited the most from Estágios Emprego, one of the abovementioned measures, so as to measure the impact of firm size on measures of firm performance. Given that this program requires a net increase in employment to receive the funds, this complementary analysis may help measure cost-effectiveness and the efficiency consequences of the measure. This is one of the few studies trying to measure the effect of ALMP, and firm size, on firm performance at firm level, as opposed to studies relying on individual data, which are extensive.

In light of the above, the research questions would be "How many and what kind of firms rely on ALMP in Portugal" and "Do employment traineeships in Portugal lead to an increase in the product of benefited firms?"

The remaining of the paper is structured as follows: section 2 is a literature review, while section 3 explains with more detail the specific measure "Estímulo 2012" and gives a general overview of the programs in the period 2012-13. Section 4 proceeds with a further analysis of the Ministry of Finance dataset by focusing on specific groups of measures while Section 5 provides some descriptive statistics of Quadros de Pessoal (QP) dataset. Section 6 covers the empirical approach while section 7 analyses the main results. Section 8 concludes by providing a summary of the main results, policy recommendations and suggestions of further research.

2. Literature review

Although the main topic of this work is the whole set of ALMP in Portugal in the period 2012-2015, whenever possible, a measure called "Estímulo 2012" will be used as a case study. Estímulo 2012 was a hiring credit scheme launched by the Portuguese government in 2012, targeted at people unemployed for at least six months, with the employer being obliged to provide in-the-job training. The fact that it can be considered both a subsidy to employers and a training program allows us to cover two of the most important categories of ALMP.

Considering that, this literature review will be mainly based on papers studying the effect of hiring credits (or subsidies) and training programs on employment and firm's performance.

Regarding the existing empirical evidence, it is important to note that in Europe, hiring credits are "frequently coupled with job search assistance programs" and other active labor market policies. (Cahuc, Carcillo and Le Barbanchon 2018)

Hiring credits reduce the effective cost of hiring workers and are aimed at stimulating demand for labor and therefore employment. However, there are some factors which can affect the effectiveness of such measures. The first one is the fact that some hiring credits do not demand a new net increase in employment, which might mean that some employers will end up receiving subsidies to hire workers they would hire anyway in the absence of it. This generates a mere windfall to employers and an inefficient use of public funds. The second factor is that hiring credits reduce the cost of some workers relative to others, which may incentivize employers to substitute incumbent workers for other workers only to take advantage of the subsidy. The third factor is related with the administrative costs imposed on firms to require the subsidy, which may deter some of them, especially the smallest ones, from doing it. Finally, hiring credits directed at some disadvantaged groups may stigmatize them by signaling low productivity to employers, making more difficult their medium to long-term insertion in the labor market. (Neumark and Grijalva 2014)

While there is extensive empirical research on the effects of hiring credits and training programs on employment and wages at worker level, literature at firm-level is somewhat less developed. Early papers studying the impact of hiring credits date back to the late 70s and 80s and address measures at federal level in the United Sates (Perloff and Wachter 1979) (Bishop 1981). More recent work includes Kangasharju (2007) who, relying on "difference-in-differences adjusted by regression and matching methods", found that subsidized jobs increased employment in

Finland while having a negligible effect on other firms in the same industry and geographical region.

Neumark and Grijalva (2016), in turn, found hiring credits to be effective in raising job growth in the US following the 2008 great recession, namely if the credit is targeted at all unemployed and not only at disadvantaged groups, and if refunding is demanded in the absence of net job creation. For this they used a difference-in-differences strategy comparing the job growth in states which launched and did not launch hiring credit schemes, controlling for other factors.

Additionally, Cahuc, Carcillo and Le Barbanchon (2018) obtained results from a hiring credit implemented in France during the sovereign debt crisis in Europe which showed a significant effect on employment but virtually no effect on wages. To do this they relied on a difference-in-differences strategy comparing employment in a group of eligible (6-10 employees) and ineligible (11-14 employees) firms before and after the program implementation and a further analysis with an IV strategy which yielded converging results.

Finally, as far as we know, there is only one study addressing the effect of hiring credits on firm performance: Lombardi, Skans and Vikström (2018) analyzed a 1998-2008 dataset on wage subsidies targeted at some unemployed groups. They matched firms which hired unemployed workers through the program with firms that hired unemployed workers outside the program, controlling for observable characteristics such as profits and staff composition. They found that firms who used the program significantly outperformed those who did not despite the similar pre-treatment trends, although with a weakening of the results after 2007, when a reform excluded caseworkers from the recruitment process.

Regarding on-the-job training, there are some factors which may discourage firms from investing. Some of those factors are the possible poaching by other firms once the training is

over and the direct and indirect costs involved, which may lead to an inefficient level of investment, as noted by Leuven (2005).

In what concerns empirical evidence, Mincer (1962) was one of the first to try to quantify the returns of on-the-job training. Since then, extensive research has been done on the effects of this type of training on firm performance, although not very diverse in terms of methods. Some recent work was based on assumptions about firm's production function (Almeida & Carneiro 2009, Mehra et al. 2014), estimation of firm fixed effects (Zwick 2006, Barrett and O'connel 1999, Dumas and Hanchane 2010, Dearden, Reed and Van Reenen 2006), analysis of a certain firm or small group of firms (Lyons 2020), and Probit and Tobit estimation (Addison and Belfield 2004). To the best of our knowledge, only one study used a difference-in-differences strategy to estimate the effects on firm performance (Martins 2021).

On the other hand, literature concerning the effect of on-the-job training on employment at firm-level is much scarcer, with Holzer et al. (1993), Negoita and Goger (2020) and Kang Jie et al. (2021) being some of the few examples.

Given the econometric analysis at the end it is equally important to look at empirical literature regarding the effect of firm size, as determined by the number of employees, on firm performance measures, namely sales and profits. Although the literature concerning the relation between firm size (as measured by the number of employees) and employee earnings is extensive and suggests that wages rise with firm size, the literature on the impact of these factors on firm performance measures such as sales and profits is much scarcer.

Söderbom and Teal (2001), for example, found, after controlling for unobserved time-invariant specific factors that firm earnings and profitability increase with firm size while for the impact of human capital they found no clear relationship. They argue that neither the unobservable

quality of labor nor the unobservable characteristics of the workplace are the source of these relationships.

Van Biesebroeck (2005), on the other hand, studied the relation between the number of employees and firm productivity in a set of 9 sub-Saharan countries and found, after controlling for unobservable time-invariant specific factors and past performance, that, just like in more developed economies, larger firms (especially the ones with more than 100 workers) are more productive and likely to survive than smaller ones. Moreover, they found a reallocation of credit to more productive firms and, a lack of access from the smallest ones, which also goes in hand with what is observed in more developed economies, and a very slow transition of firms between size and profitability categories.

Becker-Blease, Kaen and Baumann (2010) analyze 109 four-digit SIC industries in the United States and found that the relation between the number of workers and profitability increased at an increasing rate and eventually decreased in 47 of them, with no relation being found in 52 of these industries. Only in 11 industries the relation is positive for any number of employees. They conclude that this relationship is thus industry specific. Moreover, they found that for a given firm size measured in terms of total profits and sales the relationship between firm size as determined by the number of employees and profitability is negative.

Finally, Dogan (2013) studied a set of 200 firms listed in the Istanbul stock exchange from 2008 to 2011 by analyzing the relation between different firm size measures, including number of employees, and profitability measures such as Return on Assets. He found a positive relationship between all the firm size measures and Return on Assets but a negative relation between control variables such as firm age and financial leverage and firm profitability.

3. Institutional background

An important part of this paper is based on a dataset made available by IGF, a department of the Portuguese Ministry of Finance. The dataset contains all the transfers from public administration (including Public Employment Services (PES)) to private, cooperative and social sector entities as well as other public entities outside the Public administration system in the years 2012 and 2013.

Based on these data we were able to identify and group different transfers into the ALMP defined by European Commission's labor market reform database (LABREF) (see figure 1 in appendix). The ALMP we analyze here are only the ones launched in the period 2012-2013 and include all types of beneficiaries.

The ALMP analyzed here totaled 139,77 million euros in the period 2012-13 being most of them identified as either Labor market training or Private sector employment incentives. The ones with the largest budget allocations were Estágio Emprego (Employment traineeship), Passaporte Emprego (Employment passport) and Património Ativo (Active Heritage) with 54,07%, 22,14% and 10,24% of the total ALMP budget respectively. Estágio Emprego was created in 2013 and succeeded to a series of funded traineeships in different areas, such as Passaporte Emprego and Estágios Património, by aggregating them into a single program, which can explain such a large amount of funds.

Património Ativo, Passaporte Empreendedorismo (Entrepreneurship passport) and Estágio Emprego were the ones with the largest average grant per subsidized firm, ranging between 20600 and 11500 euros. These results can be explained partly by the nature of these programs: all of them have in their target groups more educated workers, which require a higher amount of subsidy (1,65 times the value of the "Social support index", as opposed to 1 time the value of SSI in the case of less educated workers). On the other hand, Estágio Emprego has a

minimum duration of 12 months which is more extensive than the majority of ALMP, which only require a minimum of 3 or 4 months.

It would be interesting to see the average grant per job contract supported as well, however the available dataset was not detailed enough to allow that analysis.

One can therefore observe that Estímulo 2012 covers only a small stake of the total ALMP budget in the years 2012 and 2013 (3,3%).

The ALMP that will be further analyzed, called Estímulo 2012, was launched by the Portuguese government, with partial funding from the European Social Fund, on the 13th of February 2012 with the law starting to have effects in the next day. The measure consisted of a credit given to firms that hired people who had been unemployed for 6 months or more, with the condition of giving them professional training. The amount of the subsidy was equal to 50% of the worker's monthly salary, and in some special cases such as open-ended contracts or jobs for handicapped people, the amount could go as high as 60%. In both cases, the credit could not surpass the amount of 419,22 euros per month in a maximum of six months. The hiring credit could be accumulated with a total or partial general contribution relief (being it an ALMP or not) but not with other types of ALMPs directed at the same job offer. ("Diário Da República" 2012)

Specifically, 3 general conditions had to be verified for the job offer to be eligible for this program:

First, the entity offering the contract had to be a profit or non-profit organization with 5 or more employees without missing payments to the fiscal authority, social security or other ALMP.

Second, the job had to be full-time and employ a person unemployed for 6 or more consecutive months with the employer having to register net employment growth. In this context, net employment growth is defined as having a number of workers equal or higher than the average of the previous 12 months plus the number of hired through the measure. Additionally, during

the hiring and at least until the end of the subsidized period the employer should have a number of employees at least as high as the one it had when it applied to the program.

Third, the employer had to provide the worker with professional training adapted to the specific task, either in-the-job for at least 6 months and with a mentor, or in a certified training entity during the work schedule for at least 50 hours. ("Diário Da República" 2012)

Additional conditions included a maximum of 20 workers hired under the scheme and the mandatory retribution of the full amount of the subsidy in case of firing for economic reasons, worker inadequacy, performing of an illegal act by the worker during the program application, or non-compliance with the training obligations by the employer. In this case, the employer had to refund the Public Employment Service in a period of 60 days since notification, under penalty of interest fees. ("Diário Da República" 2012)

The payment was done in 3 instalments: the first during the first month of the program, the second one until the 3rd month and the third payment starting in the 6th month after the program inception. All of the payments were subject to the cumulative compliance of the rules referred above. In addition, there was a special strategic interest projects regime which allowed some firms proved to be of special interest to their region or the country's economy, to be financed for 9 months in job contracts of at least 18 months. ("Diário Da República" 2012)

4. Analysis of the 2013 IGF dataset

Taking into account the large amount of funds transferred every year from PES to different entities, a portion of them financed by European funds, and given the richness of the available data, we decided to perform a more refined analysis of these transfers, focusing however on the ALMP, the main topic of this project.

We thus started by collecting data on the top 10 recipients of transfers from the PES (see figure 3 of appendix). This includes both firms and non-firms. Most of the funds obtained by the top

10 recipients are related to training courses financed by the PES but performed in external entities, such as vocational training schools, trade and industry associations, and large firms. In fact, there is only one firm, and in the 10th place. Thus most of these programs namely, “Cursos de Aprendizagem”, “Cooperação com outras entidades na política de emprego e formação profissional”, “Vida Ativa-Emprego qualificado” and “Sistemas de aprendizagem” would be classified as training programs under the European Commission definition described in table 1.

One can equally observe that all of the top 10 recipients are located in coastal regions, which is expected, given the concentration of population and economic activity, but mainly in the Lisbon region (6 out of 10). The top 10 entities received a total of 27,11 million euros and most of these funds were obtained to finance training courses, with other programs representing only a tiny portion. Interestingly, all of the entities are dedicated to training in the secondary and tertiary sector (even though PES also finances such activities in the primary sector).

The program which retains the most transfers, “Cursos de Aprendizagem – Entidades externas” (Apprenticeship course – external entities) is a type of course directed at workers with at least the 9th grade but incomplete secondary education. It usually accepts students with no more than 25 years, last 3 years, and includes both a theoretical and a practical part, with partner firms having a central role in this last one. ("Cursos De Aprendizagem-IEFP" 2022)

The second program with the most funds received “Vida Ativa – Emprego Qualificado – Entidades Externas” (Active Life – Skilled Employment – External Entities) consists of short intensive courses directed at unemployed people with the aim of providing them with skills for a quick return to the labor market. They can be administered in public or private training institutions or PES training centers. The courses are usually directed at more qualified workers and can even be taken in higher education institutions in cases of very specific skills and other areas with high employability. ("Vida Ativa - IEFP" 2022)

We then restricted the analysis to include only firms and ALMP (those launched in 2012 and 2013 and the ones already existing) since this is the target of the project. As can be seen, most of the firms, 9 out of 10, are from the Education sector. The first four firms remain from the previous table since they were the only firms there, but are now followed by smaller training centers, all of them located in coastal regions and mostly in Lisbon. Also, firms which receive funds for apprenticeship courses do not rely much on other type of ALMP.

Out of the 10 firms, the only one whose first program is not “Apprenticeship course - External entities” is “MULTIPESSOAL - UPGRADEM, S.A.”. Besides having training as one of their core activities, among others related with information technologies and human resources consulting, there is no register of them receiving funding for training courses. Given the large amount of transfers, we suspect part of these funds may be directed at training courses and that there was a data reporting error. ("Portal De Emprego | Multipessoal" 2022)

Next, we decided to look at the top 10 firms benefiting from “Estágios Emprego” an employment traineeship of 12 months funded by PES, directed at young workers to help them having a smoother insertion in the labor market and to unemployed workers, helping them reconverting skills for a quick return. It was the program launched in the 2012-13 period with the most funds attributed, 75,58 million euros, as seen before.

At the top 10 firms benefiting from this program, one observes a larger diversity of industries, although still only from the secondary and tertiary sectors (see figure 5). Additionally, there is not a single firm coming from non-coastal regions and Lisbon keeps being the region of the most benefited firms, 9 out of 10. Here, however the funds are considerably smaller than, for example, the ones directed at apprenticeship courses. Also, one can observe that firms which benefit from Estágios Emprego choose to rely very little on other ALMP. ("Estágios" 2022)

As seen in figure 1, the difference in amounts allocated to Estágios Emprego relatively to other ALMP launched in the 2012-13 period highlights a high popularity among firms. (Varejão and Costa Dias (2012) analyze, based on a survey to a group of participants (workers) performed by the IEFP three months after the end of the program, a group of IEFP traineeships in the period 2004-08. These traineeships, although not exactly equal to Estágios Emprego, can help us understand part of this popularity. It is referred that in the four years the percentage of workers employed three months after the end of the program ranges between 68,9% in 2006 and 79,5% in 2008, being generally two to three percentage points higher for men than women, and higher for more educated workers. In the period analyzed, roughly half of the new jobs were temporary contracts with 16% being independent workers.

Also worth highlighting are the word-of-mouth and PES centers as the top ways in which participants found out about the program. However, 30% of the participants referred the employers as being the ones who informed them about the program, which although it may signal employer satisfaction about the program it can also mean that part of the funds is being used to substitute regular workers by subsidized ones to perform some vital activities. (Varejão and Costa Dias, 2012)

According to the classification included in “Livro Verde sobre as Relações Laborais 2016” (Green book of labor relations 2016) published by the Portuguese Ministry of Labour, Solidarity and Social Security, employability can be classified into gross, an employment situation after the end of the program where there may subsist some kind of support, real, when there is not any support, general employability, when the worker is employed in any institution after the end of the program, and direct employability, a situation where after the program ends, the worker is employed in the same institution where it attended it. Note that a worker, besides being in one of the two main categories, gross and real can simultaneously be included in general or direct employability. ("Livro Verde Sobre As Relações Laborais 2016" 2016)

According to this classification, Estágios Emprego registered 12 months after the end of the programs ending in 2013 and 2014 a direct employability of 43,3% and 40,1% for the respective year and a general employability of 67,9% and 67,1% for the same years. Also, for the same years, from gross employability, 54,7% and 53,5% of the contracts were fixed term. It is equally interesting to note that from the workers employed in the same entity after 12 months, two thirds are supported by a hiring subsidy, and six months after the end of the program, only 15,2% remain employed in the same entity without any kind of support.

After analyzing a "pure" subsidy to employer we now turn to a measure which can be considered both a subsidy to employer and a training scheme, "Estímulo 2012 (see table 6 in appendix). As explained before it consists of a subsidy given to employers who hire people unemployed for 6 or more months being obliged to give them professional training.

A noticeable feature is the greater diversity of regions compared to the two previous tables: only half of the top 10 firms is located in Lisbon and there are firms in regions such as Leiria and Évora. Additionally, and going in line with Portuguese productive structure, in general, one observes that firms in northern regions are usually from the industrial sector unlike the ones in the southern regions which are usually in the services sector.

This data goes in line with evidence found by Varejão and Costa Dias (2012) based on enquiries made by the PES to both employees and employers some months after the end of the programs. These inquiries were made based on the 1999,2000 and 2001 editions of the hiring credit programs, which had conditions considerably different from Estímulo 2012. Despite this, it was found, among other things, that benefited firms were predominantly very small (less than 5 employees) located in the north and center regions and from the commerce sector. In the same study it is found that although there are on average net increases in employment in the benefited firms, much of the effect is made at the expense of public entities. Private firms, especially the

largest ones were not very fond of the program as they considered the amount of the subsidy small for the obligation of a job contract for such a long period.

Also, the amounts transferred to firms are considerably lower than in the case of Estágios Emprego. This might be explained not only by the maximum number of months of funding (12 in the case of Estágios Emprego and 6 in the case of Estímulo 2012) but also by the fact Estágios Emprego are directed at younger (18 to 30 years old) and more qualified workers contrasting with Estímulo 2012 which is targeted at workers who have been unemployed for 6 or more months, among other disadvantaged circumstances.

Finally, we analyze "Estímulo 2013", a remake of the 2012 measure which extended the worker eligibility and the subsidized period in relation to "Estímulo 2012" among other practical factors in the implementation by the PES (see figure 7 in appendix). In specific, beyond people unemployed for at least 6 months, the program was now also directed at people unemployed for 3 consecutive months in special circumstances and to the so-called NEET (Not in Education, Employment or Training) for at least 12 months. Estímulos 2012 and 2013 were launched as temporary measures but eventually resulted in a permanent measure called Estímulo Emprego launched in 2014.

These modifications to the program are certainly related with the observed increase in the transferred funds, already analyzed. Interestingly, there is now only one firm from the top 10 located in Lisbon and the predominant sector is Textiles, clothing, leather, and footwear.

According to calculations made in the Portuguese Green Book of Labor Relations 2016 based on PES data, 46,4% of the supported labor contracts under Estímulo 2012/2013/Emprego in the period 2012-2015, corresponding to 21,9% of the total amount, were directed at fixed term contracts. However, the share of open-ended contracts increased continuously since 2013, from

40 to 60% which might be related to the financial incentive launched in 2013 for firms who hired in such type of contracts. ("Livro Verde Sobre As Relações Laborais 2016" 2016)

Additionally, gross employability 12 months after the end of hiring credit programs realized in 2013 and 2014 ranged between 70 and 75% respectively, decreasing to 50% when we impose an additional criterion of staying in the same firm (direct employability). Real employability on the other hand, is slightly lower, 65% and decreases to 45,8% when the criteria of staying in the same firm is added (direct employability). Interestingly, only 21,8% (2013) and 28,9% (2014) of program participants had an open ended contract twelve months after the end of the program, which might be related to the fact that between 2013 and 2015 46,4% of the funds were directed at supporting fixed term contracts. ("Livro Verde Sobre As Relações Laborais 2016" 2016)

We now look at the share of firms which kept receiving funds from Estágios Emprego in 2013-2015 (see figure 8). As it has been referred, one of the main problems of ALMP which transfer funds to employers are the possibility of windfalls, that is, of employers receiving transfers from the government to hire workers they would hire anyway in the absence of the subsidy. This generates a deadweight loss and represents an inefficient use of public funds. Consequently, if firms recur continuously to such programs, that might indicate they are using the funds to hire workers that would have to be hired anyway. In the case of Estágios Emprego around 50% of the benefiting firms in 2014 had already benefited from the program in 2013, with this percentage falling to 20% in 2015. Additionally, the average transfer by firm in the period 2013-2015 was 11292,30, lower than the value of 11530 for 2013 indicated in figure 1 (note however that this last value refers to both firms and non-firms). The number of different benefiting firms in the period, was, in turn, 13858.

To have an idea of the distribution of the amounts received per firm we made a histogram with relative frequencies for each of the years (figure 9). We observe that all the distributions are rightly skewed, with the ones for 2013 and 2014 being relatively similar, although differing in its peak (the 2013 has its mode in the 2500-5000 interval while the one from 2014 has it in 7500-10000). The 2015 distribution instead, which has considerably lower observations (only 3895 compared to 12642 and 29009 in the two previous years) shows there was not a single firm receiving less than 7000 euros under the program, with the peak being again in the 7500-10000 interval. This is equally observable looking at the value of the 3rd quartile of 14768 as compared for example with the one of 2013, 9570,42. It means that in 2015, 75% of firms which benefited from Estágios Emprego received a transfer of 14768 or less.

We then performed a similar analysis for Estímulo 2012, Estímulo 2013, and Estímulo Emprego (launched in 2014). For this analysis, we joined them as if they were a single ALMP because of their similarity, although Estímulo 2013 and Estímulo Emprego cover a wider range of target groups and entitles the employer to receive support for longer periods. In this case, and looking at figure 10, the share of firms which kept receiving funds relatively to 2012 were 71,5% and 48,6% for 2013 and 2014 respectively. These values are considerably higher than the ones verified for Estágios Emprego. Additionally, the average transfer by firm in the period was 6569,33 and the total number of different firms benefiting was 7596, both values lower than in Estágios Emprego again. We therefore have more evidence of Estímulos 2012, 2013 and Emprego being smaller programs than Estágios Emprego.

In terms of distribution of transfers by firm in the three years analyzed, we observe a considerable difference between the 2012 and the rest of the distributions. This is certainly related to the fact that we joined both measures. The 2012 distribution has its peak (mode) in the 1125-1500 interval with 60 firms, being rightly skewed. The 2013 distribution is also rightly

skewed although heavier tailed than the 2012 one. The peak is now the “overflow” category of more than 7500 euros per firm.

Then, the 2014 distribution is, in general, even flatter than the 2013 with an even higher concentration of firms in the “>7500” category, with roughly 32% of the observations. Comparing the shape of the three distributions it looks like the 2013 is somehow a mix of the ones from 2012 and 2014. The relatively high value of the 3rd quartile, 8133,305 as compared to, for example the one of 2012, of 2934,54, provides further evidence of the shape of the distribution.

To compare the concentration of funds in certain firms we proceeded by calculating the Herfindahl-Hirschman Index (HHI) of both measures in the respective periods. HHI is a market concentration measure often used in merger analysis that helps regulators see if a certain operation raises antitrust concerns. Usually, a market with a HHI below 1500 is considered to be a “competitive marketplace”, within the range 1500-2500 a “moderately concentrated” market and above 2500 a “highly concentrated” one. HHI is calculated by summing the squares of the market shares of the different firms expressed as a whole number, not a percentage. Given this, it is also frequently used in situations other than merger analysis to analyze concentration of observations. (Hayes, Kindness and Rathburn, 2022)

$$HHI = \sum_{i=1}^{n} s_i^2$$

Equation 1: the Herfindahl-Hirschman Index (HHI)

Looking at figure 12 in the appendix, one observes that observations in Estágios Emprego would be considered “moderately concentrated” while those of Estímulo would be considered “low concentrated” in the years analyzed. Interestingly, both measures register a decrease in concentration in the second year analyzed.

Empirical part

Considering the analysis of the top 10 firms benefiting from Estágios Emprego in the period 2012-2013, and in order to obtain a broader picture of the program, we decided to identify the 40 firms benefiting the most from it and classify them by sector according to the framework of the International Labor Organization. In this program the most represented sector in the first 40 firms was “Financial services and professional services” with eleven observations and “Postal and telecommunication services with seven. We did the same for the Estímulos program and, in this case the most represented sectors in the first 40 firms were “Textiles, clothing, leather and footwear” and “Commerce” with fourteen and five observations respectively. These results confirm the differences between both programs: Estágios Emprego is directed mainly at more educated workers and predominantly used by services industries while Estímulos are directed mainly at less educated workers and used mostly by industrial and commercial sectors.

In light of this, and in order to obtain a sense of the contribution that Estágios Emprego provide to the country’s economy, we perform now an analysis on the effect of firm size, as determined by the number of workers on firm’s sales, restricting the data to firms from the most represented sector in the first 40 observations of Estágios Emprego: Financial and professional services. Since the attribution of the subsidy is conditional on the net creation of employment in the firm, this allows us to have an idea of the contribution of Estágios Emprego to the country’s GDP and, in the presence of data on the average subsidy received by hire, insights on the efficiency of the subsidy (i.e. subsidies attributed to more productive firms will generate more production per euro subsidized than less productive ones, and, in extreme cases, the additional output generated by an additional worker may be even less that the subsidy).

5. Data

The data used was obtained from "Quadros de Pessoal" (Personnel Records) a rich matched employer-employee panel database resulting from compulsory reports from employers on multiple establishment and worker characteristics. It contains all the establishments with at least one wage earner.

The data started being collected in 1985 and has, since then, been recorded every year, with the exception of 1990 and 2001. The access was granted by the Portuguese Ministry of Labor, Solidarity and Social Security and the results and interpretation are sole responsibility of the authors.

For the purpose of this analysis, we used data from 2011 to 2015 from both firms and workers. We started by renaming, converting to numeric, and creating some variables both in employer and employee datasets for each year. Then, in the employee datasets for each year, we grouped employee data by employer through a common fictitious employer identifier, obtaining through the "collapse" command a dataset with averages of various worker characteristics per employer. We then merged for each year the employer and employee datasets through the common fictitious firm identifier.

The next step was to append all the year datasets (with data on employers and averages of various worker characteristics) into a single one, obtaining a large dataset with 1.413.292 employer observations for years 2011-2015 and 53 variables.

In figure 13, we observe the summary statistics for the final observations obtained after selecting all the relevant two-digit sectors, dropping missing observations for the various variables and observations from non-firms.

6. Empirical strategy

With this large 2011-2015 Employer-Employee dataset we started the panel data analysis by setting the common firm identifier as the individual index and year as the time index. We then

dropped some missing observations for the included variables and kept only the observations whose two-digit sector belonged to Financial services and professional services.

To choose between fixed and random effects we performed a Hausman test for fixed effects after running a very general model in both methods.

$$log(sal)_{it} = C_i + \mu + log(emp)_{it}A + x_{it}B + u_{it}$$

Equation 2

in which log(sal) is the logarithm of firm's annual sales, ci represents unobserved time-invariant firm fixed effects, miu is a set year dummies, log(emp) the logarithm of employment, xit is a set of control variables shown in figure 14 and ui represents idiosyncratic error.

In the Hausman test, the null hypothesis is that there is no correlation between unobservable time invariant specific effects ci and the regressors, meaning in that case that a random effects model is more efficient than a fixed effects model with both being consistent. The test resulted in a p-value lower than 1, 5 of 10% which led us to reject the null hypothesis of no correlation between ci and the regressors. Consequently, there was evidence of the random effects estimator being inconsistent, and we chose to proceed the analysis with the less efficient although consistent fixed effects model. We decided to not consider first differences estimators as we see no reason for idiosyncratic error to be considered to follow a random walk. In performing these tests, we had to rescale some variables upwards by dividing them by 100. In the end we dropped insignificant variables.

Next, after reading some literature on the topic we suspected the logarithm of employment and the average earned wage divided by 100 to be endogenous. One could argue, for example, that there are some omitted variables such as the "number of establishments" which could be correlated both with the log(sal) and log(emp) (i.e firms with a higher number of establishments

have, on average, ceteris paribus, more sales). Similarly, “average number of hours worked per week by worker” could be positively correlated with log(sal) and avearnedwag1.

Consequently, the estimators on these two coefficients would probably be (upward) biased. We proceeded trying to find instruments for these two variables. For that, we created correlation tables to find variables highly correlated with logemp and avearnedwag1 so that we could satisfy instrument relevance. We came up with lognrest (logarithm of the number of establishments), logavbasewag (logarithm of the average monthly base wage per worker) and logfirmage (logarithm of firm age) for logemp and avbasewag1 (average base wage divided by 100), avregwag1 (average regular wage divided by 100) and avworksch1 (average normal work schedule per week) for avearnedwag1.

We then proceeded by running some regressions under the command “xtivreg2”, using different combinations of instruments and the “endog” option at the end of the code, which provided us with an endogeneity test of the logemp and avearnedwag1.Additionally, the “xtivreg2” command provides an underidentification test, a test on the strength of chosen instruments (Weak identification test), and a test on the exogeneity of the chosen instruments (Hansen J statistic). After trying different regressions, we came up with a set of instruments fulfilling the conditions to be considered valid (being correlated with the potentially endogenous regressors and not correlated with the model’s error terms). Those instruments were logfirmag, a dummy for 2012 and a dummy for 2013. By using these three instruments as a whole we can reject the null hypothesis that they are not correlated with the potentially endogenous regressors (Cragg-Donald Wald F statistic of 18.694 higher than all the reported critical values) and we cannot reject the null hypothesis that the chosen instruments are exogenous (Hanjen J statistic p-value higher than 10%,5% or 1% significance levels). It is also important to refer that we used standard errors robust to heteroskedasticity and serial correlation.

We ran some more diagnostic tests such as one for multicollinearity and a RESET test for misspecification of functional form. We detected no multicollinearity nor model misspecification.

7. Results

In figure 14 we have displayed the regression coefficients obtained after running the first general regression, to compute the Hausman test, and the final regression, using all the instruments.

As one can see, the estimates are very different. While for FE xtreg regression the coefficient on log(emp) is 0,47 in FE xtivreg regression it is 1,007. We might interpret this as, by raising the number of workers in 1% sales rise by 0,47% according to the FE xtreg regression and 1,007% according to the FE xtivreg regression.

Additionally, we observe that estimated coefficients for “Average worker tenure/100”, “Average earned wage/100” and “Av. Normal working hour per month” are very different in the two regressions.

It is also important to note that even after Fixed effects, there might be some bias as this method is robust to correlation between log(emp) and ci but not to correlation between log(emp) and the idiosyncratic error.

The differences between the two models might be explained by the absence of some year dummies in the FE xtivreg2 model.

8. Conclusion, limitations, policy recommendations and suggestions of further research

This study provides evidence on the take up of various ALMP by firms in Portugal in period 2011-2015 and compares with both official statistics and past studies. Additionally, there is a

tentative approach to measure the efficiency and cost-effectiveness of Estágios Emprego, used as a case study, by analyzing the relation between firm size and sales in the sector most benefited by this program.

Relying on 2012 and 2013 data from IGF dataset we found that the entities receiving the most funds from PES were vocational training schools, trade and industry associations, and to a lesser extent, large firms, all of them located in coastal regions and mainly in Lisbon (6 of the 10 largest). The entities located outside Lisbon are ATEC, a school created by Autoeuropa and other german firms together with German_Portuguese chamber of commerce and the PES, in Setúbal, and regional trade and industry associations. They receive funding to perform educational activities such as apprenticeship courses with young and/or unemployed people.

Regarding "Estágios Emprego"(EE), which aggregates all traineeship initiatives by PES, we observe that the sectors most represented in the top 40 recipient firms were "Financial services and professional services" (11 firms) and "Postal and telecommunication services" (7 firms) being most of them located in the Lisbon region. On the other hand, "Estímulos"(EST) program which can be considered the "direct" hiring credit program of PES, has "Textiles, clothing, leather and footwear" (14 firms) and "Commerce"(5 firms) as the most represented sectors in the top 40 firm recipients. Contrarily to EE, it has a greater diversity of regions represented in the top 40 receiving firms. In general, the data confirmed that EE are used mostly by firms in the services sector with most of the hired workers being more qualified, and EST is used mainly by manufacturing and commerce sectors to hire less qualified and/or disadvantaged workers.

To study possible "windfall effects" from hiring credits we compared the share of firms which kept relying on the two programs over the period analyzed. In the case of EE, this percentage fell from 100 to 20% in 3 years while in EST it ended in 48,6% of the initial firms after 3 years. Additionally, in what concerns the distribution of funds by firms in each year, we observed that

in EE it was rightly skewed, with its peak rising over the 3 years as well as the concentration of funds in some firms (a "moderately concentrated" distribution). In EST, 2013 and 2014 distributions were much flatter than the one from 2012 and the values distributed by firm are considerably lower. According to HHI classification used in merger analysis the distribution would be considered "low concentrated".

Regarding Quadros de Pessoal (QP), after selecting the relevant industries composing the "Financial services and professional services" sector, and dropping missing observations, we obtained 75967 observations for the 5 years analyzed, in which the percentage of foreign ownership was 1.8%, and the share of female workers was 63%. After performing the regressions, we found a positive effect of log(emp) on log(sales) although differing with specification.

These results can be even more important in the presence of data on the average amount transferred by hiring made under the programs, as it would allow us to compare the product generated by an additional worker with the cost of the subsidies for taxpayers. Additionally, if we had had on time data about which firms relied on each program and when, we could have done other types of analysis (for example, a difference-in-differences regression with treatment being participation in the program and control being all the other firms in the economy, aiming at measuring the effect of programs on employment and sales at firm level).

Another limitation are the possible reporting errors in Quadros de Pessoal, even though its mandatory nature might eliminate attrition and other problems. It would also be interesting to compare the worker turnover in firms which relied on hiring credits and in firms which did not rely on it, to measure to what extent these programs increase the cost per job created.

Based on the obtained results, namely on the high concentration of attributed funds by Estágios Emprego to services jobs, it would be important to better communicate such program to other

types of sectors such as high-tech manufacturing industries. This would be even more fruitful with a deepening of the cooperation between such firms and the PES centers in tackling the education and training needs of these highly productive industries. Actually, and after performing a more detailed analysis with marginal productivity of labor by industry as explained above, the programs could be more directed to the best performing ones (without forgetting the important role of these programs in tackling human resource gaps on non-firms.)

Also, given the high "windfall effect" observed mainly in the Estímulos program, one measure to study would be to limit the receiving of funds from a program or group of programs to two consecutive years.

Another important measure to reduce administrative costs when applying to the subsidy would be to digitalize the process, without the need for employers to move to PES centers, and increase competition among PES centers giving incentives to the most efficient and better performing ones. This would be especially important for smaller firms, in which the fixed costs of applying the subsidy have a higher relative impact in the budget.

Finally, and going in line with past research, all the programs should demand the total refunding of subsidies in the absence of net job creation, and the incentives for open-ended contracts should be continued or even strengthened.

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Appendix

Program	ALMP type	Total expenditure (million €)	Total expenditure (% of total ALMP)
Estágio Emprego	2	75,58	54,1%
Passaporte Emprego	2	30,95	22,1%
Património Ativo	2	14,31	10,2%
Estímulo 2013	2, 4	12,15	8,7%
Estímulo 2012	2, 4	4,68	3,3%
Hiring subsidy by social contribution refunding	2	1,65	1,2%
Passaporte Empreendedorismo	2	0,44	0,3%
RTSU-startups	2	0,02	0,0%
Total		139,77	

Program	Nr. of recipients	Average grant per recipient (thousand €)
Estágio Emprego	6553	11,53
Passaporte Emprego	3225	9,60
Património Ativo	693	20,65
Estímulo 2013	2548	4,77
Estímulo 2012	1554	3,01
Hiring subsidy by social contribution refunding	1196	1,38
Passaporte Empreendedorismo	23	19,19
RTSU-startups	7	2,40

Figure 1: Analysis of 2012-2013 ALMPs available on European Commission's labor market reform database (LABREF)

ALMP types (European Commission definition): 1- Counselling and job-search assistance 2- Subsidies to employers 3- Direct employment schemes 4- Training

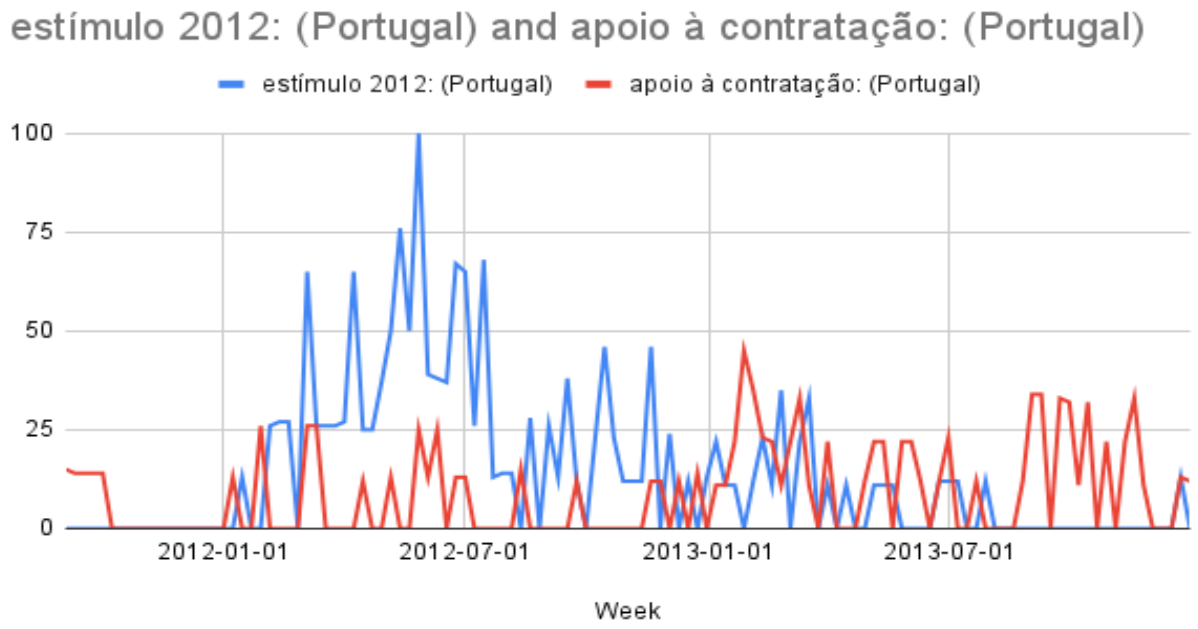


Figure 2: Google search results for different topics. In the scale, 100 represents the maximum number of searches in each week during the period considered. The green line represents the date of start of the program. Source: Google trends

Rank	Recipient	Transfers (€ million)	Region	Total programs
1	ATEC - ASSOCIAÇÃO DE FORMAÇÃO PARA A INDÚSTRIA	5,40	Setúbal	3
2	Associação Comercial e Indústrial de Barcelos	3,73	Braga	2
3	Câmara de Comércio e Indústria LUSO - ALEMÃ	3,07	Lisboa	4
4	SISEP - Sindicato dos Profissionais de Seguros de Portugal	2,74	Lisboa	3
5	CEC - Conselho Empresarial do Centro / CCIC - Câmara de Comércio e Indústria do Centro	2,30	Coimbra	4
6	ESCOLA INTERCULTURAL DAS PROFISSÕES E DO DESPORTO DA AMADORA, E.M.	2,06	Lisboa	1
7	COMPETIR - FORMAÇÃO e SERVIÇOS, S.A.	2,06	Lisboa	3
8	AERLIS - ASSOCIAÇAO EMPRESARIAL da REGIÃO de LISBOA - POLO TÉCNICO de SINTRA	2,06	Lisboa	4
9	Associação Portuguesa de Bancos	1,85	Lisboa	2
10	TOYOTA CAETANO PORTUGAL, S.A.	1,84	Porto	3

Rank	1st program	2nd program	1st (of total)	2nd (of total)
1	Cooperação com Outras Entidades na politica de emprego e formação profissional	Cursos de Aprendizagem - Entidades Externas	56,6%	38,7%
2	Cursos de Aprendizagem - Entidades Externas	Estágios Emprego	99,7%	0,3%
3	Cursos de Aprendizagem - Entidades Externas	Vida Ativa - Emprego Qualificado - Entidades Externas	77,4%	19,9%
4	Cursos de Aprendizagem - Entidades Externas	Vida Ativa - Emprego Qualificado - Entidades Externas	96,5%	2,4%
5	Cursos de Aprendizagem - Entidades Externas	Vida Ativa - Emprego Qualificado - Entidades Externas	68,9%	31,0%
6	Cursos de Aprendizagem - Entidades Externas		100,0%	
7	Cursos de Aprendizagem - Entidades Externas	Passaporte Emprego	99,5%	0,3%
8	Cursos de Aprendizagem - Entidades Externas	Vida Ativa - Emprego Qualificado - Entidades Externas	78,1%	22,6%
9	Cursos de Aprendizagem - Entidades Externas	Estágios Emprego	99,4%	0,6%
10	Cursos de Aprendizagem - Entidades Externas	Sistema de Aprendizagem - Saldos	94,7%	3,6%

Figure 3: Top 10 recipients benefiting from ALMP transfers in years 2012-2013.

Rank	Recipient	Tranfers (€ million)	Region	Sector	Total programs
1	ATEC - ASSOCIAÇÃO DE FORMAÇÃO PARA A INDÚSTRIA	5,40	Lisboa	Education	3
2	ESCOLA INTERCULTURAL DAS PROFISSÕES E DO DESPORTO DA AMADORA, E.M.	2,06	Lisboa	Education	1
3	COMPETIR - FORMAÇÃO e SERVIÇOS, S.A.	2,06	Lisboa	Education	3
4	TOYOTA CAETANO PORTUGAL, S.A.	1,84	Porto	Commerce	2
5	CIFOTIE - CENTRO INTERNACIONAL de FORMAÇÃO dos TRABALHADORES da INDÚSTRIA e ENERGIA	1,78	Lisboa	Education	4
6	FORMAJUDA - GABINETE de FORMAÇÃO e PROJECTOS da AJUDA, Lda	1,72	Lisboa	Education	2
7	INFORPREPARAÇÃO - Formação Profissional e Comércio de Equipamento Informático, Lda	1,52	Porto	Education	1
8	MULTIPESSOAL - UPGRADEM, S.A.	1,37	Lisboa	Education	1
9	GTI - Gestão, Tecnologia e Inovação, S.A.	1,35	Braga	Education	2
10	ALBIFOR - CENTRO DE FORMAÇAO Lda	1,34	Lisboa	Education	3

Rank	1st program	2nd program	1st (of total)	2nd (of total)
1	Cooperação com Outras Entidades na politica de emprego e formação profissional	Cursos de Aprendizagem - Entidades Externas	56,6%	38,7%
2	Cursos de Aprendizagem - Entidades Externas		100,0%	
3	Cursos de Aprendizagem - Entidades Externas	Passaporte Emprego	99,5%	0,3%
4	Cursos de Aprendizagem - Entidades Externas	Sistema de Aprendizagem - Saldos	92,9%	6,1%
5	Cursos de Aprendizagem - Entidades Externas	Estágios Emprego	99,7%	0,2%
6	Cursos de Aprendizagem - Entidades Externas	Sistema de Aprendizagem - Saldos	94,9%	5,1%
7	Cursos de Aprendizagem - Entidades Externas		100,0%	
8	Estágios Emprego		100,0%	
9	Cursos de Aprendizagem - Entidades Externas	Estágios Emprego	99,6%	0,4%
10	Cursos de Aprendizagem - Entidades Externas	Vida Ativa - Emprego Qualificado - Entidades Externas	86,5%	13,3%

Figure 4: Top 10 firms benefiting from ALMP transfers in years 2012-2013. The data refers only to ALMP transfers to firms. Sector classification according to International Labor Organization (ILO)

Rank	Recipient	Transfers (€ thousand)	Region
1	MULTIPESSOAL - UPGRADEM, S.A.	1371,51	Lisboa
2	ALTRAN PORTUGAL	802,49	Lisboa
3	ACCENTURE -TECHNOLOGY SOLUTIONS	486,69	Lisboa
4	SIEMENS NETWORKS, S.A.	448,24	Lisboa
5	BLUEPHARMA - INDÚSTRIA FARMACÊUTICA, S.A.	413,29	Coimbra
6	NETPEOPLE - Tecnologias de Informação, S.A.	346,93	Lisboa
7	Caixa Geral de Depósitos, S. A.	267,07	Lisboa
8	OGMA - INDÚSTRIA AERONÁUTICA de PORTUGAL, S.A.	235,96	Lisboa
9	IN FLIGHT SOLUTIONS SERVICOS DE ASSISTENCIA EM ESCALA,Lda	226,29	Lisboa
10	SONAE CENTER SERVIÇOS II, S.A.	220,62	Porto

Rank	Sector	Total of programs	% of total
1	Education	1	100,00%
2	Mechanical and electrical engineering	4	95,05%
3	Financial services and professional services	1	100,00%
4	Postal and telecommunications services	1	100,00%
5	Health services	6	84,30%
6	Postal and telecommunications services	4	94,87%
7	Financial services and professional services	2	52,14%
8	Transport equipment manufacturing	1	100,00%
9	Transport (including civil aviation, railways and road transport)	3	81,90%
10	Commerce	1	100,00%

Figure 5: Top 10 firms benefiting from Estágios Emprego in years 2012-2013. The data refers only to transfers to firms.

Rank	Recipient	Transfers (€ thousand)	Region
1	N & F - COMÉRCIO e DISTRIBUIÇÃO ALIMENTAR, Lda	77,71	Lisboa
2	AVELMOD - TEXTIL, Lda	46,86	Leiria
3	EMBRAER PORTUGAL - ESTRUTURAS METÁLICAS, S.A.	35,11	Évora
4	BENFICA ESTÁDIO - CONSTRUÇÃO E GESTÃO de ESTÁDIOS, S.A.	32,31	Lisboa
5	TEXTO EDITORES, Lda	31,79	Lisboa
6	POLOPIQUE - COMÉRCIO E INDUSTRIA DE CONFECÇÕES, S.A.	29,10	Braga
7	CRIEL, Lda	27,39	Braga
8	PRIMEIRA CATEGORIA IMPORT EXPORT, Lda	23,90	Lisboa
9	RECOLTE - SERVICIOS Y MEDIOAMBIENTE, S.A. - Sucursal em Portı	23,05	Lisboa
10	IRMÃOS MOTA - CONSTRUÇÃO DE CARROÇARIAS, S.A.	22,46	Porto

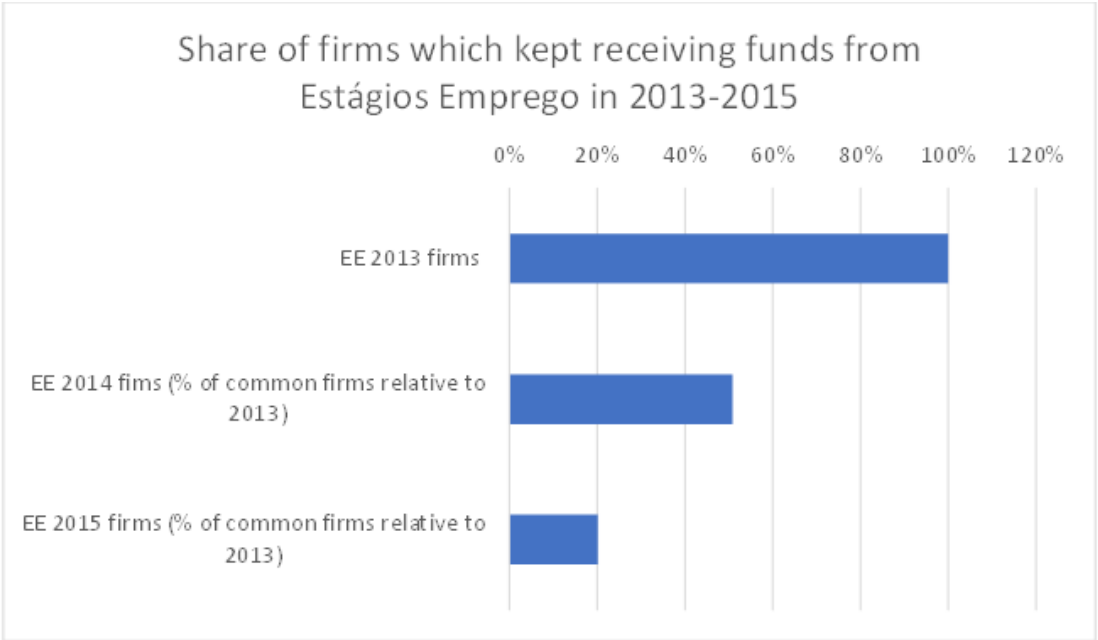
Rank	Sector	Total of programs	Total transfers (€ thousand)	% of total
1	Commerce	3	80,47	96,57%
2	Textiles, clothing, leather and footwear	3	61,94	75,65%
3	Transport equipment manufacturing	4	261,14	13,45%
4	Media; culture; graphical	6	109,53	29,50%
5	Media; culture; graphical	3	52,25	60,84%
6	Textiles, clothing, leather and footwear	1	29,10	100,00%
7	Commerce	3	29,55	92,69%
8	Commerce	1	23,90	100,00%
9	Forestry, wood, pulp and paper	1	23,05	100,00%
10	Transport equipment manufacturing	4	26,84	83,68%

Figure 6: Top 10 firms benefiting from Estímulo 2012 in years 2012-2013. The data refers only to transfers to firms.

Rank	Recipient	Transfers (thousand €)	Region
1	STRONG - SEGURANÇA, S.A.	170,74	Lisboa
2	EMBRAER PORTUGAL - ESTRUTURAS METÁLICAS, S.A.	148,84	Évora
3	IRIS - TINTURARIA E ACABAMENTOS, S.A.	102,74	Braga
4	COTTONSMILE CONFECOES UNIPESSOAL, Lda	64,51	Braga
5	OLIJEANS - Indústria e Confecção de Vestuário Unipessoal, Lda	63,55	Coimbra
6	PARSUPER SERVICOS DE GESTAO LOGISTICA E PARTICIPACOES Lda	63,12	Leiria
7	BLUEPHARMA - INDÚSTRIA FARMACÊUTICA, S.A.	61,95	Coimbra
8	AZURIBÉRICA - TEXTIL, S.A.	59,36	Coimbra
9	SÍLVIA & CARMO, Lda	50,63	Viseu
10	STAROTEIS - SOCIEDADE HOTELEIRA, Lda	46,00	Setúbal

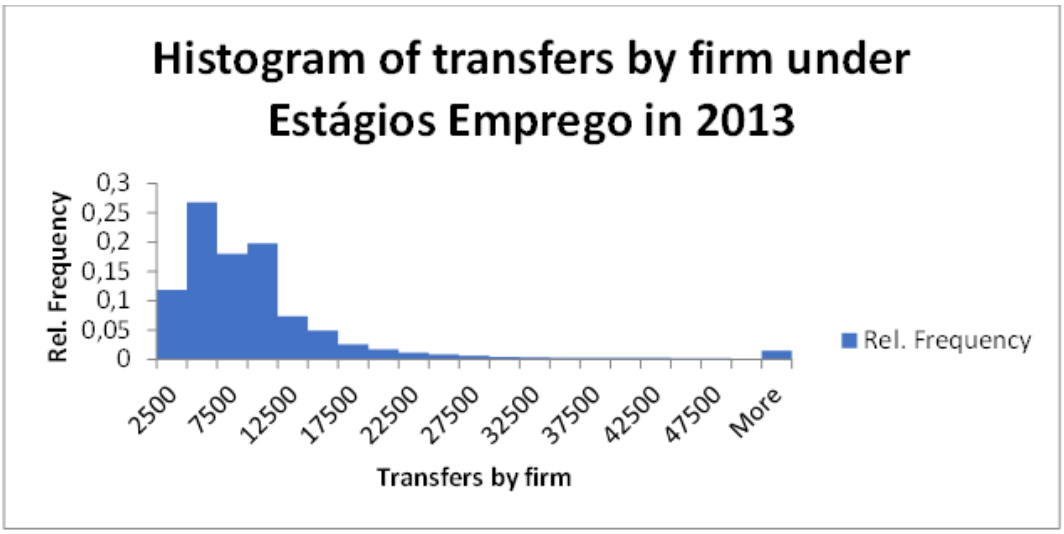
Rank	Sector	Total of programs	Total transfers (thousand €)	% of total
1	Security services	2	172,18	99,16%
2	Transport equipment manufacturing	4	261,14	57,00%
3	Textiles, clothing, leather and footwear	2	110,69	92,82%
4	Textiles, clothing, leather and footwear	3	79,56	81,09%
5	Textiles, clothing, leather and footwear	3	167,39	37,97%
6	Commerce (logistics)	2	79,00	79,89%
7	Health services	6	490,27	12,64%
8	Textiles, clothing, leather and footwear	1	59,36	100,00%
9	Textiles, clothing, leather and footwear	2	55,61	91,05%
10	Hotels, catering and tourism	3	87,27	52,70%

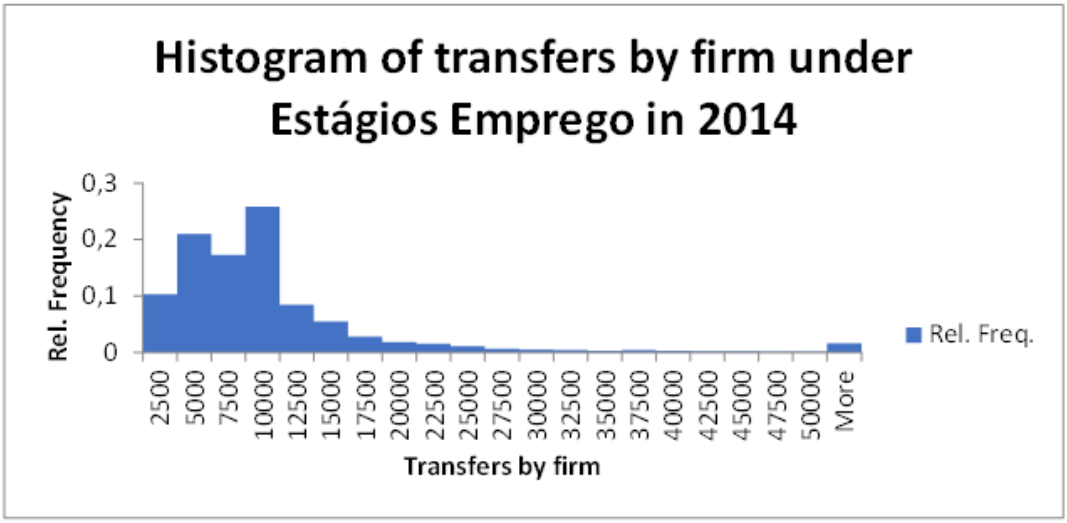
Figure 7: Top 10 firms benefiting from Estímulo 2013 in years 2012-2013. The data refers only to transfers to firms.



Average transfer by firm in 2013-2015	11292,30
Total number of benefiting firms in 2013-2015	13858

Figure 8: Share of firms which kept receiving funds from Estágios Emprego in 2013-2015





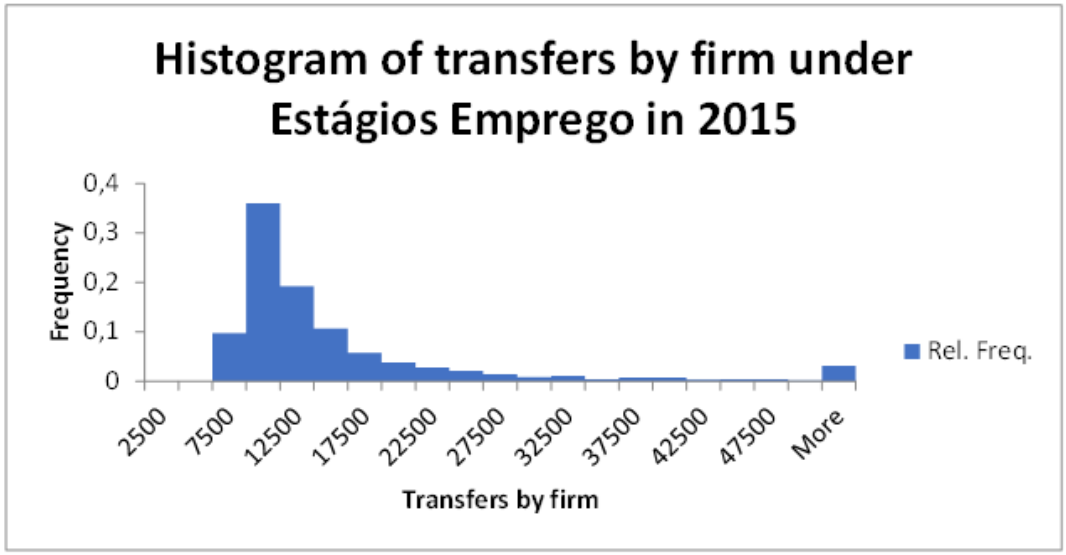
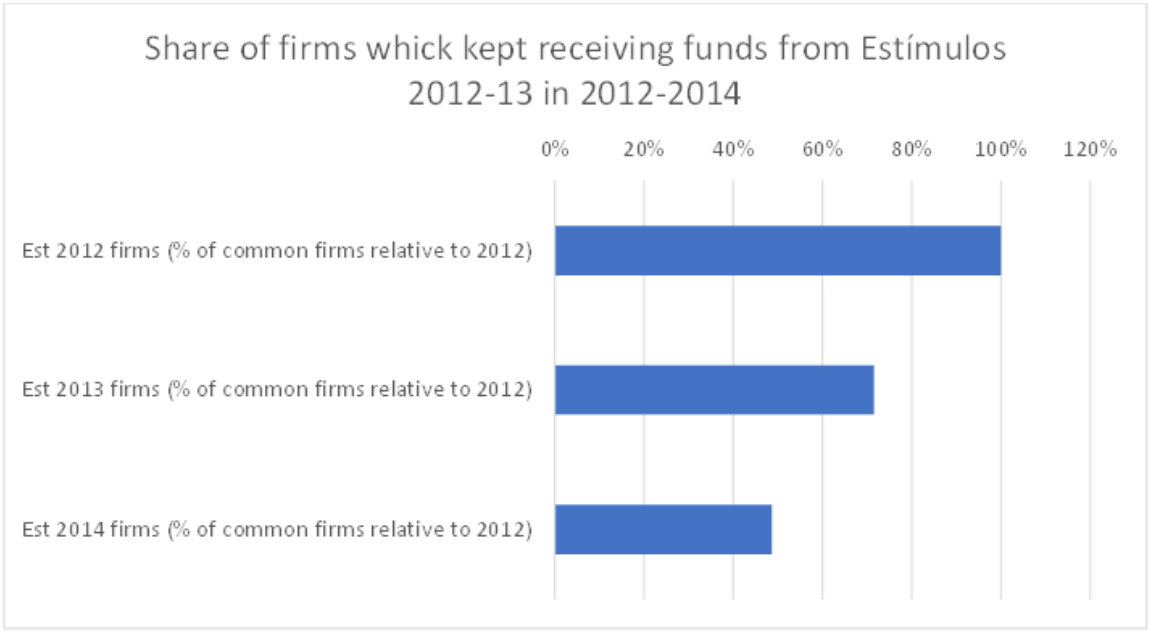
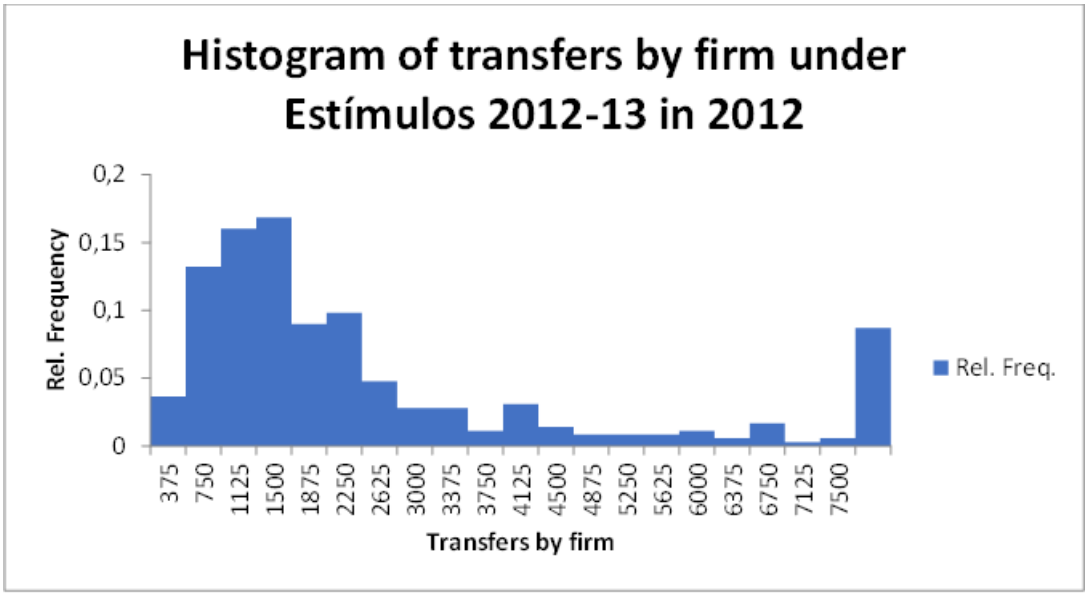


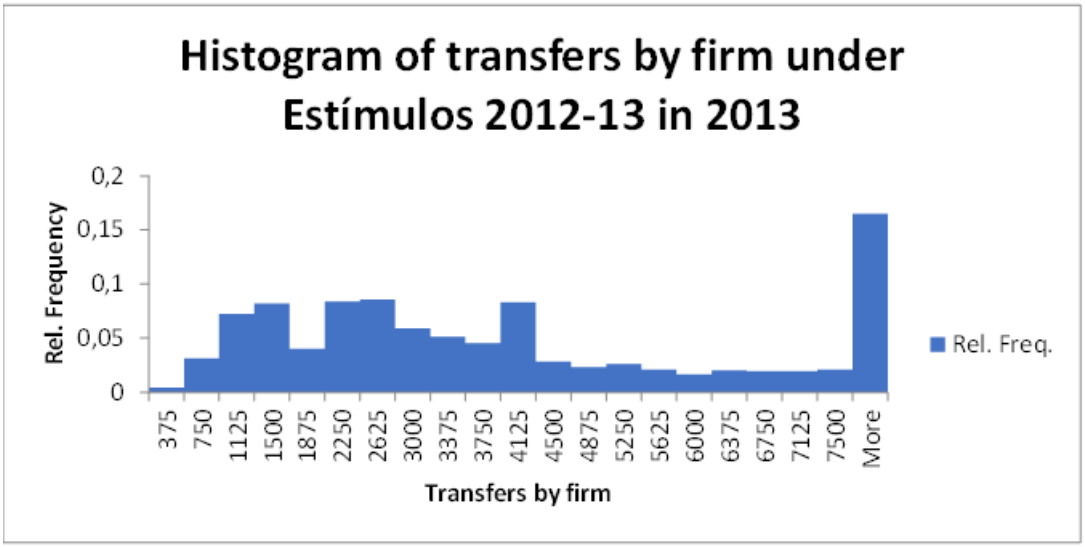
Figure 9: Histograms of transfers by firm under Estágios Emprego in years 2013-15.



Average transfer by firm in 2012-2014	**6569,33**
Total number of benefiting firms in 2012-2014	7596

Figure 10: Share of firms which kept receiving funds from Estímulos 2012-2013 in the period 2012-2014





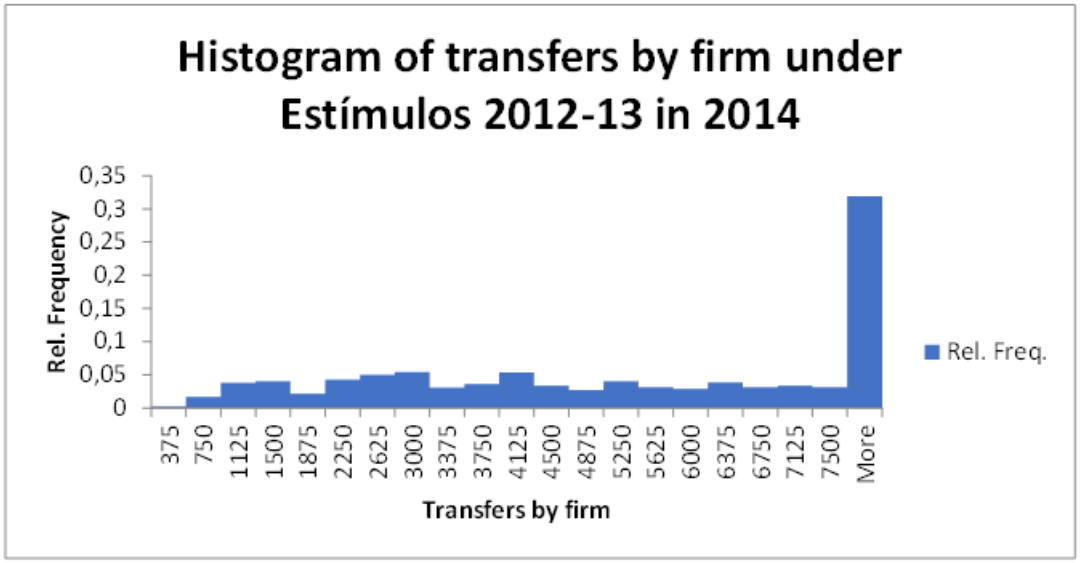


Figure 11: Histograms of transfers by firm under Estímulos 2012-2013 in the period 2012-2014

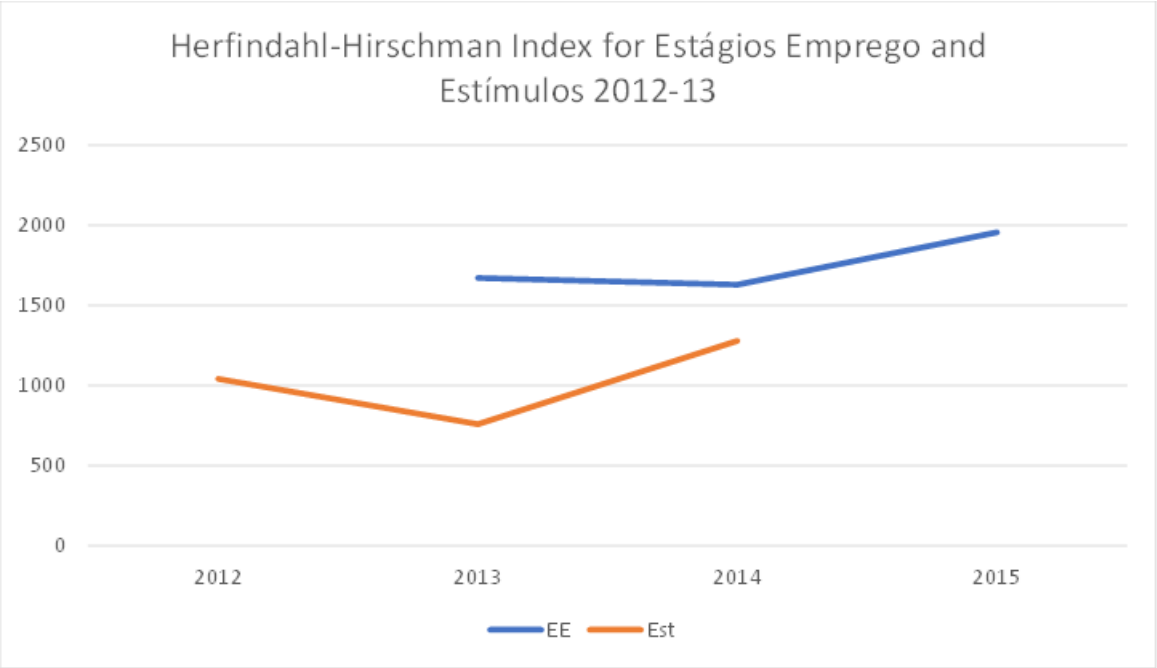


Figure 12: Herfindahl-Hirschman Index for Estágios Emprego and Estímulos 2012-13

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
Log of employment	75967	1.589	1.024	.693	8.898	.693	5.283	1.97	8.563
Average earned wage / 100	75967	7.819	4.311	.034	123.381	1.8	24.994	4.099	46.148
Average worker tenure / 100	75967	.067	.053	0	.435	0	.23	1.128	4.541
Av. normal working hours / 100	75967	1.54	.289	.01	1.84	.486	1.73	-1.898	6.585
Average worker wage	75967	24.975	6.083	16	52	16	42	.771	3.298
Average worker age squared / 100	75967	6.608	3.359	2.56	27.04	2.56	17.64	1.384	5.402
Share of workers with a full-time contract	75967	.711	.274	0	1	0	1	-.74	2.891
Average of Qualifications level	75967	3.642	1.211	1	9	2	6.5	.452	2.51
Share of workers with complete remuneration	75967	.732	.245	0	1	0	1	-.692	2.97
Percentage of foreign ownership	75967	.018	.129	0	1	0	1	7.199	53.531
Share of female workers	75967	.63	.32	0	1	0	1	-.5	2.196

Figure 13: Summary statistics

	(1) xtreg	(2) xtivreg2
Log of employment	.47***	1.007***
	(.005)	(.037)
Average worker tenure / 100	.769***	1.619***
	(.108)	(.246)
Average earned wage / 100	.014***	.215***
	(.001)	(.042)
Av. normal working hours / 100	-.094***	-.934***
	(.009)	(.162)
Average worker wage	.014***	-.03***
	(.002)	(.005)
Average worker age squared / 100	-.031***	.044***
	(.003)	(.008)
2011bn		
2012	-.074***	
	(.004)	
2013	-.086***	
	(.004)	
2014	-.08***	
	(.004)	
2015	-.038***	
	(.005)	
Share of female workers	.025*	.179***
	(.013)	(.039)
Share of workers covered by Acordo de Empresa	-.287**	
	(.139)	
Share of workers with a full-time contract	.144***	.22***
	(.011)	(.021)
Average of Qualifications level / 100	-.011***	-.085***
	(.003)	(.015)
Share of workers with complete remuneration	.065***	-.102***
	(.01)	(.036)
Percentage of public ownership / 100	.143*	
	(.073)	
Percentage of foreign ownership / 100	.1**	-.299**
	(.039)	(.135)
_cons	10.976***	
	(.031)	
Observations	115331	104093
R-squared	0.542	-0.583

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Figure 14: Effect of logarithm of employment on logarithm of sales under different specifications