

Is finance responsible for the rise in wage inequality in France?

Abstract

Based on the DADS, a very detailed French database on wages, we show that wage inequality started to increase in France in the mid-1990s. This phenomenon is limited to the top end of income distribution and concerns mainly the top 0.1%, whose share of total salaries increased from 1.2% to 2% between 1996 and 2007. This increase in inequality was accompanied by some changes in the social composition of this wage elite. These include a decline in CEOs and an increase in lower rank management, such as chief officers and other administrative managers, as well as a rise in sportspersons. A sector approach shows that finance (3% of private sector employees) is responsible for half of the rise in inequality at the top end of wage distribution. We discuss the role the volume of financial activity plays in the tremendous increase of top financial wages.

Keywords: inequality, wages, finance, France, superstars

JEL classification: D3 microeconomics, distribution; G2 financial institutions and services; J3 wages, compensation and labor costs

The considerable rise in inequality in the United States during the last 40 years (Piketty and Saez, 2003) is by now almost common knowledge. Although less impressive, this trend appears also at an international level, especially in Anglo-Saxon countries (Atkinson *et al.*, 2011). On the other hand, levels of inequality in continental Europe and Japan remained much more stable over the last 30 years. Is this contrast due to differences in the type of capitalism in those two sets of countries (Amable, 2003)—in short, free market capitalism, on the one hand, and state regulated capitalism, on the other—or is it simply that the same trend towards greater inequality has been delayed in continental Europe? Figures from Landais (2008) show that in France inequalities have been increasing again at a substantial rate, but only since the late 1990s.

The analytical description and interpretation of this rise in inequality is only just beginning. One element of this trend which has been widely commented on is the tremendous rise in CEO pay over the last 30 years (Bebchuk and Grinstein, 2005; Gabaix and Landier, 2008; DiPrete and Pittinsky, 2010; Nagel, 2010). Another element is the increase in compensations in the entertainment industry for sporting or artistic superstars (Rosen, 1981). The social importance and visibility of these elites, and the availability of their compensation to the public, may explain part of the focus. However, it is uncertain that they account for a great deal of the rise in inequality. More recently, partly owing to the financial crisis and the bonus outrage, the importance of financial wages has come under scrutiny (Kaplan and Rauh, 2010). Philippon and Resheff (2009) show that in recent years the financial sector has granted wages 50-60% higher than other sectors for jobs requiring the same level of qualification. Bell and Van Reenen (2010) estimate that 70% of the recent increase in the share of the top 1% in the United Kingdom was captured by workers in the financial industry. Bakija *et al.* (2010) offer detailed statistics on the occupations of top earners in the US. According to their dataset, a little more than 30% of the increase in the share of top earners went to people working in finance.

The goal of the following paper is to investigate the transformation of inequality in France. To that aim, we rely on the DADS data (1976-2007)¹, the French Social Security wage data for the private sector. Such data enables us to ask questions about the changing patterns of wage inequality in France. Firstly, how reliable is the rise in inequality discovered by Landais using self-declared fiscal sources? If this trend is robust, then who are the beneficiaries? CEO, managers, experts, entertainment superstars? Since Paris finance is not as wealthy as that of London or Wall Street, does it nevertheless account for as much of the rise in inequality?

The paper is organized as follows. In the first section, we will describe the data. The second section is devoted to the rise in wage inequality over the last 30 years. The third section deals with the changing characteristics of the working rich in France. In the fourth section we will concentrate on the impact of finance on the evolution of wage inequality. And finally, in the last section, we will offer interpretations of the rise of top financial wages.

1. The DADS, a detailed dataset on wages in the private sector

The DADS, *Déclaration Annuelle de Données Sociales*, is an INSEE (Institut national de la statistique et des études économiques) statistical dataset based on an administrative source. In order to collect social contributions for Social

¹ Access to the data was obtained through the CASD dedicated to researchers authorized by the French *Comité du secret statistique*.

Security—payroll taxes, which are more or less proportional to an employee’s wage—the French Government collects data on all wages from the private sector. Social contributions from national civil servants are collected through a different system, and therefore, at present, the latter are not in the database.

On the basis of these administrative records, two main datasets are available. The first is the Panel DADS (1976-2007), which contains 1/24th of private sector wage earners from 1976 to 2001 and 1/12th of the same population after 2001.² The second dataset is made up of exhaustive files, organized by year and by region, on all jobs in the private sectors from 1994 to 2007.³

The great advantage of the DADS is that it offers a very precise image of wages in France and enables us to calculate fractiles at the very top of the wage distribution. Moreover, unlike other sources (Philippon and Resheff, 2009; Kopczuk *et al.*, 2010), wages in the DADS are not top coded.⁴ Nevertheless, there are some obvious limitations in our data that might lead us to both underestimate and overestimate inequalities in France during recent years.

The notion of wage, as collected in the DADS, is more juridical and fiscal than economic. It corresponds to the part of the wage on which social contributions are collected. Two main notions of salary are available: the net salary and the gross salary.

The gross salary ‘*base csg*’ is quite exhaustive. It contains not only fixed salary and variable salary, but also perks (such as car or housing), ‘*participation*’ and ‘*intéressement*’—i.e. the two main regulated profit sharing devices (DSDS, 2010, pp. 35-36).⁵ The main limitation is that stock options and free shares are not counted in this notion of salary, since before 2007, no payroll taxes were collected directly on these forms of wages.⁶ Therefore, we may underestimate some high salaries like those granted to CEOs of major firms.

Another problem may arise from the fact that the DADS files are organized according to jobs rather than individuals. Are we to calculate inequalities among jobs or among individuals? Since workers may have multiple jobs during the year (successively or simultaneously), especially in an industry such as entertainment, the latter option appears more relevant. Unfortunately, this approach is not possible with the exhaustive data files before 2001, as those files lack individual identification variables. Therefore, before 2001, we limit

² They select people born in October every two years until 2001, and every year thereafter.

³ In the exhaustive files, it is not possible to identify a worker from one year to another or even, between 1994 and 2001, from one job to another. However, these files contain the situation in year t and year $t-1$, so it is possible to measure changes over a two-year period of time.

⁴ As outliers possibly resulting from transcription errors may have a significant impact on the top fractiles, we have excluded salaries that were more than 100 times the P99.99 threshold. That is, 2 salaries in 1994 over 50 million euros, 1 in 2002 and 4 in 2007 over 100 million euros.

⁵ Unfortunately, the DADS do not give any information on the share of the different components of the salary.

⁶ Dividends and commercial benefits are also not counted in the DADS’ notion of wage. We therefore underestimate the revenues of CEOs who own an important fraction of their firm.

ourselves to full-time, non-annex jobs⁷ and assume that those jobs are held by different individuals.⁸

The notion of hourly wage is not the best approach for studying inequality at the top of the wage distribution, since we find jobs in consultancy or the leisure industry where people earn high wages for a very limited set of hours. Moreover, hours are adjusted by INSEE for what they consider to be extravagant hourly wages. This leans in favour of using yearly wages. Nevertheless, some workers may have jobs in the private sector for very short periods of time and therefore appear to be poor on the basis of a yearly wage. In some cases, they are in fact poor, and that should be accounted for. In other cases, they might be students, civil servants or self-employed persons who work just a few hours a year as wage-earners in the private sector. Counting them on the basis of their yearly wage as low-paid workers would be artificial and lead to an overestimation of inequality. Moreover, this fraction of the population might not be stable from one year to the next, which could generate a bias in the patterns of evolution. In order to avoid this limitation, we restrict our sample, as in Kopczuk *et al.* (2010), to salaries that are over half the yearly minimum wage.⁹ We have ensured that moving this minimum threshold did not change our qualitative results.

Let us summarize: first, in the panel (1976-2007) and in the 2002-2007 exhaustive files, we use the annual sum of gross wages by individuals that are over half the minimum wage.¹⁰ In the 1994-2001 exhaustive files, we use the annual gross wage of full-time, non-annex jobs that are over half the minimum wage.

2. The rise in inequality in France

Social scientists generally consider France to be a good example of stability in inequality during the last 30 years (Atkinson, 2008; Piketty, 2001). We find very similar results within the scope of our data. The classical P90/P10 ratio drops by 14% from 4.26 in 1976 to 3.73 in 1984, rises by 10% between 1984 and 1989 and remains very stable through the rest of the period ending at 4.08 in 2007. With this classical indicator, there is no clear sign of a recent surge in inequality, in contrast to what has happened in other OECD countries. In the United States, for instance, the same ratio rose continuously by 27% between 1973 and 2000 (Atkinson, 2008, pp. 411-412); in the United Kingdom it increased by 20% between 1977 and 2000 (Atkinson, 2008, pp. 384-385). Even Germany, known for the stability of its income distribution, experienced a sharper increase than France: the P90/P10 ratio increased by 17% between 1989 and 2001.

⁷ A job is considered non-annex by INSEE if the compensation is over 3 months of minimum wage or the number of hours is over 120, the duration over 30 days and the number of hours per day over 1.5. A job is full time if the number of hours per day is over a certain threshold, which INSEE calculates for each sector.

⁸ This approximation first leads us to consider that a person who moves from one job to another in the middle of the year has two different jobs and is therefore considered two different individuals. We also exclude individuals who hold many jobs that are annex, part-time or under the threshold of half the yearly minimum wage. A comparison of the two approaches is possible for 2001. In the first approach (based on the 2001 files), we analyse inequalities among 12 670 098 'workers'. In the second approach (based on the 2002 files that go back to 2001), our analysis applies to 15 146 231 workers.

⁹ This restriction is applied to both the panel and the exhaustive files.

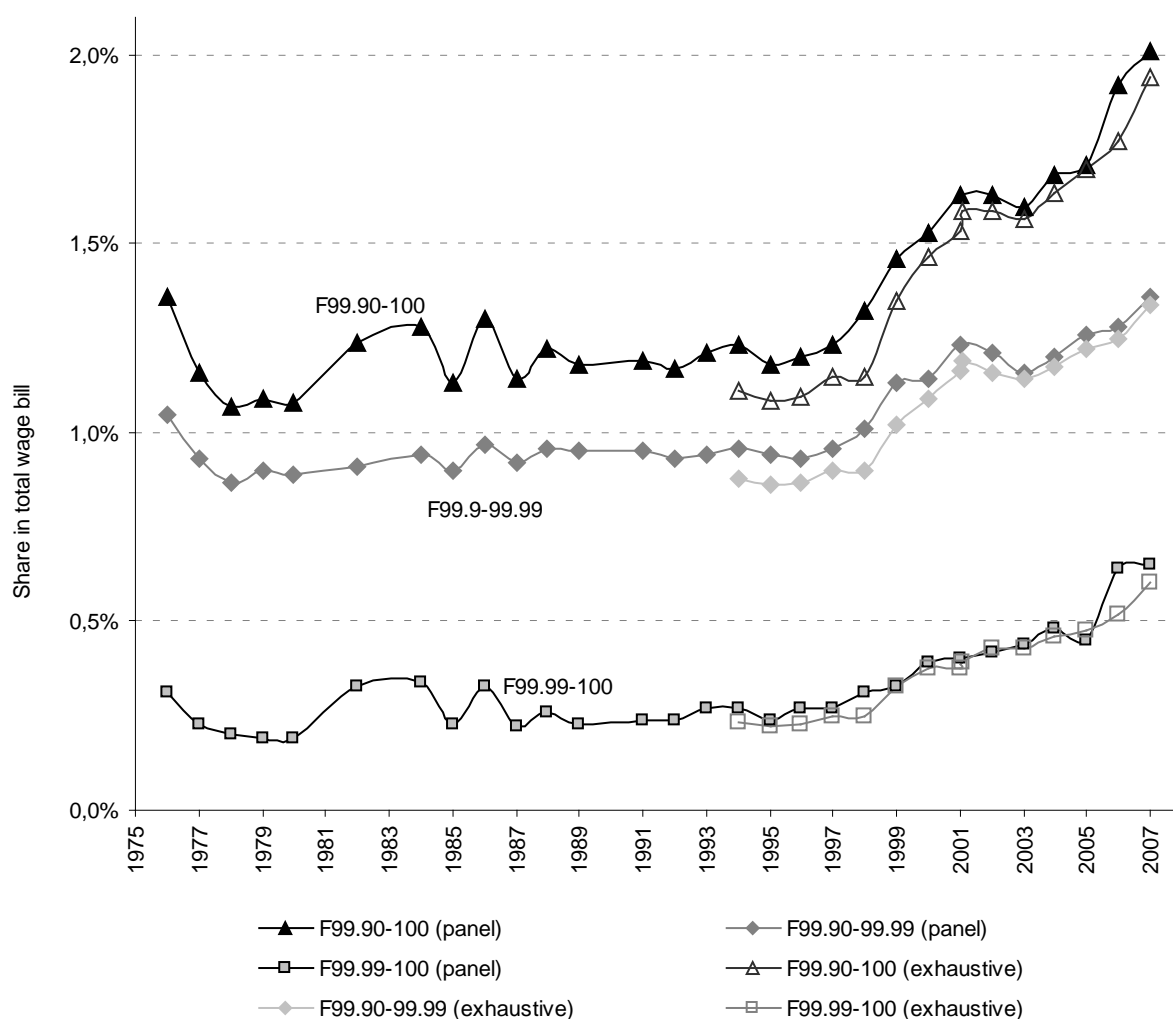
¹⁰ Before 1999, we use the fiscal gross wage and after 1999, the CSG-based gross wage. As local civil servants, mail and hospital workers only enter the panel in the 1980s; for the sake of continuity we also decided to exclude them from the panel. Local civil servants and hospital civil servants were also excluded from the treatment of the exhaustive files.

Nevertheless, the P90/P10 ratio may give a biased view of the evolution of inequality, as it excludes by construction the top wages that went through a sharp increase in many countries during the last two decades. Therefore, in order to analyse the evolution of inequality, we calculate fractiles at the top of the wage distribution following Piketty (2001). As the population panel is very large (1/24th and 1/12th) and the DADS regional files are exhaustive, there is no need to compute a Paretian approximation of the threshold or the mean of each fractile.

We find a global increase of wages, albeit at different rates for each fractile. F0-90, F90-95, F95-99 and F99-99.9 seem to have increased slowly and regularly at the rate of +1% a year. F99.9-99.99 and F99.99-100, especially over the last 10 years, have increased more quickly. In 2007, the top 0.01%—that is, the 1 692 highest-paid persons in the private sector earning more than 867 000 euros— were paid on average 1 682 000 euros a year, whereas the F0-90 fractile earned between 7 600 and 46 700 euros in gross salary and on average 22 400 euros a year (Online Table S1, S2, Figure S1).

Therefore, the share of the majority (F0-90) is globally declining, losing 2 points in 30 years. The share of the ‘middle classes’, defined by the fractiles between P90 and P99.9, remains globally stable or is increasing at a slow rate. When we move to the top 0.1%, however, we can see a sharp increase of their share after the year 1996 (Figure 1). The share of the top 0.1% increases by 0.8 points, moving from 1.2% in 1996 up to 2.0%. Half of the 0.8-point increase is for the top 0.01% and half for the F99.9-99.99.

Figure 1 Evolution of the share of the top 0.1% wage earners.



Note: In 2007, the top 0.1% earners was paid 2.0% of the salaries.

Sources: DADS, panel (1976-2007) and exhaustive job files (1994-2007).

Given that in the panel the share of the top 0.01% is based on a limited number of workers (50-60 up to 2001 and 100-120 after 2001), the robustness of the measured changes may be questionable. An analysis of the exhaustive files leads to largely similar results. The top 0.1% increases its share by 0.85%, moving up from 1.1% in 1996 and 1.95% in 2007.¹¹ Half of this increase is for the top 0.01%.

Are the changes that we have described reliable? There are some limitations in our data, discussed above, which may lead us to both underestimate and overestimate inequalities. Moreover, INSEE is generally cautious with income data from DADS, as they suspect that some reporting errors might diminish the quality of the description of top incomes. Hence, they generally study lower levels of top incomes (Amar, 2010). INSEE believes that errors have been diminishing over time (DSDS, 2010). If we consider that the main error

¹¹ 0.05 point of this increase seems to be due to the change of definition in 2001.

at this level is that of over-reporting, this should lead us to underestimate any increase in inequality.

Nevertheless, when we compare our trends with those of other sources and authors like Landais (2008) or Solard (2010), we find similar qualitative results. Landais, based on income self-declaration, finds that between 1998 and 2006, the total income of the top 0.01% increased by 64% (capital income and exercised stock options included), and the wages of the top 0.01% increased by 69%. For the same time period, we find a 123% (exhaustive files) to 131% (panel) increase in the top 0.01% of wages. Part of the difference may be due to the fact that Landais works on self-declared net wages and on a larger population (including civil servants and self-employed persons). Solard finds an increase in income of 39% for the top 0.01% (capital income and exercised stock options included) between 2004 and 2007. We find an increase of 44% of the top 0.01% in the panel and of 36% in the exhaustive files. Although one is based on wages and the other on full income, the two trends seem to conform to the same pattern.

Moreover, like Kopczuk *et al.* (2010) for the United States and Landais for France (2008), we also find with our data that the increase in inequality at the top of wage distribution during the last 12 years did not correlate with an increase in wage mobility at that level. Stability in the top 0.1% did slightly decrease in the first half of the 1980s and increased again in the second half of the same period, but remained stable in the 1990s and the 2000s. The probability of remaining in the top 0.1% in the following year remains relatively stable, changing cyclically between 70% and 80%, and after five years it remains constant between 50-60%. Therefore, despite the randomness of new forms of remuneration, such as incentive bonuses, this increase in inequality is clearly not the advent of a lottery society where people suddenly jump to the top or fall to the bottom of the wage distribution.

3. Changes among the working rich

Empirical studies on inequality (Atkinson *et al.*, 2011, Landais, 2008) usually discuss several hypotheses in order to explain this trend: biased technological progress, growth of CEO pay due to the growing size of firms as well as an increase in superstars' pay. However, given the limitations of their data, they are generally unable to provide sufficient empirical evidence to confirm or infirm either thesis. Although limited to private sector remuneration, the DADS has two reputable qualities: its historical depth and its economic and social variables. Thus, it is possible to explore the changes in the social composition of the working rich and to test these hypotheses with this data.

We therefore study the change in the composition of the top 0.1% and the top 0.01%. The panel gives the composition in terms of jobs since 1984, with the 1982 PCS coding. Figure 2 shows some striking transformations within the top 0.1%. The first surprise is the decline of CEOs since 1992.¹² The proportion of CEOs among the top 0.1% dropped from 50% in 1992 to 22% in 2007. Is this

¹² The increase of the proportion of CEOs between 1984 and 1992 is more difficult to analyse. In the 1980s, the coding of the PCS was not very reliable, and there were also some errors in the wages reported. Those two problems make it more likely that middle and lower categories will be artificially represented in the top 0.1%. This growth may also be due to the change in the composition of CEO remuneration from capital income to wages. And finally, it is also possible that the 1980s, a period in which free enterprise and, in particular, small firms were promoted, was also a time when access to top salaries was obtained mainly through a position as CEO.

decline due to a change in the composition of wages and a rise of stock options that are not reported in the DADS? Unfortunately, we lack precise data on stock options. Several studies converge in showing that stock options boomed in the 1990s for executives and declined after 2002 (Hamouda, 2010; Leroy, 2010).¹³ Nevertheless, stock options have a decisive impact on executive pay mainly in big firms. If the moderate and volatile decline of CEOs of large firms (more than 1 000 workers) within the top 0.1% is artificial, the sharp decline of CEOs of small firms (less than 1 000 workers), from 45% of the top 0.1% in 1992 to 24% at the end of our period, is less likely to be so.

Although CEO pay for large firms may have risen sharply (Evain, 2007), our data suggests that the rise in inequality is not due mainly to the traditional elites directing firms, but rather to lower ranking managers and experts. As long as the CEOs are not the category that is most responsible for the rise in wage inequality in France or in the US (Kaplan and Rauh, 2010; Bakija *et al.*, 2010)¹⁴, the rise of their pay—although higher than that of average salaries (Evain, 2007 ; Gabaix and Landier, 2008)—appears to be different than generally analysed. In most models, CEO pay fluctuates independently of that of other wage earners. For instance, CEO pay in Gabaix and Landier (2008) is set by an autonomous market design, whereas in Bebchuk and Fried (2004) it is a function of executives' power under the constraint of public outrage. The pronounced increase in pay among some lower management wage earners changes our understanding of CEO pay fluctuation, since it might also have increased the outside options (market model) or have lowered the public outrage constraint (managers' power model).

Let us now analyse the impact of lower ranking managers on inequality growth. Firstly, it must be noted that rising inequality is not due to the rise in the number of technical professionals such as engineers, whose share stagnates inside the top 0.1% at a limited level of 8-10%. This element mitigates the traditional interpretation in terms of biased technological progress. The rise in inequality does not seem to be due to workers holding the most technical and scientific knowledge, as was feared in the 1960s and 1970s with the birth of knowledge and technical societies.

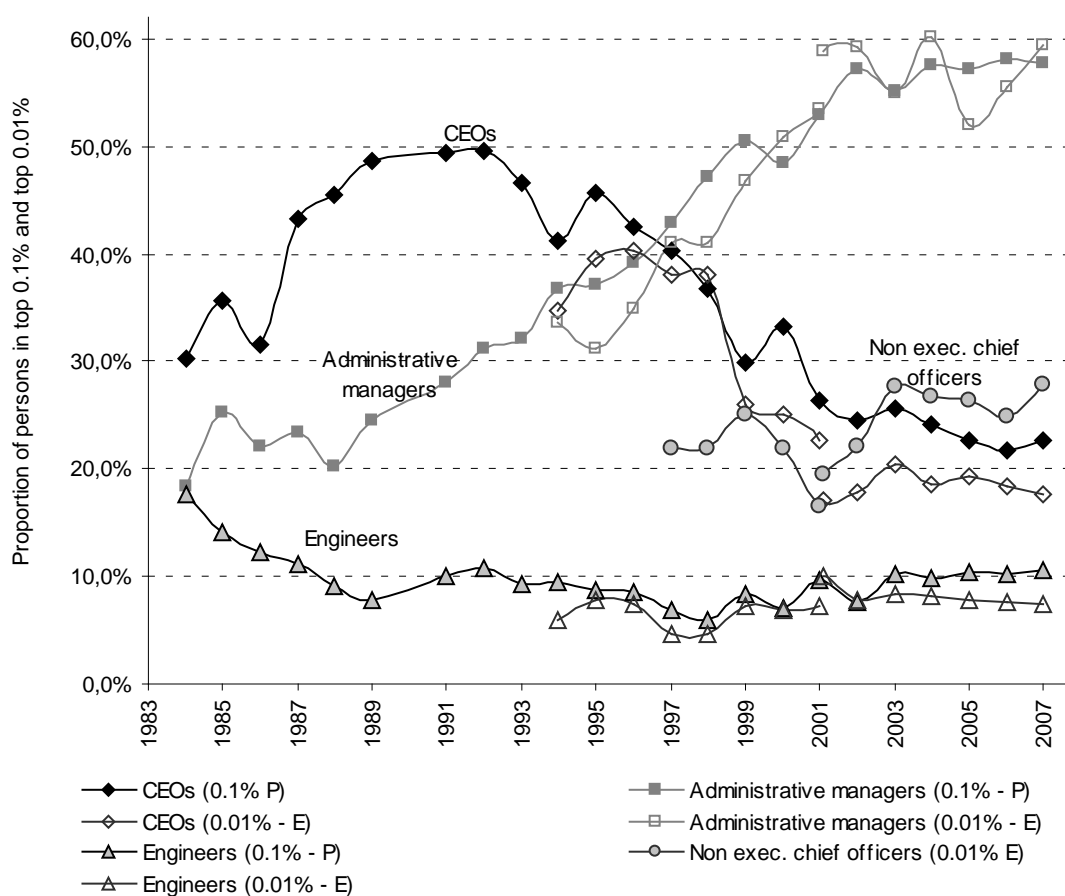
One social category accounts for most of the rise: administrative managers ('cadres administratifs'). This group accounted for a little less than 20% in the mid-1980s. They now represent almost 60% of the top 0.1%. This category increased by 20 points between 1996 and 2007, a period in which inequalities escalated once again. Almost half of this increase is due to the category 'cadres d'état major', non-executive chief officers, such as chief financial officers, chief commercial officers, chief administrative officers etc. Unfortunately, we cannot go into greater detail, but we suspect, as in the US (Zorn *et al.*, 2005), that the CFOs, with the 'financialization' of firms, are at the root of this trend among top management. The other half is due to lower ranking managers. We will see further in the next section whether this pressure on salaries exerted by lower

¹³ Proxinvest calculates the Black and Scholes values of shares and stock options granted to executives for CAC40 since 1998. It rises from 40% to 70% between 1998 and 2001 and drops back to 45% in the middle 2000s (Leroy, 2010).

¹⁴ The comparison with Kaplan and Rauh (2010) is relatively complex, since they predominantly use publicly available information on top executives of publicly traded firms. In their data we find stability of executives among the top 0.1%. The particularly detailed data from Bakija *et al.* (2010) show a decline of the proportion of CEOs among the top 0.1% from 35% in 1997 to 30% in 2005.

ranking managers is a generalized phenomenon or is due to some limited sectors of the economy.

Figure 2 Changes in the professional composition of the top 0.1% and 0.01% wage earners.



Notes: In 2007, 59% of the top 0.01% wage earners were administrative managers. P stands for panel and E for exhaustive files.

Sources: DADS, panel (1976-2007) and exhaustive job files (1994-2007).

The salaries of sports and media superstars are traditionally under significant media scrutiny due to the fame of the recipients. Rosen (1981) argues that the transformation of technology might drive a major income increase for the most famous superstars, since new technologies such as television, radio, CDs etc. enable them to replicate their production almost at no cost and become famous among a wider market. In his survey of the sports economy, Andreff (2007) also signals the importance of the institutional framework that regulates both the superstar labour market and the media and advertising industries. In France, the deregulation of television in the 1980s enabled the multiplication of TV channels and competition between them for both advertising fees and broadcasting of superstars. Therefore, superstars could extract a larger share of the advertising fees. In the early 1990s, the labour market was also deregulated in the professional sports industry. In European football, the Bosman ruling in 1995 put an end to the limitation on the number of foreign players in European football clubs and, therefore, favoured an increase in transfer fees and salaries.

As the DADS are a wage database only, it will be difficult to give a complete picture of the impact of entertainment superstars on inequality. Many artists

such as pop singers or writers are paid through copyrights. Nevertheless, we can at least provide some insight into two categories: sportspeople and film actors. Sportspeople, like football players, earn their base pay as a salary. And even if actors are also paid through copyrights and associated rights, a major part of their income is based on a labour contract and a wage.

Regarding the evolution of the proportion of artists and sportspeople among the top 0.01%, we must remain cautious in our interpretation, since the detailed 4-digit PCS job code is unreliable before 1997, and rather unreliable between 1997 and 1999 (with 40-60% of answers either missing or incorrect), becoming slightly better at the end of the period (missing answers drop from 34% to 18% between 2000 and 2007). Nevertheless, the more aggregate two-digit social categories code does not have such limitations and helps us to see the global trend.

With all of this in mind, the proportion of artists among the top 0.01% looks rather stable and is near 2%.¹⁵ Are we missing the real change, since we do not have their whole income? We do not think so. Newspapers quite often give rankings of the best-paid actors. In 2007, *Le Figaro* counted 12 actors over the threshold of 894 000 euros.¹⁶ In our database, we count 11 actors (PCS=354C) in the top 0.01%. Although their income and expenditure are largely commented on, artists—or at least actors—do not contribute a great deal to the return of inequality.

The impact of sportspeople seems more sensible. They increase from 4% of the top 0.01% fractile in the mid-1990s up to 8-10% in the 2000s. In 2007, we count 112 persons coded 424A professional sportspeople. Although we do not know their sport, it seems very likely that most of them are football players.¹⁷ Indeed, the transformation of their labour market enabled by the Bosman ruling seems to have had important effects on wages in the sports industry.

In the end, however, although we find that superstars, or at least football players, do have an effect on inequality, the effect remains limited compared to the rise in salaries of a fraction of business managers that we will try to define more precisely in the next section.

4. The impact of finance on the resurgence of inequality

A sector approach enables us to describe more precisely the type of business managers that contributed the most to the increase in inequality. It is also a way to address the question of the impact of finance, an industry under scrutiny since the subprime crash and the ensuing bonus outrage.

Some sectors such as manufacturing, retail and restaurants, transport and communication are now less represented at the top of the wage hierarchy than they were 30 years ago. For instance, 38% of the top 0.1% worked in manufacturing in 1976, whereas only 14% did so in 2007. On the other hand, service to business, finance and, to a lesser extent, entertainment and other services increased their share among the highest paid workers. In 1976, 10% of the top 0.1% were in service to business, and 6% were in finance. In 2007, these figures were 26% and 24%, respectively (Online Figure S2).

¹⁵ The data show a significant discontinuity in 2001 due to the fact that before this date we cannot sum multiple jobs.

¹⁶ Source: 'Le palmarès 2008 des acteurs', *Le Figaro*, February 22, 2008.

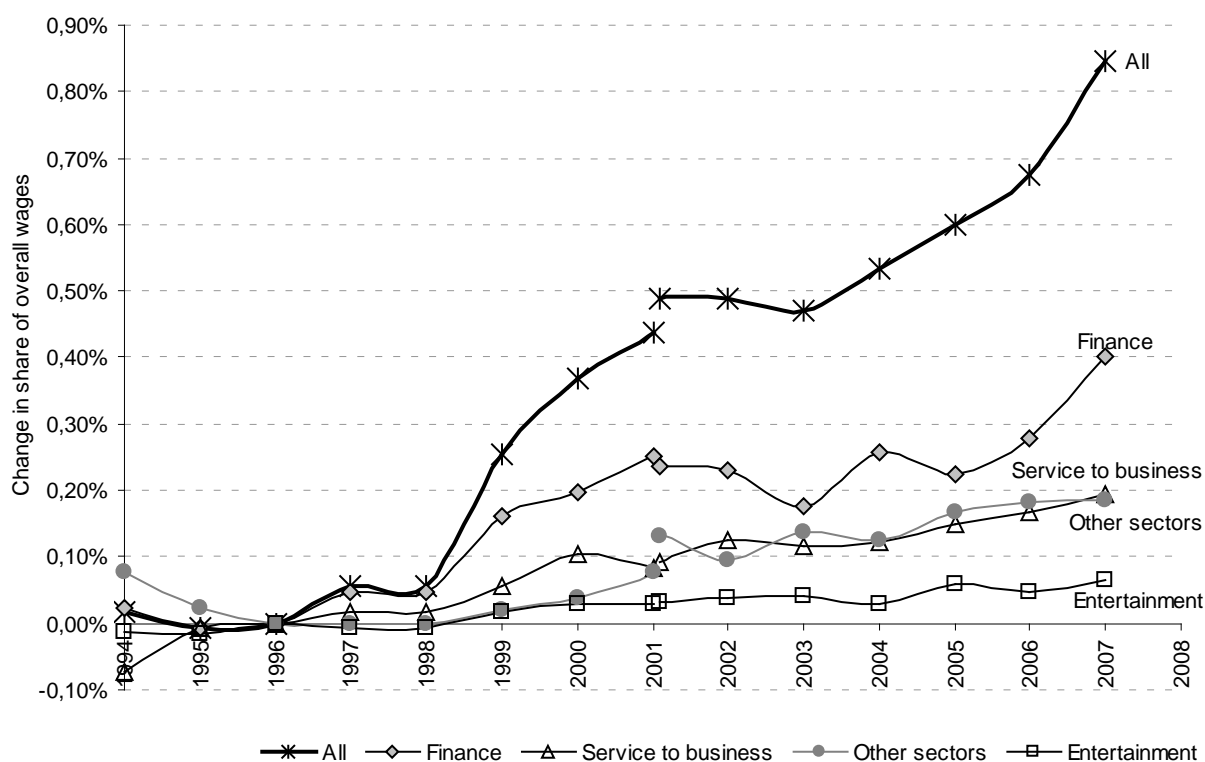
¹⁷ We find several football clubs among the firms paying the highest salaries. Moreover, there were not so many international superstars in cycling or tennis during the period, and other sports like basketball or rugby pay much less in France.

At first glance, finance still seems to lag behind service to business among the top 0.1%. However, the increase and decrease in the different sectors at the top should be compared to their evolution as a whole inside the private sector. Thus, service to business is a sector in which the headcount has grown quite rapidly during the last quarter of a century, whereas the number of workers in finance has remained a fairly stable proportion of the private sector.¹⁸ We therefore compute the odds ratio of (a) the percentage within the top 0.1% with (b) the percentage within the rest of the French private sector, in order to control for the fluctuations in the size of the sectors among the global population. The result is very striking: in the finance industry of the early 1980s, financial workers had twice the presence in the top 0.1% as they had under this threshold. This ratio increased smoothly in the 1980s and very sharply after 1995. In 2001, the ratio peaked at 10, as a result of the considerable bonuses granted after the excellent market year of 2000. The 2001-2002 crisis lowered it to 7, and the following boom pushed the ratio back to 10 (Online Figure S3). Although some sectors might be over-represented among the top salaries, like service to business or entertainment, no overrepresentation is as considerable as that achieved by the finance industry in the last 10 years.

We find a correlation between the notable rise in the overrepresentation of finance among the top 0.1% after 1995 and the rise in inequality in the same period. Therefore, we can try to quantify the contribution of this sector to this increase, following Bell and Van Reenen (2010). We calculate the contribution of finance, service to business, entertainment and other sectors to the 0.85-point increase of the wage share. We find that finance contributed to 48% of this rise, whereas service to business and other sectors each contributed nearly 23%, and entertainment to 8% of the rise (Figure 3).

¹⁸ 2.8% of the private-sector workforce was working in finance at the end of the 1970s. This proportion rose to 3.5% in the mid-1980s, declining to 2.9% in 2000 and stabilizing around 3% thereafter (Panel).

Figure 3 Increase of the top 0.1% wage earners's share of all wages by professional sector.



Notes: Between 1996 and 2007, the share of the top 0.1% wage earners globally increased by 0.85 points, and the share of finance within this fractile increased by 0.40 points. We have corrected the economic activity for holdings (see online appendices, sector coding).
Sources: DADS, exhaustive job files (1994-2007).

When we move into the top 0.01%, we find that finance makes a contribution of 57% to the increase in the share of the working rich (Table 1). At the end of the period, finance constitutes 37% of the headcount of the top 0.01%, which are 19.4 times more present at this level than below. Overrepresentation of this sector within the top fractile is much higher than that of service to business (2.3) or entertainment (6.7). Moreover, we must not forget that we have a small discontinuity in 2001 in our series of exhaustive files that may lead us to overestimate the increase between 1996 and 2007 and to underestimate the impact of finance on this increase. When we look at calculations on the basis of the panel data, finance makes a greater contribution to the increase in the top fractiles – between 47% and 70% (Table 1).

Table 1 Contribution of finance to the increase in the share of the top fractiles

		Top 10%	Top 1%	Top 0.1%	Top 0.01%
France panel	Share in 1996	26.45%	5.74%	1.20%	0.27%
	Share in 2007	27.74%	7.06%	2.01%	0.65%
	Increase in the share	1.29%	1.32%	0.81%	0.38%
	Contribution of finance to this increase	51%	47%	57%	69%
France exhaustive files	Share in 1996	25.67%	5.43%	1.10%	0.23%
	Share in 2007	27.70%	6.97%	1.95%	0.60%
	Increase in the share	2.03%	1.54%	0.85%	0.38%
	Contribution of finance to this increase	33%	39%	48%	57%
UK 1998-2008	Increase in the share	3.00%	1.80%	-	-
	Contribution of finance to this increase	73%	72%	-	-
US 1997-2005	Increase in the share		2.54%	1.65%	
	Contribution of finance to this increase		32%	31%	

Notes: Between 1996 and 2007, according to the panel, the share of the top 10% globally increased by 1.29 points, and the share of finance within this fractile contributed 51% to this increase.

Sources: France: DADS, panel (1976-2007) and exhaustive job files (1994-2007). UK: Bell and Van Reenen, 2010, table 3 – ASHE. US: Bakija *et al.*, 2010, Table 5 & 6.

Our figures for France are in between those that can be calculated from Bakija *et al.* (2010) for the United States and those found by Bell and Van Reenen (2010) for the United Kingdom. In all three countries, finance played a major role in the return of wage inequality, contributing to a third (US), a half (France) and three quarters (UK) of the rise of top wages. This strong contribution must be balanced against the much more limited share of finance within the workforce at the end of the period: 2% in France, 3% in the United Kingdom and 3.4% in the United States.¹⁹ Beyond this overrepresentation of finance at the top and in the surge, we nevertheless find some striking differences. Part of the discrepancy is due to differences in data, methods and industry definition. For instance Bakija *et al.* (2010) analyse the full income. For France, the limitation to private sector wages only (excluding therefore many self-employed professionals such as doctors and lawyers) and to cash salaries (excluding CEO stock-options and shares) leads us to recognize that our estimation of the contribution of finance to the surge in inequality is more likely an upper bound. Nevertheless, part of the divergence also seems to come from the nature of the phenomenon.²⁰ In the United States, growth of top incomes seems to additionally concern many other sectors and professions, such as lawyers, real estate professionals and non-finance business executives and managers. In France and in the United Kingdom, where the surge in inequality is much more recent, it is more concentrated in finance, a sector that could be viewed as the avant-garde of this new trend. The difference in the size

¹⁹ We use the 2007 *Emploi* survey for France (civil servants and self-employed persons included), the 2007 *Labour Force Survey* for the United Kingdom and the 2008 County Business Patterns for the United States.

²⁰ Bell and Van Reenen (2010) also estimate the contribution of finance to the growth of top incomes at 60%, a figure that can be more easily compared to that of Bakija *et al.* (2010).

of the two financial centres, Paris and London, probably accounts for this difference between France and United Kingdom.²¹

Finance, therefore, appears to have played a major role in the return of wage inequality in France. How did this trend arise? Has remuneration in finance been growing at all levels compared with the rest of the economy? Or is the deviation due to certain levels of income distribution?

In order to analyse the structure of the premium for the financial sector, we run annual cross-section wage quantile regressions with the following control variables: sex, age, square age, seniority, square seniority, social group (managers, technicians, clerks, workers), geographical location (Paris region versus rest of France), number and square number of employees in the firm and a variable for the financial sector (Online Figure S4). In 1976, the premium for the financial sector was 23%. It went down to 11% in 1989 and climbed back to 22% in 2007. Quantile regressions show a similar evolution for most of the thresholds except for P99, which has been increasing in the medium term from 9% to 37%. The hierarchy of premium also changed substantially. At the end of the 1970s, the premium was larger at the bottom of the distribution (ranging from 9% for P99 to 34% for P10); in the 2000s, apart from the P99, most of the thresholds converged between 19 and 23%. Therefore, the contribution of finance to the increase in wage inequality mainly seems to be linked to the evolution of its top 1% and to the considerable rise in inequality within this sector. Hence, in less than 12 years, the share of the top 1% within finance moved from 6% to 12% of the wage share.

Who is responsible for the increase in inequality within the finance industry? Following Kaplan and Rauh (2010), we would expect the employees who are most tied to the financial markets to be linked to this phenomenon. In 2003, INSEE reformed its PCS code and introduced a new category, financial market managers (*cadres des marchés financiers*), among whom we find traders, salespeople, financial analysts, portfolio managers, brokers, financial engineers and risk managers. The category reflects quite well what people in the market generally call ‘front offices’. This group is very likely to capture the impact of the growth of financial markets on wages. Unfortunately, there are a few drawbacks. First, the category does not allow close scrutiny of the 12 years under consideration and does not allow us to view the great boom of the financial markets during the second half of the 1990s. Second, due to its novelty, firms might not be accustomed the new code for people that were traditionally coded as bank managers (*cadres de banque*). Third, we do not know if heads of trading rooms and heads of desks, the highest-paid employees on the financial markets, are always coded as such. Despite its limitations, the category is a good proxy for the recent impact of the financial market (with perhaps a little underestimation of the actual scope).

During the last five years, the importance of this category grew in the top fractiles of the financial sector. They made up 20.6% of the top 1% in finance. They represented 27.8% in 2007. The same growing trend is observable within the French private sector. By 2007, at the end of the period studied, financial market managers accounted for 13% of the top 0.01%—that is more than

²¹ In 2007, 3.8% of the workforce worked in finance in the Paris region (*Emploi* survey), while 5.5% did the same in the London region (*Labour Force Survey*). It should be noted that when we do the same decomposition on the Paris region only, we find that the rate of increase in inequality and the contribution of finance to this increase are more similar to the situation in the United Kingdom. The increase of top 0.1% share in *Île de France* is 1.4% and the contribution of finance amounts to 60% of that share.

professional sportspeople—and were 150 times better represented than in the rest of society. Therefore, although we do not have much historical depth, the impact of market managers on the 2003-2007 rise in inequality suggests that it is mainly the boom of financial market activity since the mid-1990s that fuelled inequality in finance.

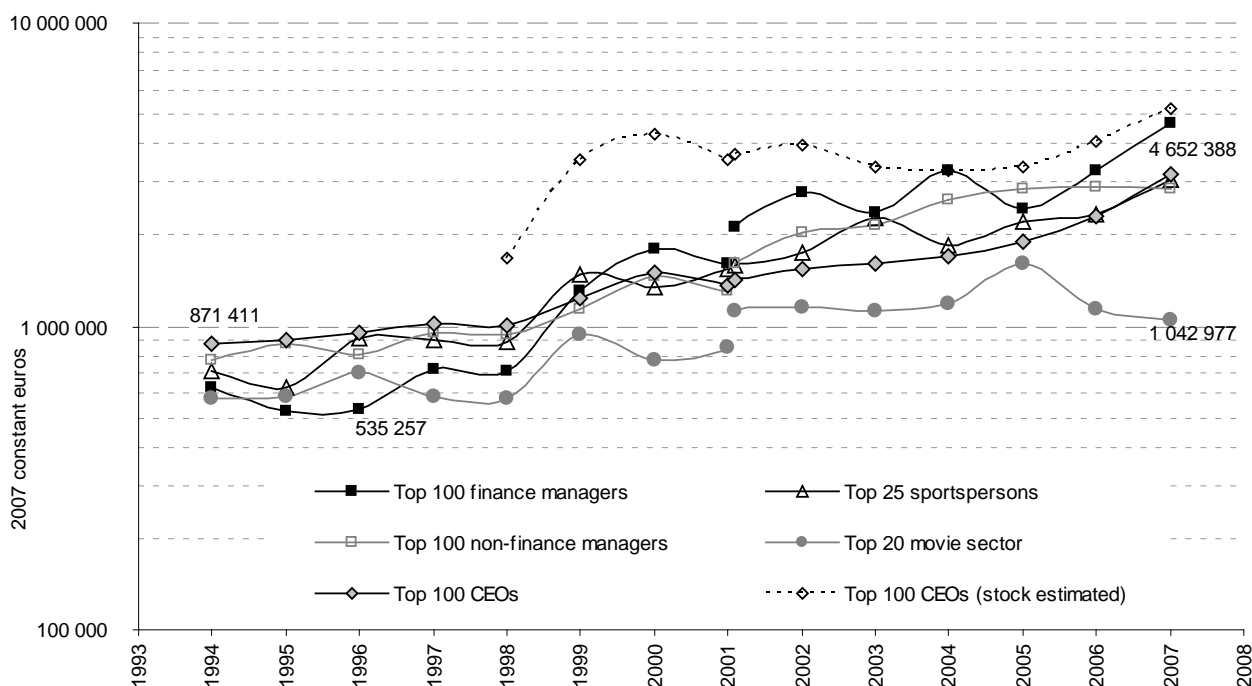
5. Elements of interpretation

Finally, Figure 4, which compares the evolution of top salaries, allows us to sum up some of our main findings. In the figure, we analyse the evolution of the top 100 finance managers (people working in finance sector as ‘*cadres*’), the top 100 non-finance and non-entertainment managers, the top 100 CEOs, the top 25 sportspersons and the top 20 wage earners in the movie, TV and video sectors (most of whom are actors). Between 1996 and 2007, wages increased by 1.5 in this latter group, by 3.3 in sports and among the top CEOs, by 3.6 among the top non-finance managers and by 8.7 among the top 100 finance managers. On the basis of salary comparison, top finance managers clearly surpass other elites both by the pace of growth and by the level of pay at the end of the period. We nevertheless must remain cautious, as we lack information on other forms of compensation such as shares or stock options. In order to partly overcome this limitation, we have estimated for top CEOs the probable changes in compensation, stock options included, by applying the share of stock options to them that Proxinvest (2009) calculated for CAC40 executive teams.²² The pace of increase of top finance managers pay (salary only) was double that of top CEOs, and the former almost caught the level of the latter in 2007. Moreover, although remuneration in shares and above all in stock options was not particularly common before the 2008 crisis, it is likely that this small financial elite did increasingly benefit from this form of pay.²³

²² We must note that the top100 CEOs and the executive teams of CAC40 (approximately 400-500 executives) is not the same population. The best-paid CEOs in cash may be outside CAC40, or even outside the SBF 250 spectrum. They may also work in non-public firms. Nevertheless, there is enough proximity between the two populations to use as a rule of thumb the Proxinvest series, which has to my knowledge the most historical depth. Proxinvest calculates the Black and Scholes value of options granted to CEOs, with a small discount for the invalidity period. The Black and Scholes value of stock options is a good representation of compensation and, thus, of inequality in the firm from the point of view of the shareholder. It may be more questionable in order to estimate the inequality of standard of living, since options may or may not be exercised.

²³ In an internet survey launched with efinancialcareers.fr in September 2008—a snow ball sample ($n = 992$), broadly representative of the diversity of the financial industry (with a junior bias)—we found that the proportion of persons earning stock options was only 3%, and the proportion of those with shares was 4%. Since the subprime crisis, pay regulation policies have recommended that firms pay roughly one-third of bonuses in restricted shares. Hedge fund managers who are partners of their firm may also earn directly commercial benefits in addition to fixed salary, bonuses and stock options. However hedge funds remain rare and small due to restrictive legislation in France.

Figure 4 Evolution of the top wages for several well-known jobs.



Notes: In 2007, the top 100 finance managers were paid 4,652,388 euros on average per year. Yearly figures have been calculated in 2007 constant euros.

Sources: France – exhaustive job files DADS (1994-2007) and Proxinvest (2009).

Therefore, the most scrutinized, highly paid professionals, such as CEOs and entertainment superstars, are not responsible for most of the increase in inequality in comparison with finance managers, in particular heads of desks and heads of trading rooms.

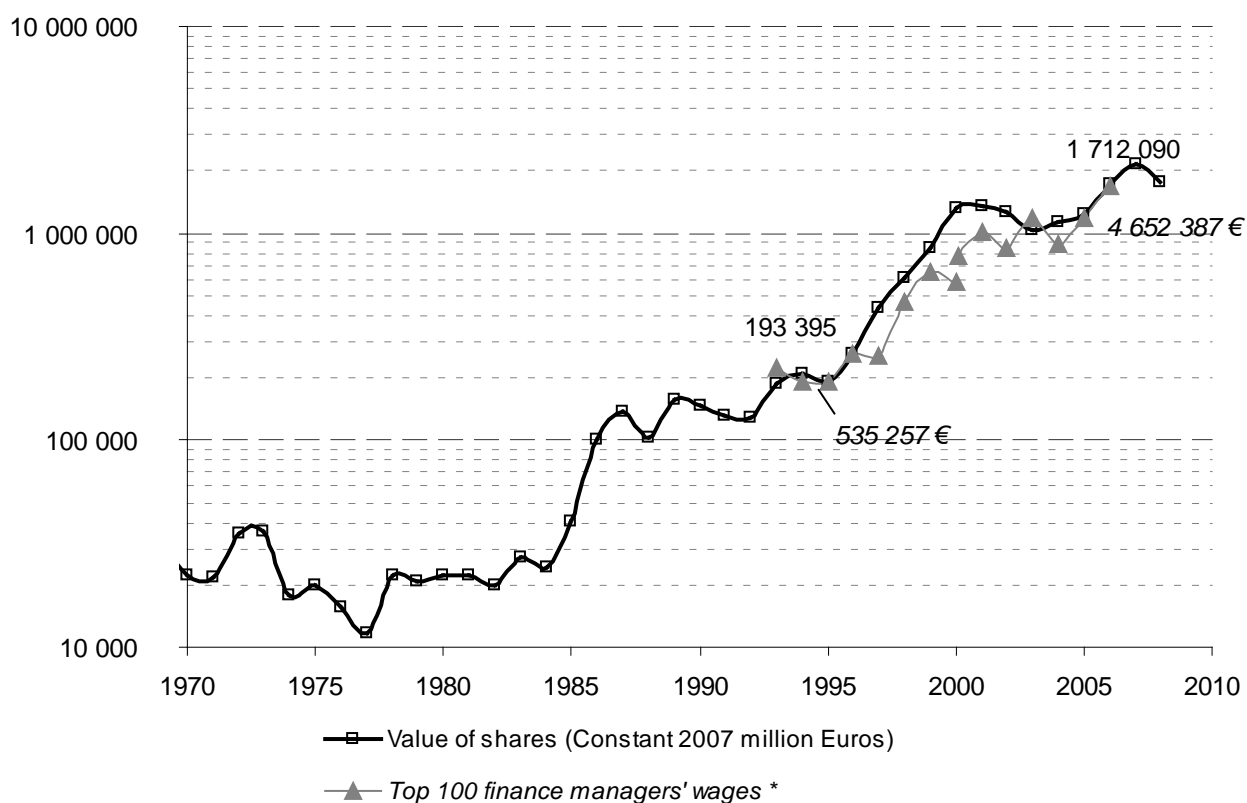
Several interpretations have been provided in order to explain this extraordinary wage trend in the financial industry. The importance of human capital has been researched both by Philippon and Resheff (2009) for the US, and also for one of France’s main banks (Godechot, 2011). Despite the importance of higher education degrees at the core of the financial markets, even very detailed education variables in traditional wage equations fail to explain the wage structure or its evolution.

A great deal of recent research links the way in which compensation in the financial industry has evolved with the evolution of the volume of activity (Meunier, 2007; Kaplan and Rauh, 2010; Célérier, 2010). Kaplan and Rauh (2010) outline an impressive series on the rise in the amount under management in hedge funds, increasing from 20 billion in 1986 to 1 trillion in 2004.

Although the volume of shares exchanged on the Paris stock market (Figure 5) may not be fully representative of the increase in the volume of financial activity—missing over-the-counter, fixed-income or foreign financial products—it is at first glance a reasonably good approximation of investment bank activity, which, in the end, in France is mainly an activity of intermediation (brokering, equity derivatives pricing and marketing etc.). Figure 5 clearly shows how financial activity boomed at a very rapid rate during three periods: 1984-1987 (+70% per year), 1995-2000 (+50% per year) and 2004-2007 (+25% per year).

If we compare the evolution of the top 100 finance managers during the last 12 years with our volume index, results are strikingly congruent with the idea that there is a strong link between volume and compensation²⁴. Between 1995 and 2006, volume was multiplied by 8.85. During the same period, the top 100 finance managers' wages were multiplied by 8.26. The correlation between the two curves ($r = 0.92$), although not perfect, is nevertheless impressive.²⁵ Although we must remain cautious and acknowledge that a correlation based on 14 observations may be spurious, let us note that this relation is also supported by more qualitative elements collected in fieldwork research. If banks tended in the 1980s and the 1990s to replace formulas for bonus by qualitative discretionary pay, they also introduced some collective formulas based on net revenue in order to generate bonus pools at the departmental level (for instance, equity derivative departments) (Eccles and Crane, 1988). Those formulas (more generally a simple proportion of the net income) are volume driven, and in practice heads of departments' share of the bonus pool did not seem to diminish with growth of the headcount under their supervision.

Figure 5 Value of shares exchanged on the Parisian stock market and the top 100 finance managers' wages.



Notes: In 2006, 1,712,090 million euros' worth of shares were exchanged on the Paris market. In 2006 (that is, in 2007 for their 2006 performance), the top 100 finance managers were granted 4,652,387 euros on average. *We rescale the top 100 finance managers curve a) in year $n-1$, as bonuses are generally paid in year n for the year $n-1$ performance, b) so that the two curves share the same reference point: 1995.

²⁴ The effect of the first boom of the 1980s on compensations is more difficult to detect for the following reasons: financial markets represented only a small fraction of the finance activities at that time, the panel at 1/24th of the population lacks precision, and a large part of these activities were then carried out by the *Agents de change*, traditional French brokers and their employees, who were largely paid via heterodox means.

²⁵ If we regress the logarithm of the top 100 average wages on the logarithm of volume index, we find an R2 of 85% and a very significant coefficient of 0.9.

Sources: France – exhaustive job files DADS (1994-2007) and Euronext, Euronext Fact Book, Historical Series (Turnover), accessed at <http://www.euronext.com/editorial/wide/editorial-20786-EN.html>.

The traditional but intriguing correlation between CEO pay and firm size was recently given an explanation that could be relevant for financial market managers. Gabaix and Landier (2008) explain how the heterogeneity of CEO talent may be multiplied by a skewed distribution of volume. They develop a model where the biggest firm hires the best CEO in order to maximize the impact of the CEO for its shareholders. In this model, the best CEO does not need to be a ‘superhero’, but only to be slightly better than the 250th CEO (that is, to increase the capitalization by 0.016%) in order to get, due to the skewness of the distribution of company size, a multiple of its salary (for instance 5 times more in their calibration). In their model, while the cross-section relation between logarithm of pay and logarithm of size is only 1/3, it increases to 1 in a longitudinal approach.

This mechanism was also invoked for financial labour markets by several authors (Meunier, 2007; Kaplan and Rauh, 2010), and Célérier (2010) developed a model based partially on this idea. In the same spirit, if a star trader can get 5.1% return on equity instead of 5.0% as an ordinary trader, he will be matched to the biggest portfolio and will get an extra bonus of 0.1% of the size of the portfolio (for instance, 1 million euros more if he is matched to a 1-billion-euro portfolio). If we follow this perfect market mechanism of matching of size and talent, which requires the following two strong conditions, perfect mobility and perfect knowledge of the hierarchy of talent, the hierarchy of pay only follows a natural, independent hierarchy of talent.

Two cases may be distinguished depending on the generality or the specificity of talent for finance.

If talent is general (like in Gabaix and Landier’s main framework), pay will be distorted by the skewness of the distribution of volume. But we still cannot talk of rents here. The theoretical result rests on perfect mobility both within and between sectors. This first hypothesis is at odds with the data: the mobility rate from non-finance to finance did not increase during the 1996-2001 finance boom, although the increase in size of projects in finance should have attracted more non-finance top performers.²⁶

If talent is sector specific, the model still holds under the hypothesis of perfect mobility within the sector. But if a boom in finance increases volume and therefore pay, we may be allowed to talk of a global rent in finance, in the sense that after the boom there will be an excess in earnings over the amount necessary to keep the factor in its current occupation (Shepherd, 1970).

Moreover, the ‘natural’ origin of talent that plays an important role in these models in order to justify these compensations may be questioned. Thus, Oyer (2008) shows that MBAs will be all the more likely to work in finance, to stay in the sector long-term and to earn top wages if they have graduated in a bull market. This statement may seem quite trivial, but it shows clearly that finance managers ‘are largely “made” by circumstance rather than “born” to work on Wall Street’ (Oyer, 2008). Were finance talent natural, there would be no reason for talented finance people to be more numerous in bull years than in bear years. And were they incorrectly selected in bull years, we should see more

²⁶ In 2001, only 1.1% of the top 10% of managers in 1996 working in non-finance had moved to finance (booming period). In 1996, 1.7% of 1991’s similar population did so (non-booming period).

of them leaving finance, which is clearly not the case. Oyer concludes that MBAs develop finance-specific human capital shortly after taking jobs on Wall Street.

Therefore, we can retain the idea that the volume of financial activity is responsible for the increase in pay without linking it to a natural and intangible hierarchy of talents. Talent may not only be natural, observed and eventually revealed by the financial industry (Célérier, 2010), but also acquired on the job²⁷, a process which has been, therefore, largely funded by the employer. Moreover, talent may not be the only capacity an employee might acquire on the job. Other research has developed a model of financial activities where financial operatives appropriate the key assets of the firm and can threaten to move those assets to a competitor in the same sector (Godechot, 2008). Those assets can be traditional human sector-specific capital such as knowledge and know-how, but we must also include more material assets such as software and databases, as well as social capital such as customer relations or productive teams. In our 2008 paper, we analyse in detail a case of 'hold-up'. In a 2001 wage renegotiation, the head of a trading room and his deputy were granted 10 and 7 million euros, respectively, by effectively threatening to move their whole teams, and therefore the core of the firm's financial activity, to a competitor. Although those two individuals might have been very talented, what was at stake in this wage renegotiation was not their initial talent but their on-the-job accumulated social capital that enabled them to expropriate part of the firm's assets. Thus, the specificity of finance may not be its greater sensitivity to talent (Célérier, 2010), but rather the fact that physical property rights, intellectual property rights such as patents and labor contract devices like non-compete clauses are much less effective at protecting the firms' assets against worker appropriation.

Therefore, in such a model, if the accumulation of movable assets allows a financial worker to capture a fraction of financial activity, the growth of the latter leads to a growth in his pay. Even if we cannot totally rule out that their remuneration can be explained in a superstar framework, we can, however, find an explanation for the trend in finance pay without considering that the financial elites are the natural elites of society. Nevertheless, we must also recognize one limit of the model: although it explains the share of the joint value added between financial operatives and firms, it does not give an explanation of the growth of volumes in finance or of the value added captured by this sector.

6. Conclusion

France has experienced a strong increase in inequality over the last 12 years. Half of the increase of the share of the top 0.1% is due to an increase in pay among top finance managers. On the other hand, CEOs and entertainment superstars did not seem to play a major role in the increase in inequality.

The interpretation of this trend is only just beginning. We nevertheless find a striking correlation between the top 100 finance managers' pay and turnover on the Paris stock market. The relationship between the volume of financial activity and pay may not only be due to a multiplicative effect of volume on

²⁷ Célérier builds a model where finance is a sector more sensitive to talent. Talent is discovered after the first working period. In the model, this talent can either be an initial talent that is revealed or on-the-job acquired talent. Nevertheless, in her argumentation, Célérier favours the first hypothesis.

initial talent, but also to the fact that workers in finance can appropriate a share of the firm's assets, assets which have been growing rapidly over the last 12 years.

Although the basic models linking volume of financial activity and pay might be relatively similar, should they be based on initial talent or on acquired assets, more work is needed in order to separate the contribution of these two factors. This research program has an obvious policy implication. With the 2008 financial crisis, some social analysts pleaded in favour of a tax on financial wages, and the UK and France have experimented with this tax for a limited time. In this debate, taxing talent or taxing rents does not have the same political significance.

It should also be noted that the taxation of finance workers and the taxation of high incomes has received contradictory attention in the public debate. France, during the last decade, as in many developed countries, has been lowering the tax rates for the highest incomes, after some consideration of the positive effects of those elites on overall activity. At the same time, CEOs during the whole decade, finance workers after 2007 and sportspeople after the 2010 World Cup defeat, have been widely criticized. Both the meritocratic character of their pay and the usefulness of their economic role have been subject to debate. It should be noted that these categories are not marginal among top wages in France. In the top 0.01% of wages for 2007, we find nearly 40% of finance workers, 20% of CEOs and 10% of sportspeople. Taxing this fractile of salary more would be another way (perhaps more easily achieved than a sectorial tax) to redistribute those salaries, which more and more citizens consider as rents.

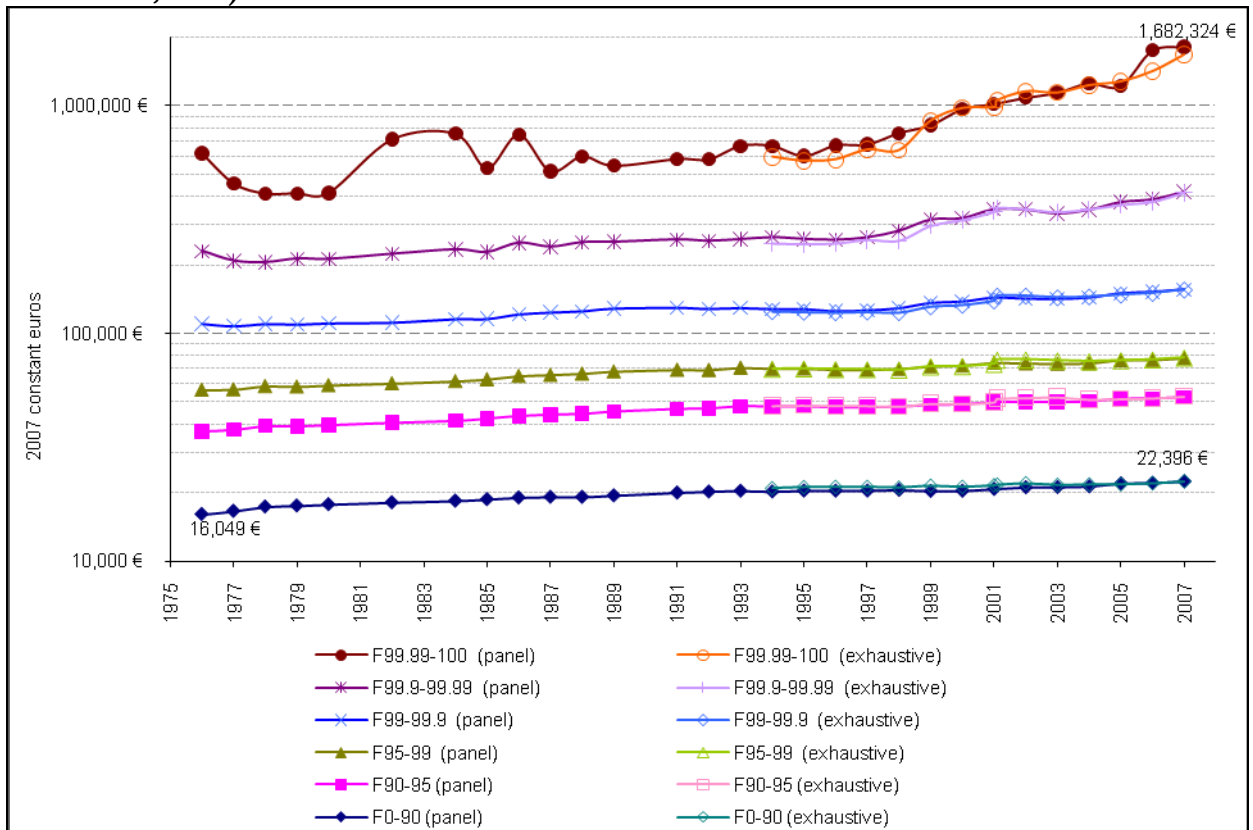
References

- Amable, B. (2003) *The diversity of modern capitalism*, Oxford, Oxford University Press.
- Amar, M. (2010, Avril) *Les très hauts salaires du secteur privé, insee première*, INSEE Première No. 1288, Paris, Institut national de la statistique et des études économiques, accessed at <http://www.insee.fr/fr/ffc/ipweb/ip1288/ip1288.pdf> on February 8, 2012..
- Andreff, W. (2007) 'Régulation et institutions en économie du sport', *Revue de la régulation*, 1, accessed at <http://regulation.revues.org/1274> on February 1, 2012.
- Atkinson, A.B. (2008) *The Changing Distribution of Earnings in OECD Countries*, Oxford, Oxford University Press.
- Atkinson, A.B., Piketty, T. and Saez, E. (2011) 'Top Incomes in the Long Run of History', *Journal of Economic Literature*, **49**, 3-71.
- Bakija, J., Cole, A., Heim, B. (2010) *Jobs and Income Growth of Top Earners and the Causes of Changing Income Inequality: Evidence from U.S. Tax Return Data*, Department of Economics Working Papers, Williamstown, Williams College, accessed at <http://web.williams.edu/Economics/wp/BakijaColeHeimJobsIncomeGrowthTopEarners.pdf> on February 1, 2012.
- Bebchuk, L.A. and Fried, J. (2004) *Pay without Performance: The Unfulfilled Promise of Executive Compensation*, Cambridge, MA, Harvard University Press.
- Bebchuk, L.A. and Grinstein, Y. (2005) 'The Growth of Executive Pay', *Oxford Review of Economic Policy*, **21**, 283–303.
- Bell, B. and Van Reenen, J. (2010, April) *Bankers' pay and extreme wage inequality in the UK*, CEP Special Paper No. 21, London, Centre for Economic Performance, London School of Economics, accessed at <http://eprints.lse.ac.uk/28780/1/cepsp21.pdf> on February 8, 2012.
- Célérier, C. (2010) 'Compensation in the Financial Sector: Are all Bankers Superstars?', paper presented at Paris School of Economics, Lunch Seminar, Paris, January 18, accessed at http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2011-Braga/papers/0485_update.pdf on February 28, 2012.
- DiPrete, T. and Pittinsky, E. (2010) 'Compensation Benchmarking, Leapfrogs, and the Surge in Executive Pay', *American Journal of Sociology*, **115**, 1671-1712.
- DSDS (2010) DADS, Guide méthodologique, Validité 2008, Dijon, INSEE.
- Eccles, R. and Crane, D. (1988) *Doing deals: investment banks at work*, Cambridge, MA, Harvard University Press.
- Evain, F. (2007) *Le salaire des chefs d'entreprises, moyennes et grandes*, INSEE Première No. 1150, Paris, Institut national de la statistique et des études économiques.
- Gabaix, X. and Landier, A., (2008) 'Why has CEO Pay increased so much?', *Quarterly Journal of Economics*, **123**, 49-100.
- Godechot, O. (2008) "'Hold-up" in finance: the conditions of possibility for high bonuses in the financial industry', *Revue française de sociologie* (Supplement annual English edition), **49**, 95-123.

- Godechot, O. (2011) 'Le capital humain et les incitations sont-ils les deux mamelles des salaires dans la finance?', *Revue d'économie financière*, **104**, 145-164.
- Hamouda, M. (2010) 'Le bilan des stock-options en France de 1997 à 2003', *Management et avenir*, **45**, 149-167.
- Kaplan, S. and Rauh, J. (2010) 'Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?', *Review of Financial Studies*, **23**, 1004-1050.
- Kopczuk, W., Saez, E. and Song, J. (2010) 'Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937', *Quarterly Journal of Economics*, **125**, 91-128.
- Landais, C. (2008) *Top incomes in France (1998-2006): Booming inequalities?*, PSE Working Paper, Paris, Paris School of Economics, accessed at <http://www.stanford.edu/~landais/cgi-bin/Articles/topincomes.pdf> on January 11, 2012.
- Leroy, P.-H. (2010) 'La rémunération des dirigeants et des traders dans le secteur financier'. In *Rapport moral sur l'argent dans le monde 2010*, Paris, Association d'économie financière, pp. 181-188.
- Meunier, F. (2007) 'Les hauts salaires dans la banque : talent ou collusion ?', *Revue française d'économie*, **22**, 49-71.
- Nagel, G. L. (2010) 'The Effect of Labor Market Demand on U.S. CEO Pay Since 1980', *The Financial Review*, **45**, 931-950.
- Oyer, P. (2008) 'The Making of an Investment Banker: Stock Market Shocks, Career Choice, and Lifetime Income', *The Journal of Finance*, **63**, 2601-2628.
- Philippon, T. and Reshef, A. (2009) *Human Capital in the U.S. Financial Industry: 1909-2006*, NBER Working Paper No. 14644, Cambridge, MA, National Bureau of Economic Research, accessed at <http://www.nber.org/papers/w14644.pdf> on January 11, 2012.
- Piketty, T. (2001) *Les hauts revenus en France au XXe siècle*, Paris, Fayard.
- Piketty, T. and Saez, E. (2003) 'Income Inequality in the United States, 1913-1998', *Quarterly Journal of Economics*, **118**, 1-39.
- Proxinvest (2009) *La rémunération des dirigeants des sociétés cotées*, Paris, Proxinvest.
- Rosen, S., (1981) 'The Economics of Superstars', *American Economic Review*, **71**, 845-858.
- Shepherd, R. (1970) 'Economic Rent and the Industry Supply Curve', *Southern Economic Journal*, **37**, 209-211.
- Solard, J. (2010) 'Les très hauts revenus: des différences de plus en plus marquées entre 2004 et 2007'. In *Les revenus et patrimoine des ménages, édition 2010*, Paris, Insee, pp. 45-64.
- Zorn, D., Dobbin, F., Dierkes, J. and Kwok, M. S. (2005) 'Managing Investors: How Financial Markets Reshaped the American Firm'. In Knorr Cetina, K. and Preda A. (eds) *The Sociology of Financial Markets*, Oxford, Oxford University Press, pp. 269-289.

Is finance responsible for the rise in wage inequality in France?
 Supplementary Data on line

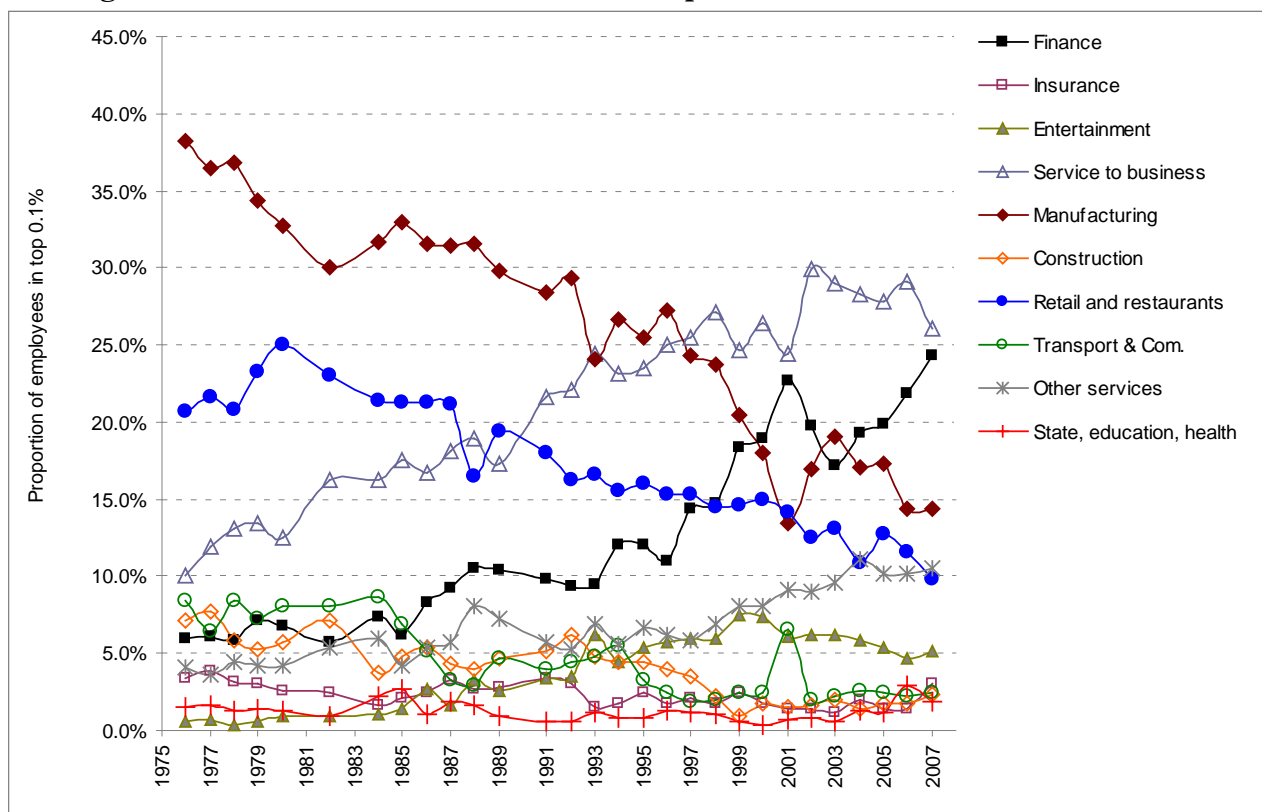
Figure S1. Evolution of constant wages of the different fractiles (in euros, 2007)



Note: In 2007, the mean salary in the top 0.01% was 1,682,324 euros.

Sources: DADS Panel (1976-2007) and exhaustive job files (1994-2007).

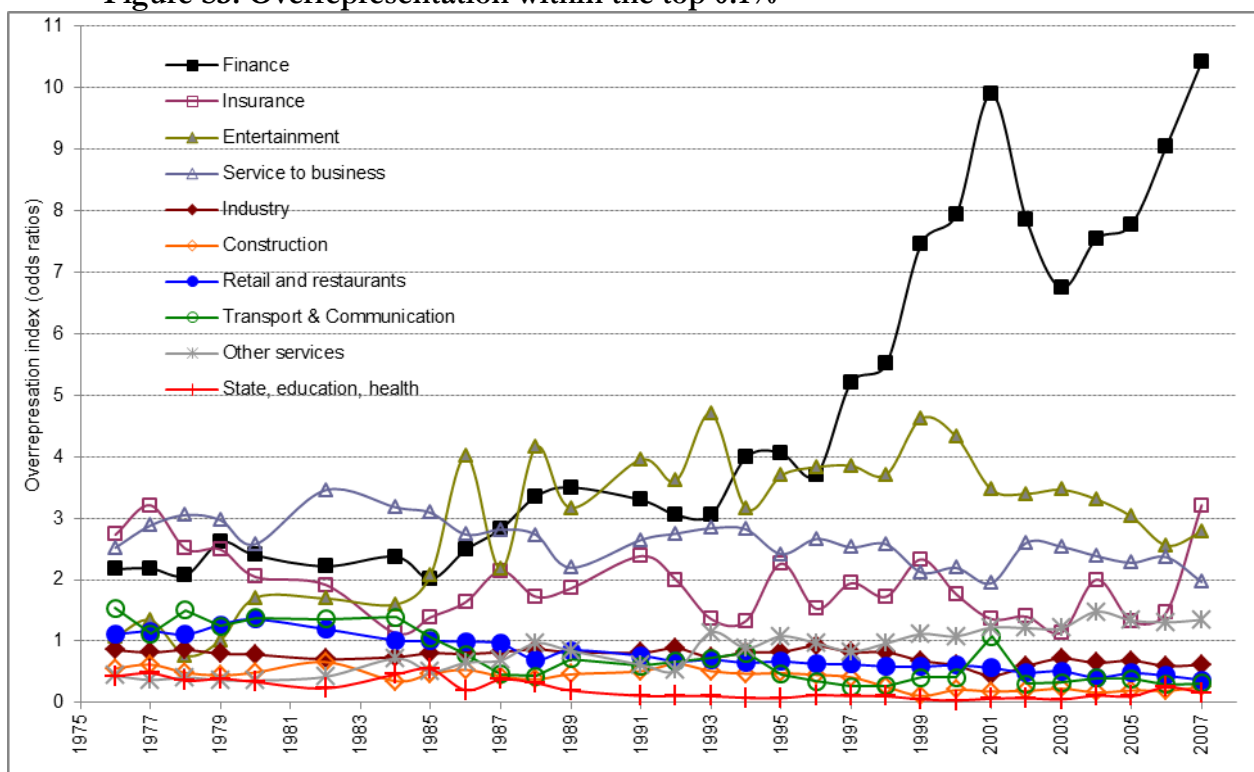
Figure S2. Finance and other sectors in the top 0.1%



Notes: In 2007, 26% of the top 0.1% worked in service to business. We correct the economic activity for holdings coded among the service to business sector.

Source: DADS, Panel (1976-2007).

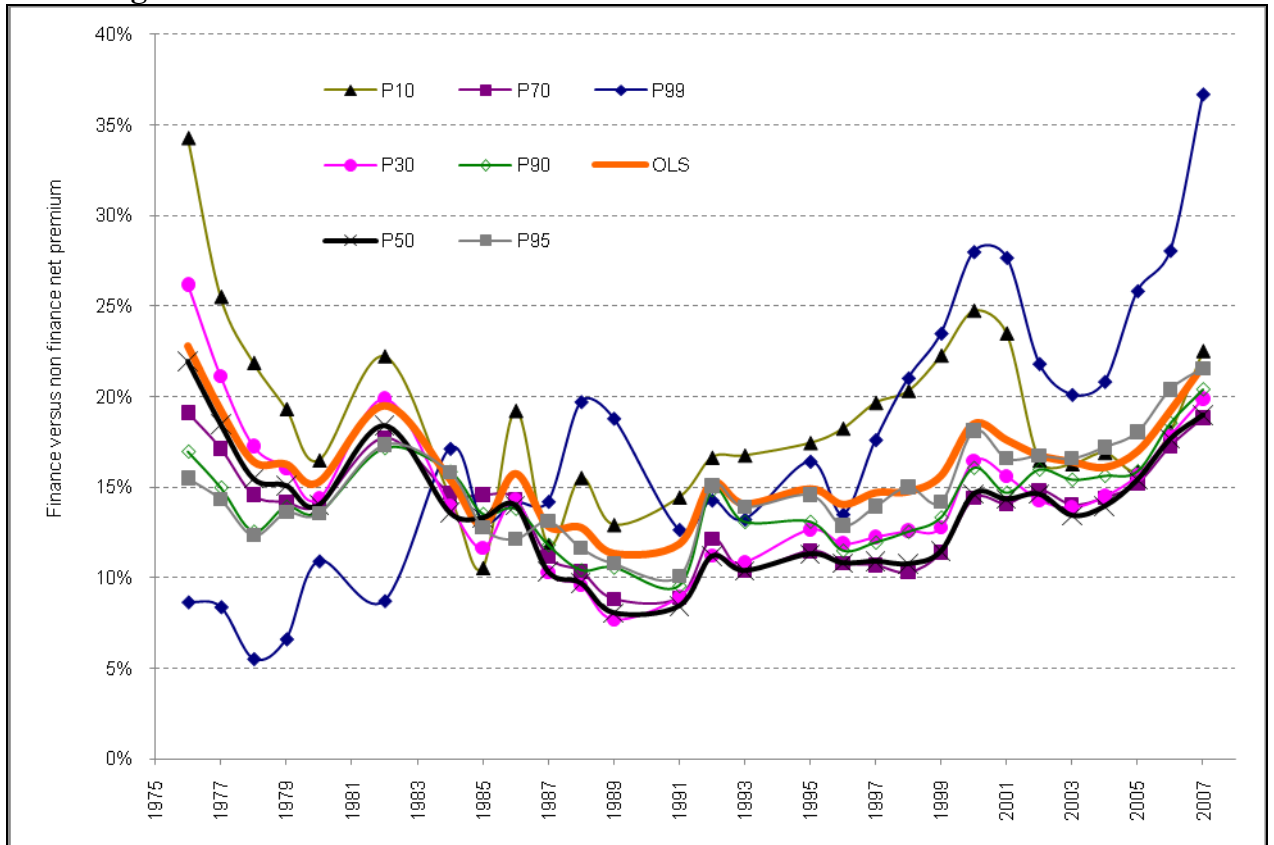
Figure S3. Overrepresentation within the top 0.1%



Notes: In 2007, there are 10.3 times (in terms of odds ratio) more finance employees in the top 0.1% than there are in the rest of the distribution. We correct the economic activity for holdings (cf. Appendices, sector coding).

Source: Panel DADS (1976-2007).

Figure S4. Evolution of Finance Premium.



Notes: On the figure is plotted the wage premium for finance estimated through both OLS regressions and quantile regressions. Working in finance in 1976, increases by 34% the P10 threshold.

Source: DADS, Panel (1976-2007).

Sector coding

Sectors	NAP	NAF 1993
Finance	89, 7801	65, 67.1
Insurance	88, 7802	66, 67.2
Entertainment	86	92
Service to business	76, 77	74
Industry (and agriculture)	01-54, 56	01-41
Construction	55	45
Retail and restaurants	57-67	50-57
Transport and communications	68-75	60-64
Other services	90-97, 99	70-73, 90-99
State, education, health	98	75-85

Correction of sectors for holdings

With the financialization of the firm, heads of firms are often constituted as holdings, managing many different units involved in many different economic activities. Their economic sector is difficult to code unilaterally. Therefore, before 1993, in the NAP nomenclature, INSEE gave them their own division (76). After 1993, in the NAF nomenclature, we find them inside the service to business division (74), the “administration of firm” code, “741J”, with other activities of firm management or representation. Holdings, therefore, are not totally isolated: in the Panel, we count 1756 individuals working for holdings in 1992 whereas 7995 are working in the 741J “administration of firm” code in 1993.

Heads of groups, where we generally find the highest salaries, working in industry, retail, construction, transport, and finance, will therefore be coded in service to business. This type of coding might overestimate the role of service to business in higher fractiles. In order to eliminate this bias we tried to correct the coding. We used the 2002-2007 Lifi survey in order to correct the sector for heads of groups. When a head of group is coded as a holding we assign to it the sector of its biggest (in head-count) subsidiary. For the years before 2002, we use the 2002 Lifi survey. The approximation is not too bad, as far as during the period holdings are generally created rather than destroyed. We reassign 20% of workers coded in 741J in 2007, 16% in 2002, 13% in 1995, and 30% of workers coded in NAP76 in 1991, 20% in 1976.

Within the 2007 top 0.1% fractile, this correction helps to reduce the proportion of wage-earners in service to business from 31% to 26%, and to increase that of industry from 11% to 14%, and that of retail and restaurants from 9 to 10%. It does not have much impact on other sectors, especially on finance.

Table S1. Thresholds, means and standard estimates of yearly gross wages for different fractiles of the distribution (Panel). Constant 2007 euros.

Year	Selection threshold	F00-90 Mean	F00-90 Std	P90	F90-95 Mean	F90-95 Std	P95	F95-99 Mean	F95-99 Std	P99	F99-99.9 Mean	F99-99.9 Std	P99.9	F99.9-99.99 Mean	F99.9-99.99 Std	P99.99	F99.99-100 Mean	F99.99-100 Std	All Mean	All Std	N
1976	4,528 €	16,049 €	6,544 €	32,673 €	37,158 €	3,054 €	43,445 €	56,553 €	10,538 €	83,079 €	110,412 €	24,100 €	183,050 €	230,117 €	41,955 €	354,629 €	617,527 €	491,825 €	19,827 €	17,485 €	535 292
1977	4,851 €	16,573 €	6,550 €	33,243 €	37,755 €	3,069 €	44,037 €	56,786 €	10,269 €	82,927 €	107,797 €	20,557 €	167,550 €	208,334 €	36,030 €	329,028 €	454,875 €	206,709 €	20,279 €	15,915 €	545 229
1978	5,234 €	17,305 €	6,729 €	34,487 €	39,164 €	3,175 €	45,669 €	58,718 €	10,501 €	85,336 €	110,183 €	20,978 €	170,093 €	204,923 €	30,097 €	300,252 €	410,739 €	167,556 €	21,099 €	16,009 €	534 515
1979	5,314 €	17,482 €	6,721 €	34,543 €	39,130 €	3,125 €	45,579 €	58,433 €	10,325 €	84,266 €	109,577 €	21,338 €	172,087 €	212,782 €	33,001 €	306,318 €	411,695 €	161,894 €	21,246 €	15,989 €	549 794
1980	5,412 €	17,716 €	6,827 €	34,964 €	39,597 €	3,163 €	46,128 €	59,227 €	10,483 €	85,500 €	110,873 €	21,897 €	174,628 €	211,916 €	30,733 €	314,561 €	413,035 €	131,824 €	21,524 €	16,125 €	542 101
1982	5,805 €	18,066 €	6,889 €	35,752 €	40,517 €	3,281 €	47,276 €	60,395 €	10,438 €	86,300 €	111,769 €	22,072 €	177,507 €	223,168 €	42,255 €	355,700 €	711,491 €	484,745 €	21,980 €	18,010 €	521 238
1984	6,026 €	18,366 €	6,934 €	36,396 €	41,317 €	3,342 €	48,160 €	61,777 €	10,805 €	88,954 €	115,585 €	23,058 €	183,025 €	233,406 €	45,153 €	368,471 €	753,563 €	581,191 €	22,393 €	18,849 €	485 279
1985	6,157 €	18,638 €	7,072 €	37,181 €	42,260 €	3,420 €	49,279 €	62,977 €	10,841 €	89,753 €	115,878 €	22,529 €	180,719 €	227,480 €	40,056 €	348,280 €	531,495 €	239,727 €	22,708 €	17,397 €	479 365
1986	6,253 €	18,961 €	7,269 €	38,123 €	43,435 €	3,595 €	50,847 €	65,095 €	11,254 €	92,893 €	121,337 €	24,704 €	195,690 €	249,900 €	51,582 €	404,474 €	745,958 €	504,037 €	23,233 €	19,471 €	483 321
1987	6,307 €	19,089 €	7,394 €	38,629 €	43,988 €	3,600 €	51,364 €	65,847 €	11,509 €	94,598 €	123,501 €	24,727 €	195,460 €	240,099 €	39,109 €	364,627 €	514,812 €	208,007 €	23,393 €	18,248 €	486 983
1988	6,311 €	19,079 €	7,524 €	38,905 €	44,345 €	3,683 €	51,875 €	66,712 €	11,716 €	95,677 €	125,079 €	25,864 €	201,399 €	251,313 €	44,367 €	396,400 €	598,328 €	232,914 €	23,469 €	18,901 €	484 805
1989	6,344 €	19,359 €	7,725 €	39,774 €	45,336 €	3,743 €	52,980 €	68,136 €	12,068 €	98,334 €	128,496 €	25,686 €	201,628 €	252,274 €	47,804 €	414,841 €	544,504 €	108,896 €	23,854 €	19,020 €	508 852
1991	6,504 €	19,919 €	7,940 €	40,896 €	46,526 €	3,779 €	54,255 €	69,348 €	11,944 €	99,056 €	129,497 €	26,196 €	206,521 €	258,354 €	48,700 €	423,901 €	582,962 €	188,851 €	24,484 €	19,450 €	527 896
1992	6,604 €	20,131 €	8,004 €	41,173 €	46,757 €	3,732 €	54,359 €	69,232 €	11,620 €	98,043 €	128,048 €	25,683 €	201,512 €	254,962 €	49,264 €	412,031 €	581,312 €	181,237 €	24,666 €	19,304 €	534 834
1993	6,637 €	20,286 €	8,172 €	42,011 €	47,865 €	3,909 €	55,847 €	70,808 €	11,606 €	99,649 €	129,206 €	25,427 €	202,710 €	259,364 €	54,160 €	433,983 €	666,159 €	275,301 €	24,946 €	20,016 €	518 688
1994	6,671 €	20,139 €	8,255 €	41,908 €	47,697 €	3,838 €	55,523 €	70,141 €	11,376 €	98,318 €	127,875 €	25,749 €	205,394 €	264,314 €	56,028 €	445,012 €	665,313 €	314,843 €	24,771 €	20,064 €	513 955
1995	6,757 €	20,319 €	8,202 €	41,997 €	47,754 €	3,854 €	55,550 €	70,256 €	11,422 €	98,942 €	127,945 €	24,719 €	202,017 €	259,720 €	47,794 €	407,830 €	600,817 €	223,798 €	24,931 €	19,625 €	522 383
1996	6,864 €	20,301 €	8,135 €	41,688 €	47,331 €	3,790 €	55,021 €	69,439 €	11,240 €	97,329 €	125,219 €	24,183 €	197,712 €	257,542 €	54,421 €	433,172 €	669,643 €	338,505 €	24,841 €	19,728 €	527 345
1997	6,979 €	20,324 €	8,149 €	41,750 €	47,316 €	3,737 €	54,892 €	69,366 €	11,215 €	97,350 €	126,270 €	25,282 €	200,441 €	264,106 €	56,490 €	437,931 €	675,288 €	254,620 €	24,875 €	19,758 €	533 517
1998	7,138 €	20,471 €	8,157 €	42,016 €	47,651 €	3,797 €	55,347 €	70,067 €	11,485 €	98,606 €	129,096 €	26,968 €	210,077 €	282,243 €	68,806 €	505,238 €	758,573 €	288,755 €	25,101 €	20,541 €	551 889
1999	7,218 €	20,247 €	8,184 €	42,531 €	48,456 €	3,949 €	56,492 €	71,803 €	12,114 €	102,520 €	136,022 €	29,918 €	229,015 €	316,474 €	80,274 €	562,880 €	821,373 €	290,008 €	25,109 €	21,821 €	533 422
2000	7,256 €	20,287 €	8,196 €	42,767 €	48,739 €	3,977 €	56,822 €	72,463 €	12,427 €	103,843 €	138,010 €	30,476 €	234,457 €	320,895 €	82,686 €	589,959 €	964,457 €	507,948 €	25,223 €	23,009 €	560 247
2001	7,396 €	20,655 €	8,324 €	43,691 €	49,894 €	4,131 €	58,248 €	74,465 €	12,899 €	107,180 €	143,404 €	33,091 €	252,082 €	351,439 €	92,246 €	655,473 €	1,018,925 €	599,667 €	25,773 €	24,310 €	580 405
2002	7,494 €	21,011 €	8,383 €	43,937 €	49,982 €	4,045 €	58,175 €	74,045 €	12,611 €	106,329 €	142,049 €	32,540 €	247,598 €	350,434 €	96,936 €	658,239 €	1,085,736 €	639,644 €	26,074 €	24,529 €	1 182 443
2003	7,626 €	21,063 €	8,403 €	43,920 €	49,885 €	4,012 €	58,056 €	73,710 €	12,495 €	105,592 €	141,749 €	32,896 €	245,381 €	336,867 €	87,124 €	612,532 €	1,141,530 €	864,798 €	26,093 €	25,206 €	1 186 862
2004	7,884 €	21,205 €	8,365 €	44,103 €	50,102 €	4,035 €	58,333 €	74,125 €	12,631 €	106,543 €	143,537 €	34,057 €	253,278 €	349,348 €	91,678 €	653,136 €	1,256,144 €	980,544 €	26,287 €	26,395 €	1 174 623
2005	7,746 €	21,834 €	8,680 €	45,465 €	51,616 €	4,146 €	60,101 €	76,609 €	13,245 €	110,894 €	149,955 €	36,497 €	266,729 €	378,316 €	106,398 €	722,456 €	1,222,500 €	723,692 €	27,108 €	26,324 €	1 178 154
2006	7,524 €	21,960 €	8,769 €	45,531 €	51,674 €	4,116 €	60,052 €	76,729 €	13,441 €	111,467 €	152,005 €	37,980 €	273,951 €	389,019 €	108,801 €	748,510 €	1,752,971 €	3,273,959 €	27,311 €	43,337 €	1 245 212
2007	7,603 €	22,314 €	8,898 €	46,237 €	52,454 €	4,174 €	61,014 €	78,600 €	13,723 €	113,781 €	155,959 €	39,325 €	285,527 €	420,043 €	128,585 €	835,934 €	1,810,961 €	2,287,504 €	27,790 €	37,294 €	1 269 372

Table S2. Thresholds, means and standard estimates of yearly gross wages for different fractiles of the distribution (Exhaustive files). Constant 2007 euros.

Year	Selection threshold	F00-90 Mean	F00-90 Std	P90	F90-95 Mean	F90-95 Std	P95	F95-99 Mean	F95-99 Std	P99	F99-99.9 Mean	F99-99.9 Std	P99.9	F99.9-99.99 Mean	F99.9-99.99 Std	P99.99	F99.99-100 Mean	F99.99-100 Std	All Mean	All Std	N
1994	6,670 €	20,913 €	8,200 €	42,431 €	48,062 €	3,764 €	55,753 €	69,860 €	11,028 €	97,262 €	124,806 €	23,670 €	195,372 €	247,703 €	47,337 €	392,474 €	594,876 €	493,287 €	25,425 €	19,651 €	11 439 684
1995	6,757 €	21,135 €	8,186 €	42,642 €	48,251 €	3,766 €	55,850 €	70,073 €	10,990 €	97,298 €	124,099 €	23,116 €	192,742 €	245,887 €	47,083 €	389,209 €	570,918 €	280,595 €	25,632 €	19,078 €	11 253 327
1996	6,864 €	21,183 €	8,148 €	42,581 €	48,111 €	3,718 €	55,617 €	69,668 €	10,893 €	96,692 €	123,473 €	23,204 €	192,977 €	247,821 €	48,920 €	396,729 €	580,261 €	267,212 €	25,650 €	19,009 €	11 233 725
1997	6,979 €	21,189 €	8,172 €	42,611 €	48,108 €	3,717 €	55,590 €	69,624 €	10,896 €	96,708 €	124,334 €	24,126 €	196,959 €	256,797 €	53,920 €	424,775 €	640,994 €	289,023 €	25,674 €	19,386 €	11 429 251
1998	6,931 €	21,043 €	8,116 €	42,318 €	47,777 €	3,692 €	55,208 €	69,145 €	10,821 €	96,043 €	123,479 €	23,960 €	195,604 €	255,030 €	53,549 €	421,853 €	636,584 €	287,034 €	25,498 €	19,253 €	11 429 251
1999	7,218 €	21,427 €	8,369 €	43,430 €	49,174 €	3,849 €	56,978 €	71,621 €	11,502 €	100,559 €	131,037 €	27,210 €	216,320 €	296,305 €	74,997 €	538,701 €	860,305 €	426,292 €	26,140 €	21,507 €	11 942 916
2000	7,256 €	21,191 €	8,388 €	43,284 €	49,046 €	3,850 €	56,833 €	71,715 €	11,702 €	101,263 €	133,220 €	29,001 €	225,847 €	314,418 €	83,948 €	597,029 €	977,859 €	506,115 €	25,973 €	22,562 €	12 400 411
2001	7,395 €	21,526 €	8,429 €	44,039 €	49,981 €	3,969 €	58,014 €	73,493 €	12,275 €	104,654 €	139,155 €	31,411 €	240,293 €	341,918 €	96,814 €	653,796 €	985,567 €	411,276 €	26,471 €	23,216 €	12 670 098
2001	7,395 €	21,674 €	8,841 €	45,521 €	51,794 €	4,190 €	60,291 €	76,686 €	13,020 €	109,881 €	146,385 €	33,065 €	252,935 €	356,328 €	98,404 €	673,132 €	1,057,729 €	604,312 €	26,908 €	24,905 €	15 146 231
2002	7,495 €	21,956 €	8,900 €	45,939 €	52,175 €	4,152 €	60,590 €	76,823 €	12,906 €	109,805 €	146,280 €	33,016 €	251,250 €	350,605 €	94,937 €	661,717 €	1,158,246 €	870,210 €	27,190 €	26,013 €	15 160 086
2003	7,627 €	21,640 €	9,083 €	46,378 €	52,503 €	4,044 €	60,640 €	76,147 €	12,349 €	107,805 €	143,795 €	32,749 €	247,394 €	340,690 €	86,488 €	619,859 €	1,143,812 €	975,510 €	26,863 €	26,148 €	16 066 991
2004	7,883 €	21,723 €	8,774 €	45,291 €	51,363 €	4,052 €	59,584 €	75,486 €	12,697 €	108,083 €	144,996 €	33,361 €	250,379 €	350,292 €	94,943 €	660,466 €	1,232,770 €	1,113,680 €	26,882 €	27,062 €	15 950 337
2005	7,747 €	21,772 €	8,813 €	45,481 €	51,598 €	4,087 €	59,905 €	76,126 €	12,992 €	109,528 €	147,842 €	34,910 €	259,262 €	366,355 €	102,018 €	701,003 €	1,281,250 €	1,336,719 €	27,009 €	28,642 €	16 321 586
2006	7,525 €	21,975 €	8,967 €	45,896 €	52,019 €	4,099 €	60,358 €	76,777 €	13,181 €	110,839 €	150,363 €	36,323 €	266,399 €	378,753 €	108,988 €	739,876 €	1,421,522 €	1,647,971 €	27,286 €	31,147 €	16 724 583
2007	7,604 €	22,396 €	9,104 €	46,708 €	52,935 €	4,179 €	61,452 €	78,312 €	13,585 €	113,613 €	155,574 €	39,058 €	282,787 €	414,348 €	131,333 €	866,596 €	1,682,324 €	1,631,479 €	27,878 €	33,067 €	16 921 903