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Finance and the rise in inequalities in France[1]

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Abstract: Based on the DADS, a very detailed French database on wages, we show that wage inequalities 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 employees in the provinces, in CEOs; and an increase in lower rank management like chief officers and other administrative managers, in sportspersons, and in Paris Region employees. A sector approach shows that finance (3% of private sector employees) is responsible for half of the rise in inequalities at the top end of wage distribution. We discuss the role of the size of financial activity in the tremendous increase in top financial wages.

Keywords: Inequalities, Wages, Finance, Superstars, France.

JEL classification: D3, G2, J3

Résumé : En nous fondant sur les DADS, une base de données très détaillée sur les salaires en France, nous montrons que les inégalités salariales ont commencé à augmenter au milieu des années 1990. Ce phénomène est limité à l'extrémité supérieure de la distribution des salaires et concerne principalement les 0,1% les mieux payés, dont la part au sein de la masse salariale est passée de 1,2% à 2% entre 1996 et 2007. Cette hausse des inégalités est allée de pair avec des changements dans la composition sociale de cette élite salariale, marquée en particulier par la diminution des salariés travaillant en Province, des PDG, ainsi que par l'augmentation des cadres d'état major non dirigeants, des autres cadres administratifs, des sportifs, et des salariés de la région parisienne. Une approche sectorielle montre que la finance (3% des salariés du secteur privé) est responsable de la moitié de la hausse des inégalités à l'extrémité supérieure de la distribution des salaires. Nous analysons le rôle de la taille de l'activité financière dans cette hausse considérable des salaires de l'élite financière.

Mots-clés : Inégalités, Salaires, Finance, Superstars, France

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

The rise in inequality in the United States is by now almost common knowledge. The Piketty and Saez (2003) series based on US income taxes have shown very clearly the rise in inequalities at the very top of the income distribution since the mid-1960s. By the end of the 20th century, income inequalities had caught up with early twentieth-century levels. However, behind this similarity, there is a striking difference: inequalities at the end of the century were largely due to wage inequalities rather than capital income and to the rise of the working Rich.

This phenomenon is not limited to the USA alone but is much more general and international (Atkinson, Piketty, Saez, 2010). Other English-speaking countries such as the United Kingdom, Canada, Australia and New Zealand have also experienced a sharp rise in inequalities. On the other hand, levels of inequality in continental Europe and Japan remained much more stable over the last thirty 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 hand, or is it simply that the same trend towards greater inequality has been delayed in continental Europe? Figures from Landais (2007, 2009) show that in France, inequalities have been increasing again at a significant rate, but only since the late 1990s.

The analytical description and interpretation of this rise in inequalities is also only just beginning. One element of this trend that has been widely commented is the tremendous rise in CEO pay over the last thirty years (Bebchuck, Grinstein, 2005, Gabaix, Landier, 2008; DiPrete, Erich, 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 those elites, and the availability of their compensation, can explain part of the focus. However, it is not certain that they account for much of the rise in inequality. More recently, partly thanks to the financial crisis and the bonus outrage, the importance of financial wages has been under scrutiny (Kaplan, Rauh, 2009). Philippon and Resheff (2010) show that in recent years the financial sector is an industry that grants wages that are 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 of the share of the top 1% in the United Kingdom was captured by workers of the financial industry.

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

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 inequalities over the last thirty 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 inequalities. And finally, in the last section, we will give elements of interpretation of the rise in top financial wages.

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

The DADS, *Déclaration Annuelle de Données Sociales*, is a statistical dataset based on an administrative source. In order to collect social contributions for the Social Security – payroll taxes which are more or less proportional to an employee's wage – the French Government collects all wages from the private sector. Social contributions for national civil servants are collected through a different system and, at present, national civil servants 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 $1/24^{th}$ of the private sector wage earners from 1976 to 2001 and $1/12^{th}$ of the same population after 2001[2]. The second dataset is made up of exhaustive files of all jobs in the private sectors from 1994 to 2007. The exhaustive files are organized by year and by region. It is not possible to identify a worker from one year to another[3], or even, between 1994 and 2001, from one job to another.

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, Resheff, 2010, Kopczuk, Saez, Song, 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 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*", the two main regulated profit sharing devices (DSDS, 2010 : 35-36). The main limitation is that stock options and free shares are not counted inside this notion of salary, since before 2007 no payroll taxes were collected directly on these forms of wages. 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 second option appears more relevant. Unfortunately, this

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

[3] However, the exhaustive regional files contain the situation in year *t* and year *t-1*, so it is possible to measure evolutions 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.

approach is not possible with exhaustive data files before 2001 since those files lack individual identification variables. Therefore, before 2001, we limit ourselves to full-time non-annex jobs[5] and consider that those jobs are held by different individuals[6].

It is well known that the notion of hourly wage might not be the best approach for studying inequalities at the top of the wage distribution since we find jobs in consultancy or the leisure industry where people get 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 favor 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 really are poor and therefore should be taken into account. 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 inequalities. Moreover, this fraction of the population might not be stable from one year to another and could generate a bias in the patterns of evolution. In order to avoid this limitation, we restrict our sample, as in Kopczuk, Saez, Song (2010), to salaries that are over half a yearly minimum wage[7]. We have made sure that moving this minimum threshold does 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 a minimum wage[8]. In the 1994-2001 exhaustive files we use the annual gross wage of full-time non-annex jobs that are over half a minimum wage.

II. The rise in inequalities in France

In order to analyze the evolution of inequalities, we calculate fractiles at the top of the wage distribution following Piketty (2001) and Piketty and Saez (2003). As the population panel is very important ($1/24^{th}$ and $1/12^{th}$) and the DADS regional files are exhaustive, there is no need to compute here a Paretian approximation of the threshold or the mean of each fractile.

Graph 1 shows the evolution of wages for different fractiles. We find a global increase of wages but at different rates for each fractile. F0-90 is increas-

[5] A job is considered by INSEE as non-annex 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.

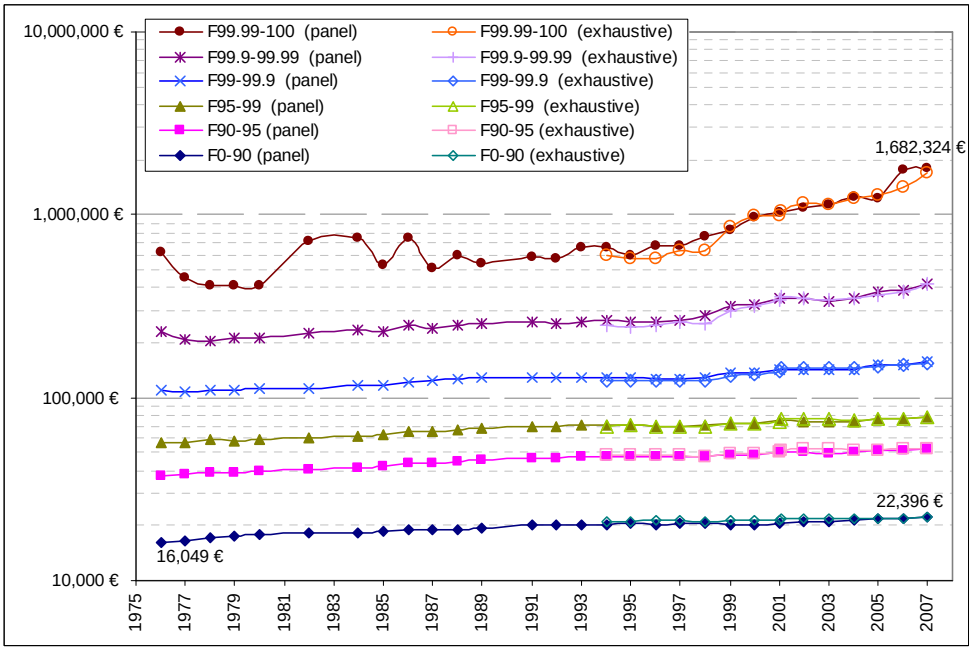
[6] This approximation first leads us to consider that a person who moves from one job to another in the middle of the year has two different jobs and is therefore two different individuals. We also exclude individuals who hold many jobs that are annex, part-time or under the threshold of half a yearly minimum wage. A comparison of the two approaches is possible for 2001. In the first approach (based on the 2001 files) we analyze 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.

[7] This restriction is applied to both the panel and the exhaustive files.

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

ing rather slowly. On the whole, F90-95, F95-99 and F99-99.9 seem to increase regularly and at the same rate. F99.9-99.99 and F99.99-100, especially over the last ten years, increase more quickly. In 2007, the top 0.01%, that is the 1692 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 evolved between 7600 and 46,700 in gross salary and earned on average 22,400 euros a year (Appendix, table A2).

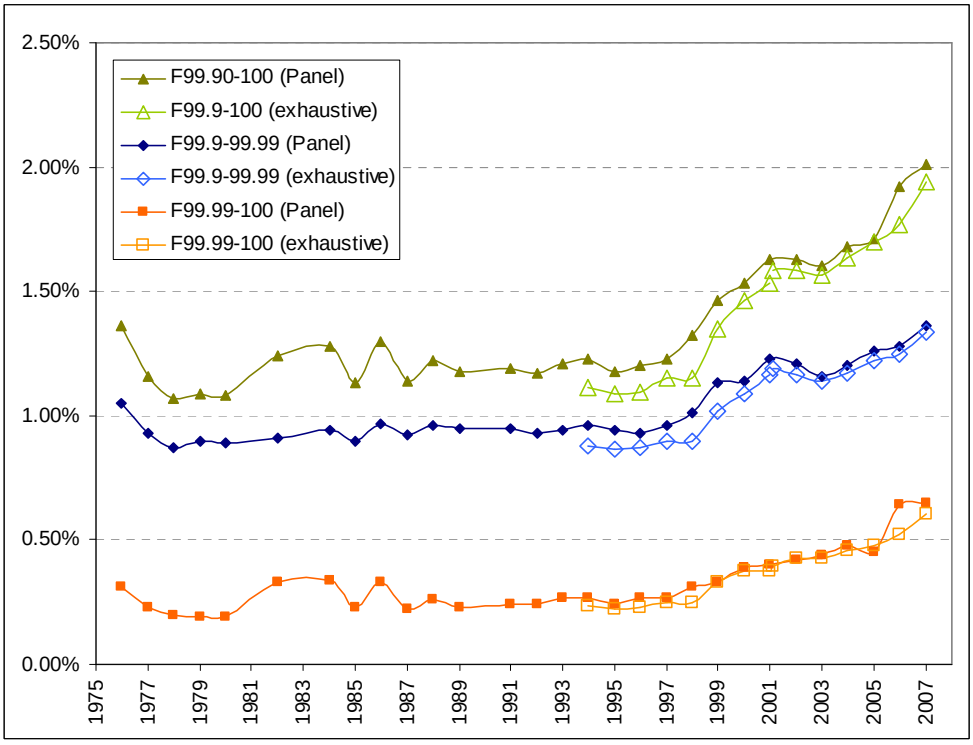
Graph 1. Evolution of constant wages of the different fractiles (in euros, 2007)



Note: In 2007, the mean salary in the top 0.01% was 1,682,324 euros. Sources: Panel DADS (1976-2007) and France – exhaustive job files DADS (1994-2007).

The consequences of this trend are the following. The share of the majority (F0-90) is globally declining, losing 2 points in 30 years (Appendix, Table A3 and A4). The share of the "middle classes" defined by the fractiles between P90 and P99.9 remain globally stable or are increasing at a slow rate (Table A3 and A4). When we move to the top 0.1%, however, we can see a sharp increase in their share after the year 1996. 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.

Graph 2. Evolution of the share of the top 0.1% wage



Note: In 2007, the top 0.1% was paid 2.0% of the salaries. Sources: Panel DADS (1976-2007) and France – exhaustive job files DADS (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 evolution may be questionable. An analysis of the exhaustive files shows that the evolution is largely similar. The top 0.1% increases its share by 0.85%, moving up from 1.1% in 1996 and 1.95% in 2007[9]. Half of this increase is for the top 0.01%.

Is this evolution reliable? There are some limitations in our data, discussed before, which may lead us to both underestimate and overestimate inequalities. Moreover, INSEE is generally cautious with income data from DADS, since they suspect that some reporting errors might mitigate the quality of the description of top incomes. Hence, they generally study lower levels of top incomes (Amar, 2007). INSEE believes that errors have been diminishing over time (DSDS, 2008). If we consider that the main error at this level is that of over-reporting, this should lead us to underestimate the increase in inequalities here.

Nevertheless, when we compare our trends with those of other sources and authors like Landais (2007, 2009) 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% increases by 64% (capital income and exercised stock-options included) and the wages of the top 0.01% increases by 69%. For the same time period and with the same method, we find a 123% (exhaustive files) to 131% (panel) increase in the top 0.01% wages. Our evolution is more pronounced than that given by Landais. Part of the difference may be due to the fact that Landais works on self-declared net wages and on larger population (including civil-servants).

[9] 0.05 point of this increase seems to be due to the change of definition in 2001.

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 we have all incomes on the one hand and wages on the other, the two trends seem rather in line.

Discrepancies remain due to differences in sources, definition and field, but broadly, qualitative results are similar and there is no sign that we have underestimated the increase in inequalities.

III. Changes among the working Rich

Landais (2009) explores several hypotheses in order to explain this trend in terms of biased technological progress and growth of CEO pay due to the growing size of firms or superstars. However, given the limitation of his data, he cannot give many empirical elements in order to confirm either thesis.

The great quality of the DADS does not reside in its precision (due to its limitation to private sector pay) but in its historical depth and its economic and social variables. It is possible to start to explore the change in the social composition of the working Rich.

We therefore studied the change in the composition of the top 0.1% and the top 0.01%. The panel gives the composition in terms of jobs, with the 1982 PCS coding, since 1984. Graph 3 shows some striking transformations within the top 0.1%. The first surprise is the decline in CEOs since 1992[10]. Is this decline due to the change in the composition of wages, and the rise of stock-options, that are not reported in the DADS? We do not think so, since the decline of CEOs inside the top 0.1% was in volume mainly due to the decline of the CEO leading small firms (less than 1000 workers) – CEOs that are less likely to earn stock-options. Those small CEOs accounted for 45% of the top 0.1% in 1992 and dropped to 24% at the end of our period. The share of CEOs for large firms is more volatile, but also diminished during the 2000s.

Although CEO pay for large firms may have risen sharply (Evain, 2007), our data suggests that the rise in inequalities is not mainly due to CEO pay or to the traditional elites running firms but rather to lower rank managers and experts. As long as the CEOs are not the category that is most responsible for the rise in wage inequalities in France or the US (Kaplan, Rauh, 2010)[11], the rise in their pay – although higher than that of average salaries (Evain, 2007 ; Gabaix, Landier, 2008) – appears differently then generally analyzed. It may not only be an internal phenomenon, limited to CEOs alone, should pay be set by a market design (Gabaix, Landier, 2008), or by the managers' power under the constraint of public outrage (Bebchuck, Fried, 2004). The great increase in

[10] The increase in the proportion of CEOs between 1984 and 1992 is harder to analyze. It is known that the coding of the PCS is not very reliable for the 1980s and that 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 the CEO pay 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.

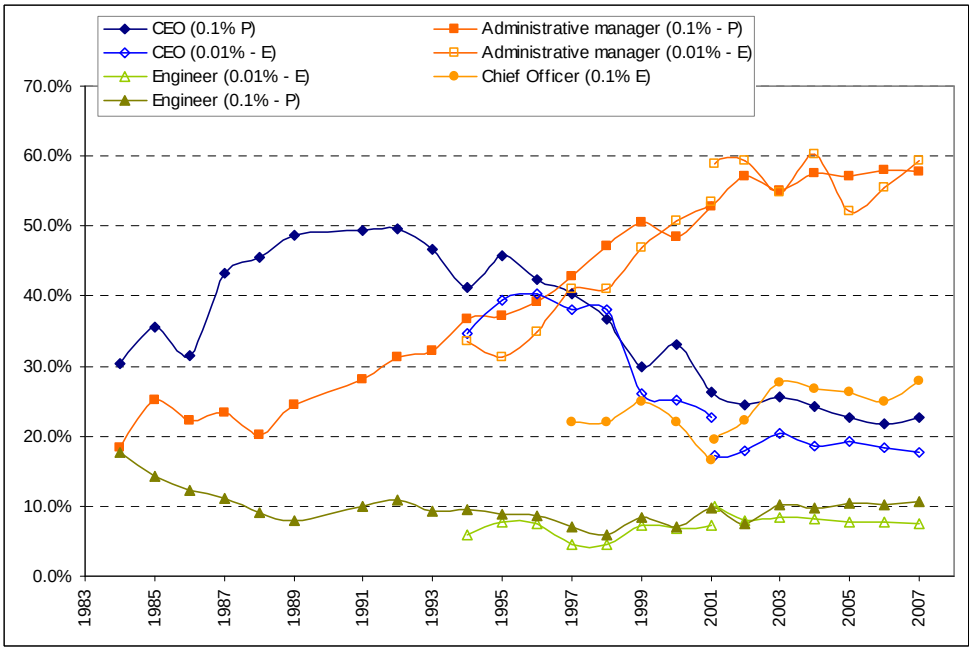
[11] The comparison with Kaplan and Rauh (2010) is not very easy since they use heterogeneous sources, but if we analyze the evolution of executives among the top 0.1%, we find that there is considerable stability.

pay among some lower management wage-earners might also have increased the outside options (market model) or have lowered the public outrage constraint (managers' power model).

Let us now analyze the impact of lower-rank managers on the growth in inequalities. Firstly, it must be noted that it is not due either to the rise in the number of most technical workers such as engineers, whose share stagnates inside the top 0.1% at a limited level of 8-10%. This second element mitigates the traditional interpretation in terms of biased technological progress. The rise in inequalities 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: the administrative managers ("cadres administratifs"). They accounted for a little less than 20% in the mid 1980s. They now represent almost 60% of the top 0.1%. The growth of this category between 1996 and 2007, a period in which inequalities escalated once again, is of 20 points. 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, chief human resources officers, etc. Unfortunately we cannot go into greater details but we suspect, like in the US (Zorn et alii, 2005), that the CFOs, with the financialization of the firm, are at the root of this trend among top management. The other half is due to lower-rank managers. We will see further in the next section whether this pressure on salaries exerted by lower-rank managers is a very general phenomenon or is due to some limited sectors of the economy.

Graph 3. Evolution of the categories among the top 0.1% and 0.01% wage



Note: In 2007, 59% of the top 0.01% were administrative managers. Sources: Panel DADS (1976-2007) and France – exhaustive job files DADS (1994-2007). P stands for Panel and E for Exhaustive files.

The salaries of sports and media superstars are traditionally under great 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 with new technologies such as television, radio, CDs, etc., they can 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 frame that regulates both the superstar labor 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 labor market was also deregulated in the professional sport industry. In football, the Bosman ruling in 1995 put an end to the limitation on the number of foreign players in European football clubs and therefore favored an increase in transfer fees and salaries.

As the DADS is 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 give some insight into two categories: sportspeople and film actors. Sportspeople, like football players, get 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 labor contract and a wage.

Graph 4 shows 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 very bad before 1997, and rather bad 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 2 numbers social categories code does not have such limitations and helps us to see the global trend.

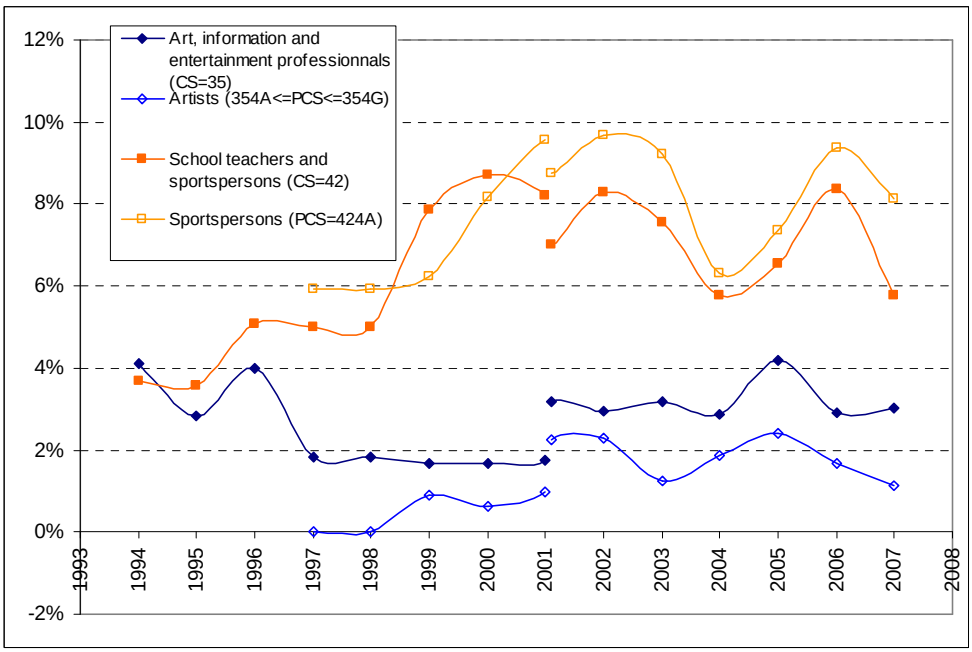
Given those elements, the proportion of artists among this fractile looks rather stable and is near 2% (Graph 4). There is a strong discontinuity in 2001 due to the fact that before this date we cannot sum multiple jobs. Are we missing the real evolution since we do not have their whole income? We do not think so. Newspapers quite often give rankings of the best-paid actors. In 2007, *Le Figaro* counts 12 actors over the threshold of 894 000 euros[12]. In our database, we count 11 actors (PCS=354C) in the top 0.01%. Although their income and expenditure are largely commented, artists – or at least actors – did not contribute much to the renewal of inequalities.

The impact of sportspeople seems more sensible. They increase from 4% up to 8-10% of the top 0.01% fractile. 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[13]. Indeed, the transformation of their labor market enabled by the Bosman ruling seems to have had important effects on wages in the sports industry.

[12] Sources: "Le palmarès 2008 des acteurs", *Le Figaro*, 22/02/2008.

[13] 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.

Graph 4. Artists and sportspersons within the top 0.01%

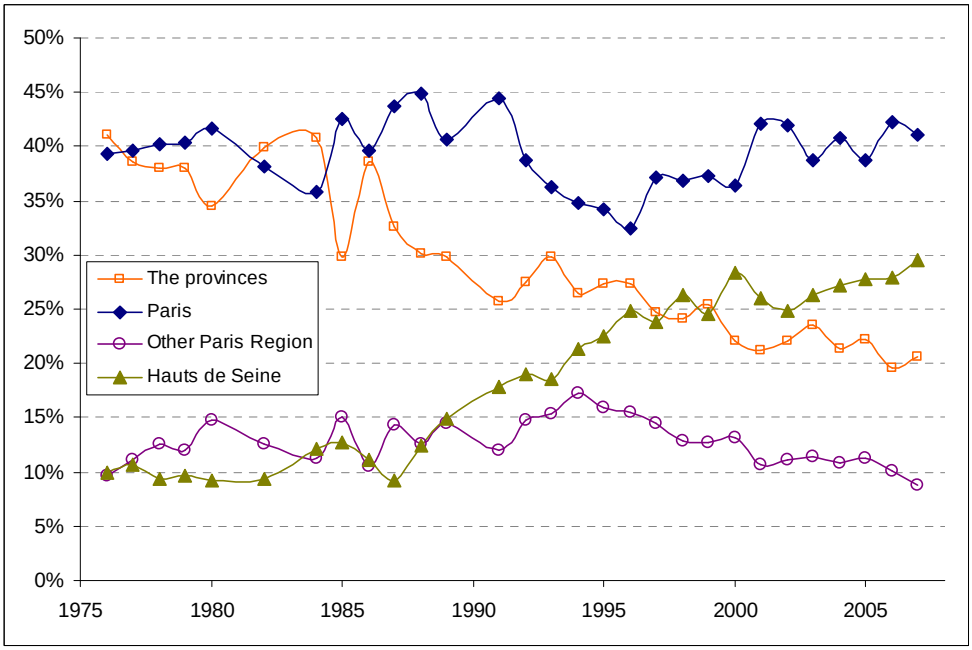


Note: In 2007, 8% of the top 0.01% were sportspeople. Sources: Exhaustive job files DADS (1994-2007).

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 through this article.

Let us explore other social characteristics such as geographical location. In the DADS, we also know the region where people work and, over 30 years, we witness a major concentration of wealth in France's "global city": Paris (Sassen, 1991). The proportion of the working Rich outside the "Ile de France" Paris region dropped from 40% to 20% (Graph 5). There are now more working Rich in one department, "les Hauts de Seine", where we find Paris business center "La Défense", than in all the provinces put together. At the same time, the share of the Paris region among the wage-earners of the whole private sector remained fairly stable (35% of private sector workers).

Graph 5. Paris and the provinces in the top 0.1%



Note: In 2007, 41% of the top 0.1% worked in Paris. Sources: Panel DADS (1976-2007).

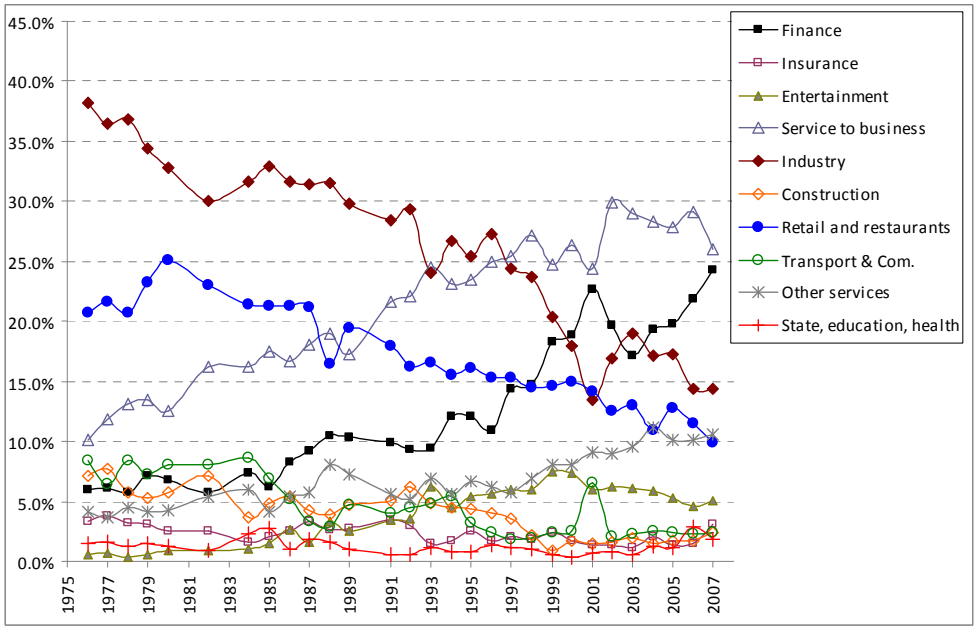
IV. The impact of finance on the renewal of inequalities

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

In Graph 6, one can see important sector transformations among the top 0.1%. Some sectors such as industry, retail and restaurants, transport and communication are now much 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 the industry 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 among the highest-paid workers. In 1976, 10% of the top 0.1% were in service to business and 6% in finance. In 2007, they were 26% and 24% respectively.

Graph 6. Finance and other sectors in the top 0.1%



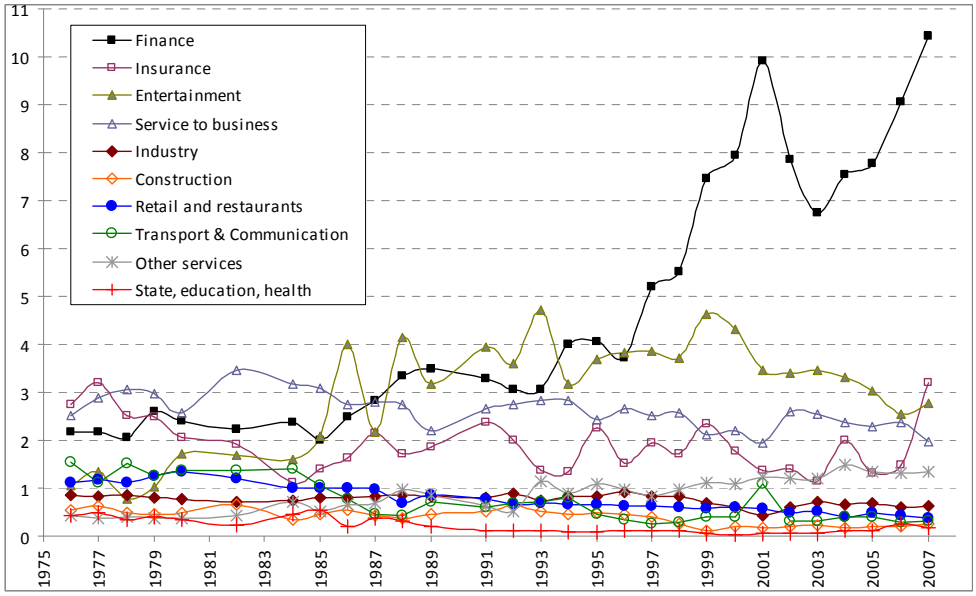
Note: In 2007, 26% of the top 0.1% worked in service to business. We correct the economic activity for holdings (cf. Appendices, sector coding). Sources: Panel DADS (1976-2007).

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[14]. In Graph 7, we compute the odds ratio of the percentage within the top 0.1% with the percentage within the rest of French private sector. We therefore check for the evolution of the size of the sectors inside the global population. The result is very striking. In the early 1980s finance industry, financial workers were twice as present in the top 0.1% as they were under this threshold. This ratio increased smoothly in the 1980s and very sharply in the 1990s. In 2001 it peaked at 10, as a result of the considerable bonuses granted after the excellent year 2000 on the market (Godechot, 2007). The 2001-2002 crisis lowered the ratio to 7 and the following boom led the ratio back to 10.

Although some sectors might be over-represented among the top salaries, like service to business or entertainment, no overrepresentation is as important as that achieved by the finance industry in the last ten years.

[14] 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).

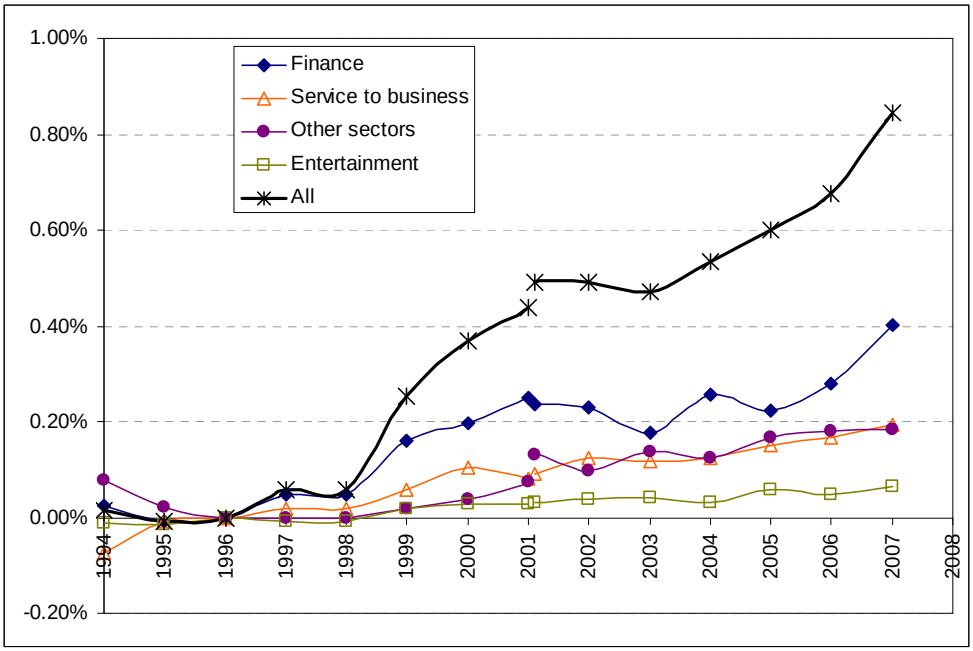
Graph 7. Overrepresentation within the top 0.1%



Note: 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). Sources: Panel DADS (1976-2007).

We find a correlation between the great rise in the overrepresentation of finance among the top 0.1% after 1995 and the rise of inequalities in the same period. Therefore we can try to quantify the contribution of this sector to this increase. We follow here 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 to nearly 23%, and entertainment to 8% of the rise (Graph 8).

Graph 8. Contributions to the increase of the share of the top 0.1%



Note: Between 1996 and 2007, the share of the top 0.1% globally increased by 0.85 points and the share of finance within this fractile increased by 0.40 points. We correct the economic

activity for holdings (cf. Appendices, sector coding). Sources: France – exhaustive job files DADS (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 in that fractile is much higher than that of service to business (2.3) or entertainment (6.7) (Table A5). 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 (cf. Table A4) and to underestimate the impact of finance on this increase. When we look at computation with the panel, 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%	1.91%	0.85%	0.38%
	Contribution of finance to this increase	33%	39%	48%	57%
UK 1998-2008 (Bell and Van Reenen, 2010, Table 3 - ASHE)	Increase in the share	3.00%	1.80%	-	-
	Contribution of finance to this increase	73%	72%	-	-

Note: Between 1996 and 2007, according to the panel, the share of the top 10% globally increased by 1.29 point and the share of finance within this fractile contributed to 51% of this increase. Sources: France – exhaustive job files DADS (1994-2007).

When we compare these with figures from Bell and Van Reenen (2010), we find a similar phenomenon. In both countries, finance played a major role in the renewal of wage inequalities. Two differences must be noted. Both the rhythm of increase in inequalities and the contribution of finance to this phenomenon seem to be 1.5-2 times as high in United Kingdom than in France. The considerable difference in the size of the two financial centers, Paris and London, probably accounts for this difference[15].

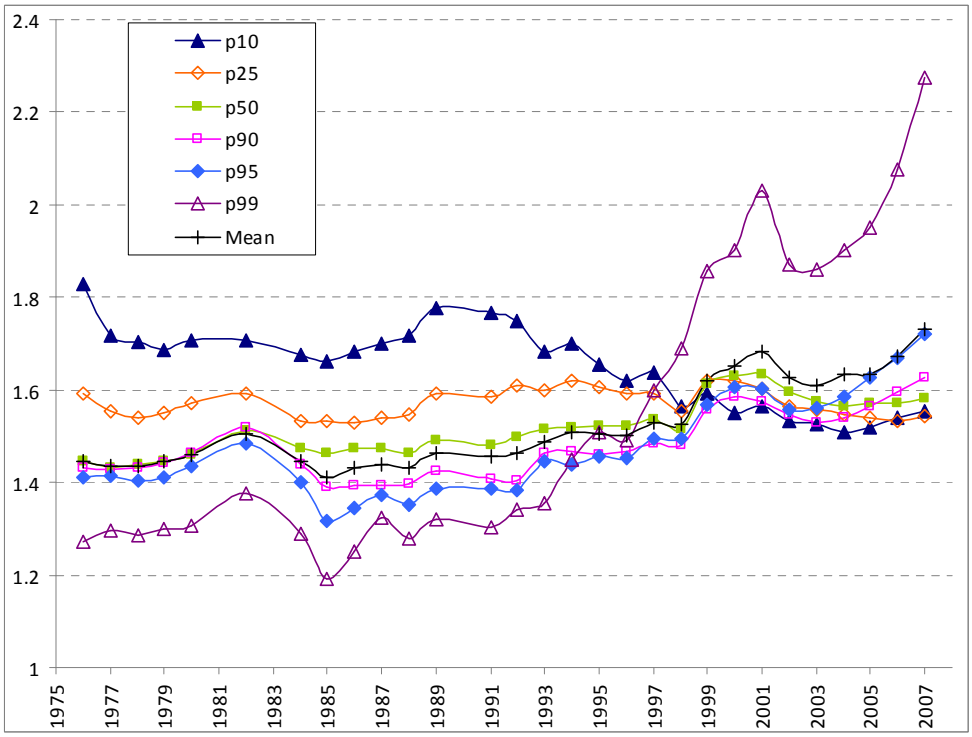
Finance therefore appears to have played a major role in the renewal of wage inequalities in France. How has this trend arisen? Has pay in finance been growing at all levels compared with the rest of the economy? Or is the deviation due to some levels of the income distribution?

On average, finance workers were paid 43% more at the end of the 1970s. They were paid 73% more at the end of the 2000s. However, this moderate growth in relative income in finance hides very heterogeneous situations at different thresholds of the distribution (Graph 9). The P10 ratio

[15] It should be noted that when we do the same analysis on the Paris Region only, we find that the rate of increase in inequality and the contribution of finance to this increase are very similar to the situation in the United Kingdom.

($P10_{Finance}/P10_{Non\text{-}finance}$) declined during the period from 1.8 to 1.5. The lower end of the distribution in finance is now much less favored than it was previously. The P25 ratio remains fairly stable between 1.5 and 1.6. The P50 ratio makes a small increase and the P90 and P95 are in line with the average ratio. However, when we move to the P99 ratio, we see a very sharp rise from 1.3 to 2.3. Therefore, the contribution of finance to the renewal of French inequalities is mainly due to a sharp increase in wages at the upper end of the financial wage distribution and not to a general increase.

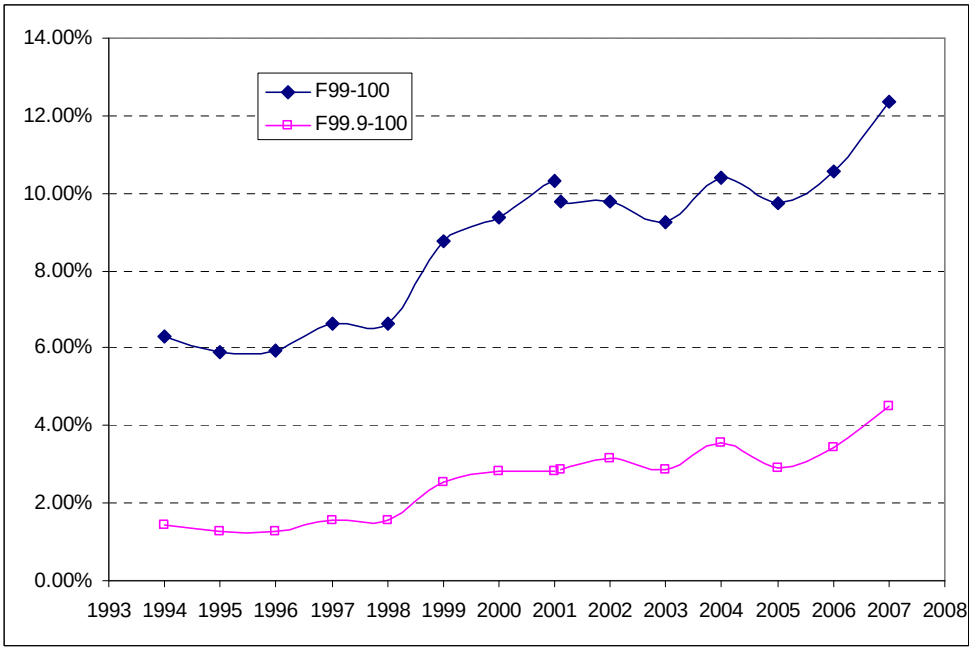
Graph 9. Ratios between finance and non-finance for different thresholds of the distribution (panel)



Note: In 2007, the P99 threshold in finance was 2.28 higher than the P99 threshold outside finance. Sources: Panel DADS (1976-2007).

In fact, inequalities within the financial industry grew at a very rapid rate during the latter 12 years, especially during the late 1990s when prices and volume increased substantially on the stock exchange (Graph 10). The top 1% share grew from 6% to 10%. The 2002 recession on the market (visible in 2003 bonuses paid for the year before) mainly led to a stabilization of this new sharing. The new financial euphoria of the mid-2000s led to another increase in inequalities. In less then ten years French finance saw an increase in inequalities (with the top 1% rising from 6% to 12% of the total wages) similar in scale to that experienced by the whole of the United States during a period of over 35 years (with the top 1% of wages going from 6% to 12% of the total wages between 1965 and 2000, Piketty, Saez, 2003). Although we have two different phenomena, with a single sector on the one hand and a global wage-earner society on the other, this comparison at least shows the great speed of the increase in inequality in French financial sector. We therefore confirm the amplitude of a trend that we had previously detected for France's three main banks (Godechot, Fleury, 2005) on the basis of their *Bilans Sociaux* French compulsory social reports.

Graph 10. Evolution of the share of the top 1% and the top 0.1% in the financial sector



Note: In 2007, in Finance, the F99-100 fractile was paid 12.4% of the salaries. Sources: France – exhaustive job files DADS (1994-2007), Finance sector only.

Who is responsible for the increase in inequalities 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 which we find traders, salespeople, financial analysts, portfolio managers, brokers, financial engineers and risk managers. The category reflects quite well what people on the market generally call "front offices" (Godechot, 2001). This group is very likely to capture the impact of the growth of financial markets on wages. Unfortunately the category does not allow close scrutiny of the latter 12 years and does not enable us to view the great boom of the financial markets during the second half of the 1990s (cf. Graph 13). Second, due to its novelty, firms might not be very used to 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 (Godechot, 2007), are always coded so. Despite its limitations, the category is a good proxy for the recent impact of the financial market (with maybe a little underestimation of the actual scope).

During the latter five years, the importance of this category grew in the fractiles of the financial sector. They made up 20.6% of the top 1% in finance. They represented 27.8% in 2007 (Table 2). The same growing trend is observable within the French private sector. At the end of the period, market managers accounted for 13% of the top 0.01% – that is, more than professional sportspeople – and were 150 times more present than in the rest of society. Therefore, although we do not have much historical depth, the impact of market managers on the 2005-2007 rise in inequalities suggests that it is mainly the boom of financial market activity since the mid-1990s that fueled inequality in finance.

Table 2. Importance of market managers among top fractiles

Domain	Year	Top 0.01%	Top 0.1%	Top 1%	Top 10%	All	N
Finance only	2003	-	28.4%	20.6%	9.1%	1.674%	6801
	2004	-	22.6%	21.5%	9.0%	1.656%	6803
	2005	-	26.9%	23.1%	9.6%	1.843%	7697
	2006	-	27.3%	25.3%	10.6%	1.970%	8584
	2007	-	30.8%	27.8%	11.6%	2.097%	9334
France	2003	8.0%	4.2%	1.8%	0.51%	0.078%	8923
	2004	9.0%	4.8%	1.9%	0.50%	0.073%	8624
	2005	8.1%	5.3%	2.0%	0.53%	0.078%	9872
	2006	9.0%	6.4%	2.2%	0.56%	0.081%	10758
	2007	13.0%	7.4%	2.5%	0.59%	0.084%	11368

Note: In 2007, 30.8% of the top 0.1% finance wage-earners and 7.4% of the top 0.1% private sector wage-earners were market managers (PCS=376A). Sources: France – exhaustive job files DADS (2003-2007), Finance sector only.

To what extent is this very fast-growing inequality visible to people working in the financial sector? Do those earning normal salaries and high-end salaries work in the same environment and find themselves in a situation where they will have to cooperate, generating possible frustrations? Or are high-end salaries concentrated in very specific firms, like hedge funds, where they constitute a sort of cooperative of working Rich. In order to answer this question, we decompose the variance both within and between financial units[16] (Graph A1). Results show that inequalities have mostly been growing within units rather than between units. As Graph 9 also shows, finance was once a sector that was both well paid and relatively egalitarian, with a pay grid rather similar, in its philosophy, to that of civil servants. It is now at the forefront of inequality. The change occurred within a few years, in the middle of the 1990s, and now coworkers separated by tremendous inequalities share the same buildings. We could expect this type of inequality to lead to some form of relative frustration. Although no sign of major protest (such as strikes) were particularly visible within the French banking system, we might see some consequences in the recurrent hesitation in this industry between two types of development: integration of financial activities and retail banking, or separation of those two components (Lordon, 2002). The root of this hesitation may be found in the profound inequalities that separate the two branches of finance.

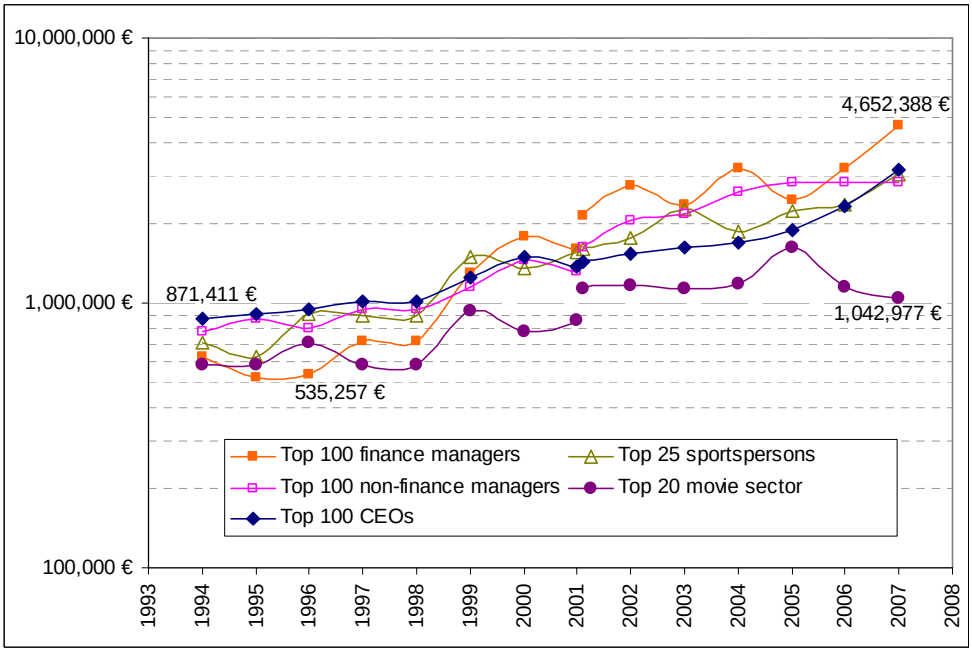
Elements of interpretation

Finally, Graph 12, which compares the evolution of top salaries, enables us to sum up some of our main findings. In the graph, we analyze 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 movies, TV and the video sector (most of whom were 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. One will find similar series in appendices for the top 1000

[16] The notion of a unit of a firm (*établissement*) is based on geographical addresses. The firm is a juridical notion. A firm may have one or more units.

based on the panel (Graph A2), showing how finance, even at the broader level of the top 1000, happened to catch up with the top 1000 CEOs and the top 1000 non-finance managers and managed to leave behind the top 1000 entertainment stars.

Graphe 12. Evolution of the top wages for several well-known jobs.



Note: In 2007, the top 100 Finance managers were paid 4,652,388 euros. Evolutions are in 2007 constant euros. Sources: France – exhaustive job files DADS (1994-2007).

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

Several elements of interpretation have been provided in order to explain this extraordinary wage trend in the financial industry. The importance of human capital has been researched both in Philippon and Resheff (2009) for the US, and in Godechot (forthcoming) for one of France's main banks. Despite the importance of diplomas at the core of the financial markets, even very detailed diploma variables in traditional wage equations fail to explain the wage structure or its evolution.

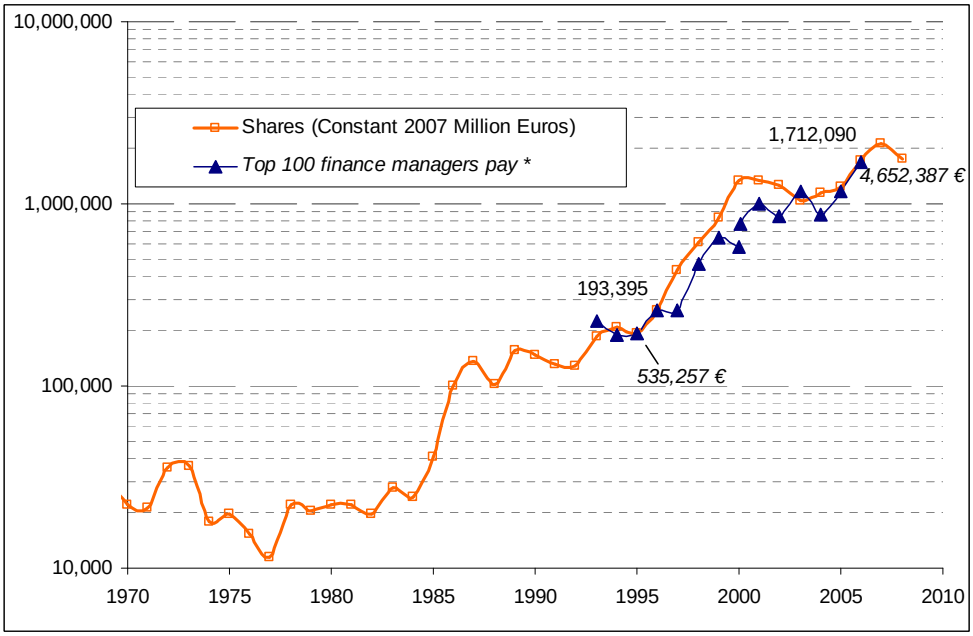
A great deal of recent research links the way in which compensation in the financial industry has evolved with the evolution of the size of activity (Meunier, 2007, Kaplan, Rauh, 2010, Célérier, 2010). Kaplan and Rauh (2010) therefore give an impressive series on the rise in the amount under management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

Although the volume of shares exchanged on the Paris stock market (Graph 13) may not be fully representative of the increase in the size 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, is mainly an activity of intermediation in France (brokering, equity derivatives pricing and marketing, etc.). This graph 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 very striking[17]. Between 1995 and 2006, volume rose by 8.85. During the same period, the top 100 finance managers' wages increased by 8.26. The fit of the two curbs, although not perfect, is nevertheless impressive[18].

Graph 13. Volume of shares exchanged on the Parisian stock-market and the top 100 finance managers' pay.



Note: In 2006, 1,712,090 million euros' worth of shares were exchanged on the Paris market. In 2006 (that is, in 2007 for 2006 activity), the top 100 finance managers were granted 4,652,387 euros.
* We rescale the top 100 finance managers curb a) in year *n-1* as bonus are generally in year n for the year *n-1* activity, b) so that the two curbs share in 1995 the same reference point.
Sources: France – exhaustive job files DADS (1994-2007) and Euronext, Euronext Fact Book, Historical series - Turnover. http://www.euronext.com/editorial/wide/editorial-20786-EN.html

Several interpretations of such a strong correlation (r=0.92) are possible. First, it must be acknowledged that this correlation of pay with an exogenous observable variable enables us to reject a traditional explanation in terms of incentives in a principle-agent framework. If an agent's pay is correctly monitored by the principle it should be tied to the agent's effort and not to an exogenous form of chance like the turnover on financial markets, an indicator for which financial managers can hardly be said to be responsible. Therefore, any observable form of exogenous chance should be discounted from the incentive indicator (Holmstrom, 1981). Bertrand and Mullainathan (2001) uses this feature in order to test the efficiency of CEO pay. They conclude that

[17] The effect of the first boom of the 1980s on compensations is harder 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 great 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 (Godechot, Lagneau-Ymonet, 2009).
[18] If we regress the logarithm of the top 100 average wages on the logarithm of volume index we find a R2 of 85% and a very significant coefficient of 0.9.

poorly-monitored CEO are likely to be rewarded for unexpected luck such as an increase in petroleum in the oil industry. Here the strong correlation between global volume and top compensations in finance leans in the same direction. At the very least, it shows that the evolution of top compensations are difficult to understand within a classical principal-agent framework.

Nevertheless, the traditional but intriguing correlation between pay and size was recently given a different 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 very slightly better than the 250th CEO (that is to have an impact of only 0.016% more than the 250th firm's capitalization) 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 synchronic relation between logarithm of pay and logarithm of size is only of 1/3, it increases to 1 in a diachronic approach.

This mechanism was also invoked for financial labor markets by several authors (Meunier, 2007, Kaplan, Rauh, 2010), and Célérier developed a model (2010) 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, the hierarchy of pay both within and between sectors follows only a natural, independent hierarchy of talent. Pay is distorted by the skewness of the distribution of volume but we cannot talk of rents. The mechanism nevertheless supposes very strong conditions: that is, both perfect mobility within and between sectors and perfect knowledge of the hierarchy of talent.

In order to put this idea to the test, let us compare the evolution of managers' rank and salary during the 1996-2001 boom. Let us imagine that before the boom, in 1996, the best managers were assigned to the biggest project in an assortative matching process similar to that described by Gabaix and Landier. The boom in finance, and moreover the increase in the size of financial projects, should increase pay in finance but also attract a fair amount of non-finance managers in order for them to work on bigger projects and earn more. Therefore salary increases and evolution of salary rank should be the same for both finance and non-finance top managers.

Table 3. The fate of 1996 top 10% of managers in 2001

	Evolution	Mean (sd)	N
Ranks of 1996 top 10%	In 1996, managers working in non-finance in 1996	94.94 (2.88)	3178
	In 2001, managers working in non-finance in 1996	86.47 (19.50)	3178
	In 1996, managers working in finance in 1996	95.50 (2.94)	369
	In 2001, managers working in finance in 1996	88.52 (19.26)	369
Wages of 1996 top 10%	In 1996, managers working in non-finance in 1996	113 126 € (43 421)	3178
	In 2001, managers working in non-finance in 1996	126 914 € (75 858)	3178
	In 1996, managers working in finance in 1996	125 724 € (66 125)	369
	In 2001, managers working in finance in 1996	174 582 € (165 878)	369
Moving from non-finance to finance (5 years later)	1996 top 10%, managers working in non-finance in 1996	1.1% (0.105)	3178
	1996 bottom 90%, managers working in non-finance in 1996	1.1% (0.104)	29103
	1991 top 10%, managers working in non-finance in 1991	1.7% (0.129)	2641
Increase of pay between 1996 and 2001 for the 1996 top 10%	managers working in non-finance in 1996	13% (0.49)	3178
	managers working in finance in 1996	38% (0.93)	369

Note: Thanks to the panel, we can study here the population of managers (entertainment sector excluded) working both in year *t* and year *t+5* in order to analyze individual evolution. We rank this population both in time *t* and *t+5* and isolate the top 10% in *t*. Sources: Panel DADS (1976-2007).

Table 3 shows that among the 1996 top 10% of managers, salaries and ranks, although a little higher, were quite close. Nevertheless, despite the 1996-2001 boom in financial activities very few top managers (1.1%) moved from non-finance to finance. Contrary to the assortative matching hypothesis, this proportion is similar to that of the rest of the distribution of managers and inferior to the 1991-1996 period, when finance was not booming in France. As a thought experiment, we simulated the mobility from non-finance to finance if 1996 salary ranks were to be maintained in 2001. In such a case, 10% of non-finance top managers would have moved to finance instead of 1.1%, and 89% of 1996 finance top managers would have moved to non-finance instead of 15%. As a result of this low mobility, 1996 non-finance top managers received an average 13% individual wage increase while 1996 finance managers received a 38% wage increase. If we consider the two populations as equally talented in 1996, then the 25% extra salary increase for 1996 finance workers can be considered as a rent that is not due to extra talent.

As finance managers "are largely 'made' by circumstance rather than 'born' to work on Wall Street" (Oyer, 2008) than we can conserve the idea that the size of financial activity is responsible for the increase in pay without plugging it with 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 job[19]. In previous work (Godechot, 2007, 2008), we develop 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. 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 analyze 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 be 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. 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. We can therefore find an explanation of the trend in finance pay without considering that the financial elites are the natural elite of society.

Conclusion

France has experienced a strong increase in inequalities 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 inequalities.

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 size of financial activity and pay may not be only due to a multiplicative effect of size on 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 twelve years.

Although the basic model linking size of financial activity and pay might be relatively similar in the two cases, more work is needed in order to separate the contribution of initial talent and acquired assets. This research program has an obvious policy implication. With the 2008 financial crisis, some social analysts pleaded in favor 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 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

[19] 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 favors the first hypothesis.

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 has been subject to debate. It should be noted that those 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.

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Appendices

Table A1. 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 €	612,332 €	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 €	78,060 €	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 A2. Table A1. 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

Table A3. Share of the total gross wage of different fractiles (Panel)

Year	F0-90	F90-95	F95-99	F99-99.9	F99.90-99.99	F99.99-100.0
1976	72.85%	9.37%	11.41%	5.01%	1.05%	0.31%
1977	73.55%	9.31%	11.20%	4.78%	0.93%	0.23%
1978	73.82%	9.28%	11.13%	4.70%	0.87%	0.20%
1979	74.05%	9.21%	11.00%	4.64%	0.90%	0.19%
1980	74.08%	9.20%	11.01%	4.64%	0.89%	0.19%
1982	73.97%	9.22%	10.99%	4.58%	0.91%	0.33%
1984	73.82%	9.23%	11.04%	4.65%	0.94%	0.34%
1985	73.87%	9.31%	11.09%	4.59%	0.90%	0.23%
1986	73.45%	9.35%	11.21%	4.70%	0.97%	0.33%
1987	73.44%	9.40%	11.26%	4.75%	0.92%	0.22%
1988	73.16%	9.45%	11.37%	4.80%	0.96%	0.26%
1989	73.04%	9.50%	11.43%	4.85%	0.95%	0.23%
1991	73.22%	9.50%	11.33%	4.76%	0.95%	0.24%
1992	73.45%	9.48%	11.23%	4.67%	0.93%	0.24%
1993	73.19%	9.59%	11.35%	4.66%	0.94%	0.27%
1994	73.17%	9.63%	11.33%	4.65%	0.96%	0.27%
1995	73.35%	9.58%	11.27%	4.62%	0.94%	0.24%
1996	73.55%	9.53%	11.18%	4.54%	0.93%	0.27%
1997	73.54%	9.51%	11.15%	4.57%	0.96%	0.27%
1998	73.40%	9.49%	11.17%	4.63%	1.01%	0.31%
1999	72.57%	9.65%	11.44%	4.88%	1.13%	0.33%
2000	72.39%	9.66%	11.49%	4.92%	1.14%	0.39%
2001	72.13%	9.68%	11.56%	5.01%	1.23%	0.40%
2002	72.52%	9.58%	11.36%	4.90%	1.21%	0.42%
2003	72.65%	9.56%	11.30%	4.89%	1.16%	0.44%
2004	72.60%	9.53%	11.28%	4.91%	1.20%	0.48%
2005	72.49%	9.52%	11.30%	4.98%	1.26%	0.45%
2006	72.37%	9.46%	11.24%	5.01%	1.28%	0.64%
2007	72.26%	9.44%	11.24%	5.05%	1.36%	0.65%

Table A4. Share of the total gross wage of different fractiles (Exhaustive files)

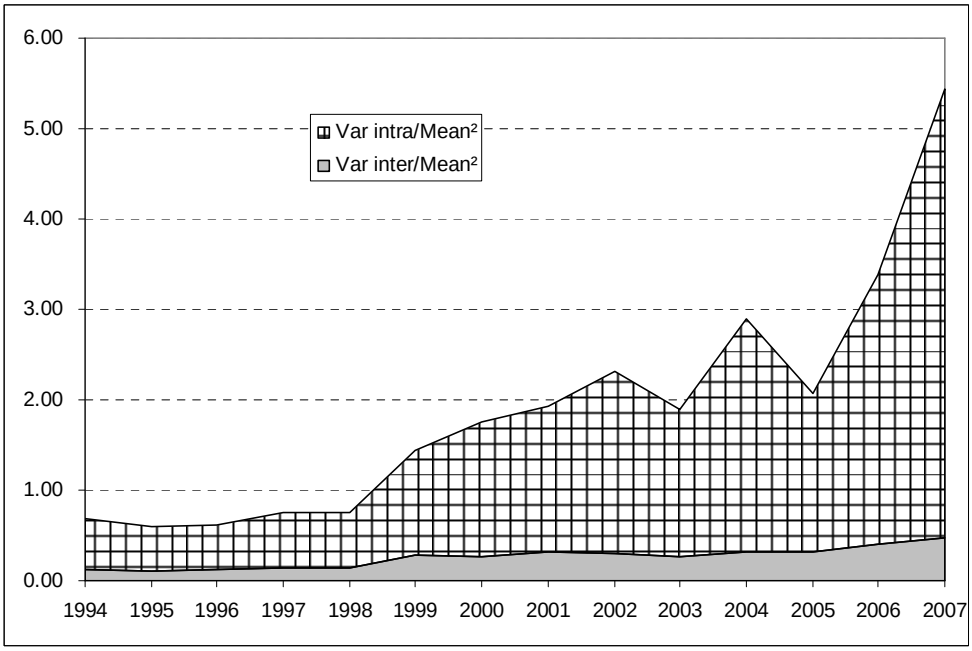
Year	F0-90	F90-95	F95-99	F99-99.9	F99.9-99.99	F99.99-100
(Old series) 1994	74.03%	9.45%	10.99%	4.42%	0.88%	0.23%
1995	74.21%	9.41%	10.94%	4.36%	0.86%	0.22%
1996	74.33%	9.38%	10.87%	4.33%	0.87%	0.23%
1997	74.28%	9.37%	10.85%	4.36%	0.90%	0.25%
1998	74.28%	9.37%	10.85%	4.36%	0.90%	0.25%
1999	73.77%	9.41%	10.96%	4.51%	1.02%	0.33%
2000	73.43%	9.44%	11.05%	4.62%	1.09%	0.38%
2001	73.19%	9.44%	11.11%	4.73%	1.16%	0.37%
(New series) 2001	72.49%	9.63%	11.40%	4.90%	1.19%	0.39%
2002	72.68%	9.60%	11.30%	4.84%	1.16%	0.43%
2003	72.50%	9.77%	11.34%	4.82%	1.14%	0.43%
2004	72.73%	9.55%	11.23%	4.86%	1.17%	0.46%
2005	72.55%	9.55%	11.28%	4.93%	1.22%	0.48%
2006	72.48%	9.53%	11.26%	4.96%	1.25%	0.52%
2007	72.30%	9.50%	11.24%	5.02%	1.34%	0.60%

Table A5. Sector composition of the top 0.01% (Exhaustive files)

	Finance			Service to business			Entertainment			Other		
Year	Share of total wages	Share of top 0.01% headcount	Odds ratio	Share of total wages	Share of top 0.01% headcount	Odds ratio	Share of total wages	Share of top 0.01% headcount	Odds ratio	Share of total wages	Share of top 0.01% headcount	Odds ratio
1994	0.06%	25%	8.98	0.05%	20%	2.99	0.02%	8%	7.55	0.11%	47%	0.41
1995	0.04%	18%	6.08	0.06%	27%	3.57	0.02%	8%	6.95	0.11%	47%	0.40
1996	0.04%	16%	4.89	0.07%	30%	4.24	0.03%	11%	9.76	0.10%	43%	0.37
1997	0.06%	26%	9.27	0.07%	28%	3.71	0.02%	8%	6.82	0.10%	38%	0.33
1998	0.06%	26%	9.27	0.07%	28%	3.71	0.02%	8%	6.82	0.10%	38%	0.33
1999	0.13%	36%	15.75	0.07%	23%	2.57	0.04%	11%	8.51	0.10%	31%	0.26
2000	0.13%	32%	13.54	0.09%	24%	2.63	0.04%	11%	8.41	0.12%	32%	0.27
2001	0.15%	39%	18.68	0.08%	23%	2.37	0.04%	10%	7.35	0.10%	28%	0.24
2001	0.16%	37%	18.23	0.08%	23%	1.87	0.04%	11%	6.30	0.11%	30%	0.24
2002	0.16%	33%	16.14	0.10%	26%	2.19	0.05%	12%	7.05	0.12%	29%	0.24
2003	0.13%	29%	13.92	0.09%	26%	2.30	0.05%	12%	8.09	0.15%	33%	0.27
2004	0.19%	37%	19.52	0.10%	23%	1.97	0.04%	9%	6.29	0.13%	31%	0.25
2005	0.14%	28%	13.27	0.11%	24%	2.02	0.06%	12%	8.68	0.17%	35%	0.29
2006	0.17%	31%	14.65	0.12%	27%	2.22	0.05%	12%	7.79	0.18%	31%	0.25
2007	0.25%	37%	19.42	0.12%	23%	1.73	0.06%	10%	6.67	0.17%	30%	0.25

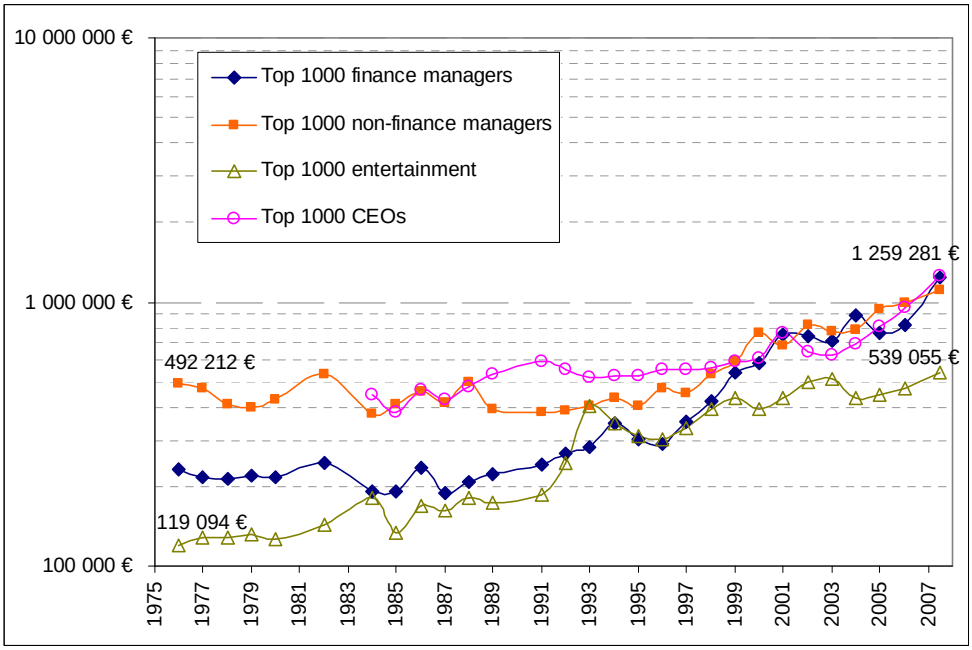
Note: In 2007, finance members of the top 0.01% earned globally 0.25% of total wages. They were 37% of this top fractile and were 19.4 more represented (in terms of odds ratio) in the top fractile than they are in the rest of the distribution. We correct the economic activity for holdings (cf. Appendices, sector coding). Sources: France – exhaustive job files DADS (1994-2007).

Graph A1. Decomposition of the variance of wages in the financial sectors



Note: In 2007, in the financial sector, the variance of wages was 5.4 times the square mean. This dispersion of wages ratio can be decomposed in the following way: the dispersion within units is 4.95, the dispersion between units is 0.48. Sources: France – exhaustive job files DADS (1994-2007), Finance sector only.

Graph A2. Top 1000 finance managers, non-finance managers, entertainment and CEOs



Note: In 2007, we estimate, based on the panel that the top 1000 CEOs were paid 1,259,281 euros on average. Sources: Panel DADS (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) subsidy.

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.