"Gender disparities in criminal justice"

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January 2017

Abstract: This paper uses the universe of convictions occurred in France between 2000 and 2003 to document the gender gap in criminal justice. First, during this period, and after controlling for very precise description of the offenses as well as other observable characteristics, women get prison sentences 15 days shorter than men on average. This represents a 33% decrease in comparison to the average prison length in the sample (44 days). Second, this gender gap is also observed within pairs of criminals, each consisting of one man and one woman, who are convicted together, on the same day, by the same person and for the same crime. Lastly, this paper present robust evidences that the gender gap is affected by the judges' gender but not the prosecutors' gender. Using the evolution of courts' composition between 2000 and 2003, results show that a one-standard-deviation increase in the number of women in the court decreases the gender gap by 10%.

1. Introduction

Does the judicial system treat women and men equally? Gender has been proved to be a support for extensive discrimination in different social mechanisms, including grading at school and firm promotion. Biases are mainly to the disadvantage of women. The treatment of the sexes by the judicial system seems to differ from the prior observations. Men are more likely to be arrested by the police and then to be sent to court. Their sentences are, on average, of a longer duration. Those facts tend to characterize a bias against men. This rapid conclusion is coherent with the standard gender stereotypes that present males as more violent and risk-takers and women as more gentle and risk-averse. However, this apparent heterogeneity could simply be derived from differences among criminal behaviors and not from disparities in judicial treatment of gender. In this paper, I use several methodologies to investigate this question in the French context.

In 2010, in France, women represented 10.5% of convicted persons for the most common criminal category[2] (i.e. excluding the most severe crimes like murder or rape which are

judged by specific courts). Overall, 40% of women were sentenced to a non-monetary sanction (e.g., probation, prison, suspended prison), and 8.5% were sentenced to prison. The same year, 47% of male offenders were sentenced to non-monetary sanctions and 19.9% to prison. The gender gap is also observed – while attenuated – before judgment. According to the French Ministry of justice, women represent 18% of the defendant but only 10.5% are sued (Büsch et al 2016). This gender gap is not specific to France. Female prisoners are slightly more numerous in the USA (8.8% of all prisoners) than in France (approximately 3.5% of all prisoners), but they are still largely "under-represented". According to the world prison brief[3], women represent between 2 and 9% of the prison population in all countries.

This gender gap in conviction and sentencing could be related to another important gender gap within police and judicial administration. Indeed, the regalian power of the state is traditionally devoted to men. In both England and France, women represent between 20% and 30% of the police forces[4]. Among judges, women represent only 25% of the workforce in England and 25% of the federal judges in the US[5]. The situation is much more balanced in France, where women are more numerous than men. However, this evolution is recent (the profession was only opened to women in 1946), and women are still underrepresented in high-ranking positions. This gap could be partly responsible for the differences in conviction probability and sentences between men and women. Indeed, men and women have been shown to judge differently in some specific cases (e.g., Fischer 1997, Boyd Epstein Martin 2009), and they probably react differently to defendants' characteristics.

In this paper, I first quantify and then try to understand the origins of the gender gap in sentencing. I rely on two different administrative datasets from the French Ministry of Justice. The first one contains all convictions for crime in France from 2000 to 2003. For each conviction, the dataset contains precise information on crime type – a 1400-cell nomenclature that in turn contains all possible cases provided for by the law –, sentences, criminal record, dates, place, procedural mechanisms and some socio-demographic variables: age, sex and nationality. The second dataset gives the gender composition of the 175 first instances of criminal court proceedings in France both in 2000 and in 2003. Unfortunately, the data are not available for the two years in between. Both the judges' and prosecutors' genders are available.

Using the datasets, I first document the gender gap in sentences over the period. While the average prison sentence for men is 47 days, women get, on average, 19 days. They also get shorter probation time and longer suspended prison time. Even after controlling for all the

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[2] Those statistics come from the « Annuaire statistique de la justice ». http://www.justice.gouv.fr/budget-et-statistiques-10054/annuaires-statistiques-de-la-justice-10304/

[3] http://www.prisonstudies.org/news/more-700000-women-and-girls-are-prison-around-world-new-report-shows

[4] England: https://www.gov.uk/government/publications/police-workforce-england-and-wales-31-march-2013/police-workforce-england-and-wales-31-march-2013 ; France: http://infos.emploipublic.fr/metiers/les-secteurs-qui-recrutent/les-metiers-de-la-securite/polices-municipale-et-nationale-gendarmerie-quelle-place-pour-les-femmes/apm-4409/ .

[5] England and Wales: http://www.theguardian.com/law/2014/oct/09/uk-lags-europe-gender-balance-judiciary ; USA: https://www.acslaw.org/acsblog/male-judges-far-outnumber-women-judges-federal-court-graph-shows .

observable characteristics – including a very precise description of the crime – this gender gap remains sizable: women get prison sentences that are 16 days shorter.

However, it is possible that some differences in crimes remain. It is the case if, for example, men tend to commit the most severe offense within each (small) category. In order to overcome this problem, this paper document the gender gap among group of two offenders of different sex who are convicted together. In these situations, the charges, judges, and external context are all similar for the members of the group. The gender gap measured by this strategy is even higher than what was measured before, with an average difference of 38 prison days.

It is still possible that responsibilities diverge among members of the group. Indeed, the gender gap could be explained if men tend to be leaders more frequently or if women present unobserved characteristics that are associated with shorter sentences. I address this concern by restricting the sample to groups in which either the woman is convicted for more charges than the man or the woman has more past convictions than the man. In those two situations, women have "worse" observable characteristics and we can reasonably expect that the man is less frequently the leader of the group. Even if the gender gap is either smaller or cancelled, women are far from being as harshly sentenced as in other heterogeneous group (when men have the worst observed characteristics or in non-mixed groups).

If the previous results are driven by unobserved heterogeneity between men and women (e.g., family situation, professional status, academic level), the differences in sentencing should not be affected by the sex of the judges. On the contrary, if the size of the gap is affected by the gender composition of the court, it will reinforce the hypothesis of disparities in the judicial treatment of genders. I test this alternative by using the gender composition of the court.

Gender gap decreases with the share of women among judges in the court. An increase of one standard deviation in the share of women decreases the gender gap by 1.5 prison days (around 10% of the gender gap). Prosecutors do not seem to affect differences neither in sentences nor in pre-trial decisions. This result is coherent with previous literature that focused on criminal justice in the US and used a very similar approach (Schanzenbach 2005), along with several papers in education (Carrell Page West 2009; Boring 2015) and labor economics (Kunze Miller 2014). This literature demonstrates that women tend to be less affected by gender, even when this means being harsher on women.

This paper provides evidence of a distorted treatment of men and women by the judicial system. Though, the results cannot be interpreted in terms of discrimination so far. Indeed, the harshness of sanction could be different – for example if prison for women are worse than prison for men – and the specific deterrence effect could also be different – if one prison day has more effect on women's recidivism than it has on men's recidivism. Those aspects are beyond the scope of this paper but if one of them is true this constitute a rational base for gender disparities.

This paper stands at the frontier of two different areas of literature. The first one follows Becker's seminal book on discrimination (Becker 2010) and is devoted to gender biases in different social areas. The two most dynamic fields are education and labor. In a setting close to the last one used here, Kunze and Miller (2014) use Norwegian data on private employment to document the fact that women have fewer chances to be promoted than men do. More precisely: chances are higher when there are more women at the next hierarchical level but are lower when there are more women at the same rank. On the contrary, Bagues and Volart (2010) show that in Spain, women have fewer chances to be hired when there are more women on the recruitment committee.

In education, Carell et al (2009) document the effect of the sex of the teacher on students' performance. They show that the gender gap disappears when teachers are women. This effect is partly reversible. Using students' evaluations of the teachers, Boring (2014) shows that, after controlling for performance, women obtain lower scores than their male colleagues do. This discrimination is more present among male students.

The second related literature follows Becker seminal paper on the economics of crime (Becker 1968) and is devoted to optimal judicial decisions and bias. Several papers have already documented the importance of race (Shayo Zussman, 2009; Anvar et al, 2012; Depew et al, 2016), age (Anvar et al, 2014), political convictions (Anvar et al, 2015), media content (Philippe Ouss, 2015), media pressure (Lim et al 2012), and cognitive bias (Guthrie et al 2002).

The effect of sex, from both the judges' and the defendants' perspectives, has also been addressed. Though judges of the two sexes treated the majority of the cases equally (Fischer, 1997; Boyd, Epstein, Martin, 2009), some differences were observed for decisions regarding sexual harassment, abortion, and death penalty. For male judges, having a daughter seems to increase the probability of voting in favor of women (Glynn, Sen, 2014). The importance of the gender gap among defendants has been addressed (Mustard, 2001; Starr, 2015; Depew et al 2016) in the US context. As in the present work, the author shows that women are less frequently convicted and are less severely sentenced when they are convicted. Starr (2015) emphasizes the importance of the gender gap in pre-trial decisions. In particular, controlling for arrest offense, charges are less severe for women. Glaeser and Sacerdote (2003) also show that the victims' gender matters. In vehicular homicides, offenders who kill women get 59% longer sentences and offenders who killed black people get 60% shorter sentences.

The closest work to the one presented here is a paper by Schanzenbach (2005), who also studies the interaction between the gender of the judges and the gender of the defendant. The author shows that average sentences do not diverge depending on the age, race, or sex of the judges. However, Schanzenbach documents that the gender gap is reduced when the judge is a woman and that racial minorities are less discriminated against when the judge also is of a racial minority. He interprets the first result as the sign of paternalistic bias among male judges.

This paper replicates some results from previous studies on gender gap in criminal justice. Moreover, compared to the existing literature, it innovates in two ways. First, it uses a

simple measure of sentence heterogeneity within criminal groups – here duos. This procedure could easily be replicated for other questions such as racial bias. Second, it extends the work done by Schanzenbach (2005) to include the effect of prosecutors' gender[6]. In addition to those innovations, this paper measure gender gap in a new institutional context.

The rest of the paper is organized as follow. Section 2 gives information on institutional setting in France. The data and the overall gender gap are presented in section 3. The fourth section uses the composition of criminal groups to document the differences in sentencing between men and women. The effect of the judges' and the prosecutors' sex on the gender gap is presented in section 5. Section 6 concludes.

2. Institutional setting

2.1. Procedure and sentencing

This paper focus on crimes that can be punished by prison sentences up to ten years. This criminal category – called "délits" in French – contains the vast majority of what is commonly viewed as crime: theft, violence, drug consumption or drug dealing, road related offenses. At the time studied in this article (2000-2003), there were around 400,000 crimes of this type per year[7].

There is no plea-bargaining in France[8] and all sentences are decided after a trial. The courts that judge the infraction studied in this paper are composed of three professional judges. The French criminal code foresees an accelerated procedure, which is similar to the normal one except that the investigation term is extremely short (less than a week). The prosecutor conducts the investigations – and eventually impose pre-trial detention[9] -, choose the charges, and goes for an accelerated procedure if it seems appropriate.

Every type of crime is characterized by a maximum prison sentence going from zero to ten years. Those maximum are largely bigger than sentences pronounced in reality[10]. There are no minimum sentences in France at the time of the study[11] [12]. The most important types of sentences are prison, probation, suspended prison, community service and fines. In this paper I focus on the three first sentences. Probation sentences will be defined by the prison

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[6] The role of prosecutors have been partly addressed in Farell et al 2010

[7] There is two other categories: minor infractions that cannot be punished by prison and the most severe crimes – murder, rape… – that can be punished by very long sentences and are judged by specific courts.

[8] A limited one has been introduced after the period of interest. It remains marginal nowadays.

[9] However, another judge controls this decision.

[10] For e.g., in 2003, 49% of offenders convicted for a crime that could be punished by up to ten years get no prison sentence and 95% of those who get a prison sentence get one shorter or equal to 4 years.

[11] Minimum sentences for recidivists were introduced in 2007 and removed in 2014.

[12] Sentences are supposed to be chosen "according to the circumstances of the crime and the offenders' personality (…) in order to protect society, to punish the offender, to protect victims' interests and in order to promote offender's rehabilitation and to avoid new crimes" (art. 132-24 of the criminal code, change into art. 130-1)

sentence people get in case of violation of their probation[13]. In this paper I will treat those different sentences as independent[14].

2.2. Courts organization

In French criminal justice, cases are attributed to judges independently of the characteristics of the judges but depending on the characteristics of the case (type of crime and procedure of judgment). Apart from accelerated procedure, all crimes of one type are attributed to the same pool of judges. Cases heard according to accelerated procedure are attributed to different pools of judges in accordance with the date of the facts.

Jurisdictions are organized in several "chambers" responsible for the judgment of one or several types of crime. The head of the jurisdiction organize the work on a semester basis. A fix schedule allocates every judge to a single chamber, defines the types of crime each chamber will have to hear and decides the date of the audiences of every chamber. Then, over a six months period, the three same judges will hear every crimes of one type.

In the largest courts, there are specific hearings for the cases heard according to the accelerated procedure. Those hearings are characterized by a high turnover and judges usually rotate every week. A case heard according to the accelerated procedure is officially attributed to one of those specific hearings in accordance with the date of the end of the investigation. In practice, the date of the hearing depends on the date of the facts. As a consequence, offenders (and their lawyers) cannot choose the judges they will face.

In France both judges and prosecutor are civil servants. There are roughly 5,500 judges and 1,800 prosecutors[15] hired through a common competitive exam. They can change from judge to prosecutor and vice-versa at different times during their career. Even if the frequency is not clearly defined, judges and prosecutor are obliged to move frequently from one court to another (one or two years is too short, three or four seem to be optimal for junior judges).

3. Data

The original dataset used in this paper is a compilation of criminal records from the statistics service of the French Ministry of Justice (Sous Direction de la Statistique et des Etudes). It contains a detailed description of every criminal case judged each year. More precisely, it

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[13] Probation length are not recorded in the database

[14] They are not totally unrelated as the sum of the three should not exceed the maximum define in the penal code. However, as mentioned previously, this not a strong limitation in reality.

[15] In 2007, according to the Supreme Court. https://www.courdecassation.fr/IMG/File/pdf_2007/10-05-2007/10-05-2007_mcKee_fr.pdf

contains the date, place, and procedural detail of the trials; the date of the crime and its exact category based on the criminal code; the sentence decided (e.g., prison, probation, and suspended prison); and, finally, sex, age, and nationality. Each individual is identified by a single ID (constant through the period). This enables the penal history of an individual to be reconstructed. Because the data on court compositions are only available for 2000 and 2003 and for the court of first instance (see section 4), I only use the criminal record data for the same period, including the two years in between.

Descriptive statistics for all men and women convicted between 2000 and 2003 are presented in the left part of table 1 (column 1 to 4). The demographic characteristics of the two sexes are slightly different: women are older and more frequently French than men are. Criminal careers diverge largely: 32% of men have already been convicted in the last two years while only 17% of the women have. This is important since past conviction is one of the most important aggravating factors[16].

The infractions committed are not as different as one would expect. The share of violent crime is almost equal (16% vs 15%), even if men are usually viewed as more violent. The main differences, regarding crime types, come from robbery and road-related crimes. The former is predominant among female offenders, but the latter is more frequent among men. This structure is important because robbery is considered a more severe crime than road-related crime and is more severely punished. Regarding the severity of the crime – measured by the longest sentence allowed by the criminal code – the differences between women and men are not extremely important. The largest divergences are observed for crimes that could be punished by a maximum of 2 or 3 years. These two categories are not far from one another.

Even if the aggregate characteristics of the crimes are not extremely different, the trials' outcomes are. From a procedural point of view, women are judged after longer investigations (30% longer), and they are rarely sentenced after accelerate procedure (trial within a week after arrest) or after pre-trial detention (4% versus 7%)[17]. The difference in investigation length between men and women is mainly due to the crime structure. Taking crime types into account reduces it from 120 days to 30. On the contrary, the difference in accelerate procedure rate between men and women remains high after controlling for crime (-3.4% reduced to -2.5%).

Women's sentences are less severe. Prison and probation are less used against women (prison is 13% less frequent and probation 3% less frequent). Regarding quanta, prison and probation sentences are shorter (18 days shorter for prison and 4 days shorter for probation) and suspended prison sentences are longer (8 days) for women.

The difference in sentences between men and women could be driven by differences in offenders' characteristics. However, the gender gap in sentences remains sizable, even after controlling for all the observables (see appendix A). Indeed, controlling for the precise crime

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[16] The average prison sentence over the sample goes from 30 days to 77 days for offenders who have already been convicted.

[17] Those characteristics are associated with longer sentences. For e.g. Offenders convicted after an accelerated procedure get sentences twice longer (44 days vs 105). See Christin, Lenoir 2008.

structure (1395 dummies), place (175 dummies), time (4 dummies for years, 12 for months), socio-demographic characteristics, type of procedure and criminal career), women have a 8% lower chance to be sent to prison (35% reduction in comparison to the 22% average in the sample) and their average prison time is 15 days shorter than for men (33% shorter than the 44 days average in the sample). They also have slightly more chances to get suspended prison time (or probation)

The differences between men and women that survive to crime structure and other control variables could still be due to unobserved variables. Educational attainment, job, family structure, presence or absence of children could strongly differ between male and female. Those variables could explain why women are sentenced less severely than men even in the absence of an effect of the gender itself.

4. Gender gap within criminal groups

Men and women receive different sentences, even after controlling for a large set of covariates that includes very precise crime categories. This gap could have several origins: differences in the crime severity within criminal categories defined by the criminal code; differences among unobserved socio-economics characteristics (e.g., education, family); and differential treatment by the judicial system.

To further investigate the gender gap, this section documents the gender gap in mixed criminal groups. Within each group, offenders were convicted for the same crime, committed on the same day in the same place, and judged by the same court in the same external context.

The sample used in this section is a specific subsample of the main database. Gender gap among criminal groups can be different from the one observed in the general case as observed by Starr (Starr, 2015, p10). Then, the external validity of this exercise is limited. However it provides an interesting setting in which case heterogeneity between men and women are smaller.

4.1. Identifying peer groups

People will be considered as belonging to the same criminal group if they have been convicted for a crime that they committed together. This information is not directly registered in the dataset, as there is no ID per criminal case but per individual. However, the dataset does record whether the crime has been committed "in group"[18]. This does not necessarily mean that the rest of the group has been arrested. If only one person is arrested among three robbers who work together, the crime is still registered as a "robbery in group".

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[18] People convicted for a crime "en réunion", "en association", as "complice" or in a "trafic".

To identify the composition of the criminal groups, I proceed as follows. First, I only keep people who have been convicted for crimes committed "in group". Then, I am sure that those persons have criminal partners, even if those peers were not necessarily arrested. Second, among this subset, I consider people to be convicted for the same crime when they are judged in the same place (175 courts), on the same date, and for the same type of crime (172 in-group crimes) that was committed on the same day. These criteria are restrictive. For example, people could commit the same type of crime, on the same day and in the same place, but being judged on two different days. However, those cases are difficult to identify, and having strict criteria limits the number of false matches.

Among the persons who commit a crime "in group", I find at least one partner in 59% of the cases. In comparison, the same strategy applied to offenders who do not commit a crime described as "in group"[19] leads to the identification of a "partner" in 18.7% of the cases. This rate could be viewed as high and problematic if it is interpreted as a "false match rate" equal to one over five. However, this interpretation is not correct. First, the latter group is seven times larger than the former (810,000 vs 115,000 offenders). In a large group, there are more chances to find two persons who were convicted on the same day, in the same court, for a crime of the same type that was committed on the same day. If 18.7% represent the proportion of false matches in a group of 810,000 persons, this rate is 2.6% in the group of interest. Second, a large proportion of the "false matches" are probably real matches that have been rejected from the main data set because of the strict criteria. For example, approximately 26.2% of the matches are found in the categories "robbery with two aggravating circumstances" and "violence with two aggravating circumstances". Further, they probably represent crimes that were committed within the group, even if this circumstance is not clearly mentioned because of the presence of a second one[20].

In this analysis, we are only interested in groups composed of one man and one woman. For the sake of simplicity, I also restrict the analysis to duos (excluding triplets, quadruplets, etc.) that comprise the vast majority of the sample. Over the 2000-2003 period, I find 2,382 mixed duos regrouping 4,764 offenders (2,382 women and 2,382 men).

It is important to notice that the different offenders of each group are convicted for the same main crime. Groups in which offenders get different charges are excluded. In particular, groups in which one person is convicted for "failure to assist a person in danger", "assistance to commit a crime", "non denunciation", etc. are excluded[21]. Groups in which women are charged for less severe crime even when crimes are similar are excluded and, then, the gender gap is measured net of the disparities in the charging decision.

Descriptive statistics of these groups are presented in table 1, column 5 to 8. In-group offenders are younger (30 years old) and less frequently French (around 75%) than is the average convicted population. The crime structure is different, with a large predominance of

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[19] Road related offenses are dropped here as they could not be committed in group. They are mainly composed of "driving under influence" and driving without a license or insurance.
[20] Another 16.5% is composed of drug use without the mention of trafficking. In France, the difference is mainly driven by the quantity seized by the police.
[21] Obviously, cases were the crimes are different like drug-dealing vs drug consumption, theft vs fencing, procuring vs prostitution are also excluded.

robbery (65%), followed by violence (15%) and drug use (15%). Finally, the sentences are harsher than those for average offenders (80 prison days on average versus 47 in the general convicted population). This is coherent with the fact that having committed a crime in-group constitutes an aggravating circumstance.

Within the groups, men are on average older, less frequently French and they have longer criminal careers. Their sentences, however, remain largely harsher than those decided for women. The average prison days are almost doubled (102 days versus 57), which is partly counterbalanced by shorter suspended prison terms (40 versus 53). The probation times are similar.

4.2. Main results

Mixed peer groups allow gender differences to be measured within duos. I first document the share of groups in which men are more, equally or less severely sentenced as women. This work is presented in figure 1. We can first see that sentences are usually equal. Overall, 70% of the duos receive the same prison term or the same suspended prison time, and more than 85% receive the same probation time. This is partly because some of the duos are composed of two offenders who receive no prison (65%), no probation (81%), or no suspended prison (50%).

More interesting is the fact than when sentences diverge, the shares of cases where women are more or less severely sentenced are not balanced. Regarding prison time, it is usually the men who receive the longest sentence: 22% of the time versus 4%. The inverse is true regarding suspended prison sentences: women receive longer sentences in 19% of the cases versus 10% for men.

The same picture emerges from the analysis of the type of sentence used (instead of the quanta). Figure 2 presents, for each type of sentence, the proportion of duos in which none of the offenders gets prison (resp. probation or suspended prison), both offenders get prison (resp. probation or suspended prison), only the man gets it or only the woman gets it. No one gets prison in 64.4% of the cases; both get it in 17.5% of the cases; only the man in 15.7% of the cases and only the woman in 2.4% of the cases. Then, the man is frequently the only one to get a prison sentence. Men are the only one to get probation sentence as frequently as women are. Women are frequently the only one to get suspended prison.

I further investigate those observations using regression of the following form:

$$Sentence_{i,g} = \sigma_g + \alpha_1 * sex_i + \beta * X_i + \varepsilon \qquad (2)$$

where $Sentence_{i,g}$ is the outcome variable (e.g., prison day, probation day) of person *i* who belongs to group g; σ_g are group fixed effects (2383 dummies); sex_i is a dummy equal to one if *i* is a woman; and X_i is a set of control variables (i.e., age, age square, past convictions, nationality, criminal career). Contrarily to date, place or crime type – that are, by construction, identical within groups – the control variables used in equation (2) are not equal within groups. Those variables can then be identified.

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The results are presented in table 2. The first three columns present the effect of the sex on average sentences for prison, probation, and suspended prison. The gender gap among duos is even larger than the one observed in the entire sample. Women receive prison sentences that are 38 days shorter (50% decrease in comparison to the average prison sentence), probation sentences that are 3 days shorter (11% decrease) and suspended prison sentences that are 10 days longer than men receive (21% increase). Men have a higher chance to be sentenced to prison (+9.6%), but a lower chance of getting suspended prison sentences (-7.5%).

4.3. Leadership

When a crime is committed in a group, judges are supposed to punish the offenders who have the largest responsibility more severely. If men are more often the leaders of the duos or frequently commit a larger share of the crime (e.g., sell more drugs, land more punches), this could explain the pattern observed in the last subsection. Note that this difference in responsibility should occur, by construction, within identical criminal categories. As previously mentioned, cases in which one offender is convicted for a less severe crime or for helping others commit a crime are excluded from the analysis because they could not have been selected as a group during the data construction procedure.

The leadership among the group is not identifiable in the data and I cannot rule out the hypothesis of a differential responsibility. However, in order to investigate this question, I focus on two characteristics that are usually associated with harsher sentences. When the woman get one of them and the man do not, the hypothesis of a higher implication of the man (on average) is still possible but seems less convincing.

The first characteristic I use is the number of charges. By construction, the main crime is identical within groups but offenders could also be convicted for other crimes. For example, two persons could commit a burglary together but it is possible that only one is responsible for selling the stolen goods. Among non mixed groups, the offender who is convicted for more crimes than the other gets longer prison time in 30% of the case while the contrary is true in only 11% of the cases (appendix B figure B1). Then, the characteristic "being convicted for more crimes than the peer" is clearly associated with harsher sentences.

Among duos where women are convicted to more charges than men (136 duos)[22], the proportion in which women receive higher/equal/shorter sentences is presented in figure 3a. Men receive longer prison sentences than women do more frequently than the contrary. The lag between those two situations decreases – compared to the results observed in figure 1 –, but the former is still 2.5 times more frequent than the latter (25% vs 9.6%). On the contrary, women receive longer suspended prison sentences more frequently. When the man is convicted for more crimes than the woman, the pattern observed in figure 1 is accentuated. Men get longer prison times 13 times more frequently than woman do (figure 3b).

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[22] Descriptive statistics of those groups are presented in appendix B (table B1, columns 1 and 2).

The second characteristic I use is criminal record. Among non mixed groups, when one offender has been convicted more frequently than the other he receives a longer prison sentence 29.9% of the time and a shorter prison sentence only 7.5% of the time (see appendix B, graph B2). Probation time is also frequently longer (11.3% vs 7.5%) while probation time is usually shorter (5% vs. 23%).

Among duos where women have a longer criminal career than men (255 duos)[23], the proportion in which women receive higher/equal/shorter sentences is presented in figure 4a. Women receive longer prison time only slightly more frequently than the contrary (16.5% vs 14.1%). In the same time, when the man has a longer criminal record, he receives a longer prison sentence 25 times more frequently than the woman do (figure 4b).

The results of the regressions on the two main subgroups – groups in which the woman is convicted to more crimes than the man and groups in which the woman has a longer criminal career than the man – are presented in table 3. The number of crimes convicted is no longer used as a control variable in regressions on the first subgroup and the criminal record is not used as control variable for the second subgroup. Men still receive longer prison sentences in groups were women are convicted to more crime. Among groups were women have a longer criminal career, gender is not significant.

While offenders who are convicted to more crimes or have longer criminal history in the group are, in general, more severely punished than their co-offender, this is not the case among mixed group when the woman have those characteristics. Women who are convicted to more numerous crimes are still less severely punished. Those with longer criminal history get sentences similar to their male co-offender. Men could still be leaders of the group or frequently present some unobserved characteristics that induced higher sentences (or do not present some characteristics related with shorter sentences like children or job). However, the fact that the gender gap does not reverse and sometimes remains even when women have "worse" observable characteristics is striking. It pleas in favor of the existence of gender disparities in criminal justice that are not explained by case characteristics nor unobserved heterogeneity

5. Gender bias and gender of the court

Up to this point, we cannot rule out the hypothesis that gender differences are entirely due to unobserved heterogeneity even if this is unlikely considering the high homophily rate among criminal groups (see for e.g. Grund Denseley 2014; Young, 2011). If, for example, women more frequently have children or work, this could explain the gap observed in the last two sections. If the unobserved heterogeneity problem is hard to address, it is possible to see if different conditions affect the gender gap.

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[23] Descriptive statistics of the groups in which women have a longer criminal career than men are presented in appendix B (table B1, columns 3 and 4). Property crimes are over represented.

In this section, I focus on the gender composition of the court. This dimension is a priori orthogonal to the offenders' characteristics. If we observe differences in gender gap depending on the sex of the court, we will have evidence of a distorted treatment of the sexes by the judicial system.

5.1. Court data

Data on gender composition of French criminal courts come from the magistrate directories of 2000 and 2003[24]. For those two years, I gather data on the 175 first court instances. I compute data on the sex of the presidents of the court; sex of the state prosecutor (the chief of the prosecutors in the court); number of judges (excluding examining magistrate and judges dealing in cases involving minors); number of female judges (idem); number of prosecutors; and number of female prosecutors.

Women are quite numerous in the French judicial system. They represent 54% of the judges in 2000 and 50% in 2003. However, they are under represented among prosecutors (34% in 2000, 40% in 2003). This relative equality among the sexes in terms of access to the judicial profession masks strongly distorted hierarchical positions. For both judges and prosecutors, women are far more numerous in "low" rank positions. They are only less than 20% of the presiding judges (15% in 2000, 19% in 2003) and only 10% of the state prosecutors[25].

5.2. Empirical strategy

Merging the data from criminal records with the data on courts' gender composition, I can now measure the effect of the sex of judges and prosecutors on gender gap in sentencing. The simplest identification strategy would rely on the variations in courts' gender composition per years and places. I would then measure the effect by running regressions of the following form:

$$Outcome_{i,p,t} = \alpha_0 + \alpha_1 * sex_i + \alpha_2 * \% \, women_{t,p} + \alpha_3 * sex_i * \% \, women_{t,p}$$
$$+ \beta * X_{i,t,p} + \varepsilon \qquad (3)$$

where $Outcome_{i,p,t}$ is the outcome of interest (sentence, procedural variables) of person i convicted at time t in place p; sex_i is a dummy equal to one if i is a woman; $\% \, women_{t,p}$ is the proportion of women among judges or prosecutors at time t in place p; and $X_{i,t,p}$ is a set of control variables.
α_1 measures the effect of offenders' sex, α_2 is the effect of judges' or prosecutors' gender on average sentences and α_3 is the parameter of interest, measuring the effect of judges' or prosecutors' sex on gender gap.

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[24] Directories are no longer published since 2003 and only up to date directory is available on line.

[25] . This pattern fits well with research in the labor economy mentioned in the introduction: women are strongly disadvantaged regarding promotion and access to high-rank positions (Kunze Miller 2014). This situation seems to improve slightly between 2000 and 2003

This strategy would rely on two sources of identification. The first one is based on court variations. For e.g., in 2000, the share of women among judges is, on average, 51% but vary between 0% and 100% with 50% of the sample between 40% (25th percentile) and 66% (75th percentile). The second source of identification is within court variation between 2000 and 2003. The average variation is close to zero – as it is a zero sum game due to rotation of judges between courts and only slightly affected by recruitment and retirement – but 25% of the court experiment a decrease of women proportion among judges bigger than 16% (up to -50%) and 25% of the court experiment an increase higher than 11% (up to +75%).

This strategy is valid only if women, whether judges or prosecutors, are randomly spread among time and jurisdictions. If the proportion of women in the court is correlated with offenders' characteristics then the previous equation will lead to biased estimates. This problem could be tested for the two sources of identification.

The correlation between the proportion of women in the court and observable characteristics of the offenders is presented in appendix C. It appears that gender composition of the court is correlated with several observable characteristics of the offenders – especially sex but also nationality, pre-trial detention, procedure and investigation length (see appendix C, table C1). Then, between court variations in judges' or prosecutors' gender do not seem to be a good source of identification.

On the contrary, changes in the gender composition of the court between 2000 and 2003 do not seem to be correlated with observable characteristics (see appendix C, table C2). This is coherent with the idea that those temporal variations are mainly due to judges' rotation. Then, within courts variation in the gender composition appear to be a better source of identification.

As variation among jurisdiction is correlated with the gender gap, I turn to a model using changes over time as the unique source of identification. I neutralize variations among courts by adding places*sex fixed effects. I then use a regression of the following form:

$$Sentence_{i,p,t} = \alpha_0 + \sum_{p=1}^{175}(\gamma_p * place_p + \delta_p * place_p * sex_i) + \alpha_2 * \% \, women_{t,p}$$
$$+ \alpha_3 * sex_i * \% \, women_{t,p} + \beta * X_{i,t,p} + \varepsilon \qquad (4)$$

where the notation is similar to that used in the previous equations and $place_p$ is a dummy equal to one if the trial occurred in place p.

The second term of the right member in equation (4) captures all the gender variations between places. It is a list of 2*175 (two sex and 175 courts) fixed effects for being a man in jurisdiction 1, a woman in jurisdiction 1, a man in jurisdiction 2, and so on. Then, all of the variations between men and women across places are absorbed. The remaining variations in $\% \, women$ come from changes over time due to judges' and prosecutors' rotations.

Errors are clustered at the court level. α_3 remains the parameter of interest because it measures the effect of judges' or prosecutors' sex on gender gap.

It is important to notice than the effect of gender composition of the court could be twofold. Firstly, women could judge men and women differently and affect the gender gap by changing the average sentences. Secondly, the share of women could affect all judges' decisions by changing the way their male colleagues judge men and women (like for example the effect of daughters on judges' decisions documented in Glyn Sen, 2015). As the database does not contain the sex of the judge for every single decision (but only the gender composition of each court), those two channels could not be disentangled.

5.3. The effect of judges' sex

The effects of the number of women among courts' judges are presented in table 4. As we can see in the first line, the sex of the judges does not affect the average sentences. The point estimates are small and non-significant. Women do not seem to be harsher "in general".

However, as presented in line 4 ("Woman * Prop women judge"), the share of women among judges does affect the gender gap. When it increases, offenders who are women receive, on average, a longer prison term, longer probation time and shorter suspended prison time.

A one-standard-deviation increase in the share of women among judges increases the prison sentences for women by 1.6 days (a 10% reduction of the gender gap), probation by 1.7 days and decreases suspended prison time by 1.7 days (columns 1 to 3). These results represent a decrease in the gender gap. Columns 4 to 6 indicate that the results do not come from an increase in the probability to send women to jail or in probation.

Thus, the gender gap in sentencing seems to partly depend on judges' sex. This is a strong argument in favor of the hypothesis of a distorted treatment of sex by the judicial system. This is still possible that female offenders present some characteristics– regarding work or family – and that female judges are not as attentive to those characteristics as their male colleagues. Even if this hypothesis cannot be refuted so far, the hypothesis of a distortion based on sex remains more parsimonious. These results are similar to those obtained by Schanzenbach (2005) and Starr (2015) in the US context. Schanzenbach interprets this decrease of the gender gap as a sign of a paternalistic bias among male judges. This is possible but, as it is impossible to know what the "correct" sentence is, those results could also come from excessively harsh sentences given by female judges to female offenders.

The effect of judges' sex on gender gap varies depending on offenders' characteristics (see appendix D). Women seem to be less "tolerant" (or harsher) than men with violence committed by women. Interestingly, the effect of judges' sex is more important on young offenders. This is coherent with Schanzenbach's interpretation: if the gender gap is due to some paternalistic biased, it's not surprising to find that the effect of judges' sex is bigger on young offenders among which women could be viewed as more fragile.

5.4. The effect of prosecutors' sex

Prosecutors could also affect the gender gap. Firstly, they could select different charges, choose different procedures – especially accelerated procedures – and they could ask for pre-trial detention (their decisions have to be confirmed by another judge but they trigger the process). Secondly they could directly affect sentences by asking for more or less severe sentences.

The effects of the number of women among prosecutors are presented in table 5. The effect of prosecutor's gender on charges is hard to measure in the absence of cases' characteristics at the moment of the arrest or in the beginning of the justice process (as in Starr, 2015). The only way to approach this question is to measure how prosecutors' gender affects the severity of the charges conditional on the type of crime. A good proxy for the severity of the charge is the highest sentence that could be chosen for the crime according to the criminal code (going from 0 to 10 years). Then, I measure the effect of the sex of the prosecutor on crime severity, conditional on crime category, split in 26 "large" categories (for e.g., property crimes are divided in three categories: theft, selling stolen goods, vandalism).

Results are presented in the first column of table 5. Based on this (imperfect) measure, women's charges do not seem to be affected by the sex of the prosecutor. The point estimate of the interaction is both non significant and extremely low (-2 days while maximum sentences goes up to 10 years).

Table 5 presents the results of equation (4) on three other pre-trial outcomes: probability to be judged through an accelerated procedure (column 2); probability to experience pre-trial detention (column 3); number of days under pre-trial detention (column 4). Prosecutor's gender does affect women's probability to be convicted after accelerated procedure but does not affect pre-trial detention. A one-standard-deviation increase in the share of women among prosecutor decreases the proportion of accelerated procedures for women by roughly 0.5%.

Results on sentences are presented in the last three columns of table 5. The sex of the prosecutors does not seem to affect the gender gaps in sentences. The point estimates are both small and non-significant. Only suspended prison seems to be slightly affected: quanta increase for women when there are more prosecutors who are female.

All in all, the sex of the prosecutor does not seem to affect the gender gap observed in criminal justice. This could be due to the fact that the main discretionary power of the prosecutor is to decide if the person should be sued or not and which charges should be hold. Those decisions are hard to study with the database used in this article – even if some evidence goes against the hypothesis of an impact of prosecutor's gender. However, it is interesting to know that the gender gap in sentences conditional on charges is almost unaffected by the prosecutor's sex.

6. Conclusion

This paper documents the gender gap in criminal justice. It uses three different strategies to tackle this question: simple regression with extensive control variables; within criminal group differences; and the effect of courts' gender compositions on the gender gap. The main result is that criminal justice is one of the rare social areas in which gender disparities advantage women. They tend to be sentenced to prison far less than men are and, when women are sentenced, the sentences are for shorter periods of time. Even when they belong to a criminal group composed of different sexes, women tend to be less severely punished than their male counterparts. This gender gap is less significant when judges are female. This last result confirms that the differences observed before are not due to unobserved heterogeneity not absorbed by control variables or group-fixed effects. If this were the case, judges' sex should not affect the gender gap. The prosecutor's gender does not affect the sentencing of men and women.

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Figure 1: sentence distribution within group.
Man and woman have equal prison sentences in 74% of the groups. Man has higher sentences in 22% of the cases, woman in 4% of the cases.

Figure 2: sentence distribution within group.

(a)

(b)

Figure 3: sentences distribution when the woman is convicted to more offenses than the man (a) or when the woman is convicted to fewer offenses than the man (b).

(a)

(b)

Figure 4: sentences distribution when the woman has a longer criminal record than the man (a) or when the woman has a shorter criminal record than the man (b).

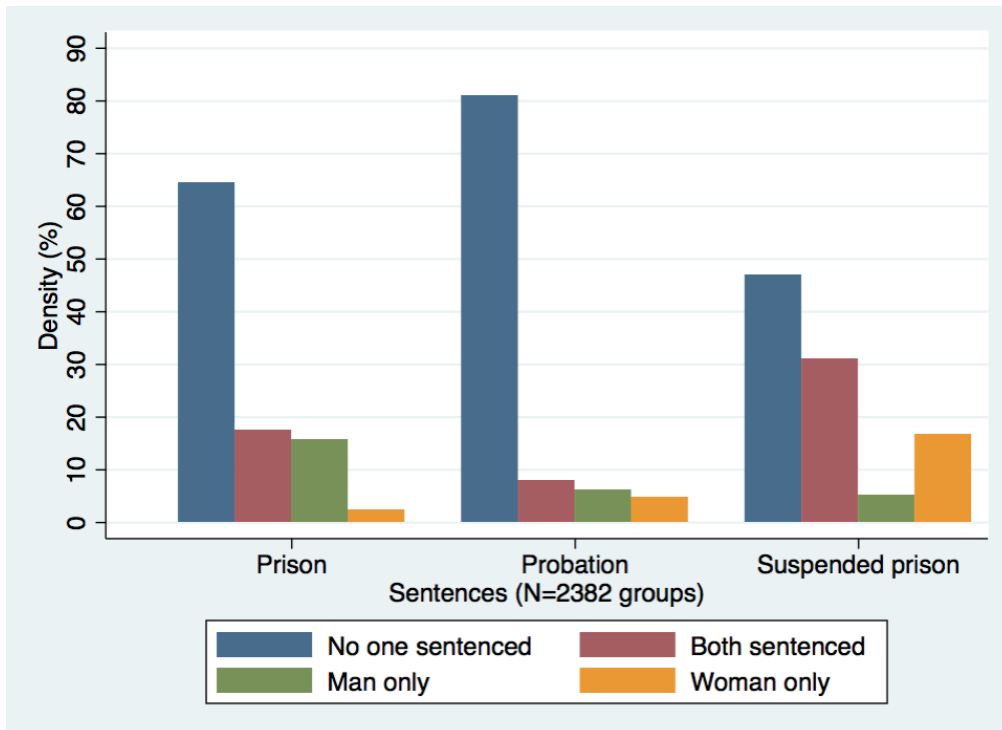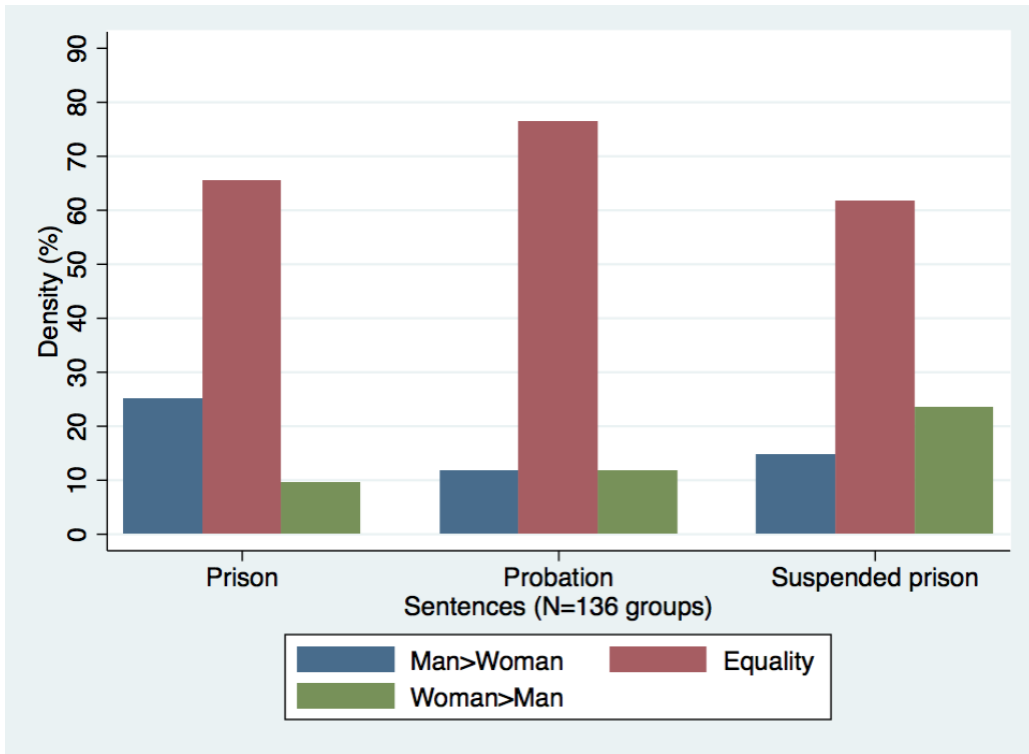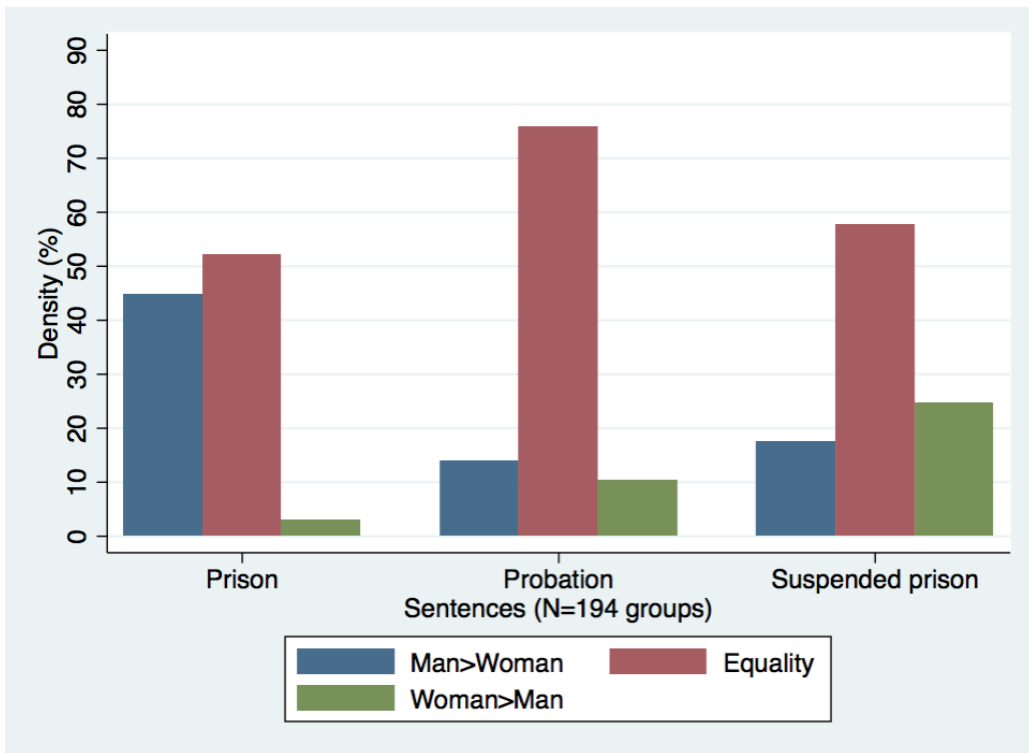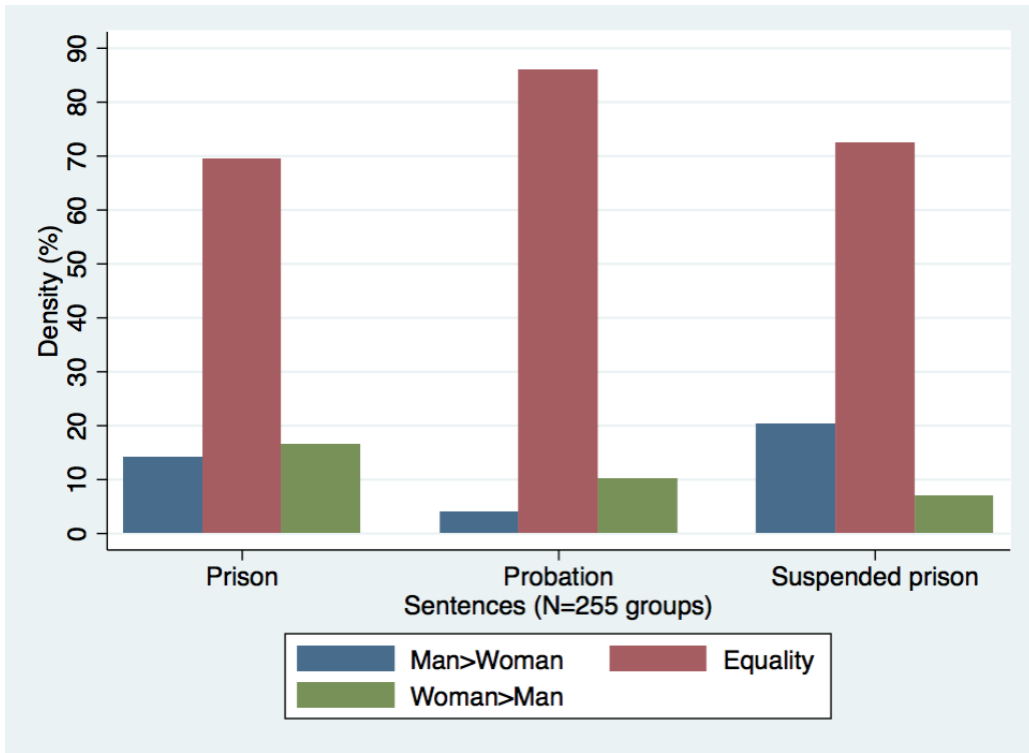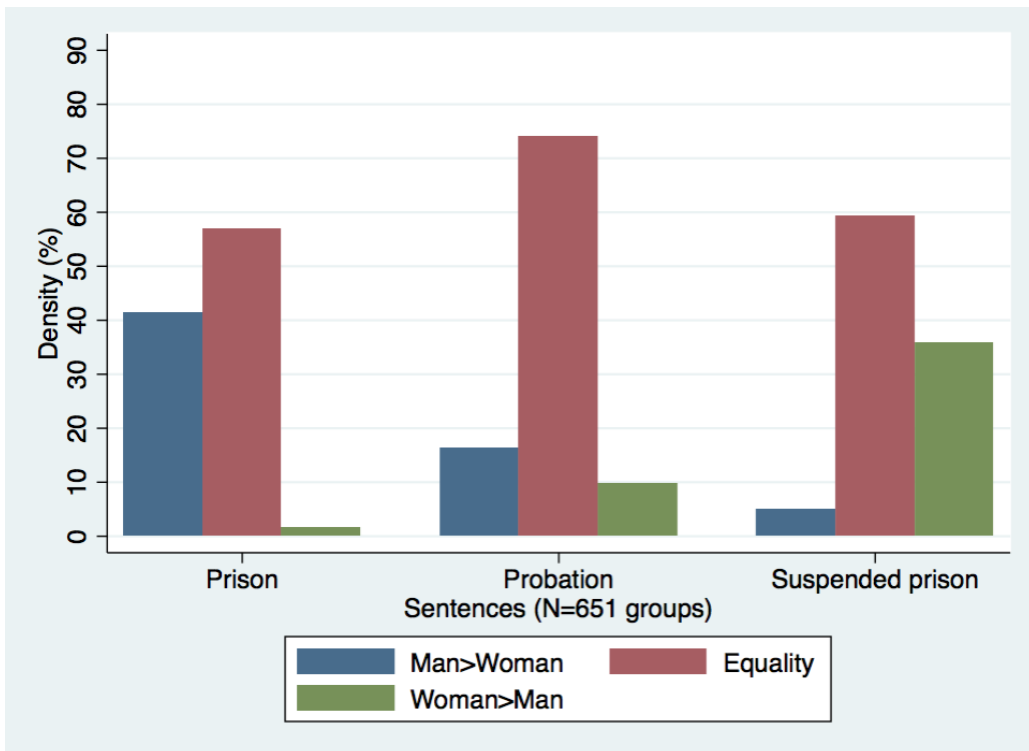|	All				Mixed duos			
	Women		Men		Women		Men	
	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Age	35.5	12.1	33.1	12	29.6	10	30.6	9.9
French	.89	.31	.86	.34	.77	.42	.74	.44
Past conviction	.17	.37	.32	.47	.21	.41	.35	.48
Crime type								
Robbery	.37	.48	.27	.44	.65	.48	.65	.48
Road	.25	.43	.37	.48	0	0	0	0
Economy	.08	.27	.04	.19	.02	.12	.02	.12
Violence	.15	.36	.16	.37	.15	.36	.15	.36
Drug	.04	.19	.06	.24	.15	.35	.15	.35
Insult	.06	.24	.05	.23	.04	.19	.04	.19
Could be punished by a maximum of…								
1 year	.14	.35	.13	.34	.02	.14	.02	.14
2 year	.23	.42	.33	.47	.02	.13	.02	.13
3 year	.32	.47	.22	.41	.11	.32	.11	.32
5 year	.21	.41	.19	.39	.66	.47	.66	.47
more than 5 years	.1	.3	.13	.34	.19	.39	.19	.39
Pre-trial detention	.04	.19	.07	.26	.09	.29	.12	.32
Investigation length (days)	404	573	284	465	299	468	299	468
Accelerated procedure	.03	.18	.07	.25	.07	.26	.07	.26
Nb of conviction	1.47	.94	1.54	1.01	1.7	1.35	1.73	1.39
Sentences								
Prison (quantum)	19	100.9	47.4	163	57.5	218.6	102.2	309.9
Probation (quantum)	25.9	88.6	29.9	89.9	26.2	91.1	30.4	97.2
Suspended prison (quantum)	36.6	82.3	28.2	71.2	53.2	110	39.7	93.4
Prison (probability)	.11	.31	.24	.43	.2	.4	.33	.47
Probation (probability	.15	.36	.18	.38	.13	.33	.14	.35
Suspended prison (probability)	.38	.49	.31	.46	.48	.5	.36	.48
N	127065		1267883		2382		2382	

Table 1 : Descriptive statistics, convicted offenders 2000-2003.
The first part presents the socio-demographic characteristics of the offenders while the second one present the type of crimes. The third part gives the longest prison sentences that could be pronounced against offenders. This variable is a proxy for crime severity as defined in the criminal code. Parts four and five describe the procedural characteristics of the cases and part six gives information on sentences.

	(1)	(2)	(3)	(4)	(5)	(6)
	Prison	Probation	Suspended prison	Prison	Probation	Suspended prison
	Quantum	Quantum	Quantum	Dummy	Dummy	Dummy
Woman	-37.93***	-3.114*	10.44***	-0.0954***	-0.00715	0.0739***
	(4.212)	(1.800)	(1.964)	(0.00828)	(0.00704)	(0.00931)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Obs	4,762	4,762	4,762	4,762	4,762	4,762
Mean sample	79.88	28.28	46.47	0.266	0.135	0.421
Sd sample	269.1	94.24	102.3	0.442	0.342	0.494

Table 2: Effect of gender on sentences among mixed groups.
Woman is a dummy equal to one if the defendant is a woman. Controls include: group fixed effects, nationality, age, age square, criminal record, number of convictions.

	(1)	(2)	(3)	(4)	(5)	(6)
				Woman with longer criminal career than man		
	Woman more convicted than man					
	Prison (quantum)	Probation (quantum)	Suspended prison (quantum)	Prison (quantum)	Probation (quantum)	Suspended prison (quantum)
Woman	-99.00***	-7.348	34.32***	-2.438	2.287	-9.276**
	(28.58)	(11.28)	(11.96)	(5.757)	(4.555)	(4.647)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	272	272	272	510	510	510
Mean sample	133.6	47.98	54.32	73.46	32.38	33.56
Sd sample	400.5	114.1	105.8	198.6	85.25	79.10

Table 3: Effect of gender on sentences among different subtypes of mixed groups.
Woman is a dummy equal to one if the defendant is a woman. Controls include: group fixed effects, nationality, age, age square, criminal record (only in column 1 to 3), number of convictions (only in columns 4 to 6).

	(1)	(2)	(3)	(4)	(5)	(6)
	Prison	Probation	Suspended prison	Prison	Probation	Suspended prison
	Quantum	Quantum	Quantum	Dummy	Dummy	Dummy
Prop women judge	3.521	-2.485	0.316	0.0106	0.00279	0.00726
	(3.349)	(3.649)	(2.488)	(0.0121)	(0.0191)	(0.0267)
Woman * Prop women judge	8.103**	9.291***	-8.717**	0.0149	0.0127	-0.0534**
	(4.066)	(3.197)	(3.374)	(0.0123)	(0.0163)	(0.0233)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	709,717	709,717	709,717	709,717	709,717	709,717
Mean sample	44.35	28.97	30	0.225	0.172	0.324
Sd sample	160.8	88.90	73.40	0.418	0.377	0.468

Table 4: Effect of judges' gender composition on gender gap.
Woman is a dummy equal to one if the defendant is a woman. *Prop women judge* is the proportion of women among judges (between 0 and 1). Control variables are: courts*offender's sex fixed effects, year, month, crime, age, nationality, criminal record.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Longest possible sentence	Accelerated procedure	Pre-trial detention	Time in pre-trial detention	Prison	Probation	Suspended prison
	Day	Dummy	Dummy	Day	Quantum	Quantum	Quantum
Prop women prosecutor	-9.652	0.00287	0.00310	0.580	-0.744	1.898	-2.158
	(15.04)	(0.00786)	(0.00540)	(0.710)	(2.115)	(2.766)	(1.723)
Woman * Prop women prosecutor	-2.807	-0.0205**	5.05e-05	-1.226	-1.655	1.945	4.992**
	(22.23)	(0.00899)	(0.00538)	(0.923)	(2.430)	(2.446)	(2.288)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	729,285	729,976	729,976	729,976	729,976	729,976	729,976
Mean	1227	0.0617	0.0675	7.311	44.35	28.97	30
Sd	837.4	0.241	0.251	49.94	160.8	88.90	73.40

Table 5: Effect of prosecutors' gender composition on gender gap.
Woman is a dummy equal to one if the defendant is a woman. *Prop women prosecutor* is the proportion of women among prosecutors (between 0 and 1). Control variables are: courts*offender's sex fixed effects, year, month, crime, age, nationality, criminal record.

Appendix A

Table A1 presents the results of regressions of defendants' sex on different measure of sentences after controlling for the observables. Control variables include: crime type (1395 dummies), place (175 dummies), time (4 dummies for years, 12 for months), age, age square, past convictions, nationality, type of procedure, criminal career. Infractions that are never sanctioned by prison, probation or suspended prison are dropped. In columns (1) to (3), offenders who were not convicted to prison (resp. probation, suspended prison), are considered as having a zero day sentence.

Before the choice of a sentence, pre-trial decision could also be affected by gender. Some pre-trial decisions are registered in the database: severity of the charges, accelerated procedure, investigation length, pre-trial detention. The effect of defendants' gender on those variables is presented in table A2. The severity of the charges is captured by the longest possible sentence. As this is fully determined by the precise crime type, the regression presented in column (1) only includes control for large criminal categories (26 dummies).

Regressions presented in table A1 could be broken down by subgroups, especially by large infraction categories. This is interesting because crime controls are more or less stringent depending on the category. If, for example, crime severity could vary within the "violence inducing sick leave shorter than 8 days" category, there is far less variation within the "driving under influence category". Results are presented in table A3.

	(1) Prison Quantum	(2) Probation Quantum	(3) Suspended prison Quantum	(4) Prison Dummy	(5) Probation Dummy	(6) Suspended prison Dummy
Woman	-15.27*** (0.875)	1.069*** (0.325)	1.392*** (0.347)	-0.0778*** (0.00194)	0.00573*** (0.00154)	0.0354*** (0.00266)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-72.61*** (4.293)	-8.855*** (1.921)	28.79*** (1.845)	-0.231*** (0.00825)	0.0410*** (0.0106)	0.538*** (0.0139)
Obs	1,389,766	1,389,766	1,389,766	1,389,766	1,389,766	1,389,766

Table A1: Effect of gender on sentences, controlling for an extensive number of variables. *Woman* is a dummy equal to one if the defendant is a woman. Controls include: crime (1395 dummies), place (175 dummies), time (4 dummies for years, 12 for months), age, age square, nationality, type of procedure, criminal career, investigation length, accelerated procedure (dummy), number of convictions and time in custody (if any).

	(1)	(2)	(3)	(4)
	Longest possible sentence	Accelerated procedure	Investigation length	Time in pre-trial detention
Woman	-60.52***	-0.0130***	24.16***	-3.456***
	(3.230)	(0.00227)	(2.032)	(0.278)
Control	All	All	All	All
Constant	1,350***	0.0549***	-9.011	-8.530***
	(16.39)	(0.00472)	(11.66)	(0.672)
Observations	1,388,503	1,389,766	1,389,766	1,389,766

Table A2: Effect of gender on pre-trial decisions.
Woman is a dummy equal to one if the defendant is a woman. Controls include: crime (1395 dummies) or crime type in column (1), place (175 dummies), time (4 dummies for years, 12 for months), age, age square, nationality, type of procedure, criminal career, investigation length (except in columns (3) and (4)), accelerated procedure (except in columns (3) and (4)), number of convictions and time in custody (except in column 5).

	(1)	(2)	(3)	(4)	(5)	(6)
	Robbery	Road	Violence	Drug	Under 30	Above 30
Prison						
Sex	-22.87***	-4.280***	-17.06***	-55.52***	-14.71***	-16.56***
	(0.996)	(0.162)	(1.274)	(5.989)	(1.017)	(0.925)
Probation						
Sex	2.553***	-0.780***	-5.966***	13.18***	0.922*	0.186
	(0.585)	(0.294)	(0.900)	(3.169)	(0.505)	(0.393)
Suspended prison						
Sex	2.388***	-2.410***	-1.384*	17.64***	1.413***	0.887**
	(0.502)	(0.215)	(0.818)	(3.072)	(0.449)	(0.390)
Observations	389,477	496,435	223,038	80,731	693,465	696,301

Table A3: Effect of gender on sentences by crime and age.
Controls include: crime (1395 dummies), place (175 dummies), time (4 dummies for years, 12 for months), age, age square, nationality, type of procedure, criminal career, investigation length and time in custody (if any).

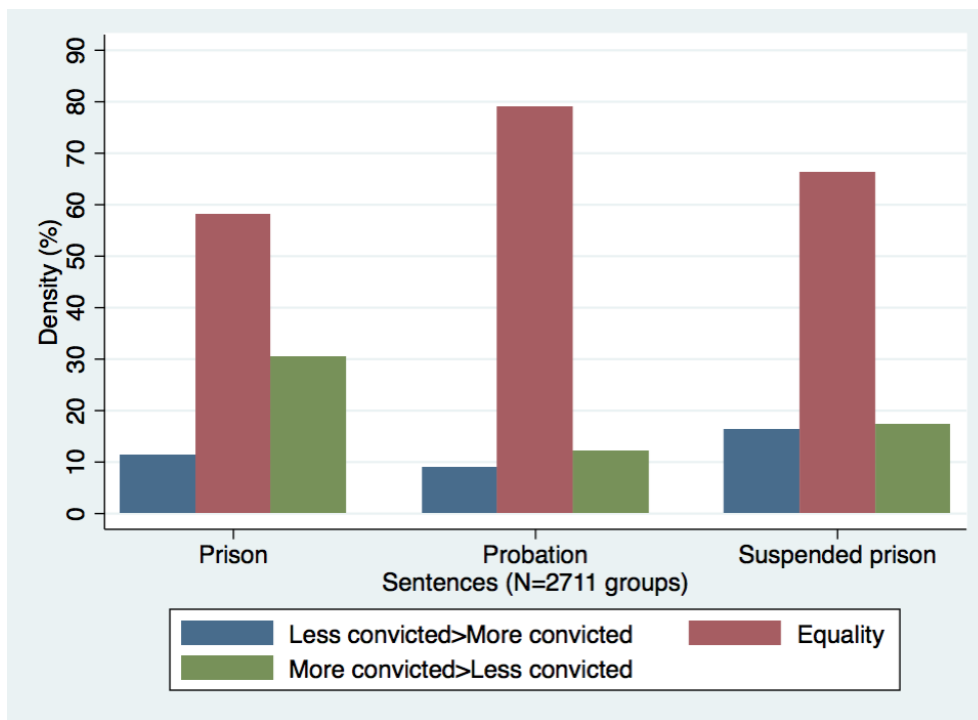**Appendix B: additional material on criminal groups**

Figure B1: sentence distribution within non-mixed group when one offender has been convicted to more crime than the other.
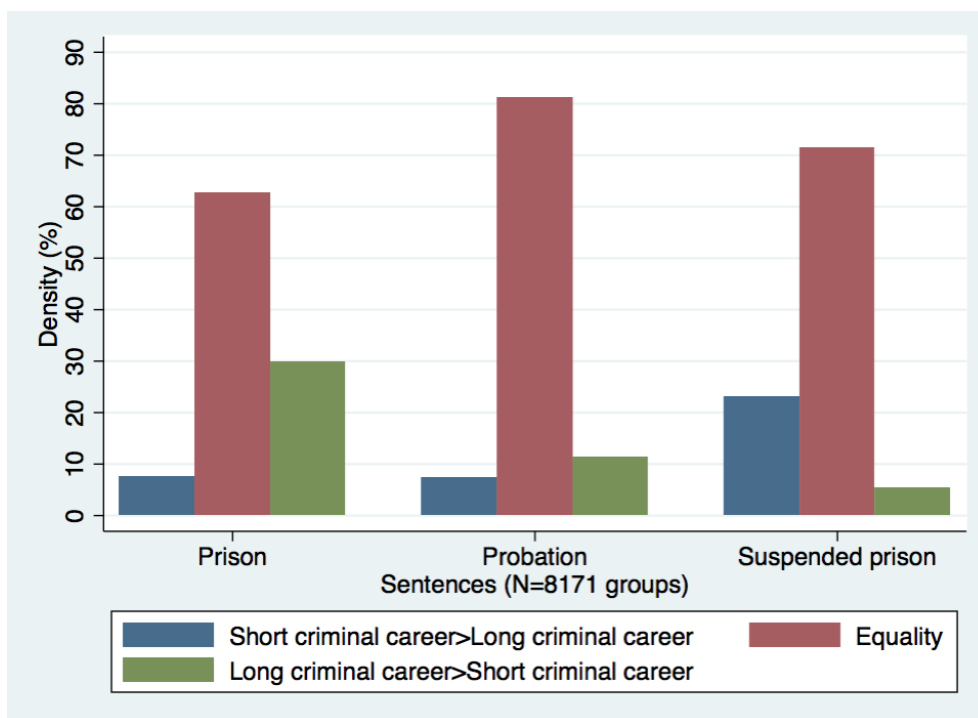

Figure B2: sentence distribution within non-mixed group when one offender has a longer criminal record than the other.

		Women more convicted		Women with longer criminal career	
		Women	Men	Women	Men
		Mean	Mean	Mean	Mean
	Age	29.15	30.11	29.14	30.58
	French	.82	.76	.7	.61
	Past conviction	.26	.38	1	.26
	Investigation length	296.76	296.76	238.76	238.76
	Pre-trial detention	.15	.13	.11	.13
Type of crime	Robbery	.5	.5	.77	.77
	Violence	.19	.19	.1	.1
	Drug	.21	.21	.1	.1
	Nb of conviction	3.07	1.76	1.51	1.49
Sentence	Prison (quantum)	98.16	169.03	72.03	74.88
	Probation (quantum)	43.9	52.06	34.41	30.35
	Suspended prison (quantum)	72.57	36.07	28.06	39.06
	Prison (probability)	.29	.41	.4	.34
	Probation (probability	.24	.23	.21	.15
	Suspended prison (probability)	.45	.38	.27	.4
	N	136	136	255	255

Table B1: descriptive statistics, offenders in mixed groups in which women are more convicted (columns 1 for women, 2 for men) or women have longer criminal career (columns 3 for women and 4 for men).

Appendix C

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sex=woman	Age	French	Investigation length	Accelerated procedure	Pre-trial detention (day)	Past convition	Nb convictions
% women judge	-0.00646*	-0.467	-0.0561***	54.55***	0.0311***	3.787***	0.0201**	0.0462*
	(0.00360)	(0.336)	(0.0149)	(17.45)	(0.00796)	(0.869)	(0.0101)	(0.0236)
Year=2003	-0.000312	-0.0449	-0.00464**	-1.169	0.00760***	0.194	-0.00127	0.0313***
	(0.000529)	(0.0494)	(0.00219)	(2.568)	(0.00117)	(0.128)	(0.00149)	(0.00347)
Observations	335	335	335	335	335	335	335	335
Mean	0.0954	33.70	0.904	274.5	0.0401	5.568	0.289	1.506
Sd	0.0145	1.342	0.0617	70.90	0.0343	3.586	0.0408	0.106

Table C1: correlation between proportion of women among judges and observable characteristics of the offenders.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Difference between 2003 and 2000 in…				
	Sex=woman	Age	French	Investigation length	Accelerated procedure	Pre-trial detention (day)	Past convition	Nb convictions
Diff % women judge between 2000	-0.00104	0.548*	0.00715	-13.89	0.00912	-0.187	-0.00493	-0.0346
2003	(0.00510)	(0.308)	(0.00751)	(19.25)	(0.00924)	(0.960)	(0.0114)	(0.0310)
Obs	161	161	161	161	161	161	161	161
Mean sample	-0.000391	-0.127	-0.0131	-1.852	0.0208	0.606	-0.00527	0.0932
Sd sample	0.0154	0.949	0.0227	55.20	0.0281	2.896	0.0333	0.0927

Table C2: correlation between change in the proportion of women among judges and changes in observable characteristics of the offenders.

Appendix D

		(1) Robbery	(2) Road	(3) Violence	(4) Drug	(5) Under 30	(6) Above 30
Prison	Prop women judge	1.249	0.268	1.358	44.86*	3.400	4.610
		(5.923)	(1.411)	(6.341)	(24.72)	(3.868)	(3.485)
	Woman * Prop women judge	6.152	1.797	24.49*	-6.390	12.77**	2.058
		(7.708)	(2.068)	(12.61)	(64.17)	(6.152)	(4.848)
Probation	Prop women judge	-5.542	-1.426	-2.902	3.128	-1.993	-2.985
		(5.547)	(2.901)	(6.906)	(12.62)	(4.269)	(3.622)
	Woman * Prop women judge	9.689*	6.892**	23.85**	16.60	6.719	11.64**
		(5.425)	(3.244)	(11.88)	(36.90)	(4.733)	(4.567)
Suspended prison	Prop women judge	1.185	1.574	-1.896	-1.596	0.0373	0.461
		(3.001)	(2.959)	(5.383)	(12.20)	(2.882)	(2.842)
	Woman * Prop women judge	-16.10**	0.254	-15.84*	2.745	-16.34***	-4.088
		(7.019)	(2.500)	(8.925)	(39.77)	(5.525)	(4.323)
N Obs		205,083	248,015	115,142	42,565	356,178	353,539
Mean prison term		61.93	9.007	58.23	145.5	46.61	42.07
Sd prison term		159.1	38.51	194.7	369.1	146.4	174.1

Table D1: Effect of judges' gender composition on gender gap depending on crime type or age. Control for courts*offender's sex fixed effects, year, month, crime, age, nationality, criminal record.