Taxation and International Mobility of Superstars: Evidence from the European Football Market*

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Abstract

This paper analyzes the effects of top earnings tax rates on the migration decisions of football players across European countries. We construct a panel data set of top earnings tax rates and football players in the first leagues of 14 European countries since 1980. We identify the effects of top earnings tax rates on migration using various tax and institutional changes: (a) the 1995 Bosman ruling which liberalized the European football market, (b) top tax rate reforms within countries, and (c) country specific tax provisions offering lower tax rates for immigrant football players. We provide both case study analyses and a structural mobility model estimated using all the data and sources of variation simultaneously. Both approaches show that the level of top earnings tax rates has a very large impact on the migration decisions of football players, especially after the 1995 Bosman ruling. Specific tax reductions for immigrants also have large impacts on location decisions. Overall, the elasticity of the probability of playing in a given country with respect to the net-of-tax rate on earnings in this country is large, and even larger for younger players and top quality players. The large tax induced migration effects we uncover translate into significant effects in the performance of football clubs across countries.

1 Introduction

Tax induced international mobility of talent is a crucial public policy issue, especially when tax rates differ substantially across countries and immigration barriers are low as is the case in the European Union: high tax rates on highly paid workers might induce such workers to migrate to countries where the tax burden on high-income individuals is lower.[1] Therefore, international mobility might severely limit the ability of governments to redistribute income through highly progressive taxation. A theoretical literature, following the seminal contribution by Mirrlees (1982), has analyzed optimal taxation in the presence of international migration (e.g., Bhagwati and Wilson, 1989; Cremer et al., 1996; Wildasin, 1998). In particular, concerns have been raised that mobility of skilled workers is generating harmful tax competition driving down the progressivity of taxation in European countries.[2] As a result, the mobility response to high tax rates perhaps looms even larger in the policy debate on optimal tax progressivity than traditional within-country labor supply responses.

There is an enormous empirical literature on labor supply and taxable income responses to tax rates (see, e.g., Blundell and MaCurdy, 1999 and Saez, Slemrod and Giertz, 2009 for recent surveys of those literatures). However, the literature on the effects of taxes on the international mobility of people, and especially mobility among highly skilled workers, is extremely limited mostly due to lack of available data.[3] There is a small empirical literature on tax induced mobility across local jurisdictions *within* a given country, including Felstein and Wrobel (1998) on the case of US states and Kirchgassner and Pommerehne (1996) on the case of Swiss cantons. But there is no systematic information on the flux of workers, especially at the top of the distribution, across OECD countries as citizenship information is in general not available in micro tax data that have traditionally been used to study behavioral responses to income taxes.

This paper takes a first step to fill this gap in the empirical literature by focusing on a specific labor market, the market for professional football players in Europe. The European football market has four key advantages for the study of mobility and taxation.

First, although professional football is a small segment of the high-skill labor market, it is

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[1]Similarly, generous benefits for low-income individuals in certain countries might encourage migration of low skilled workers toward those countries.

[2]There is a large theoretical literature on tax competition focusing primarily on capital income tax competition (e.g., Wilson, 1999), but also on labor income tax competition (e.g., Wilson, 1995 and Wildasin, 2006).

[3]There is a very large literature on the effects of international taxation on multinational corporations and international capital mobility. See e.g., Gordon and Hines (2002) for a recent survey.

a highly visible segment as a significant fraction of the European population follows the sport closely. As a result, tax induced mobility of football players is of interest in its own right.[4] Recently, tax competition in Europe to attract the best football players has been the subject of heated discussion, especially after the star-player Cristiano Ronaldo moved from Manchester United to the Real Madrid in 2009 to benefit from the so-called "Beckham tax law" in Spain offering a 24% flat tax rate, thereby avoiding the announced creation of a 50% top tax bracket in the UK.[5] Arsene Wenger, the emblematic manager of Arsenal immediately stated that "The new taxation system, (...), means the domination of the Premier League will go. That is for sure."[6] At the same time, preferential tax schemes for high-income football players are subject to huge criticisms from a large fraction of the electorate questioning the fairness of such schemes. In response to these concerns, politicians currently seem prone to increase the progressivity of the taxation of top athletes, and some plans to repeal special tax schemes for football players have been introduced in France and in Spain, spurring a heated public debate.

Second and crucially, extensive data on the careers and mobility of professional football players can be gathered for most countries and long time periods. For this project, we have gathered exhaustive data on the career paths of first league football players (top 20 or so football teams in each country) for 14 European Union countries over the last 30 years, as well as performance data of all first league teams. As football players earn very high salaries, their average tax rate is well approximated by the top rate applying to earnings when combining (a) the top statutory individual income tax rate, (b) social security contributions (including both employee and employer contributions) when such taxes apply to uncapped earnings, and (c) the value added tax. We collect such *top earnings tax rate* data across countries and over time, taking into account special tax rules applying to immigrant workers (or athletes specifically).

Third, mobility costs for players are relatively low as the game is the same everywhere so that skills are portable across clubs and countries. Indeed, international mobility is quite common, making it a valuable case study to detect tax effects.

Fourth, there are many sources of variation in both tax policy and labor market regulation,

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[4]As we shall see, such concerns do have impacts on tax policy. For example, in 2005 Spain enacted the so-called "Beckham law", which allows foreign residents to pay an alternative modest flat rate tax (David Beckham is a star British player, who was recruited at the time by Real Madrid, a top football club in Spain).

[5]The top marginal tax rate in the UK is scheduled to increase from 40% to 50% on annual incomes above £150,000 from April 2010. This tax increase was announced in April 2009, several months prior to Ronaldo signing the contract with Real Madrid.

[6]The Premier League is the top football League in the UK.

which can be exploited to identify the effects of tax rates on mobility: (a) top tax rates vary across countries and over time, and occasionally on a cohort basis within countries, (b) several countries have special tax provisions that offer substantially lower tax rates for immigrant football players, and (c) the 1995 Bosman ruling which liberalized the European football market and allows us to analyze the interaction of taxes and regulation in determining mobility. These variations create credible sources of identification of the causal impact of taxation on location decisions of football players, by allowing for all sorts of controls, and in particular controls for year and country fixed effects interacted.

Our analysis starts by exploring reduced form evidence of cross-country correlations as well as case studies of specific tax reforms in specific countries. We then develop a simple structural choice model of tax induced mobility that we estimate on the complete data and exploiting all sources of variation simultaneously. We obtain three main results.

First, we find a strong negative correlation across countries between top earnings tax rates in the country and (a) the fraction of players from the country playing at home and (b) the performance of the first league clubs in the country (in a Europe-wide ranking of clubs). Importantly, those negative correlations are present only in the 1996-present period after the Bosman ruling, which liberalized the European football market and allowed clubs to recruit an unlimited number of foreign players. This correlation is much weaker in the pre-Bosman era (until 1995) when there were tight limits on how many foreigners could play in any club. In a nutshell, following the Bosman ruling, Spanish, Italian, and English clubs came to fully dominate European football both in terms of their ability to recruit top international stars and overall performance at the expense of other big football countries such as France, Germany, or the Netherlands. Spain, Italy, and the United Kingdom are precisely the countries with the lowest top earnings rates among the big football European countries.

Second, the case studies we analyze show very strong and compelling evidence that top earnings tax rates have large impacts on location decisions. The fraction of foreign players increases sharply in Denmark, Belgium, and Spain after those countries institute preferential tax treatment for high-income immigrants. In each case, the country level time series provide striking evidence of mobility changes following the tax change. Moreover, Greece removed the cap on payroll taxes for workers entering the workforce in or after 1993, creating a huge increase in top earnings tax rates for such workers. That data shows that Greek players starting their

career in Greece in or after 1993 are much more likely to eventually move abroad. Interestingly, the cap was restored in 2004, and we do observe that the extra mobility disappears for the more recent cohorts.

Finally, our structural model also displays significant evidence of behavioral responses to tax rates. Overall, the elasticity of the probability of playing in a given country with respect to the net-of-tax rate on earnings in this country is large. It is even larger for younger players and top quality players with elasticities as high as 1.5. This implies that the revenue maximizing tax rate (Laffer rate) for immigrant skilled labor is around .4: from a single country perspective, instituting a preferential tax treatment for immigrant football players can increase tax revenue.

The paper is organized as follows. Section 2 presents key facts on the European football market, and our data. Section 3 presents reduced form and case studies evidence. Sections 4 presents the structural model and estimation. Section 5 offers concluding remarks and discusses policy implications.

2   Context and Data

2.1   The European Football Labor Market

Football clubs are attached to a particular city and a local stadium, and each club includes about 25-40 players.[7] Within each country, there is a top national league including between 12 and 22 national clubs depending on country. On top of these national championships, there is currently two European-wide competitions gathering a select number of the best clubs from each league.

Each country also forms National teams that play World and European championships on a strictly national basis. The national championships take place every second year (World and European championships each happen every fourth year and alternate), and take place independently and in addition to the club competitions at the national and European level.

Year t season starts from August/September of year t and ends in May/June of year $t + 1$.[8] In contrast, taxes are typically computed on an annual calendar basis. Because the composition of the team for the year-t season is to a very large degree determined before the beginning of

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[7]The game itself is played by 11 players, but the full team is much larger because of rotation of players within and across games, and to insure against potential injuries.

[8]With the exception of Sweden, Norway, Finland, and until 1991 Denmark, where the leagues follow the calendar year

the season, we will assume that the relevant tax rate for year t season is the tax rate prevailing during calendar year t.[9]

Professional players sign contracts of limited duration with a given club (typically 3 to 5 years), which specifies an annual salary. Clubs cannot easily fire under-performing players under contract, although they can always choose to not align them in the games. If a player under contract in club A wants to move to club B before the end of his contract, the two clubs can negotiate a transfer fee whereby club A receives a transfer from club B. This transfer fee is typically a transfer from club to club and is not paid by the player or to the player, and hence is not part of the taxable compensation of the player. In addition to their salaries, the most famous players also obtain a share of club revenue from the sale of items carrying their image ("image rights").

Before the 1995 Bosman ruling, the market for football players was heavily regulated. Two rules are particularly important for our analysis. First, the "three player rule" required that no more than three foreign players could be aligned in any game in the UEFA club competitions.[10] This rule sharply limited international mobility. Second, the "transfer fee rule" allowed clubs to require a transfer fee when a player wanted to move to another club even if the contract with the player had ended. Hence, out-of-contract players were not allowed to sign a contract with a new team until a transfer fee had been paid or a free transfer had been granted by the original club.[11] This rule also limited mobility (within and across countries) as any surplus resulting from a move had to be shared with the initial club.

The European Court of Justice made the landmark Bosman ruling on December 15, 1995.[12] According to the Bosman ruling, the three-player rule and the transfer-fee rule used by UEFA placed restrictions on the free movement of labor and was prohibited by the EC Treaty. As a result, all EU football players were given the right of free transfer at the end of their contract with the provision that they were transferring from a club within one EU football association to a club within another EU football association. Therefore, transfer fees now apply only to in-

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[9]International transfers take place during two so-called transfer windows. The longest transfer window (up to 12 weeks) where most transfers take place is placed in between seasons. A shorter transfer window that cannot exceed 4 weeks takes place in mid-season.

[10]The three-player rule was also imposed in most national competions.

[11]A few countries such as France and Spain prohibited these out-of-contract transfer fees.

[12]Jean-Marc Bosman was a Belgian player, whose contract with his Belgium club RFC Liege expired in 1990. Bosman wanted to move to a French club, Dunkerque, but the two clubs could not agree on a transfer fee. His Belgian club refused to let him go, reduced his salary, and forced him to play in its B-team. Bosman took the case to the European Court of Justice and won.

contract players. The ruling also lead to the elimination of the three-player rule for EU-players in EU-teams. Hence, foreign player quotas now apply only to non-EU players playing in EU clubs.[13]

The first season the Bosman ruling could start having an effect is the 1996 season[14]. The Bosman ruling applied only when existing contracts came to an end. Therefore, the effects of the Bosman ruling took a few years before reaching their full impact. Note that the transfer fee aspect of the Bosman ruling has received some attention from economists (Antonioni & Cubbin, 2000; Feess & Muehlheusser 2003; Tervio, 2006; Verbon, 2007). Evidence seem to confirm the theoretical predictions that before the Bosman ruling, contracts were typically shorter (because clubs had a lot of bargaining power anyhow thanks to the "transfer fee rule" at the end of contracts). After the Bosman ruling, new contracts signed were typically longer because clubs tried to insure themselves. Feess & al. (2004) find for instance that average contract length increased significantly after the Bosman-ruling (from about 2.5 to more than 3 years in the German Bundesliga. But some pieces of evidence suggest as well that overall turnover increased significantly and that the distribution of player salaries became more unequal in the first years after the Bosman-ruling, indicating that star players were able to convert transfer fees into higher salaries (Frick, 2007).

2.2   European Football Data

We have collected data on the universe of soccer players playing in 14 European top leagues since 1980. The countries include Austria, Belgium, Denmark, England, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. This set of countries includes all the top (Western) European football countries. The data has been collected from various online resources and from data provided directly by national leagues.[15] Our data include name, nationality, and date of birth of each player in each club of the first leagues in

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[13]To get around this remaining quota, some non-EU players (mostly from South-America) apply for EU citizenships (mostly in Italy, Spain and Portugal).

[14]The Court restricted the temporal effect of the ruling to transfers payable after the date of the judgment : 15 december 1995, in order to avoid the multiplication of retrospective claims.

[15]Two main online sources were used. The national team football website contains all information on players having played at least once in the national team of their home country. The second source, playerhistory.com, is the more exhaustive and contains information on all players for all clubs and countries. Information is perfectly exhaustive for all countries since the beginning of the 1990s. For most countries, exhaustive information is also available since the 1970s. These two websites can be found at:
http://www.national-football-teams.com/v2/index.php. and http://playerhistory.com.

all 14 countries from 1980 to present.[16] We can therefore easily track down mobility patterns of players.

Results from European competitions are used by UEFA to develop official rankings of all European clubs each year.[17] Our club data include results from all matches played in European competitions since 1975, along with results from the National Leagues of the 14 countries in the data set. This data allows us to contruct the so-called UEFA team and country coefficients that form the basis for UEFA's official rankings, along with alternative ranking measures based on different formulas. Our analysis below will be based on the following measure of club performance in a country: total points earned by all clubs in a given country and year in all European competitions, where total points are calculated according to UEFA's formula and gives 2 points for each win, 1 point for each draw, and bonus points for advancing from various tournament stages.[18] Using total points for ranking is different than using UEFA's country coefficient, which is based on the average amount of points earned by clubs participating in the European competitions in a given year.[19] Our results are very robust to using different ranking measures.

2.3 Top Earnings Tax Rate Data

In contrast to athletes in individual sports, soccer players cannot live far away from the hometown of their club because they need to train almost daily with their teammates. Barring special rules, income and social security taxes on labor earnings are assessed on a residence basis. Therefore, professional football players typically face the tax systems of the countries in which they work. We have collected top earnings tax rates by combining top income tax rates, payroll tax rates (social security contributions both on the employer and employee side), as well as the Value-added-Tax (VAT).

For the income tax, we use the top statutory income tax rate because professional football

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[16]Exhaustive data for Denmark only starts in 1991 on playerhistory.com. However, national-team-football.com has extended information on Danish players before 1991. Figures 6 to 8 are therefore computed on a sample restricted to top players only.

[17]In the period we consider, there are three major European championships: the Champions League, the UEFA Cup, and the Cup Winners Cup.

[18]Points earned in qualification stages gets weight 0.5. This weighting scheme has been used by UEFA only since 1999. For comparability of performance over time, we use this weighting throughout the period.

[19]The UEFA country coefficient is conceptually problematic, because successful leagues get more teams into the European competitions. Thus, the UEFA measure effectively compares top teams in weak leagues to upper-middle and top teams in strong leagues, which biases down performance differences across countries.

players in top leagues have very high salaries (relative to the average in the country) and typically face the top tax rate. However, in each case, we have taken into account all the tax rules and deductions for earned income that might apply in the calculation of the income tax. In the cases where local income taxes apply, we have used the average top local income tax rate.[20] We have computed such top income tax rates on earnings since 1975 in our 14 countries of analysis. Importantly, as several countries have special rules with preferential tax treatment for immigrant workers, we have also computed alternative series of top earnings tax rates for foreign players. We have used as sources OECD *Taxing wages* from the period 1980 to the present, and OECD (1986), *Personal income tax systems* for the period 1975 to 1983, and PriceWaterhouseCoopers: *Worldwide Tax Summaries*, and International Bureau of Fiscal Documentation: *The International Guide to the Taxation of Sportsmen and Sportswomen*. The first three sources provide annual information while the later source is particularly helpful for determining specific rules applying to professional football players. Because tax rules are complex, it is essential to cross-validate various sources to create an error free database. In particular, we investigated thoroughly situations where discrepancies arose between our sources and used additional country specific data obtained directly from domestic sources to resolve such discrepancies.[21]

Payroll tax rates include social security contributions both at the employer and employee level as well as some additional specific taxes on wage earnings. For our analysis, the critical aspect of such taxes is whether such taxes apply only up to a cap, in which case we assume that the relevant payroll tax rate is zero. When payroll tax rates do not have a cap, they end up having a very large impact on our top earnings tax rate. We have used as sources OECD *Taxing wages*, MISSOC *La protection sociale dans les Etats membres de l'Union europeenne*, as well as direct information from the Social Security administrations in charge of soccer players in the different countries: e.g. IKA in Greece, or ENPALS in Italy).

Finally, we also include value-added-tax (VAT) rates in our computations. We have used the normal VAT rate which applies on the broadest set of goods. If players consume most of their income in the country in which they live and play, then it is preferable to include the VAT rate. If players consume most of their income abroad or save most of their income for future consumption, then the VAT rate should not be included. Excluding the VAT rate does not

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[20]The countries in which such local rates apply are Belgium, Portugal and Switzerland.

[21]We have created a fully documented excel database of tax rates that is available upon request.

have significant effects on our findings are VAT rates across European countries are actually quite close (much closer than top income and payroll tax rates). Our source for VAT rates is the European Commission (2009): *Taux de TVA appliques dans les Etats membres de la Communaute europeenne.*

We combined all three taxes into a single tax rate τ which measures the complete tax wedge: when the employer labor cost increases by 1 Euro, the employee can increase his consumption by $1 - \tau$ Euros. Denoting by τ_i, τ_{sE}, τ_{sR}, and τ_{VAT}, the top tax rates on earnings due to the income tax, the employee portion of payroll taxes, the employer portion of payroll taxes, and the VAT tax rate (respectively), we have in general:

$$1 - \tau = \frac{(1 - \tau_i)(1 - \tau_{sE})}{(1 + \tau_{VAT})(1 + \tau_{sR})},$$

in the most typical case where the employer and employee payroll taxes apply to earnings net of employer payroll taxes but before employee taxes have been deducted, and where the income tax applies to earnings net of all payroll taxes. We have adapted the computations to each country exact situation.

To illustrate our top earnings tax rate database, we plot on Figures 1 to 3 the tax rates for the largest five European countries, the Scandinavian countries, and six additional smaller EU countries. In each case, we depict tax rates in two panels: the top panel is for national players playing in their home country while the bottom panel is for foreign players playing in the given country.

3 Reduced Form Evidence

We start our analysis with reduced form evidence, first focusing on cross country correlations and then on case studies exploiting country specific tax reforms.

3.1 Cross Country Correlations

Figure 4 depicts the correlation between top earnings tax rates and the fraction of players playing in their home country in the six years preceding the Bosman ruling (1990-1995) in Panel A and in the six years following the Bosman ruling (1996-2001) in Panel B. Each dot corresponds to a country. The x-axis shows the top earnings tax rate that applies to players playing in their home country. The y-axis shows the fraction of players of a given nationality in our database of

top league players that are playing in their home country. Because the Nordic countries were integrated even in the pre-Bosman era, we use for those countries the fraction of players that are playing in any Nordic country (instead of home country only).

There is a striking contrast between the two panels. In the pre-Bosman era, the fraction of players playing at home is very high, above 95% in all countries except for the Netherlands,[22] and the correlation with the top earnings tax rate is very close to zero and insignificant. In the post-Bosman era, the fraction of players playing at home falls in many countries and a significant negative correlation with the top earnings tax rate appears.

Figure 5 explores the correlation between country-level club performances and top earnings tax rates before and after Bosman. Compared to the graphs on player mobility in Figure 4, we have extended the time window as it might take some time for mobility to translate into performance. The Figure has three panels: the two decades preceding the Bosman ruling are shown in Panel A (1975-84) and Panel B (1985-95), while the period following the Bosman ruling (1996-2008) is shown in Panel C. In the two upper panels, the correlation between tax rates and club performance is close to zero and insignificant. Hence, the Placebo comparison between these two panels suggests that there was no trend in the tax-performance correlation occuring prior to Bosman. In Panel C, we see that after Bosman a strongly negative and significant correlation between tax rates and performance appears.

Simply put, the five best football leagues in Europe are the French, German, Spanish, Italian, and English leagues. Their domination is due primarily to large population size as most European countries are equally committed to the sport. Spain, Italy, and the United Kingdom had top tax rates substantially lower than France and Germany at the time of the Bosman ruling and up to the early 2000s. After the Bosman ruling, Spanish, Italian, and English top league clubs did attract a large number of top foreign talent and came to dominate European football, at the expense of clubs in other big football countries such as Germany or France.

Those results are strongly suggestive that there is a link between top earnings tax rates and the mobility decision of football players and that those mobility decisions translate into club performance differences across countries.

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[22]The large fraction of Dutch players playing abroad might be due to the mandatory defined contributions Pension Fund System for football players instituted in 1972 (CFK) which requires compulsory pension contributions of to 50% of earnings (and 100% of bonuses) above a small cap. Although contributions earn market rates of returns, they might be perceived as forced savings and heavily discounted by players, which have indeed traditionally complained about the system.

3.2 Country Case Studies

After the cross-country analysis, we turn to specific country case studies exploiting tax reforms where compelling evidence of tax effects can be found.

3.2.1 Tax Preferential Regimes for Immigrants

In our sample, three countries have enacted significant tax reforms introducing preferential tax treatment for highly compensated immigrants.

- **1992 Danish Reform: "Researchers' Tax Scheme"**

In 1992, Denmark enacted a preferential tax regime for foreign researchers and high-income foreigners in all other professions, who sign contracts for work in Denmark after June 1, 1991 as shown in Figure 6. Under this scheme, the tax rate on income was limited to 30% (25% after 1995) for contracts exceeding 6 months and for a total period of up to 36 months.[23] Except for researchers, eligibility for this tax scheme requires an annual income of at least DKK 511,200 (about 80,000 Euros) in 1992 prices. The scheme also applies to Danish citizens, who have been working and paying taxes abroad for a period of at least 3 years.[24] When the 36 months of preferential tax treatment have been used up, the taxpayer will be subject to the ordinary tax scheme imposing very top marginal tax rates as shown in Figure 6. In the original law, after 7 years of residence in Denmark, a worker who had benefited from the preferential tax treatment would be subject to a claw-back whereby ordinary tax rates applied retroactively to the entire income earned during the period of preferential tax rates. For a high-income worker, this rule implied a very large retroactive tax bill after 7 years of residence. The rule was eliminated for researchers in 1998 and substantially relaxed for all other professions in 2002, so that today the retroative tax applies to very few workers. Notice finally that, although the tax scheme took effect from 1991, it was not passed until 1992 and therefore effects cannot be visible before the 1992 season.[25]

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[23]The 36 months do not have to be taken together. They can be broken up into a number of separate intervals and distributed over an unlimited time period.

[24]In principle, the rule does not distinguish between Danish and non-Danish citizenship. The requirement for eligibility is that the taxpayer has not been either fully or partially tax liable under the ordinary Danish income tax in the 3 years prior to applying for the preferential tax treatment.

[25]Notice that this unusual piece of tax policy implies large discontinuities in tax liability depending on employment history (three- and seven-year rules), income level (DKK 511,200 lower bound), and profession (researchers vs other professions). We are in the process of studying in detail the effects of this policy on all types of workers using administrative data of the entire population of Danish workers.

Figure 7 displays the fraction of top foreign Europeans players playing in Denmark and in Sweden (as a control country). For Denmark (Sweden), top foreign Europeans players are all the non-Danish (non-Swedish) players in the 14 EU countries we study that have ever played in the national team of their country.[26] The figure displays strong evidence of a tax effect as no top foreign players play in Denmark before the reform takes place. By 1993, i.e., one year after the reform was voted, some foreign players start to play in Denmark and the number grows over time. In contrast, Sweden used to have foreign players but their number went down so that, by the end of the period, Denmark attracts as many foreign players as Sweden. These findings are corroborated by anecdotal evidence and popular opinion among Danish and Swedish football commentators and managers, who often argue that Swedish clubs have a hard time competing with Danish clubs for foreign players due to preferential Danish tax rules.

Figure 9 provides further evidence by displaying the duration of stay of top European foreign players in the four Nordic countries among those arriving between 1991 and 1995 (i.e., after the Danish preferential tax treatment started to apply retroactively). Three points are worth noting. First, conditional on starting to play in a Nordic country, the likelihood of leaving after one year is much lower in Denmark than in the other three countries. Second, a much larger fraction of players staying at least 3 years leave by year 4 in Denmark than in the other countries, exactly at the time when the preferential tax treatment ceases to apply. Third, no foreigner stays more than seven years in Denmark when the claw-back provision applies, whereas some do in all the other countries. All three facts provide strong evidence of a behavioral response to the structure of the program.

- **2004 Spanish Reform: "Beckham Law"**

The "Beckham Law" (Royal Decree 687/2005) was voted in Spain in 2005, but was applicable to foreigners moving on or after January 1, 2004. The law specified that taxpayers acquiring tax residence in Spain as a result of a labor contract may choose to be taxed according to resident tax rules or non-resident tax rules in the year the option is exercised and in the following five years. In such cases, the general tax rate for non-residents will be a 24% flat rate tax in lieu of regular individual income tax rates (with a maximum rate of 43% in 2008).[27] This law only

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[26]We use this restricted database because we have not yet been able to obtain data on full set of first league players in Denmark before 1991.

[27]Spanish social security contributions apply only up to a cap and therefore are not relevant for football players.

applies if the individual was not a tax resident for the preceding ten years so that Spanish players abroad cannot take advantage of the law.

Figure 10 plots the fraction of foreign players in the Spanish top league from 1982 to 2008, along with the top earnings tax rate for such players. The two vertical lines denote the Bosman ruling and the Beckham Law. Two findings are worth noting. First, there is indeed a surge in the fraction of foreign players following the Bosman ruling. As we argued above, Spain was a low tax country at the time of the Bosman ruling and was able to attract many foreigners. Note however that the fraction of foreigners starts eroding by the late 1990s. Second and most important, when the Beckham law stars to apply in 2004, the fraction of foreign players starts to increase sharply again, providing evidence that top earnings tax rate affect mobility.

- **2002 Belgian Reform**

Since 2002, foreign football and basketball players in Belgium (playing in the first and second league) can pay a flat 18% tax rate on their earnings in lieu of the regular progressive individual income tax. Such a preferential treatment can only be requested for a 4-year period

Figure 11 plots the fraction of foreign players in the Belgian top league from 1986 to 2008, along with the top earnings tax rate for such players. The two vertical lines denote the Bosman ruling and the 2002 law. In the case of Belgium, the Bosman ruling did have a positive impact on the number of foreign players but not as large as in the case of Spain, possibly because top earnings tax rates in Belgium were high. However, the fraction of foreigners in Belgium does start to increase after the 2002 law takes place.

3.2.2 Cohort Based Tax Changes

A cohort-based change in the payroll tax system in Greece in 1993 allows us to analyze the mobility of Greek players.[28] Before 1993, payroll taxes in Greece applied only up to a cap and hence did not affect the top earnings tax rate. In late 1992, Greece passed a law removing the cap on social security contributions (for both employers and employees), but only for workers entering the system (i.e., starting to have covered earnings) on or after 1993 with no change in the cap for workers already in the system. As a result, football players in Greece starting their career on or after 1993 face a much higher top earnings tax rate than players starting their career before 1993, and hence may be more likely to leave the country to play abroad. However,

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[28]This reform is analyzed in Saez, Matsaganis, and Tsakloglou (2009) for the full population.

in 2004, a cap was re-introduced for all workers having entered the system after 1992.[29] As a result, football players starting their career in Greece in the late 1990s face much lower top earnings tax rates at the peak of the career (which happens around 7 years after becoming professional players). Therefore such players should be again less likely to leave Greece than earlier cohorts entering in the 1993-1995 period and facing uncapped payroll taxes at the peak of their careers. Figure 12 tests this by plotting the percentage of Greek players playing abroad by seniority for three cohorts: 1990-92, 1993-95, 1996-98.

Consistent with tax effects, we find that the 1993-1995 cohort players are more likely than the other two surrounding cohorts to play abroad. This evidence suggests again that top earnings tax rates do affect mobility of football players.

4   Structural Evidence

4.1   Structural Model

We now turn to structural evidence based on a simple mobility model. Let us denote by U_{ijt} the utility that player i would derive from playing in country j at time t. Let us denote by P_{ijt} the actual choice of player i, i.e., P_{ijt} is a dummy equal to one when player i plays in country j at time t.

Utility U_{ijt} is determined by the net-of-tax compensation that player i could get in country j. We denote the net-of-tax compensation by $w_{ijt}(1 - \tau_{ijt})$, where w_{ijt} is pre-tax compensation and τ_{ijt} is the average tax rate, which we approximate by the top earnings tax rate as football players have very high salaries.

In addition to net-of-tax income, various factors can influence utility including (a) a preference for home captured by a dummy variable $home_{ij}$ equal to one when country j is the home country of player i, (b) cultural preferences if the country is culturally close to the home country (we divide our 14 EU countries into 5 such cultural groups: Latin countries, English-speaking countries, Nordic countries, German-speaking countries, France-Belgium), (c) unobservable characteristics of country j captured by a country fixed effect μ_j, and (d) demographic factors such as age.

The most natural specification assumes that all the factors enter multiplicatively so that we

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[29]The new cap for post 1992 entrants was set 2.3 times higher than the cap applying of pre 1992 entrants but the new cap remained small for very high earners and hence does not affect the top earnings tax rate.

can log-linearize utility. This yields:

$$U_{ijt} = \alpha \log[w_{ijt}(1 - \tau_{ijt})] + home_{ij} + \mu_j + \varepsilon_{ijt} \tag{1}$$

Note that we cannot observe the wage w_{ijt}. Therefore, we assume that pre-tax compensation takes the following form: $w_{ijt} = a_i \cdot \psi_{jt} \cdot e_{ijt}$, where a_i is the intrinsic ability of player i, ψ_{jt} reflects the average level of wages in country j in year t, and e_{ijt} is the experience premium, reflecting the life cycle profile of performance, which we allow to vary by country j. Equation (1) can then be rewritten in the following way:

$$\begin{aligned} U_{ijt} &= \alpha \log(1 - \tau_{ijt}) + home_{ij} + \mu_j + \alpha_i + \Psi_{jt} + \gamma_j E_{it} + \varepsilon_{ijt} \\ &= V_{ijt} + \varepsilon_{ijt} \end{aligned} \tag{2}$$

where α_i is an individual fixed effect, and Ψ_{jt} is a year fixed effect interacted with a country fixed effect. To proxy for experience E_{it}, we use age, age-squared and a dummy for players playing in the A national team of their home country. We allow the effects of these different proxies to vary by country.

Equation (2) gives the baseline specification for our additive random utility model (ARUM). To estimate this model, we assume that we observe outcome j ($P_{ijt} = 1$) if the alternative j is preferred by player i at date t over all the other alternatives.

$$\begin{aligned} Pr(P_{ijt} = 1) &= Pr(U_{ijt} \geq U_{ikt}), \quad \text{for all } k \\ &= Pr(U_{ikt} - U_{ijt} \leq 0) \\ &= Pr(\varepsilon_{ikt} - \varepsilon_{ijt} \leq V_{ijt} - V_{ikt}) \end{aligned}$$

Under the assumption that errors ε_{ijt} are type I extreme value distributed, this leads to the mixed logit model that can be estimated by maximum likelihood where

$$Pr(P_{ijt} = 1) = \frac{exp(V_{ijt})}{\sum_{k=1}^{m} exp(V_{ikt})} \tag{3}$$

To understand where the identification of the causal impact of $log(1-mtr)$ comes from in this structural estimation, it is useful to recall that there are three main sources of variation of top marginal tax rates on earnings in our data. The first source of variation is across countries. But the baseline specification includes country fixed effects to control for unobservable characteristics that may affect the utility derived from playing in country j, so that the across country source

of identification is shut down. The second source of variation is over time: in a given country, marginal tax rates change over time due to legislated tax changes. But this source of variation is also shut down as the baseline specification includes year fixed effects interacted with country fixed effects to control for variation over time of unobservable characteristics in a given country. The last source of variation comes from cross-sectional variations in marginal tax rates in a given country for a given year because of the existence of tax preferential regimes for immigrants (Denmark, Belgium, Spain) or of cohort-based social security reforms (Greece). These are the variations that we take advantage of for identification here. Note that for tax preferential regimes for immigrants, identification is still possible even when controlling for home preference (with the dummy variable $home_{ij}$ for being a local). The reason is that there is still some variation among foreigners, first because of different tax wedges for two players coming from different countries and second because of the restrictions applicable to be eligible to these tax treatments (duration of stay, etc) that bring additional cross-sectional variations among foreigners.

4.2 Estimation Results

To compute our estimates, we focus on the post-Bosman years (1996-2008). Our estimation sample includes all 14 countries, and is restricted to players who are citizens of one of these 14 countries and played at least once in one of the top 14 leagues in Europe. We excluded all other players (such as players from South America and Eastern Europe), because we cannot follow their career prior to their arrival or after their departure from one of the 14 countries if they decide to go back to their country of origin. Therefore, we cannot compute proper counterfactual alternatives for their location choices. We also excluded players with multiple nationalities. The reason is that a certain number of scandals (especially in Italy) revealed that players listed with multiple nationalities happened to have in fact fake EU passports in order not to be constrained by quotas applicable to non-EU players.

Our baseline results are displayed in table 1. A positive coefficient on the term $log(1-mtr)$ means that an increase in the relative net-of-tax share in one country increases the probability that a player plays in this country. Column (1) shows results when no country fixed effects are included. The coefficient on $log(1-mtr)$ is positive and close to one. When including country fixed effects, the value of the coefficient is reduced approximately by half, but it is still strongly significant. The estimate corresponding to our baseline specification above is given in column

(5), which includes country fixed effects interacted with year fixed effects and a set of controls for experience interacted with country fixed effects. Across all the specifications, we find a strongly significant positive effect of the net-of-tax share of one country on the probability of playing in that particular country. Note that the coefficient on home preference (the alternative-specific dummy variable *home* which is equal to one for the home country of the player) is positive and quite large reflecting the existence of significant home preference or of high costs of moving out of one's home country. We do not display the coefficients for the dummy variable *topplayer* interacted with the 14 country fixed effects, but, not surprisingly, the coefficients are positive for the 5 top European Leagues and negative for the other Leagues, reflecting the preference of top quality players for playing in the best European leagues.

Table 2 studies the heterogeneity in responses to net-of-tax share variations across several dimensions. For each column, we estimated our baseline model on a selected subsample of our estimation data set. Column (1) focuses on players younger than 25, and demonstrates that younger players seem to be more elastic to taxation than older players.[30] Column (2) displays results when restricting the sample to top quality players.[31] The coefficient is around 1.15, more than two times larger than the coefficient for the whole sample, which means that top players are more elastic to tax rates than lower quality players. Column (3) restricts the sample to citizens of countries whose League does not rank among the top 5 European leagues. These countries are Austria, Belgium, Denmark, Greece, Portugal, Netherlands, Norway, Sweden and Switzerland. These countries are overall smaller countries with smaller leagues. Restricting the sample to all citizens of these countries leads to a coefficient on $log(1 - mtr)$ of 0.77, which is higher than the coefficient found for the whole sample. This suggest that players of these smaller countries are more elastic to tax rate differentials than players from bigger Leagues, who may find many more opportunities to play in their home country. Interestingly, the coefficient is very large (around 1.6) among top quality players of these small countries. This means that among all European players, the more susceptible to be attracted by special tax regimes are good players from small countries.

Table 2 also displays results of additional robustness checks. Column (4) displays the results of a model with dummies for cultural preferences interacted with country fixed-effects. This

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[30]Note that we control for year fixed effects so that this result is unlikely to be driven by cohort effects.

[31]Defined as a players having played at least once in the A national team of his home country during his career.

means that we allow players from different origins to have different location preferences because of some cultural aspects that make the costs of moving to one particular country less important. These cultural preferences can be linguistic, geographic, etc. Point estimates displayed in column (4) are quite similar to the baseline estimates but standard errors are somewhat larger than in the baseline model.

In addition, column (5) investigates a more general model relaxing the independence of irrelevant alternatives (IIA) assumption that was implicitly made in our baseline model. The model that we focus on is a random-parameters logit model (RPL) which allows the parameters of the model to vary across individuals according to some given distribution. We assume that the errors are type II extreme value distributed and that the parameters for the net-of-tax share and for home preference are normally distributed across individuals. This model may appear more appropriate because it allows the effect of taxation to vary across players. This yields:

$$
\begin{aligned}
U_{ijt} &= \alpha_i \log(1 - \tau_{ijt}) + \delta_i home_{ij} + \mu_j + \eta_i + \Psi_{jt} + \gamma_j E_{it} + \varepsilon_{ijt} \\
&= \alpha \log(1 - \tau_{ijt}) + \sigma_i \log(1 - \tau_{ijt}) + \delta home_{ij} + \rho_i home_{ij} + \mu_j + \eta_i + \Psi_{jt} + \gamma_j E_{it} + \varepsilon_{ijt}
\end{aligned}
$$

where $\alpha_i = \alpha + \sigma_i$ and $\delta_i = \delta + \rho_i$. We assume that $(\sigma i, \rho_i) \sim \mathcal{N}(0, \Sigma)$. The combined error term $(\sigma_i \log(1 - \tau_{ijt}) + \rho_i home_{ij} + \varepsilon_{ijt})$ is now correlated across alternatives whereas the ε_{ijt} alone were not. We estimate this model via maximum-simulated likelihood (MSL). Results presented in column (5) show that on average the parameter for the log of the net-of-tax share is 0.314, which is a little lower than the baseline estimates, but not significantly different from the baseline estimates.

4.3   Policy Implications

Structural estimates confirm the results of the case studies and demonstrate that marginal tax rates have a significant impact on location decisions of soccer players. To examine the magnitude of these effects, we compute in table 3 marginal effects of net-of-tax rate variations on the probability of playing in one particular country. As for other nonlinear models, these marginal effects vary with the evaluation point. The effect of a change in the net of tax rate in country k ($log(1 - \tau_{ikt})$) is:

$$
\begin{cases}
\frac{\partial P_{ijt}}{\partial log(1 - \tau_{ikt})} = \alpha(P_{ijt}(1 - P_{ijt})) & \text{if } j = k \\
\frac{\partial P_{ijt}}{\partial log(1 - \tau_{ikt})} = -\alpha P_{ijt} P_{ikt} & \text{if } j \neq k
\end{cases}
$$

In table 3, we report only the marginal effect of a change in the net of tax rate in country j on the probability of playing in country j. We report as well elasticities that can be easily computed as: $\frac{\partial P_{ijt}}{\partial log(1-\tau_{ijt})}/P_{ijt}$.

Overall, elasticities on the whole sample are close to .5, meaning that a 1% increase in the net of tax rate in one country *ceteris paribus* increases the probability that a player plays in that country by .5%. However, elasticities are strongly heterogeneous across players. First, elasticities are always lower for local players because they have a larger probability of playing at home *ceteris paribus*, and therefore $\frac{\partial P_{ijt}}{\partial log(1-\tau_{ijt})}/P_{ijt} = (1 - P_{ijt})\alpha$ is lower. But, as highlighted in the previous subsection, there is also sizeable heterogeneity that is not purely driven by functional form assumptions, but because of intrinsically different responses to taxation across players in the sample that translates into different elasticities. In table 3, we report elasticities for younger players (aged 25 or under) and for top players that are citizens of countries with smaller football Leagues. For younger players, elasticities are around 1.3 on average. And for top quality players from smaller leagues, elasticities are even larger, around 1.55.

To understand the important policy implications of these results, it is useful, as a benchmark, to calibrate the revenue maximizing tax rate (Laffer rate) implied by our estimated elasticities. Deriving the Laffer rate is interesting because it provides an upper bound on (constrained) pareto-efficient tax policy, and the actual optimum if the government does not value the marginal consumption of high-income athletes. If we assume that all players are alike and earn the same wage w and that the only labor supply response is through location decisions, this model yields with simple calculation that at the optimum:

$$\tau = \frac{1}{1 + \varepsilon}$$

where ε is the elasticity of P_{ijt} with respect to the net-of-tax rate. Our baseline estimate for the elasticity on the whole sample is around .5, which means that the revenue maximizing tax rate is around .66, very close to the actual average top marginal tax rate in our post-Bosman sample. However, the existence of important heterogeneity in elasticities across players has also important policy implications. First, larger elasticities for foreigners seem to justify the existence of tax preferential regimes for immigrants. In particular, it seems that top quality players from countries with smaller Leagues are especially elastic to tax rate differentials. With an elasticity of 1.55, the revenue maximizing tax rate on these top quality players is around 39%, which is very close to the overall preferential tax rates enacted in Denmark, Belgium,

Spain or Netherlands as shown in figures 1 to 3. Besides, if the government cares about the performances of its League, it may lower the tax rate even more than this revenue maximizing tax rate. Moreover, higher elasticities among top quality players may justify the use of tax preferential regimes especially targeted at top players like the 30% ruling in Netherlands [32]. Finally, it seems that younger players are on average more elastic to the net-of-tax rate than older players. This raises the concern that tax competition among European countries lowers the incentive to carry-on training of younger players before they become professional, because the country carrying the burden of training a young soccer player faces increasing risks of seeing the player leaving abroad once the training is over[33].

5 Conclusion

This paper analyzes the effects of top earnings tax rates on the migration decisions of football players across European countries. We have constructed a panel data set of top earnings tax rates and football players in the first leagues of 14 European countries since 1980. We identify the effects of top earnings tax rates on migration using various tax and institutional changes: the 1995 Bosman ruling which liberalized the European football market; top tax rate reforms within countries; and country specific tax provisions offering lower tax rates for immigrant football players. These variations create credible sources of identification of the causal impact of taxation on location decisions of football players, by allowing for all sorts of controls, and in particular controls for year and country fixed effects interacted. We provide both reduced-form analyses of cross-country evidence and country-specific tax reforms targeting foreign high-income immigrants, and a structural mobility model estimated using all the data and sources of variation simultaneously. Both approaches show that the level of top earnings tax rates has a very large impact on the migration decisions of football players, especially after the 1995 Bosman ruling. Specific tax reductions for immigrants also have large impacts on location decisions. Overall, the elasticity of the probability of playing in a given country with respect to the net-of-tax rate on earnings in this country is large, and even larger for younger players and top quality players. The large tax induced migration effects we uncover translate into significant effects in

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[32]In order to qualify for the 30 percent ruling, the employer must make a reasonable case that the employee possesses special expertise which is not available or scarce on the Dutch labor market. Several case arouse in Netherlands where a immigrant soccer player was denied the application of the 30% ruling on the basis that is sala ry was not high enough to prove that the player had exceptional and scarce qualifications.

[33]This concern has been already expressed by various practitioners, from managers to League officials.

the performance of football clubs across countries.

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Figure 1: Evolution of top MTR on earned income for the top 5 European Leagues
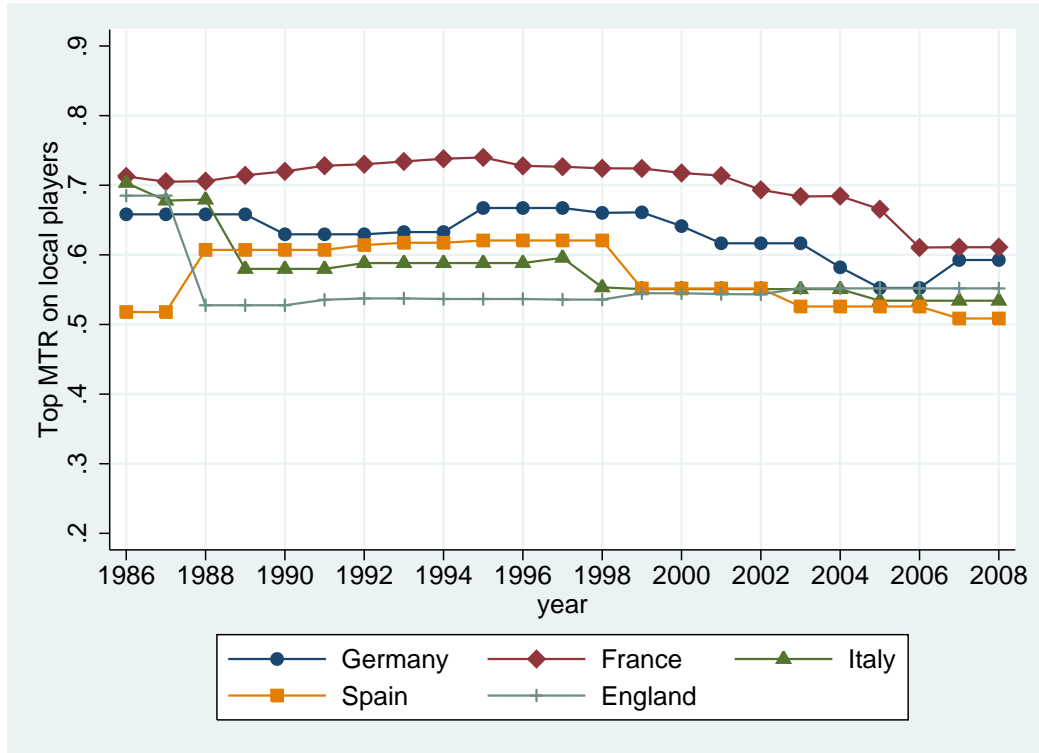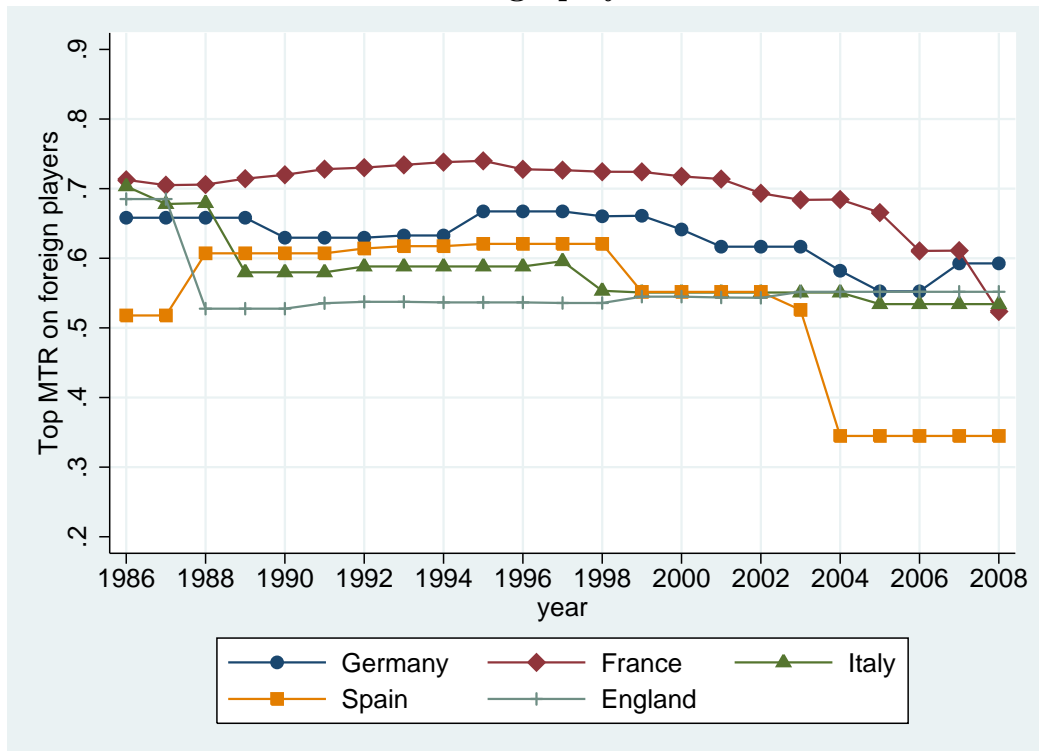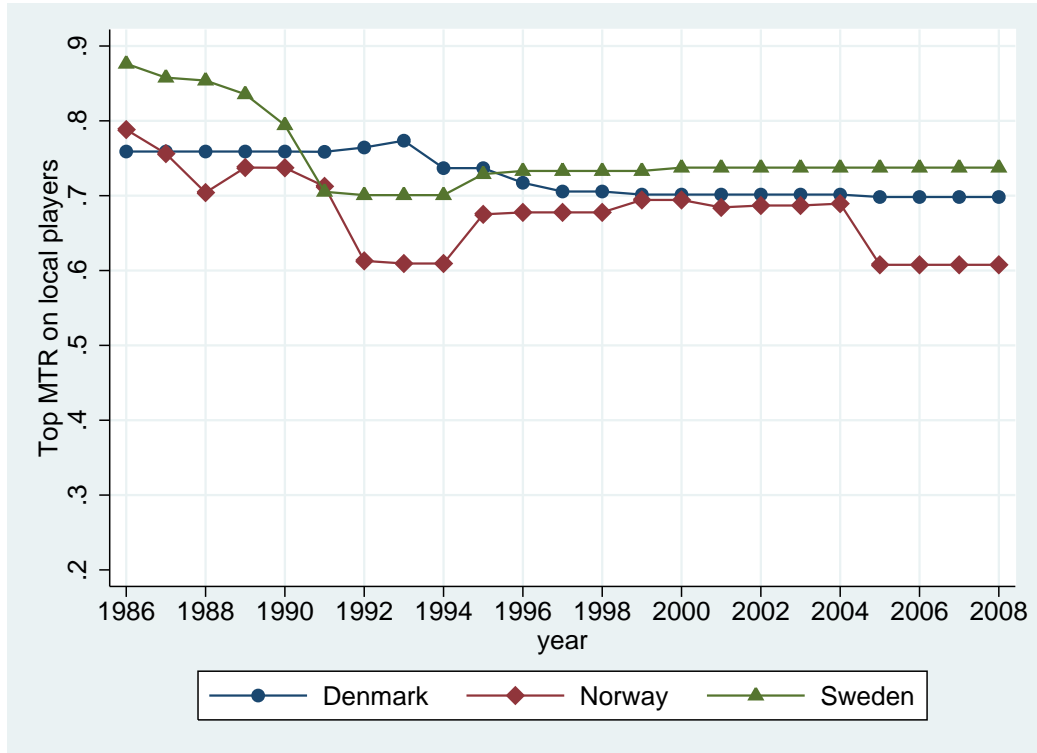
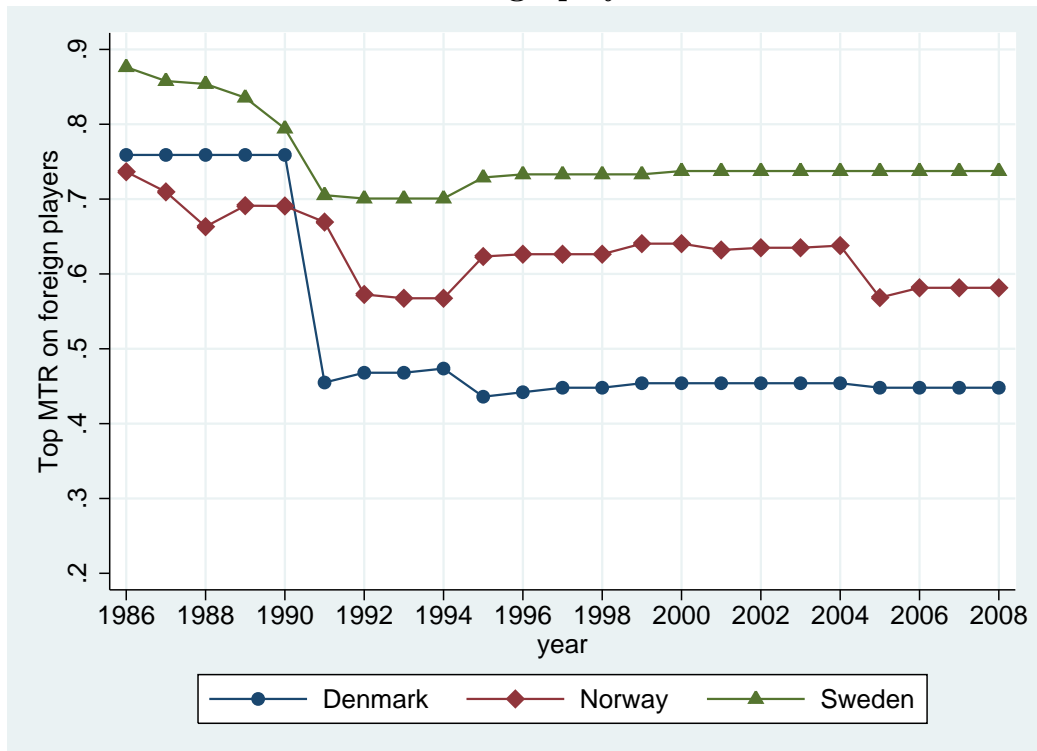**A: Local players**

B: Foreign players

NOTE: Top MTR on earned income of year n for a player entering the soccer market on year n.

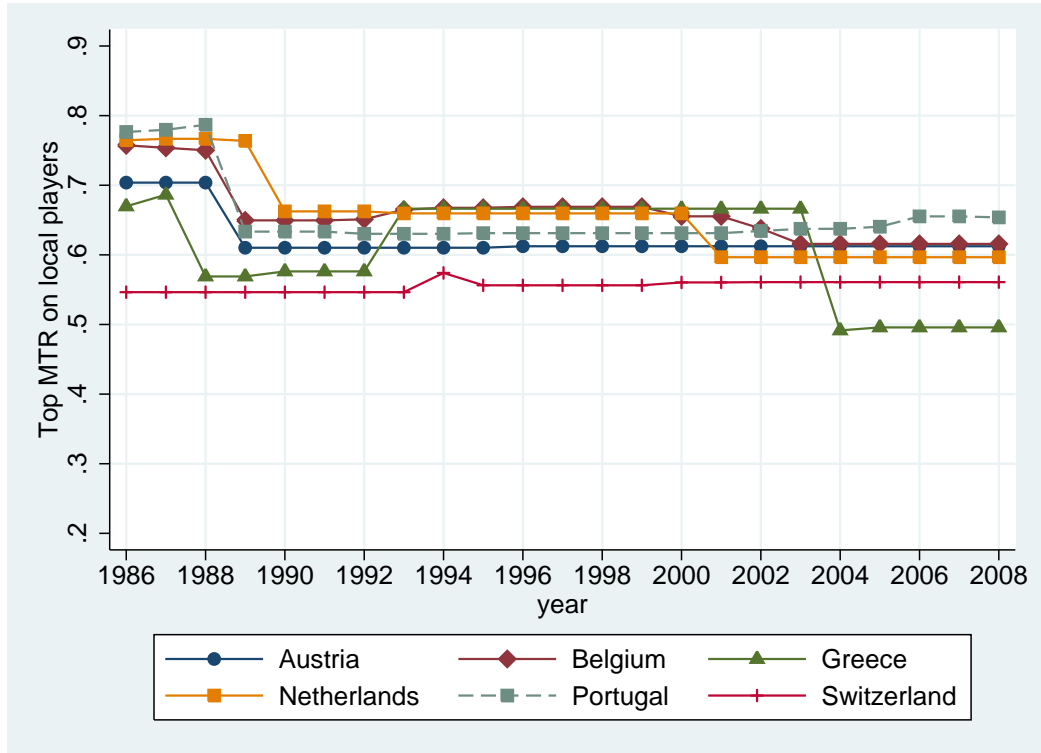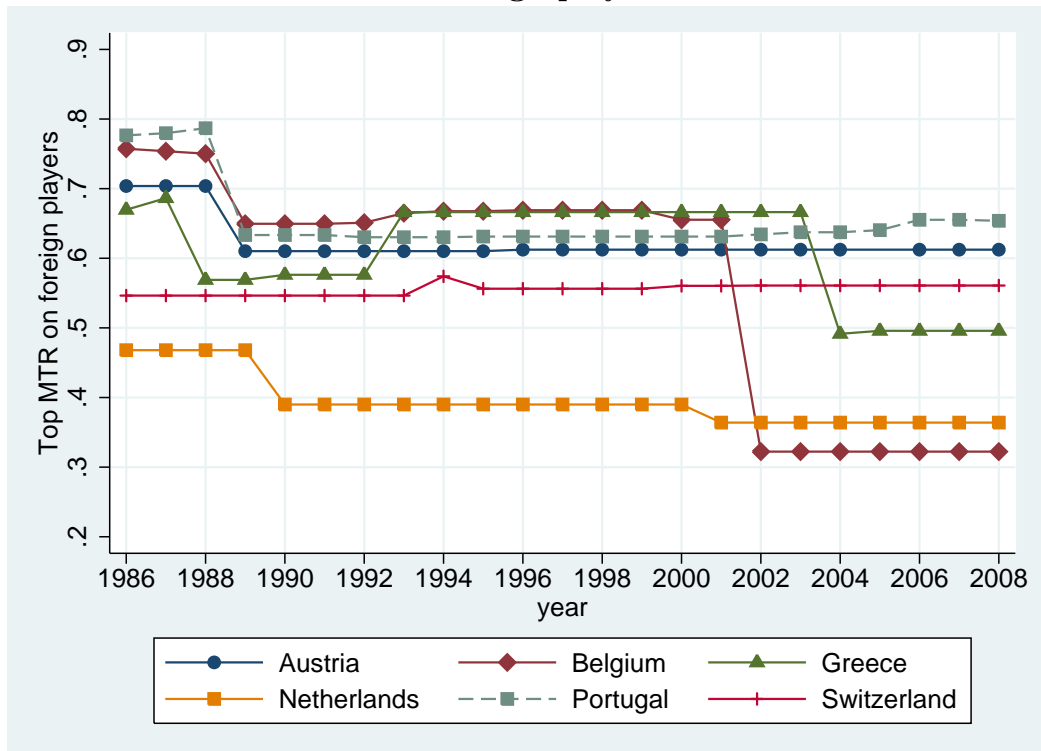Figure 2: Evolution of top MTR on earned income for Nordic Leagues

A: Local players

B: Foreign players

NOTE: Top MTR on earned income of year n for a player entering the soccer market on year n.

Figure 3: Evolution of top MTR on earned income for small European Leagues
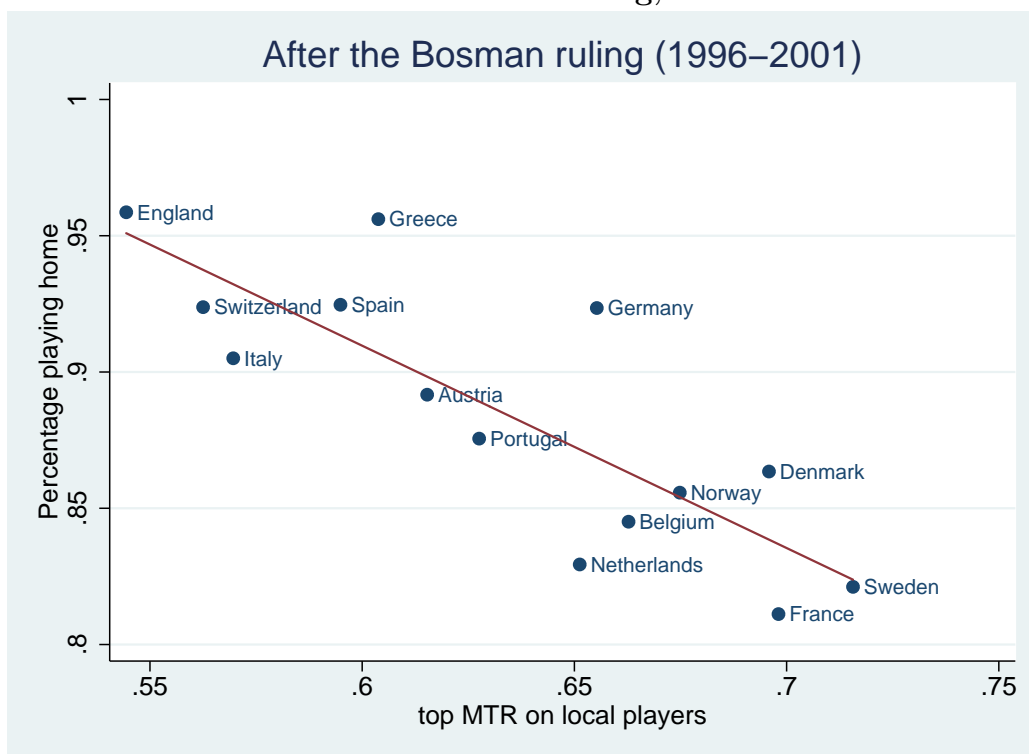
A: Local players

B: Foreign players

NOTE: Top MTR on earned income of year n for a player entering the soccer market on year n.

Figure 4: Percentage of players playing in their home country and top earnings tax rates across countries, before and after the Bosman ruling

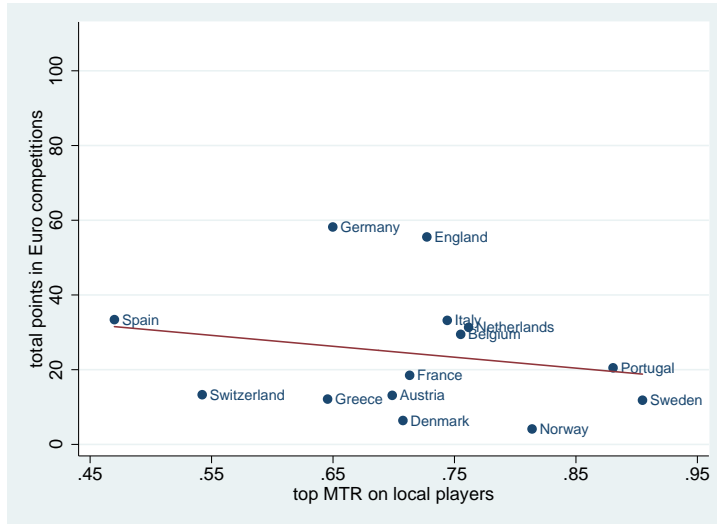**A: Before the Bosman ruling, 1990-1995**
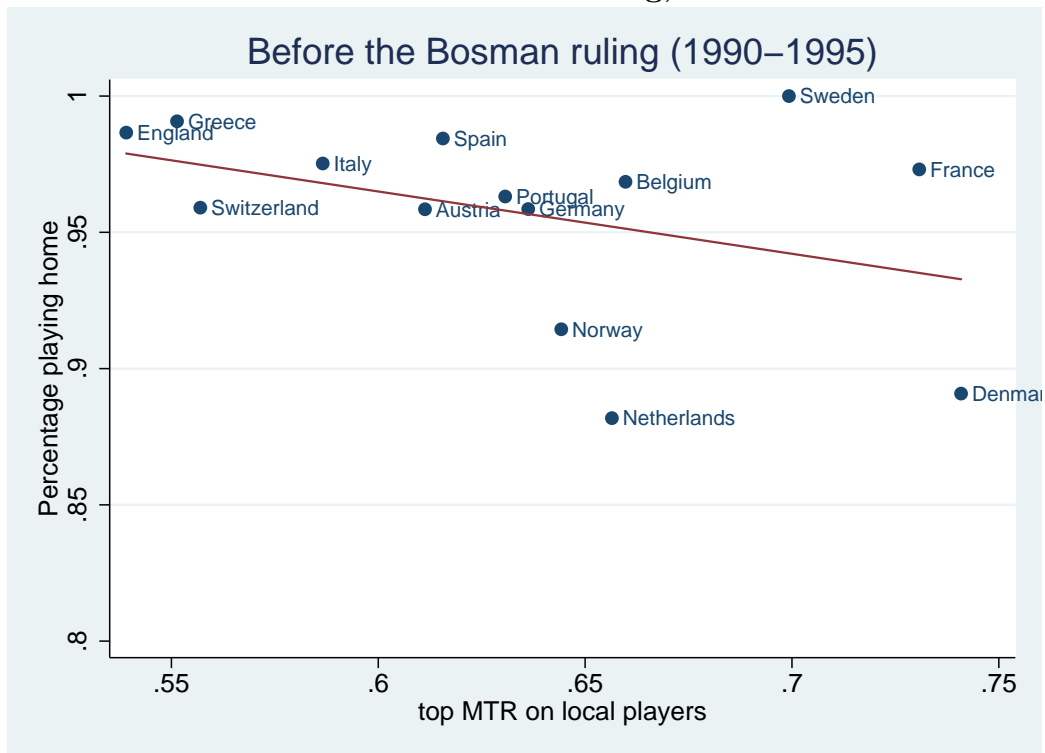
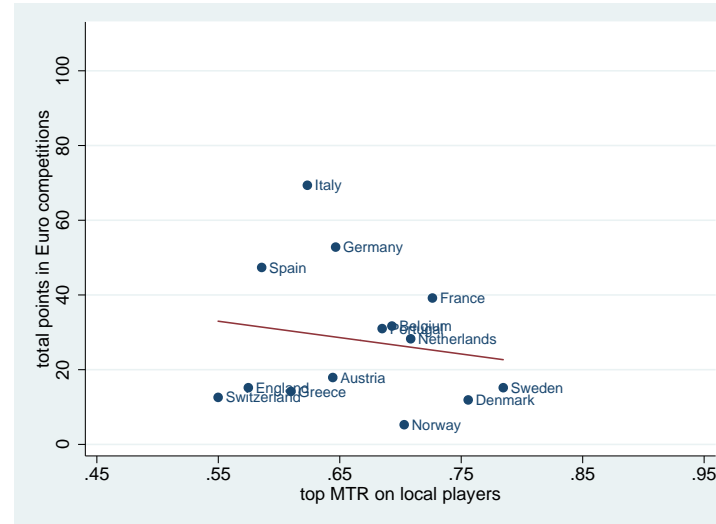**B: After the Bosman ruling, 1996-2001**

NOTE: Each scatter stands for one country, and plots the average top MTR and the average fraction of domestic players playing at home for years 1990-1995 (panel A) or years 1996 to 2001 (panel B). For Greece, MTR is a weighted average of top MTR on players pertaining to the Old and to the New payroll tax regimes.

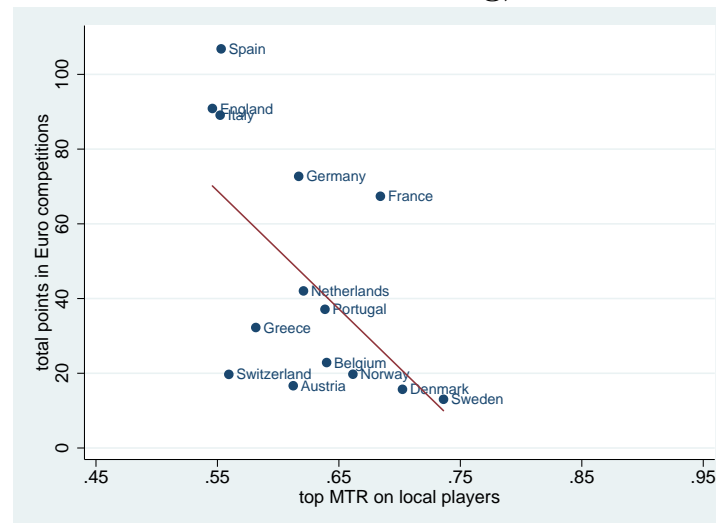Figure 5: Club performances and top earnings tax rates across countries

A: Before the Bosman ruling, 1975-1984

B: Before the Bosman ruling, 1985-1995

C: After the Bosman ruling, 1996-2007

NOTE: for each time period, the figure plots the total number of points earned by all clubs in a given country in all European competitions (Champions league, UEFA Cup, and Cup Winners Cup) against the top earnings tax rate in that country. Both the total number of points and the top tax rates are averages over the various time periods considered. The top earnings tax rate is the one that applies to local players. Total points are calculated according to UEFA's formula, which gives 2 points for each win, 1 point for each draw, and bonus points for advancing from various tournament stages. Points earned in qualification stages gets weight 0.5.

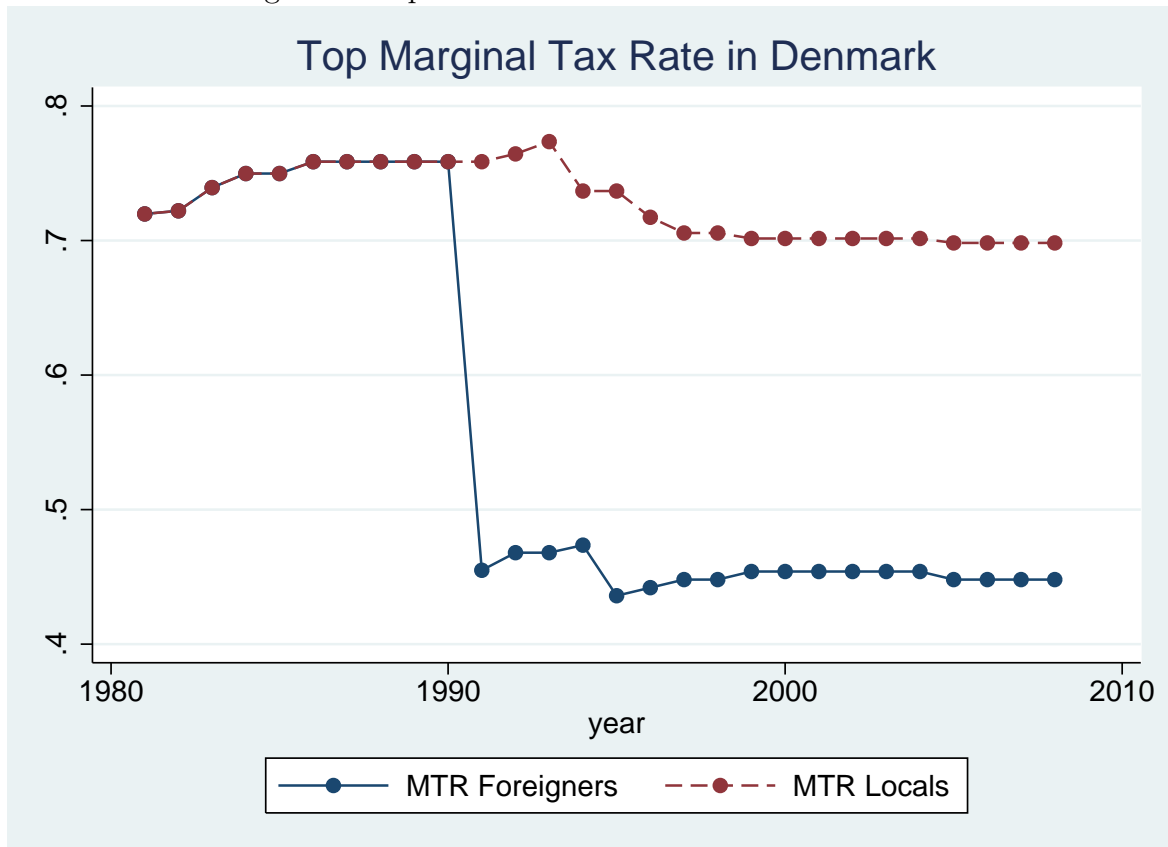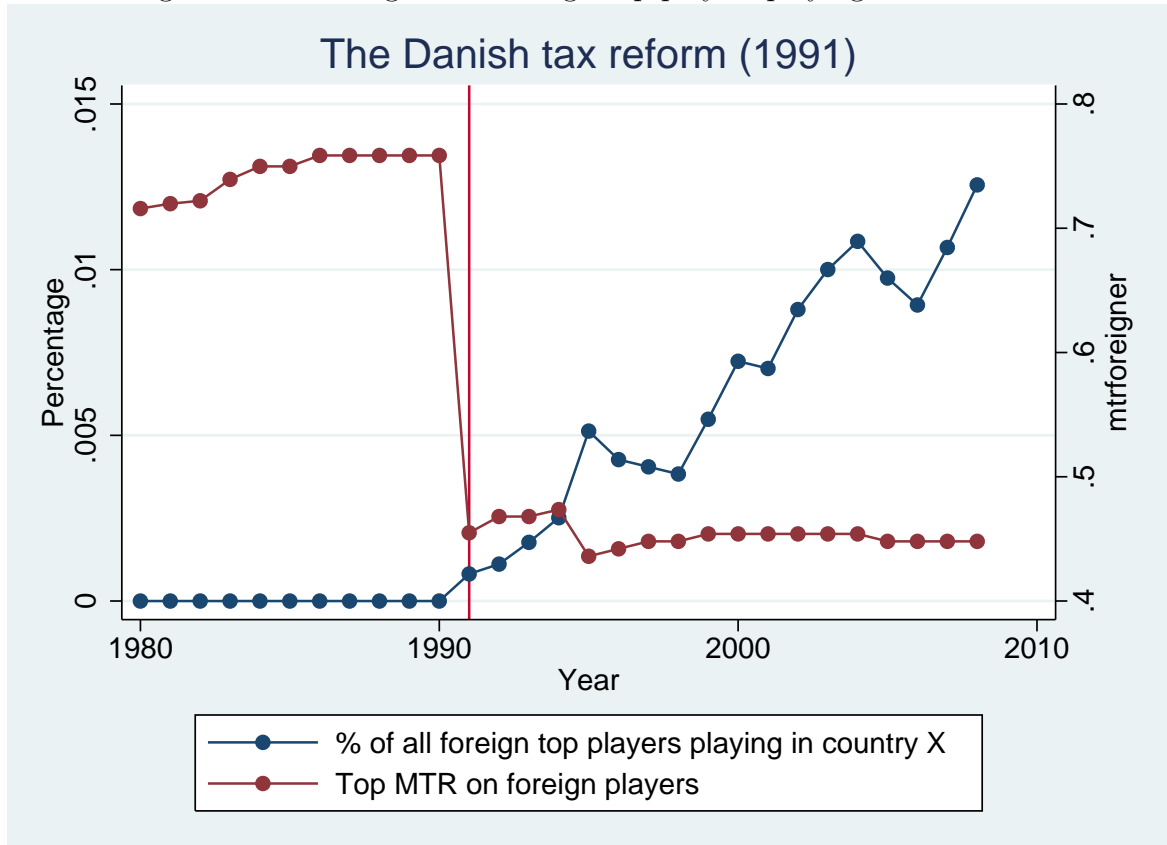Figure 6: Top MTR on earned income in Denmark

Top Marginal Tax Rate in Denmark

Figure 7: Percentage of all foreign top players playing in Denmark

The Danish tax reform (1991)

% of all foreign top players playing in country X
Top MTR on foreign players

Source : Dataset restricted to top players of 14 countries playing for the national team of their home country

Figure 8: Denmark vs Sweden
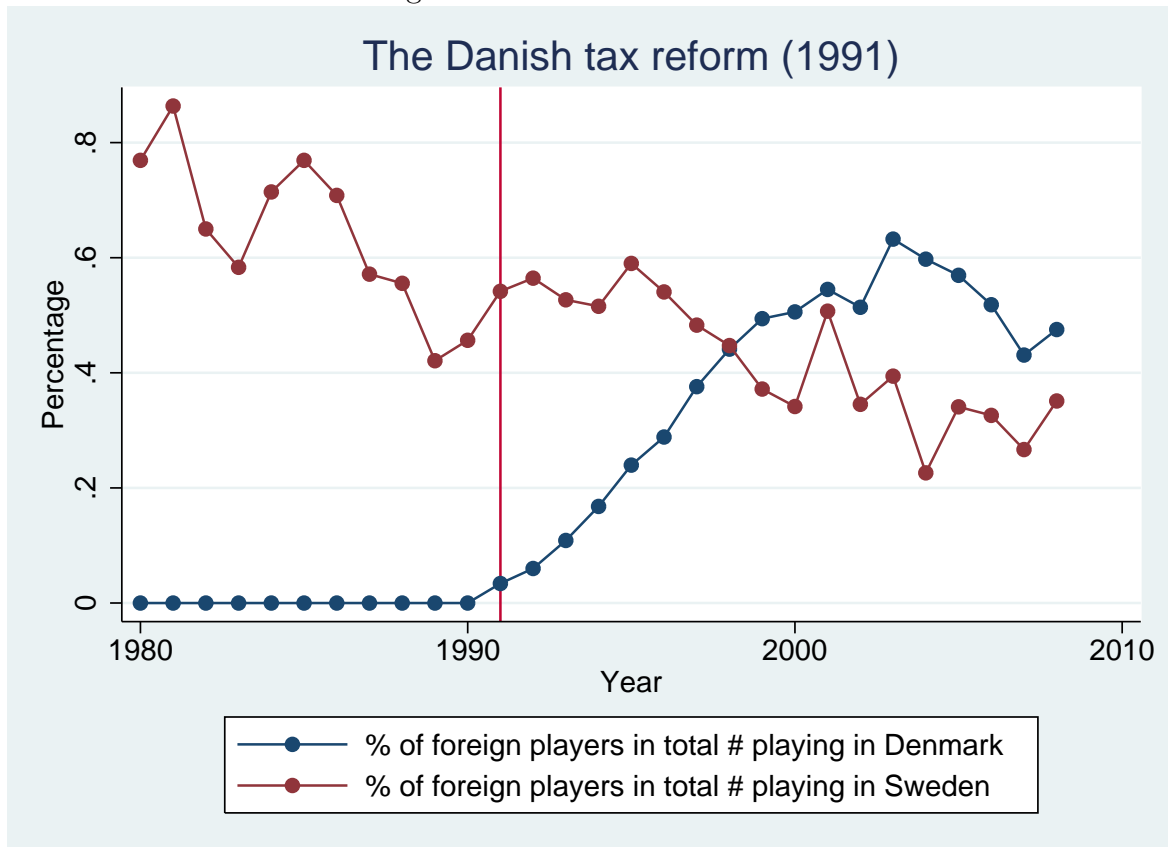
The Danish tax reform (1991)

% of foreign players in total # playing in Denmark
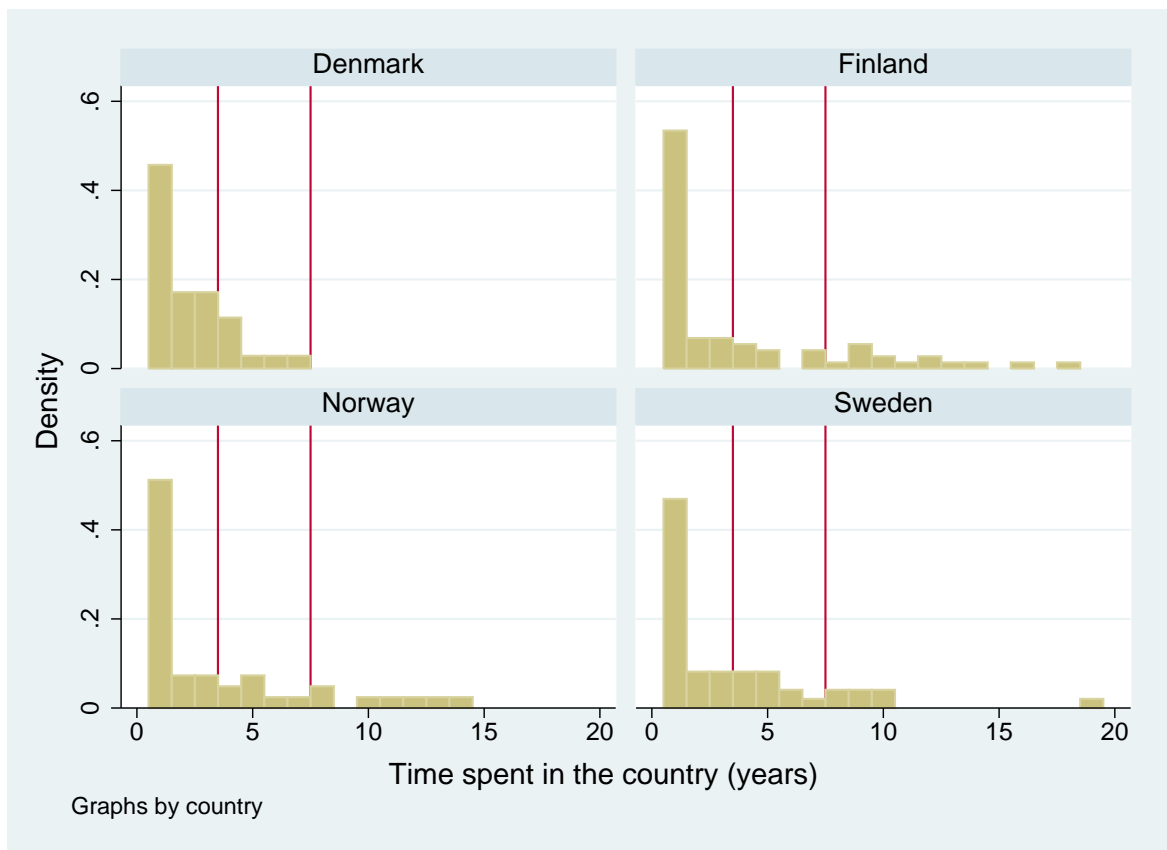% of foreign players in total # playing in Sweden

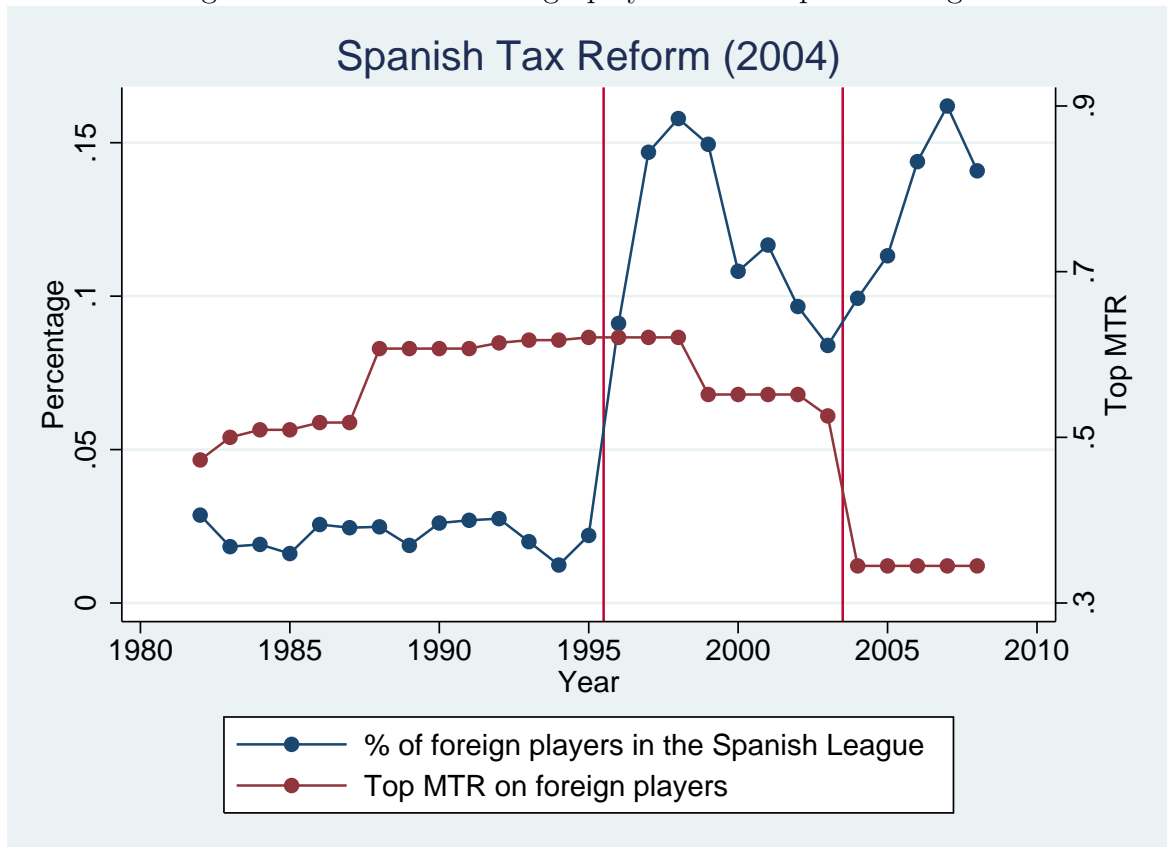SOURCE : Dataset restricted to top players of 14 countries playing for the national team of their home country

Figure 9: Distribution of the duration of stay (in years) for foreign players in 4 Nordic countries

Graphs by country

Figure 10: Fraction of foreign players in the Spanish League

NOTE : Percentage of foreign players for year N is computed as of September, at the beginning of the $N - N + 1$ season.

Figure 11: Fraction of foreign players playing in the Belgian League

Belgian Tax Reform (2002)

Legend:
- % of foreign players in Belgian League
- Top MTR on foreign players

Figure 12: Fraction of Greek players playing abroad given seniority by year of entrance in the Greek payroll tax system

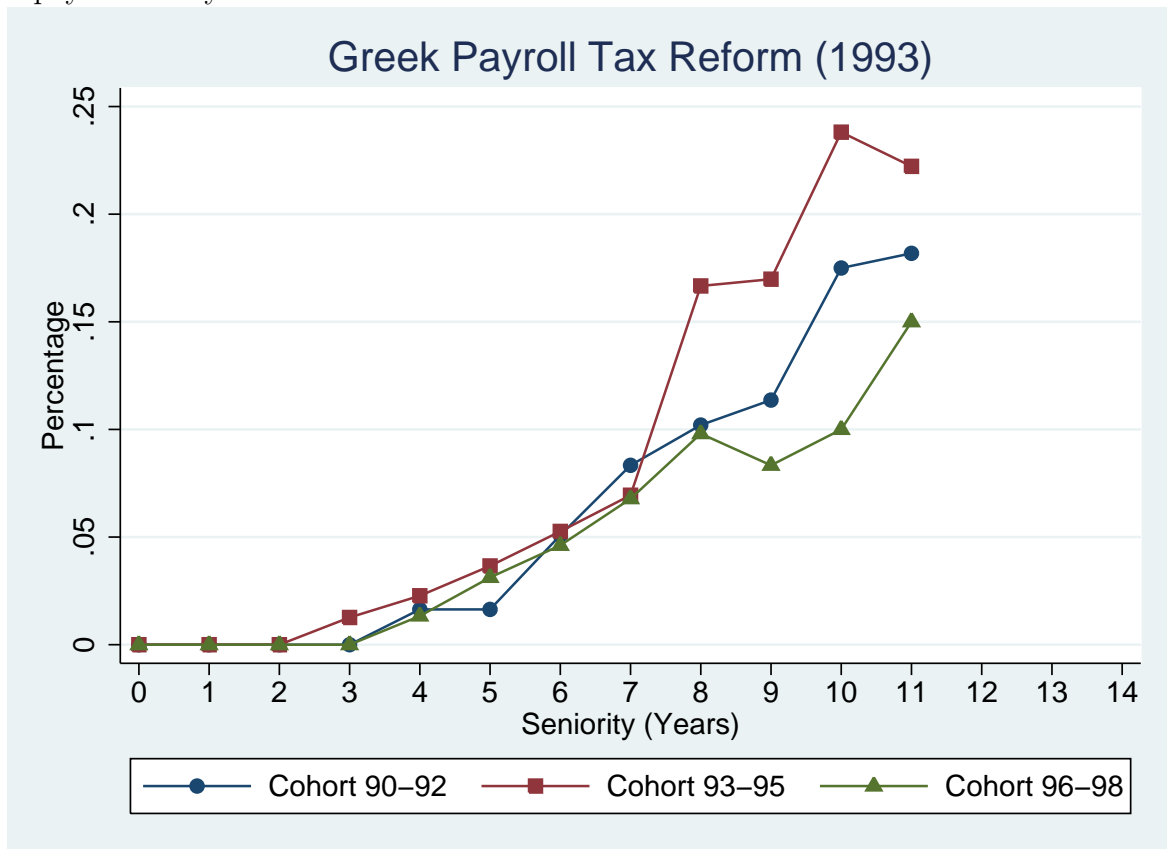Table 1: Multinomial logit estimates, 14 top Leagues, citizens of these 14 countries only (1996-2008)

	(1)	(2)	(3)	(4)	(5)
$log(1-mtr)$	0.919***	0.485***	0.565***	0.542***	0.477***
	(0.0299)	(0.0476)	(0.0510)	(0.0546)	(0.114)
$home$	4.757***	4.811***	5.021***	4.852***	4.894***
	(0.0150)	(0.0184)	(0.0205)	(0.0196)	(0.0407)
Country F-E	NO	YES	YES	YES	YES
Year*country F-E	NO	NO	NO	YES	YES
Age*country F-E	NO	NO	YES	NO	YES
Age squared *country F-E	NO	NO	YES	NO	YES
Top player*country F-E	NO	NO	YES	NO	YES
Observ.	60447	60447	60447	60447	60447

14 countries: Austria, Belgium, Denmark, England, France, Germany, Greece, Italy, Portugal, Netherlands, Norway, Sweden, Spain & Switzerland
Player clustered robust s.e. in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Top player: player having played at least once in the A national team

Table 2: Sensitivity analysis. Multinomial logit estimates, 14 top Leagues, citizens of these 14 countries only (1996-2008)

	(1)	(2)	(3)		(4)	(5)
			Citizens of smaller Leagues			
	Age< 25	Top players	All	Top players		RPL
$log(1-mtr)$	1.367***	1.148***	0.772***	1.627***	0.223	0.314*
	(0.392)	(0.161)	(0.229)	(0.168)	(0.147)	(0.152)
$home$	4.609***	4.453***	5.079***	4.563***	4.049***	5.227***
	(0.0431)	(0.0387)	(0.0701)	(0.0531)	(0.0386)	(0.323)
Country F-E	YES	YES	YES	YES	YES	YES
Year*country F-E	YES	YES	YES	YES	YES	YES
Exp*Country F-E	YES	YES	YES	YES		
Origin*country F-E					YES	
SD $log(1-mtr)$						0.406
						(0.544)

Player-clustered robust s.e. in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Top player: player having played at least once in the A national team of his home country
smaller Leagues: Austria, Belg., Denm., Greece, Neth., Norway, Portugal, Sweden, Switz.
RPL: Random-parameters logit model

Table 3: Calibrations: Marginal effects and elasticities of football player's location choices with respect to net-of-tax share

	Whole sample		Young players		Top players Smaller Leagues	
	$\frac{\partial P}{\partial log(1-\tau_{ijt})}$	ε	$\frac{\partial P}{\partial log(1-\tau_{ijt})}$	ε	$\frac{\partial P}{\partial log(1-\tau_{ijt})}$	ε
Austria	0.0065	0.471	0.0190	1.357	0.0300	1.596
Belgium	0.0295	0.446	0.0799	1.282	0.0914	1.529
Denmark	0.0207	0.454	0.0694	1.294	0.1032	1.516
England	0.0789	0.378	0.2386	1.059	0.2615	1.299
France	0.0153	0.463	0.0406	1.325	0.0851	1.536
Germany	0.0500	0.420	0.0843	1.277	0.2013	1.391
Greece	0.0303	0.444	0.0637	1.300	0.0660	1.558
Italy	0.0376	0.436	0.0880	1.273	0.1084	1.510
Netherlands	0.0440	0.428	0.2052	1.116	0.1673	1.437
Norway	0.0245	0.450	0.0762	1.286	0.0932	1.527
Portugal	0.0183	0.459	0.0342	1.332	0.0516	1.573
Spain	0.0357	0.437	0.0711	1.292	0.0978	1.522
Sweden	0.0161	0.459	0.0472	1.318	0.0585	1.566
Switzerland	0.0197	0.455	0.0892	1.271	0.0412	1.584

Young player: player aged 25 or younger

Top player: player having played at least once in the A national team of his home country

Smaller Leagues= Austria, Belgium, Denmark, Greece, Netherlands, Norway, Portugal, Sweden, Switzerland