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Working Paper Forum shopping and forum selling in German patent litigation: A quantitative analysis

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Forum Shopping and Forum Selling in German Patent Litigation: A Quantitative Analysis

Sibylle Lehmann-Hasemeyer * Alexander Morell *

February 17, 2025

Abstract

Using data on all patent cases in front of German courts between 2010 and 2015 we find that plaintiffs in patentinfringement cases mainly chose the venue where to sue by the speed with which courts dispose of their cases. We also find that quality – measured, both, as the fraction of cases challenged in the next instance and the ratio of successful appeals in the year before filing – has an impact on court choice by patent plaintiffs. We can further show that plaintiffs merely shop between three German courts, namely Duesseldorf, Munich and Mannheim. Moreover, we find that once one of these three courts introduces an additional panel of three judges, thereby working faster, the other two courts increase their working speed, too. This indicates that, indeed, courts actively compete for cases. However, we do not find evidence for courts reacting to a competitor's increase in speed by deciding in the plaintiffs favor more often or by deteriorating quality of decisions.

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JEL-Codes: D23, K11, K41, O34

Organizational Behavior, Intellectual Property, Litigation, Patents and Innovation.

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1 Introduction

Patents grant firms a break from competition rewarding them for innovation. Competition, however, is essential for pressuring firms into efficient production and innovation. Therefore, firms should not attain that break too easily. However, as has been documented in the past, German courts, deciding the bulk of cases in European patent litigation (Richter, 2022), may be too generous in awarding remedies for patent infringements (Bechtold et al., 2019). Competition between patent courts may lie at the root of the courts' generosity (Bechtold et al., 2019). Because plaintiffs can forum shop in patent infringement cases and courts find it attractive to hear such cases (we explain why below), they may engage in a race for faster dispute resolution, more plaintiff-friendly procedures, and more plaintiff-friendly decisions to attract more such cases. In this paper, we explore the determinants and effects of this competition. We are the first to study quantitatively what so far was only documented qualitatively and anecdotally. We are the first to use a complete state collected meta-dataset on all patent-infringement disputes before German courts initiated as of 2010 and disposed of no later than 2015 for conducting an inferential study on judicial behavior. We measure how much court speed matters for the choice of forum in patent disputes, and how large the impact of other factors is. Most importantly, we use an event that increases the speed of one of the three German courts involved in the competition for patent cases to measure how the other two courts react to this increase in competitive pressure in terms of speed, proplaintiff bias, and decision quality. Our observations remain relevant under the Unified Patent Court (UPC) established by several European countries lately because the UPC does not abolish the opportunity to forum shop (Veugelers and Harhoff, 2023).

1.1 Forum shopping and forum selling

If a plaintiff is free to choose the venue unilaterally, he will select the one most favorable to himself, possibly infringing upon legitimate interests of the defendant (Juenger, 1989; Klerman and Reilly, 2016; Clermont and Eisenberg, 1994; Lerner and Tirole, 2006). Other authors, in contrast, have argued that forum shopping may promote access to justice, expand the reach of regulation by democratic states beyond their borders in line with international law and drive experimentation with legal reforms (Bookman, 2016).

Generally, court selection rules try to "assure that the applicable law is not determined by the unilateral discretion of one party" (Juenger (1989), citing Savigny). However, they do not always succeed. Sometimes the jurisdictions of courts overlap, enabling forum shopping in certain areas of the law. In that case the plaintiff has free discretion where to bring a case (Juenger, 1989). While historically forum shopping was often a domestic problem (see on the jurisdictions of the Kings Bench, the Court of Common Pleas, and the Court of the Exchequer that overlapped until 1873 (Klerman, 2007)), it went global in modern times. Lord Denning could famously claim in 1983 that "[a]s a moth is drawn to the light, so is a litigant drawn to the United States" (Smith Kline & French Laboratories Ltd and others v Bloch, 1983, p. 74). Since then international forum shopping into the US system has been reigned in rather successfully – presumably by more stringent Supreme Court precedent (Whytock, 2011). Two fields of law, however,

are persistently notorious for forum shopping in the US as much as in Europe: bankruptcy filings and patent litigation. In the US, the venue to file for bankruptcy can be chosen by minor adjustments to one's business and debtors can even pick bankruptcy fora outside national boundaries (Casey, 2021). In the European Union, a reform of 2015 had little success in curtailing the debtor's discretion in choosing the venue for bankruptcy proceedings (Ringe, 2017). Forum shopping in patent litigation has attracted particular attention. The unlikely rise of the federal courts of the Eastern and later the Western Districts of Texas as leading fora for patent litigation may explain part of this interest (Klerman and Reilly, 2016; Economist, 2024). The market share of the Western District of Texas has since been curbed by requiring it to randomly assign cases to judges (Economist, 2024). The decline of cases in the west only provided the Eastern District of Texas with an opportunity to win back its dominant role in U.S. patent litigation (Castle, 2024; RPX, 2024). In Europe, patent holders are free to choose their forum, too, allocating more than 50% of their cases to Germany followed by France and the Netherlands (Cremers, 2017; Richter, 2022). As this brief and eclectic overview shows, legislators and court administrators have typically tried to curb forum shopping.

Authors have also discussed whether forum shopping leads courts to cater to plaintiff's demands in order to attract more cases, leading to pro-plaintiff bias. Such adjustment of judicial services to plaintiffs' preferences has been coined "forum selling" as courts make their product more attractive to consumers of judicial service (Klerman and Reilly, 2016). Others simply wrote of "competition for cases" (Casey, 2021) or the "dispute resolution market" (Wagner, 2014; Klerman, 2007). These authors pointed out that when the plaintiff can choose the forum unilaterally and courts adjust their service to his demand, a race to the bottom will ensue and will tilt the playing field further in the plaintiff's favor harming the fairness of procedure and possibly even the efficiency of the law by issuing one-sided precedent. Judges, of course, typically dismiss any allegations of being biased towards the applicant's demands. Bankruptcy judges wrote that they "strongly reject[.] any suggestions [...] that any bankruptcy judges make rulings for reasons other than that which is supported by fact and law" (Casey, 2021). Another judge wrote that "judges slant their rulings in order to lure future cases to their courts is an offensive fantasy" (Casey, 2021). Indeed, forum selling may foster benign results, too, if courts resist the temptation to bias their decisions in the plaintiff's favor. Competition for plaintiffs may lead to a greater specialization and incentives for judges to operate in a more efficient and predictable manner (Casey, 2021). Whether forum shopping ultimately leads to a race to the bottom or one to the top is an empirical question to the answer of which this paper contributes.

German patent litigation offers a test case for the consequences of forum shopping. For decades, plaintiffs in patent infringement disputes have been able to choose freely between 12 German courts. We quantitatively assess what plaintiffs shop for and whether courts are responding to plaintiffs' demands. We find clear evidence that plaintiffs shop for speed. Furthermore we can document benign results of a competition between German courts in that it makes courts faster. We find neither evidence that courts have any pro-plaintiff bias nor that decisions are challenged more often or with greater success due to the competition between courts. Previous evidence on forum selling in Germany has been mainly qualitative and was based on insider interviews (Bechtold et al., 2019). We set out to quantify and test some of the claims made in this literature.

1.2 Background: The German patent-jurisdiction system

The German system is a bifurcated system of patent litigation. Claims for infringement of patents are brought in front of ordinary civil courts. Claims of nullity of patents are brought in front of the patent office or the national patent court. In infringement cases, plaintiffs can freely choose the venue where to sue due to Sec. 32 of the Code of civil procedure (ZPO). This section allows the victim of an infringement of her rights to sue at the place of the infringement. Common interpretation of the provision considers any instance of sale of a product to infringe upon a patent allowing the plaintiff to sue at any place of sale and pick from 12 courts competent to hear patent infringement cases in Germany. Germany is the most important venue of patent infringement cases in Europe (Cremers, 2017; Richter, 2022). Proceedings are comparably cheap and – at the time – in cases of infringements courts awarded injunctions independently of any balancing of interest. In addition, German courts handling patent cases feature highly specialized judges, whose expertise is held in high esteem by patent practitioners (Bechtold et al., 2019).

1.3 Related Literature and Contribution

There are two papers which are particularly relevant to our research. The first is Bechtold et al. (2019). They conducted insider interviews and concluded that there is indeed both, forum shopping and forum selling in the realm of patent infringement litigation in Germany. In their interviews insiders reported that plaintiffs select the forum by quality - the judges' grasp of complex technical issues as well as the depth of their legal arguments – and by the speed of decision-making. They collected reports of forum selling, too. Insiders stated that courts do interpret legal - mainly procedural – rules in favor of the plaintiff, try to work fast, and reduce the delay of decisions by reluctance to, both, calling in expert witnesses and holding proceedings to wait for a possible patent nullification by the German Patent Court. The other paper particularly closely related to ours is Gaessler and Lefouili (2017). They hand-collected a very detailed data set of all patent infringement proceedings at the Landgerichte in Duesseldorf, Mannheim and Munich from 2003 to 2008 in which they observed among others the parties to the proceedings, the value of the claim, and the verdict in the first instance. Using a choice model, like the one we use in the first part of this paper, they found that in the 2000s the speediness of case resolution was the main determinant of the forum choice for cases in which a large amounts were at stake. They also found that the proximity of courts played a role for the plaintiff's choice of forum. We study two things: forum shopping and forum selling. On forum shopping, we confirm the qualitative finding by Bechtold et al. (2019) and the quantitative finding by Gaessler and Lefouili (2017) that the speed of court decisionmaking has a significant and seizable effect on the choice of courts. In contrast to Gaessler and Lefouili (2017) we do not estimate the expected duration for each case, but assume that all plaintiffs that start a case in a certain month face the same information about a court's current speed. We approximate the parties' expectations about a court's current speed of disposal with the average duration of the cases that ended within 30, 90, and 180 days before filing, respectively. While the design of the study by Gaessler and Lefouili (2017) is similar to ours with regard to forum shopping and the authors use very detailed hand-picked data, we go beyond their findings in several aspects. Including data on appeals courts allows us to include two measures of decision quality into our analysis of forum shopping: the rate by which decisions are appealed and the rate by which decisions are successfully appealed. We also examine the effect of the parties origin (German, European or from a non-European country). We include cases brought in Hamburg and Frankfurt and can provide quantitative evidence that these two runners-up to the main three patent fora are not part of the same market for patent dispute resolution that Duesseldorf, Mannheim and Munich act on. The decision to sue in Hamburg or Frankfurt does not seem to be influenced by improvements at the other courts. Finally, we study the 2010s while Gaessler and Lefouili (2017) study the 2000s. Our main contribution is that beyond forum shopping we also examine the phenomenon of forum selling, for which we find conclusive evidence. While Gaessler and Lefouili (2017) do not examine forum selling, Bechtold et al. (2019) document that insiders report that courts compete for cases. In particular, Bechtold et al. (2019) provide convincing albeit anecdotal evidence that at one point Duesseldorf seemed to adjust its interpretation of the law to appeal to plaintiffs. However, Bechtold et al. (2019) do not provide quantitative evidence of forum selling. We provide converging evidence to Bechtold et al. (2019) that indeed there is forum selling between the three main German courts involved in patent infringement litigation. Our evidence, however, is of a very different kind. Instead of drawing from interviews, we can show in the data, how Mannheim and Munich increase their working speed after Duesseldorf introduced a third panel specializing in patent infringement disputes – even when controlling for backlog at filing and additional workload accumulated while the case is pending. In a placebo test for Mannheim we can also show that only patent cases are affected by this increase in speed while the Mannheim judges slow down regular civil law cases to free resources for keeping up with Duesseldorf. Finally we can show that there is no shift of cases to Duesseldorf that could explain the increase in speed in Mannheim and Munich. This combination of event-study and placebo setup brings our evidence closer to causal inference, although we cannot entirely rule out all possible alternative explanations. In contrast to Bechtold et al. (2019), however, we document mainly benign results of forum shopping while neither being able to show increasing pro plaintiff bias nor declining quality.

1.4 The Motivation to Compete

Why would judges compete for cases at all? Judges are paid a flat wage independently of the effort they provide. So why would they increase their workload by actively attracting more cases? From the interviews by Bechtold et al. (2019) it seems that judges find patent cases interesting and are intrinsically motivated to deal with the matter. They also seek the power and reputation of resolving important, large-value disputes that sometimes impact a whole industry for years (Bechtold et al., 2019, p. 516). Finally, handling an increased caseload may increase a judge's prospects of promotion (Bechtold et al., 2019, p. 517). Beyond that, if designated patent panels do not attract enough patent cases, they must resolve "bread and butter" private law disputes, instead, which many of the highly specialized judges will find less attractive and possibly harder to do, than dealing with patent cases. In the attempt to attract patent cases, judges work in tandem with court administrators, i.e. the heads of courts as well as the state ministry of justice representing the states ("Laender"). The earlier have a large influence on promotions, the latter on the funding of courts. The general civil courts which decide patent infringement cases apply federal law but are run by the states.

to attract more patent cases mainly because the ratio of court fees such cases generate over the hassle they cause is particularly favorable. While they are laborious to resolve, the cases bring in a lot more fees than they cause in costs (judges' wages per hour of work, rooms, mainly; the expenses for specialized witnesses must be covered by the parties and are not included in the court fees). Bechtold et al. (2019, p. 521) estimate that in 2009 alone, patent cases in Duesseldorf generated 7.5 million Euros in fees for the judiciary. The six judges involved in resolving patent disputes at the time will not have cost the state more than 1.5 million that year in total¹. That leaves a significant contribution to the financing of the judiciary. States will also consider a strong local patent court an asset for the local economy (Bechtold et al., 2019, p. 521-522). Not only does the community of specialized law firms produce a considerable turnover. In addition, manufacturing plays an important role in the German economy and strong patent protection is often considered important to the local economy. Finally, in the years up to 2014, the pending decision on the locations of the branches of the unified patent court generated an additional incentive for court administrators to showcase their courts' brilliance in resolving patent disputes (Bechtold et al., 2019, p. 523).

2 Data

Accessing official data in Europe, and in Germany in particular, is a challenge. Administration is typically reluctant to provide official data raised to inform public officials to researchers. Data protection is typically cited as a reason. In the context of the judiciary we faced some extra resistance based on the concern to infringe upon the judges' independence. Despite that resistance we are the first to use data collected for the official court statistics of the Federal Republic of Germany and to conduct an inferential study on judicial behavior. Our data represent the most complete data-set on patent disputes in Germany available. We observe all patent infringement proceedings in Germany initiated after 2010 and resolved no later than 2015. The data are collected from court files at the conclusion of each case by clerks who complete a standardized form attached to each file. From 2010 onwards, cases dealing with patent infringements, utility models, and employee innovations are singled out and labeled "Technische Schutzrechte". Given that the majority of these cases pertain to patent infringement disputes, it is appropriate to associate this category with patent disputes.² Thus, we use a comprehensive dataset that covers all relevant cases in Germany from 2010 to 2015. However, we restrict our sample to the cases heard by the five courts that dealt with the majority of these cases. These courts are, in order of market share, Duesseldorf, Mannheim, Munich, Frankfurt, and Hamburg. More specifically we observe the following information per case: The court, the panel, the day the case was filed at the respective court, the rough location of the parties (Germany/foreign country EU/foreign country non-EU, both, for plaintiff and defendant), the number of hearings with and without seeing evidence, respectively, the type of final decision and plaintiff success. The latter can be inferred from the decision on who bears the costs as in Germany courts apply a loser pays rule. More specifically, the available data is coded as follows: 1= Only plaintiff bears the costs; 2= Mainly plaintiff bears the

¹Judges earn less than \notin 100,000 each, with pension contributions and healthcare benefits on top. Rooms and infrastructure are fixed costs. It is important to note that this is a rough estimate and should not be taken as a definitive figure.

²In the years 2004-2008 all German *Landgerichte* together acquired 708 patent cases per year on average (Cremers, 2017, p. 23). In our data, the three *Landgerichte* at Duesseldorf, Mannheim and Munich gathered 746 cases on "technische Schutzrechte" per year on average in the years 2010-2014. From 2017-2021 this number was 761 cases per year for the three courts together (Richter, 2022). Therefore, we conjecture that the vast majority of cases on "Technische Schutzrechte" deal with patent infringements

costs; 3= Both parties share the costs equally; 4= Mainly defendant bears the costs; 5= Only defendant bears the costs. Thus, values above three indicate pro-plaintiff decisions. Moreover, we know the value of the case and the days of disposal of the case. The data, however, does not include the text of the decision, the exact seat of the plaintiffs, or the type of the patent. An overview of the variables is presented in Table 1.

	Duesseldorf	Mannheim	Munich	Hamburg	Frankfurt	Total
Cases	2331	1015	914	135	206	4601
In Percent of all	50.7	22.1	19.9	2.9	4.5	100.0
Value in 1000 Euros (mean)	1147.7	1071.0	694.2	281.8	194.9	970.4
Share of Pro Plaintiff decisions	0.6	0.4	0.5	0.7	0.6	0.5
Index Pro Plaintiff decisions (1-5)	3.4	2.9	3.2	3.8	3.3	3.2
Duration in days (mean)	280	248	223	227	177	255
Share German Plaintiffs (in Percent)	0.51	0.67	0.61	0.59	0.77	0.58
Share German Defendants (in Percent)	0.61	0.71	0.65	0.73	0.77	0.65

Table 1: Overview Variables by Court (First Instance)

Data: The data was kindly provided by the ministries of justice of the 16 German Laender.

3 Forum Shopping – Quantitative Evidence

3.1 Choice Model

As previously mentioned, if a plaintiff has the freedom to choose the venue, they may select the one that is most advantageous to them, potentially encroaching on the defendant's legitimate interests (Clermont and Eisenberg (1994), Lerner and Tirole (2006)). In this section, we will explore the determinants of this choice. Furthermore, the analysis indicates whether the five major patent courts in Germany (Duesseldorf, Frankfurt, Hamburg, Mannheim, Munich) are truly in competition with each other.

We assume that each plaintiff *i* compares all possible courts simultaneously and then chooses the alternative court *a* that provides the highest value of an unobserved ranking index on court conditions C_{ia} . We estimate the following mixed multinomial logit model to represent choices between alternative courts.

$$C_{ia} = X_{ia}\beta_i + z_i\delta_a + \varepsilon_{ia},\tag{1}$$

where β_i are random coefficients that vary over cases, and X_{ia} is a vector of court-specific variables that vary between court *a* and case *i*. In the baseline regressions, we use the average duration of the proceedings that ended in the 90 days before the case was filed and the share of pro-plaintiff outcomes during these 90 days (in robustness checks, we also run this regression based on a time horizon of 30 and 180 days, Table 3). δ_a are fixed court-specific coefficients on z_i , a vector of plaintiff-specific variables (the value of the claim, the information of whether the plaintiff is a German resident and year). ε_{ia} is a random term that follows a type I extreme value distribution. We run the model twice. In the first regression (columns 1-5), we allow Düsseldorf, Mannheim, Munich, Frankfurt, and Hamburg as possible jurisdictions. In the second regression, we allow only the first three (columns 6-8). The reason for this is that the variables, based on the averages in the 90 days before filing, have several missing values, precisely whenever no case was closed in the 30 days prior to filing. These missing values are particularly frequent in the less frequently chosen courts of Frankfurt and Hamburg. The results are shown in Table 2.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	court	Mannheim	Munich	Hamburg	Frankfurt	court	Mannheim	Munich
Value of claim		3.84e-08*	-1.14e-07***	-1.02e-06***	-1.51e-06***		4.06e-08**	-1.46e-07***
		(2.12e-08)	(3.00e-08)	(2.78e-07)	(3.18e-07)		(2.02e-08)	(2.95e-08)
Plaintff from Germany		0.717***	0.382***	-0.269	0.892***		0.720***	0.211**
		(0.0992)	(0.101)	(0.231)	(0.236)		(0.0925)	(0.0891)
Defendant from Germany		0.238**	-0.140	0.778***	0.387*		0.324***	-0.0814
		(0.101)	(0.101)	(0.286)	(0.226)		(0.0941)	(0.0898)
Duration (90 days)	-0.00113*					-0.00123*		
	(0.000603)					(0.000678)		
Index Pro-Plaintiff decisions (90 days)	0.0643					0.0474		
	(0.0467)					(0.0526)		
Constant		-1.835***	-1.374***	-2.229***	-2.939***		-1.978***	-1.263***
		(0.154)	(0.140)	(0.321)	(0.335)		(0.149)	(0.128)
Year fixed effects	y	y	y	y	y	y	y	v
Cases	3,430	3,430	3,430	3,430	3,430	3,837	3,837	3,837
Observations	17,150	17,150	17,150	17,150	17,150	11,511	11,511	11,511

Table 2: Choice Model - Baseline regression

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

In terms of court-specific variables (column 1 and 6), we see that the *past speed of the courts (Duration)* has a statistically significant impact on the choice of venue. Courts that dispose of cases quickly during the last 90 days before a case is brought are more attractive venues to file a new patent infringement suit. In contrast, whether courts are leaning towards *pro-plaintiff decisions*, has no statistically significant impact on court choice. It appears that plaintiffs primarily shop for speed when deciding where to bring a patent infringement case in Germany. The effect of the average duration of a case on the choice of court can also be visualized using margin plots extrapolating the local trends (see Figure 2). For example, if the average duration of a case in Duesseldorf increases from 100 to 200 days, the probability of choosing Duesseldorf decreases from about 52% to 50% in favor of Mannheim and Munich, where the probability of choosing this court would increase from about about 47% to 49%. Hamburg and Frankfurt again remain largely unaffected by the changes in Duesseldorf, confirming that they have not managed to enter the competition for patent cases but must make do with a baseline rate of customers.

With regard to case-specific effects our regression shows that *high-stake cases* (high Value of claim) tend not to be brought to Munich, Hamburg or Frankfurt. They tend to go to Duesseldorf and Mannheim. The effect of the value of the claim on forum choice can be illustrated as in Figure 3. Linearly extrapolating the predictive margins, we find in the data that as the value of the claim increases so does the probability that it is brought in either Duesseldorf or Mannheim. Correspondingly, the probability that it is brought in Munich decreases with increasing value of the claim. We also see that the probability that a case is brought in Hamburg or Frankfurt remains low and although it is significant in the regression it seems rather independent of the claim's value.





Figure 2: Predictive Margins: Duration, Predictions for changes in Düsseldorf



Note: The figure shows the expected probabilities of choosing the courts with changes in the average duration in the 90 days prior to the decision in Düsseldorf, if there is no change in the duration of the other courts.

In the next step, we vary the time horizon over which expectations are formed over time. In the baseline, we had 90 days before submission. In Table 3, we now show the coefficients of the court-specific variable duration and proplaintiff decisions for 30 days and 180 days. While the latter does not appear to play a role in any specification, it can be clearly seen that the time horizon for expectations regarding the possible duration of the proceedings seems to be relatively short. The significance is greatest for the smallest time window of 30 days and disappears for the time window of 180 days. The number of cases varies slightly between columns 1 and the others because there are a few cases in the specification with the smallest time window in which no case was completed in the 30 days prior to enrollment.

Court specific variables	(1) 30 days	(4) 90 days	(7) 180 days
Duration	-0.001***	-0.001*	-0.001
	(0.000)	(0.000)	(0.001)
Index Pro Plaintiff decisions	0.002	0.047	0.040
	(0.030)	(0.053)	(0.077)
Year fixed effects/Court specific variables	У	У	У
Cases	3,765	3,837	3,837
Observations	11,295	11,511	11,511

Table 3: Different time horizons for court specific variables

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

The table re-estimates the second model from table 2 (columns 6-8),

providing only the estimated coefficients of the court-specific variables (equivalent to column 6) based on different time horizons.

3.2 Exploring Nationality's Role in Claims

Based on the data, we can further explore the role of the nationality of the plaintiff and defendant, as we have information on whether they were from Germany, another European country or a non-European country. In the baseline regression presented in Table 2, we include a variable indicating whether the plaintiff or the defendant was from Germany. It can be observed that the probability of a claim being heard in either Mannheim, Munich or Frankfurt is greater when initiated by a German plaintiff (Claim from Germany) than when initiated by a foreign claimant. During the years 2010 to 2014 Duesseldorf attracts almost 60% of the foreign claims and attracts over 60% of domestic ones. While Mannheim's market share among foreign claims is around 10% it manages to capture more than 10% of domestic claims. Munich attracts a little more than 10% of foreign claims and a little less of domestic ones. Hamburg's and Frankfurt's market share is invariably low in both categories (well below 5%). Cases against foreign defendants seem more likely to be brought in Duesseldorf and Munich. In the next step, we extend the analysis by also including whether the plaintiff or defendant is from Europe or a non-European country. We loose some observations, because for some cases, we only know that the nationality was not German. The results are presented in Table 4. It does not seem to make a big difference whether the cases were European or include an actor from a non-European country. Duesseldorf remains the main forum for international cases. Munich also seems to be an attractive choice if

the defendant is from a non-European Country. Hamburg is an interesting case, because it seems that the likelihood of choosing Hamburg is higher if the defendant is European than if the defendant is German. This can be explained by the fact that Hamburg is a large trading port. Products that arrive here from abroad and infringe a patent may not yet be traded elsewhere. In this case, these infringements can only be dealt with in Hamburg, because that is where the infringement took place.

	(1)	(2)	(3)	(4)	(5)
	Court-specific	Mannheim	Munich	Hamburg	Frankfurt
Value of claim		6.43e-08*	-3.34e-09	-1.10e-06***	-7.62e-07***
		(3.50e-08)	(4.02e-08)	(4.13e-07)	(2.84e-07)
		(2.94e-08)	(3.36e-08)	(2.64e-07)	(3.16e-07)
Location of Plaintiff					
Non-European countries		-0.659***	0.137	-0.482	-0.328
		(0.222)	(0.190)	(0.458)	(0.417)
Europe		-0.732***	0.0209	-2.249**	-0.310
		(0.227)	(0.196)	(1.017)	(0.370)
Location of Defendant					
Non-European countries		-0.775***	-0.461***	-1.124*	-0.901**
		(0.175)	(0.171)	(0.618)	(0.374)
Europe		-0.880***	-0.314*	0.940***	-0.970**
		(0.194)	(0.177)	(0.304)	(0.414)
Duration (30 days)	-0.001**				
	(0.000)				
Index Pro- Plaintiff decisions (30 days)	-0.018				
	(0.037)				
Constant		-0.838***	-1.286***	-1.762***	-1.814***
		(0.144)	(0.153)	(0.234)	(0.237)
Year fixed effects	У	У	У	У	У
Cases	1,879	1,879	1,879	1,879	1,879
Observations	9,395	9,395	9,395	9,395	9,395

Table 4: Choice Model - Baseline regression, actors nationality

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

3.3 Including Data on Appeal Courts

In the next step, drawing from our data on appeals court decisions, we construct three quality measures for the courts of first instance to check whether the quality of decision-making plays a role for forum choice.

First, we assume that well-reasoned decisions are harder to challenge in the next instance. We further assume that counsel will be able to assess how well-reasoned a first-instance decision is so that counsel will be able to roughly predict the prospects of challenging a verdict. Accordingly, the probability that counsel will advise party to challenge the decision decreases in the quality of the decision. This reasoning leads us to use the ratio of challenged decisions over all decisions as a measure of quality of a first instance court.

In the second measure of quality, we look at how many of the appealed cases and in a third at how many of all regional court decisions were overturned in the second instance. For this purpose, we match the first instance cases from the *"Landgerichte"* (LGs) with the second instance cases from the *"Oberlandesgerichte"* (OLGs). Although we have very

little information on the type of case, this is possible because our data includes the date of the first filing at the LG for each OLG case. In 957 cases we can clearly assign the cases. In further 16 cases, we have more than one case at the OLG that matches the case dates of the LG. In these cases, we assume that at least one of the matches was correct, and the 16 cases are counted as appealed cases. Thus, we observe that 957 of 4,601 cases (20%) were appealed to the OLG. Our regression model shows that indeed the quality of decisions is another factor by which plaintiffs choose their forum if we only allow the choice between the three largest courts Dusseldorf, Mannheim and Munich. The results are provided in Table 5. For reasons of clarity, only the coefficients of the court-specific variables of interest are reported. As before, we estimate the decision model with different time horizons. For duration and pro-plaintiff decisions, we stick to the 30-day horizon. For the number of cases appealed, we show results for the average of 30, 90 and 180 days before the decision. For the successful appeals, we use a longer time horizon of 180 and 365 days because the appeals court needs time to decide. Although the results are not robust across all variations of the model, the quality of decisions certainly seems to matter. We find evidence for both our first and second quality measures. The more cases were appealed and the more were eventually reversed in the second instance, the lower the likelihood that this court was chosen. To facilitate the interpretation of our results, we again provide the predictive margins showing how many cases a Landgericht can gain when its cases are challenged less frequently (see Figure 3). When none of the decisions by the Landgericht Duesseldorf would be challenged it would attract roughly 58 % of cases while it would only attract some 45 % of cases if all its decisions were challenged in the three preceding months (90 days).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	court	court	court	court	court	court	court
Duration (30 days)	-0.001***	-0.001***	-0.001***	-0.001*	-0.001*	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Index Pro-Plaintiff decisions (30 days)	0.002	-0.005	-0.007	-0.041	-0.039	0.001	0.001
	(0.030)	(0.029)	(0.030)	(0.041)	(0.040)	(0.030)	(0.030)
Appealed cases (30 days)	0.0174						
Appealed cases (90 days)	(0.190)	-0.601**					
() () () () () () () () () () () () () ((0.301)					
Appealed cases (180 days)		· · · ·	-0.704				
			(0.453)				
Successfully appealed cases (180 days)				-0.422			
				(0.350)	a . C. a. 17 - 11-11-		
Successfully appealed cases (365 days)					-1.615**		
Successfully appealed cases of all cases (180 days)					(0.693)	-0.0459	
Successionly appealed cases of an eases (100 days)						(0.814)	
Successfully appealed cases of all cases (365 days)						(0.01.)	-0.173
							(1.605)
Year fixed effects, case specific controls	У	У	У	У	У	У	У
cases	3,765	3,765	3,765	2,477	2,477	3,765	3,765
Observations	11,295	11,295	11,295	7,353	7,431	11,295	11,295

Table 5: Court Specific Variables - Including Data on Appeal Courts

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

The table re-estimates the second model from table 2 (columns 6-8), providing only the estimated coefficients of the court-specific variables (equivalent to column 6) based on different time horizons.

Figure 3: Predictive margins: Share appealed cases (90 days)



4 Forum Selling

Now we turn to forum selling. Can we find evidence that courts actively try to attract cases that would otherwise go to another court? To investigate this question, we use an event in Duesseldorf, which improved the court's position in the competition, to see how the courts in Mannheim and Munich react. The event is the introduction of a third panel, which made Duesseldorf faster. We can see quite clearly in figure 4 that Mannheim and Munich also became faster at that time. This may be due to two different mechanisms: On the one hand, Duesseldorf may attract more cases, because, as we saw in section 3, speed has a significant influence on which court the case is brought to. As Duesseldorf gets faster attracting more cases it may relieve the congestion in Mannheim and Munich allowing them to resolve the remaining cases faster, too. On the other hand, faster Duesseldorf may motivate Mannheim and Munich to invest more effort and thus resolve cases faster that way – this would be a true sign of forum selling. We will show that our data are consistent with both mechanisms. Beyond shifting cases (mechanism 1), the competition between courts motivates courts to invest more effort (mechanism 2). The fact that we find evidence for mechanism 2, too, is evidence for forum selling.

4.1 The third panel in Duesseldorf

On April 2nd, 2012, the *Landgericht* in Duesseldorf announced via a magazine specializing on reports from the market for legal services ("Juve") that it will install a third panel of three judges to handle patent cases (Behlau, 2012). Behlau writes that this news was surprising, even for well-informed market observers. The purpose of the measure in

Duesseldorf, she writes, was to shorten the long duration of procedures in Duesseldorf. Also, North-Rhine Westphalia aimed at positioning itself favorably in the race for attracting a regional chamber of the European Unified Patent Court. On 17 December 2012 the third panel started working (Klos, 2012). In 2012 the two preexisting panels had a total of 8.15 judges on average.³ Once the third panel started working the prior panels lost 0.4 and 0.25 positions on average, respectively, while the third panel started with 1.7 positions. At the outset, therefore, Duesseldorf only added 1.05 positions. By 2014 all panels were staffed with slightly more than 3 positions on average. In that year, Duesseldorf devoted 9.71 positions to its patent section. The introduction of a new panel is more than adding positions, however. A new panel adds a new panel chair (who also earns a higher wage than a regular judge). At German Landgerichts, there is a particular partition of labor of the three judges that work on their cases as a standing panel. There are two regular judges and one head of panel. Of the regular judges, on each case, one acts as rapporteur. She researches answers to the relevant questions of law, reports them to the panel, drafts the reasons of the verdict, and, of course, votes on the case. The second regular judge merely votes on the case, without any responsibility beyond being adequately informed and participating in panel hearings and discussion. Heads of panels deal with legal work, too, and may also draft reasons, but they alone are responsible for case management and chairing all hearings. Therefore, they have to know all files of the panel well while regular judges need to thoroughly know only the files they are assigned to as rapporteurs and can make do with a comparatively rough grasp of others. As caseload increases there is certainly more pressure on all judges to find the law and draft judgements more quickly. However, for heads of panels the task gets exponentially more complex as they have to keep track of more cases to advance them skillfully and ask the right questions in hearings. Introducing a new panel adds a further chair of panel to the patent section in Duesseldorf so that not only drafting verdicts but also case management can be distributed on more shoulders. In the eyes of a plaintiff, therefore, the third panel made the venue in Duesseldorf more attractive for two reasons at a time: More manpower for legal reasoning and more manpower for case management. Indeed, before the introduction of the third panel (between January 2010 and December 2012), Duesseldorf took on average some 321 days per case. After the introduction of third panel (between January 2013 and December 2014) this number dropped to 231 days on average. Shortly after Duesseldorf's announcment of an additional panel, Munich decided to swiftly add half a position to each of its two patent infringement panels. As of September 1st 2012, the decision in Munich was already put into practice, with an increase of 2.25 positions in its patent section.⁴ This measure was reported in the specialized media as a reaction to the announcement by Duesseldorf. It is therefore our exhibit ONE - albeit qualitative - in an attempt to build a case that courts are indeed selling their forum by catering to the plaintiffs' needs.

In terms of the sheer number of positions, Duesseldorf's measure appears weaker than that of Munich. However, no panel chair was added in Munich, leaving the work of case management and chairing invariably in the hands of the two existing chairs. This may have made the measure by Duesseldorf more effective in reducing delays than that of

³In reporting the number of positions over time we rely on reports that we requested from the three courts.

 $^{^{4}}$ Until then, the two patent panels had stably worked with 2.75 and 3 positions, respectively, since 2010. Now (and beyond its announcements) it upgraded its first panel from 2.75 positions to 4 positions. Its second patent panel receives an upgrade from 3.0 positions to 4 positions. In total, therefore Munich added 2.25 positions to its patent section. In 2013 the first panel was reduced back to 3.5 positions. In 2014 it granted 1.5 additional positions to the second patent panel, which was reduced to 3.5 positions in 2015.

Munich despite Duesseldorf adding fewer positions. In contrast to Duesseldorf and Munich, Mannheim did not grant its patent section more (wo)manpower. It continued to operate with the same number of judges. Only for the duration of the third quarter of 2012 did Mannheim add 0.5 positions to one of its two patent panels (six full positions in total), which may be due to normal fluctuations in judicial staff.

We estimate the choice model for the period before the introduction of the third panel in 2012 and find that for this sub-period, too, the average duration of trials ending in the month in which the claim was filed is the most robust predictor of court choice. Based on the estimates from the choice model, we can estimate how Duesseldorf's drastic increase in the speed of disposal should have affected the courts' market share. The results of this exercise are shown in Table 6. It shows that our estimates for the period before December 2012 are consistent with the actual realised market share. However, our prediction for the period after December 2012 is quite different from the observed values. We estimate that Duesseldorf's market share should have increased from 52 % to 56 %. Mannheim should have lost 3 percentage points of market share (from 24 % to 21 %), Munich should also have lost two (from 18 % to 16 %), Hamburg one percentage point, and Frankfurt would have remained at the same level. However, this is not what we observe. If we compare the realized market share with the estimated market share (Diff A-B), the realized shares are much less affected than we would have expected. In fact, Duesseldorf's market share remains roughly constant, Mannheim's only falls by one percentage point, and Munich's increases by five percentage points. Hamburg loses 3 percentage points and Frankfurt even gains one percentage point. The reason for this must be that, in addition to the fact that Duesseldorf is getting faster, other things are changing, too, influencing the choice of plaintiffs. But what else is changing?

Courts	t	Margins	st. Err	Z	Realized Market share (B)	Deviation
		(A)			Market Share (D)	(A-D)
Duesseldorf	Before December 2012	0.51	0.01	44.14	0.51	0%
	After December 2012	0.56	0.02	25.35	0.51	-6%
Mannheim	Before December 2012	0.24	0.01	24.1	0.22	-1%
	After December 2012	0.21	0.01	16.34	0.21	0%
Munich	Before December 2012	0.18	0.01	19.79	0.18	1%
	After December 2012	0.16	0.01	14.69	0.23	7%
Hamburg	Before December 2012	0.04	0.00	8.4	0.04	1%
	After December 2012	0.03	0.00	7.79	0.01	-3%
Frankfurt	Before December 2012	0.04	0.00	9.04	0.04	0%
	After December 2012	0.04	0.00	8.39	0.05	1%

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

We mentioned before how Munich reacted to the change in Duesseldorf by adding positions in the patent section of the court, indicating that Munich strategically reacted to forum shopping. The discrepancy between prediction and reality that we show, is most likely the result of forum selling, too. Mannheim and Munich increase efforts in response to the increased speed with which Duesseldorf was rendering its decision of 2012. The introduction of the third





Graphs by court

panel in Duesseldorf was arguably exogenous to the Courts in Munich and Mannheim. Courts are organized by the *Bundeslaender*. The courts in Duesseldorf are thus staffed by the ministry of North-Rhine Westphalia. The courts in Mannheim are staffed by the ministry of Baden-Württemberg and the Courts in Munich are staffed by the ministry of Bavaria. All these ministries are independent. There is no central judicial authority coordinating the judiciary across the *Bundeslaender*. We will now test whether we find quantitative evidence of forum selling, i.e. whether the increase in speed in Duesseldorf leads Mannheim and Munich to resolve cases faster, decide more often in the plaintiffs favor or to change the quality their decisions (lower quality because faster decisions lead to more sloppiness or higher quality to attract more cases).

4.2 Forum Selling by increasing the speed in Munich and Mannheim?

Figure 4 illustrates that the mean duration of proceedings decreased not only in Duesseldorf and Munich, but also in Mannheim, despite Mannheim not appointing additional judges to its patent panels. It is also noteworthy that the duration in Frankfurt and Hamburg remains largely unchanged, which aligns well with our findings above that these courts were not directly competing with Duesseldorf, Munich and Mannheim.

It seems plausible that the increase in speed in Mannheim and Munich is a consequence of the third panel in Duesseldorf: judges in Munich and Mannheim may have invested more effort in resolving cases more quickly in order to avoid losing cases to Duesseldorf. Nevertheless, there are at least three alternative explanations that warrant attention, the



Figure 5: Manpower of the Courts and number of cases

first two of which are part of "mechanism 1", already mentioned. First (mechanism 1a), the mere loss of cases to speedier Duesseldorf may have resulted in a reduction in the workload of the courts in Mannheim and Munich. This, in turn, may have resulted in a reduction of the average duration of the cases heard by these two courts. In particular, the number of cases handled in Mannheim has decreased considerably, as illustrated in Figure 5. Second ("mechanism 1b"), cumbersome high value suits may have gone to Duesseldorf after December 2012 leaving Mannheim and Munich with a lighter workload which is not expressed in number of cases. In addition to these two, the figure also reveals a decline in the number of cases across all courts. The decline in 2015 is particularly pronounced. Our data only covers those cases that were concluded by 2015 so that long proceedings are increasingly rarer in our data as the end of 2015 approaches. A case that started in October first 2015 would only have made it into our dataset if it was resolved in less than three months. Consequently, we decided to exclude the cases that started in 2015 from the subsequent analysis, as the declining trend from censoring in that year would distort the results. The remaining trend may still stem from the fact that our data is censored so that towards the end of our data-set long cases get rarer. Any effect of judicial effort has to be separated from this trend.

To exclude the third (general trend) alternative explanation, we regress the duration of trials in Munich and Mannheim on a dummy variable that is equal to one after the introduction of the third panel in Duesseldorf ("*Dec2012*") and include year fixed effects. This allows us to test whether there was a structural break in the general trend when Duesseldorf increased the competitive pressure on the other courts. Subsequently we are going to add a placebo test in which we check whether any structural break in the trend of the duration of patent cases differs from that in teh duration of general civil law suits treated by the patent judges. To exclude the first alternative explanation ("mechnism 1a": loss of cases) we control for the existing backlog of cases on the day the suit is filed ("*Number of cases...*"). In the appendix we further include a variable that covers the average workload of the courts during the case. The main results remain unaffected (please see Table A.1) In addition, we also control for the value of the claim but we will add more evidence that the second alternative explanation ("mechanism 1b": high value cases go to Duesseldorf) does not drive our results. Finally, we also control for hearings without evidence. Accordingly, we estimate the following ordinary least squares regression (OLS) with robust standard errors:

$$duration_{it} = \alpha + \beta Dec2012_t + \pi it + \mu_t + \varepsilon_{it}.$$
(2)

We expect β_t , to be negative and significant if the increase in speed was due to this competitive move. π_{it} covers the effect of case-specific variables such as value, number of hearings without evidence and year-fixed effects for the years when the case was brought to court, . μ_t captures the effect of court-specific variables such as the court's backlog measured as the number of currently open cases. ε_{it} is the error term.

We run the regression for Munich and Mannheim as the main competitors of Duesseldorf. The results of these regressions are presented in column 1-4 for Mannheim and column 6 for Munich in Table 7. The control variables have the expected signs. The more hearings the court holds, the longer it takes to resolve the case. Higher values increase the duration indicating that high value cases tend to be more complicated. The expected effect of backlog and workload were ambivalent. When the court is overwhelmed with cases it may take less time per case to cope. However, it may also be so distracted that it does not manage to resolve cases in a timely fashion. In our data, higher additional workload during the handling of the case leads to faster case resolution (Table A.1). The effect of higher backlog is ambivalent. In Munich it increases the duration until resolution. In Mannheim it has no effect on the duration of patent cases and decreases the duration of ordinary civil law suits. With regard to the introduction of the third panel in Duesseldorf, we see that after December 2012, the duration of proceedings in Mannheim is shorter. This difference cannot entirely be explained by a change in the caseload or by case characteristics. We consider this result **exhibit TWO** suggesting that the courts actively react to the increased speed of their competitor. The general trend should be picked up by the year fixed effects and we control for backlog (Table 7) and workload (Table A.1) so that the loss of cases should not explain why Mannheim and Munich work faster after 2012.

Moreover, we add a placebo test to further corroborate our exclusion of alternative explanations one ("mechanism 1a": loss of cases) and three (general trend). The patent panels in Mannheim and Munich deal with, both, patent cases and general civil disputes. In principle, if it was true that simply loosing cases to Duesseldorf made Mannheim and Munich faster, it should have made the relevant panels faster with regard to all cases they treat. In contrast, if the courts were in competition over patent cases but not over regular cases, judges would be keen on speeding up patent

cases only. If judges allocate their effort to attract more patent cases we should, including the controls we have, see an increase in speed for patent cases at December 2012 but not for the regular cases which the same judges resolve. In fact we may even see an increase in the duration for regular cases at this moment as judges reallocate their effort from regular cases to patent cases. We run this placebo test by checking whether *Dec2012* has the same effect on cases that are decided by the same judges in Mannheim and Munich but are not patent law suits. A difference-in-difference analysis is not a viable option, given that patent-infringement cases diverge significantly from ordinary civil law suits cases (e.g., traffic accidents) that judges on patent panels are accustomed to adjudicating. Because of that, we can not expect common trends before the event. In light of these considerations, the placebo test described above represents the optimal methodology.

Looking at the results for Mannheim (see table 7 columns 1- 4), we see that duration for non-patent cases indeed increases as of December 2012 while it decreases for patent cases. This finding is consistent with judges in Mannheim reallocating effort from ordinary cases to patent cases to resolve the latter faster in reaction to the increased speed in Duesseldorf. In Munich (columns 5 and 6), however, where more judges have been added, the data does not point to such reallocation of effort between the two classes of cases. Here the panels resolve, both, patent cases as well as non-patent cases faster than before – presumably because after adding more judges in 2012 they had the manpower to do so. We consider our finding that Mannheim judges seem to reallocate effort from regular cases to patent cases as **exhibit THREE** in our attempt to convince the reader that German patent courts are actively selling their fora.

	(1) Duration	(2) Duration	(3) Duration	(4) Duration	(5) Duration	(6) Duration
	Mannheim	Mannheim	Mannheim	Mannheim	Munich	Munich
VARIABLES	Patent	Patent	Patent	Non-Patent	Patent	Non- Patent
After December 2012	-39.09*	-49.82**	-66.50***	54.54***	-92.49**	-75.31***
	(21.55)	(22.62)	(21.69)	(11.06)	(44.68)	(18.27)
Value of the Claim	24.76***	24.85***	18.14***	17.08***	13.08***	0.195
	(2.687)	(2.693)	(2.312)	(1.794)	(3.423)	(2.030)
Number of open law suits month of claim		0.258	0.254	-1.167***	0.811**	0.588***
-		(0.362)	(0.310)	(0.193)	(0.392)	(0.156)
Hearings without evidence			133.7***	74.69***	138.2***	114.8***
			(12.20)	(7.839)	(9.705)	(9.073)
Constant	-35.19	-53.90	-42.38	22.05	-73.09*	80.56***
	(33.75)	(45.22)	(39.21)	(22.70)	(40.46)	(20.47)
Year fixed effects	У	У	У	У	У	у
Observations	879	879	879	1,970	744	1,640
R-squared	0.087	0.087	0.254	0.183	0.392	0.231

Table 7. Stu parlet and duration (OLS	Table 7: 3rd	panel and	duration (OLS
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Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

For these regressions, we exclude cases that were solved in less than two days.

To exclude the second alternative explanation ("mechanism 1b: high value cases go to Duesseldorf after 2012), we check whether the value of cases is significantly different between Duesseldorf and its competitors before and after December 2012 (see table 8) and find that case values in Duesseldorf and Mannheim have not been significantly

different either before or after December 2012. Case values in Munich and Duesseldorf have been significantly different both before and after 2012. Therefore it seems not to be the case that the third panel in Duesseldorf changed the case composition drawing high value to Düsseldorf to a greater extend than before December 2012. This is **exhibit FOUR** in our attempt of showing forum selling of German patent courts.

	Mean	Value
	before 2012	After 2012
Duesseldorf	1,237,821	984,444
Mannheim	1,140,632	925,243
t-value	0.93	0.48
Munich	805,497	532,420
t-value	3.98***	4.21***

Table 8: Mean Value by period

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

4.3 Forum selling by deciding in the plaintiff's favor more often?

While increasing speed of courts will largely be seen as a beneficial effect of competition between courts, there may also be harmful side effects. In particular, courts may react to the increased competitive pressure by deciding in the plaintiff's favor more often (see Figure 6) substituting speed for plaintiff friendliness. As there is a looser pays rule in Germany, we can derive plaintiff success from who bears the cost. Our data reports who bore the costs on a five point scale (defendant, mainly defendant, both, mainly plaintiff, plaintiff) and we count as "plaintiff success" if the defendant bore the cost in full or at least mainly. If we plot average plaintiff success over the years it seems that descriptively, in Mannheim, plaintiff success may have increased with the introduction of the third panel in Duesseldorf.

We test whether the probability of the case ending in favor of the plaintiff changed after December 2012. To do so, we estimate a logit regression with a dependent variable equal to one if the case ended in favor of the plaintiff and zero otherwise. The explanatory variables remain the same as in the previous regression and the results are presented in table 9. We are aware that there may be many case selection processes going on explaining any result we find. We merely check whether we find any indication that courts might change their inclination to decide in favor of the plaintiff. However, we cannot confirm the impression from the descriptive statistics that Mannheim became more plaintiff-friendly after Duesseldorf had introduced its third panel. In our logistic regression analysis the coefficient for the variable 'After December 2012' is not statistically significant for either Mannheim or Munich.

The results suggest that neither the competition nor the court's backlog, workload, or potentially overworked judges influence the outcome of the courts' decisions. Two coefficients are significant, however. The value of the claim impacts the probability of success negatively. That makes sense. Costs of courts and attorneys are digressive so that the higher the value the more it pays to bring a low prospect suit. Also, the coefficient of hearings without evidence is significant and positive. Possibly it makes more sense to meet anew for other reasons than hearing evidence if there is at least some prospect of success. Otherwise one would assume the court to simply reject the claim.





 Table 9: 3rd panel and pro-plaintiff leaning - OLS

VARIABLES	(1) Index Pro-Plaintiff Mannheim Patent	(2) Index Pro-Plaintiff Mannheim Patent	(3) Index Pro-Plaintiff Mannheim Patent	(4) Index Pro-Plaintiff Mannheim Non- Patent	(5) Index Pro-Plaintiff Munich Patent	(6) Index Pro-Plaintiff Munich Non- Patent
After December 2012	-0.145	0.006	-0.070	0.030	-0.753	0.323***
	(0.280)	(0.335)	(0.331)	(0.173)	(0.651)	(0.071)
Value of the Claim	-0.212***	-0.213***	-0.232***	0.075***	-0.167***	-0.273***
	(0.033)	(0.033)	(0.032)	(0.024)	(0.045)	(0.027)
Number of open law suits in month of claim		-0.004	-0.003	-0.005**	0.003	0.001
		(0.004)	(0.004)	(0.003)	(0.006)	(0.001)
Hearings without evidence			0.395***	-0.779***	-0.209*	-0.748***
			(0.121)	(0.089)	(0.107)	(0.112)
Constant	5.579***	5.845***	5.757***	4.299***	5.672***	8.797***
	(0.418)	(0.508)	(0.513)	(0.334)	(0.591)	(0.230)
Year fixed effects	y	y	y	y	y	y
Observations	568	568	568	2,212	480	9,847
R-squared	0.076	0.077	0.093	0.102	0.078	0.175

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

Figure 7: Share of appealed cases



4.4 Forum selling and quality in Munich and Mannheim

Finally we test whether Mannheim and Munich let quality increase to attract more cases or slack in quality – possibly to become faster. Figure 7 and Figure 8 show two quality measures, the share of appealed cases and the share of successfully appealed cases of all cases. Looking at the two figures, there appears to be no significant increase in quality in Mannheim. In Munich the decline in challenged decision appears not specific to patent-cases and the decline in successful appeals appears small at best.

We test statistically whether the share of appealed decisions and successfully appealed decisions increases or decreases after December 2012. To do this, we estimate an OLS regression with the dependent variable equal to one if the case was appealed (successfully appealed), including the same controls as before.⁵ In Mannheim, the rate of challenged decisions in ordinary civil cases (the control group) declines after Duesseldorf introduced its third panel, but not for the patent cases. In Munich, the likelihood of a first instance case being appealed as well as the probability of success of an appeal, are significantly lower than before 2012. This may have indicated competition between the courts. However, the probability also decreases in the control group of non-patent cases and is therefore most likely not caused by forum selling. In any event, the increased competitive pressure on Mannheim and Munich seems not to lead to a statistically

⁵We also ran logit regressions, since the dependent variables is binary. However, we lost too many observations due to the fact the some of the variables predicted failure perfectly. To test whether there is a structural break after December 2012, OLS seemed more appropriate.

Figure 8: Share of successfully appealed cases



significant decline in quality as we measure it at these two courts.

4.5 Discussion of the results on forum selling

We find four indications of forum selling of German patent courts. Munich swiftly adds two positions to its patent section when it learned of the third panel in Duesseldorf. This is our **exhibit ONE** for forum selling. Courts in Mannheim and Munich seem to work faster after Duesseldorf introduced a third panel. This effect is significant even when controlling for backlog and incomming workload of courts. This is our **exhibit TWO** and suggests that beyond working faster by loosing cases to Duesseldorf, Mannheim and Munich also allocate more effort to patent cases to resolve them faster. We also see that the patent judges in Mannheim do speed up patent cases but get slower in resolving regular cases reallocating effort from regular cases to patent cases. This is our **exhibit THREE**. Finally, the alternative explanation that Duesseldorf attracts the high value cumbersome cases seems implausible given that we can not document that Duesseldorf attracts higher value cases than Mannheim either before or after Dec. 2012. Neither is there a change at December 2012 with regard to the value difference between Duesseldorf and Munich. Both before and after December 2012 Duesseldorf attracts higher value cases than Munich and the degrees of magnitude of that difference does not seem to change markedly. This is our **exhibit FOUR**. By these four exhibits we make forum selling of patent courts highly plausible although our setup does not allow for ultimate proof of forum selling.

We do not find that with the introduction of the third panel in Duesseldorf pro-plaintiff bias in Mannheim and Munich

	(1)	(2)	(3)	(4)	(5)	(6)
	Appealed	Appealed	Successfully	Successfully	Successfully	Successfully
	Appealed	Appealed	appealed	appealed	appealed	appealed
			app. cases only	app. cases only		
	Patent	Non-Patent	Patent	Non-Patent	Patent	Non-Patent
Panel B: Mannheim						
After December 2012	-0.008	-0.212***	-0.017	-0.031	-0.003	-0.076**
	(0.027)	(0.041)	(0.054)	(0.043)	(0.002)	(0.030)
Value of the Claim	0.006*	-0.042***	-0.022	-0.007	-0.001	-0.013***
	(0.003)	(0.004)	(0.016)	(0.005)	(0.001)	(0.004)
Number of open law suits month of claim	0.001***	0.003***	0.003	0.000	7.62e-05	0.001*
-	(0.000)	(0.001)	(0.002)	(0.001)	(5.39e-05)	(0.001)
Hearings without evidence	0.033**	0.002	-0.070	-0.006	-0.000	-0.008
-	(0.013)	(0.021)	(0.063)	(0.019)	(0.002)	(0.014)
Constant	-0.164***	0.858***	0.011	0.263***	0.001	0.266***
	(0.046)	(0.070)	(0.165)	(0.071)	(0.004)	(0.056)
Year fixed effects	У	У	У	У	У	у
Observations	894	2,228	55	1,445	894	2,228
R-squared	0.052	0.060	0.174	0.017	0.014	0.022
Panel B: Munich						
After December 2012	-0.218**	-0.400***	-0.239	-0.329***	-0.143**	-0.377***
	(0.097)	(0.038)	(0.277)	(0.050)	(0.066)	(0.035)
Value of the Claim	0.029***	0.010	0.007	0.021**	0.009**	0.027***
	(0.007)	(0.007)	(0.017)	(0.009)	(0.004)	(0.007)
Number of open law suits in month of claim	0.002**	0.001***	0.002	0.003***	0.002**	0.003***
	(0.000)	(0.000)	(0.003)	(0.000439)	(0.000)	(0.000)
Hearings without evidence	0.115***	0.035	-0.010	-0.005	0.036***	-0.030
	(0.020)	(0.024)	(0.041)	(0.030)	(0.012)	(0.022)
Constant	-0.322***	0.534***	0.390*	0.037	-0.079*	-0.060
	(0.086)	(0.066)	(0.235)	(0.085)	(0.042)	(0.060)
Year fixed effects	У	У	У	У	У	У
Observations	811	9,847	175	5,784	811	9,847
R-squared	0.126	0.036	0.157	0.011	0.054	0.017

Table 10: 3rd panel and quality in Mannheim and Munich (OLS)

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

increases. We admit that this is not proof that competition between courts does not promote pro-plaintiff bias. Not only does a non-statistically significant result not prove the absence of an effect. Also, we use a very rough measure of pro-plaintiff bias that is noisy because we cannot control for case selection. Possibly Mannheim and Munich have favored plaintiffs more after 2012 but then got cases so bad that plaintiffs never succeeded. However, it remains true that we cannot find evidence of increased pro plaintiff bias after December 2012.

Neither do we find indications of a change in quality of judgments in Mannheim or Munich due to increased competitive pressure. We have to admit that our measures of quality only cover a partial aspect of quality. The judges' insight into technical detail, for instance (which plaintiffs apparently value highly in patent cases), is certainly not captured well by our measures of quality. Our measures should, however, capture some of the legal quality of decisions. The rate of appealed decisions is dependent at least in part on the assessment of quality by counsel deciding whether to appeal. The rate of successful appeals clearly depends on the assessment of quality by the appeals court. We do not account for case selection to courts. Therefore, we cannot be certain to distinguish two cases. Court decisions may not be challenged because judges reason so thoroughly. Or they may not be challenged because a court had been stacked with particularly clear cases. However, that we find that parties seem to look at quality how we measure it lends some credibility to our measure. And of course, there is a speed component to our measures of quality (especially the first one): less appeals means faster case resolution for the parties. All in all we can state that we do not find an impact of the competition between patent courts on the aspect of quality that we do measure by the rate of appeal and the rate of reversed decisions.

Lately, a group of European countries comprising Germany established the Unified Patent Court to increase the coherence of a hitherto fragmented system of patent enforcement in Europe. Inventors can now obtain a unified European patent, the infringements of which are enforced exclusively by suing at the Unified Patent Court (UPC). The UPC, however, is not a monolithic court. Instead its first instance venues comprise 13 local divisions, one regional division, and a central division. Cases can be brought, both, at the division at the seat of the defendant and that at place of the infringement (Art. 33(1) UPCA). Given that any sale of an infringing good is an infringement itself, this provision preserves ample opportunity to forum shop (Liens et al., 2023; Veugelers and Harhoff, 2023) if goods are widely sold. Most cases are drawn to three of the local divisions which — surprise — are located (in the order of the number of cases) in Munich, Duesseldorf and Mannheim.⁶ These three divisions are staffed with judges of the patent panels at the corresponding *Landgerichte*.⁷ In sum: The new system has not solved the issue of forum shopping (Liens et al., 2023; Veugelers and Harhoff, 2023). Our findings, therefore, remain relevant up to date.

⁶See the UPC's case statistics at https://www.unified-patent-court.org, more precisely at: https://is.gd/11PZQM ⁷The judges can be looked up at https://www.unified-patent-court.org/en/court/judges/ legally-qualified-court-judges?type=legally_qualified&name=&court=first_instance&division=159

5 Conclusion

We found conclusive empirical evidence for forum shopping between Duesseldorf, Mannheim, and Munich in patent infringement cases. It is interesting to note that we do not find this evidence for Hamburg and Frankfurt, confirming that indeed plaintiffs only choose between the three big patent venues in Germany.

Plaintiffs mainly pick their venue by the speed with which courts have disposed of cases briefly before the relevant case goes to court. In addition, our first measure of quality (the rate of cases challenged in the next instance) has an impact on where plaintiffs sue in patent cases. So does the reversal rate, our second measure of quality. Moreover, nationalities of plaintiff and defendant also seem to matter for the choice of the adequate court.

Furthermore, we also found strong evidence for forum selling by the competing courts: The introduction of the third panel in Duesseldorf, which gave Duesseldorf an advantage over Mannheim and Munich in terms of speed, led Munich to swiftly add two full positions to its patent section. The introduction of the third panel in Duesseldorf was exogenous to Munich and Mannheim and went with a significant reduction in the duration of proceedings in Mannheim and Munich, which cannot be explained by a change in the workload, a general trend in the data, or – in the case of Mannheim – an increase in staff. We also find that, after December 2012, judges in Mannheim seem to resolve regular cases more slowly to be able to resolve patent cases more quickly. Finally, we find that after the introduction of its third panel, Duesseldorf does not attract bigger cases than before so that such a change in case selection cannot explain the increase in speed at Mannheim and Munich.

At the same time we do not find that Mannheim and Munich adapt their inclination to decide in favor of the plaintiff. A null result is not evidence for the absence of an effect. Possibly case selection hid the effect. Or possibly courts already worked with the maximum defensible pro-plaintiff bias before December 2012 or changes in pro-plaintiff leaning come in discrete waves like the change in the standard of proof for patent invalidity that may lead to a stay of proceedings which Bechtold et al. (2019) document in their work. Be that as it may, we cannot find evidence for an increase in pro-plaintiff bias as a result of increased competitive pressure. Furthermore, we do not find evidence that the competition between courts adversely affects decision quality. In fact, when regressing decision quality on our explanatory factors, the coefficient for the dummy "After December 2012" is negative and significant for Munich's patent cases and insignificant for Mannheims patent cases indecating so that we do not observe a decline in quality due to the competion between courts. We only capture part of a court's work's quality, however. How technologically savvy judges are in discussions with specialist witnesses is poorly captured by the rate of challenged decisions.

In summary, our results confirm lively competition between the Duesseldorf, Munich and Mannheim patent courts and the evidence clearly shows that competition increases judicial speed. This increase in court efficiency seems neither to go with an increase in pro-plaintiff bias and nor with a decline in the quality of decisions. Our results remain relevant under the new unified patent court whichg does not abolish the pportunity to forum shop.

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Appendix

Speeding up the processing of cases in Duesseldorf may change the workload of the courts. This has already been tested in Table 7. Here we had the number of open cases on the day of filing as the explanatory variable. To be able to control the court's distraction by other tasks even better, we add another variable 'workload'. This counts all cases received by the patent section at the court during the processing time of a case. As this variable naturally also correlates mechanically with the processing time, we then divided it by the number of days on which the case was processed. The variable thus measures the average workload of the patent section during the processing time. The variable is negatively significant, suggesting that judges seed up old cases when they are overwhelmed by new ones. In any event, it does not affect the central result that there was an improvement in processing time in Munich and Mannheim after December 2012 (see Table A.1.

	(1) Duration Mannheim	(2) Duration Mannheim	(3) Duration Mannheim	(4) Duration Manpheim	(5) Duration Munich	(6) Duration Munich
VARIABLES	Patent	Patent	Patent	Non- Patent	Patent	Non- Patent
		CA CCARA			044455	
After December 2012	-4/.98**	-61.66***	-/4.05***	46.90***	-94.44**	-/4.22***
Value of the Claim	(21.11) 23 1/***	(21.64) 23.26***	(21.07) 17 47***	(10.31) 18 64***	(44.1 <i>3)</i> 12 70***	(17.81) 0.148
value of the Claim	(2.626)	(2.631)	(2, 274)	(1.731)	(3 389)	(1.975)
Ay, workload of the court	-1.025***	-1.029***	-0.768***	-0.605***	-0.491***	-0.136***
	(0.346)	(0.346)	(0.266)	(0.0529)	(0.129)	(0.0427)
Number of open law suits in month of claim		0.329	0.307	-1.141***	0.794**	0.571***
-		(0.349)	(0.304)	(0.184)	(0.387)	(0.152)
Hearings without evidence			123.4***	54.29***	132.4***	108.9***
			(12.50)	(7.753)	(9.814)	(9.227)
Constant	-1.625	-25.30	-21.93	30.89	-55.46	88.37***
	(34.18)	(44.80)	(39.16)	(21.91)	(40.14)	(19.89)
Year fixed effects	У	У	У	У	У	У
Observations	879	879	879	1,970	744	1,640
R-squared	0.149	0.150	0.287	0.272	0.408	0.266

Table A.1: 3rd panel and duration (OLS) - including average workload

Notes: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.



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