

The Private Cost of Legal Uncertainty

Evidence from the Unified Patent Court

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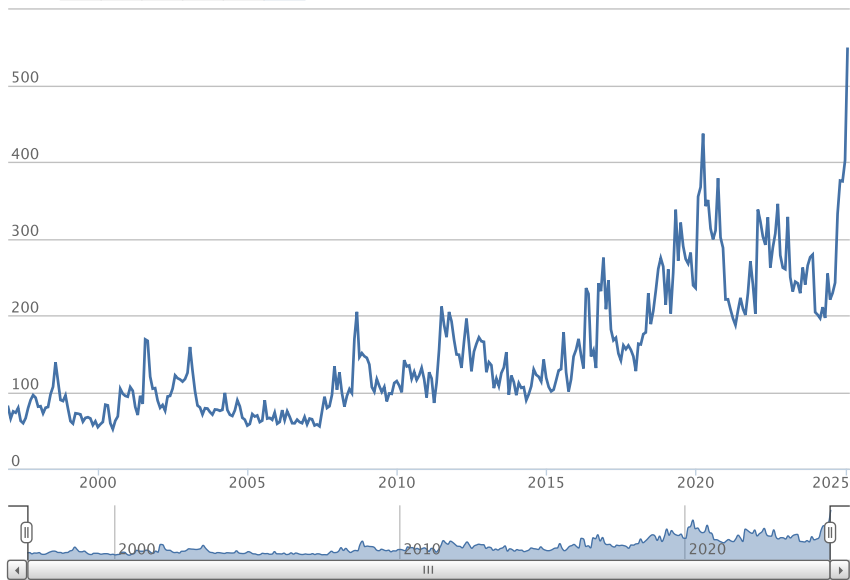
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Monthly Global Economic Policy Uncertainty Index

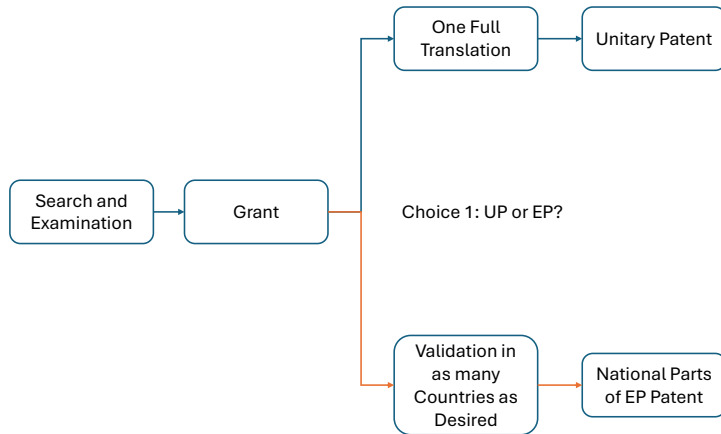
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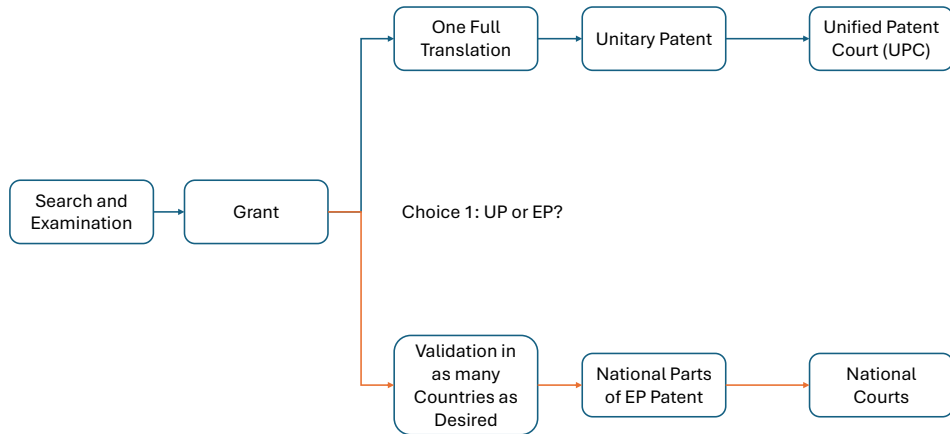
Motivation: Legal (Un)Certainty Matters

- Legal certainty is a cornerstone of economic activity
 - John Locke, David Hume, Max Weber, ...
- Uncertainty negatively affects firm decisions, market transactions, and growth
 - E.g., Baker et al. (2016, QJE), Baker et al. (2024, REStud), Lee et al. (2024, WP)
 - Innovation context:
Secure and predictable enforcement underpins investment and licensing incentives.
- Challenge: quantify the costs of legal uncertainty
 - Unique opportunity: enactment of Europe's "Unitary Patent" and "Unified Patent Court"
 - Same patent, identical search & exam, two validation routes, different courts.
 - Question for today:
What did this uncertainty cost private patentees in the UPC's first months?

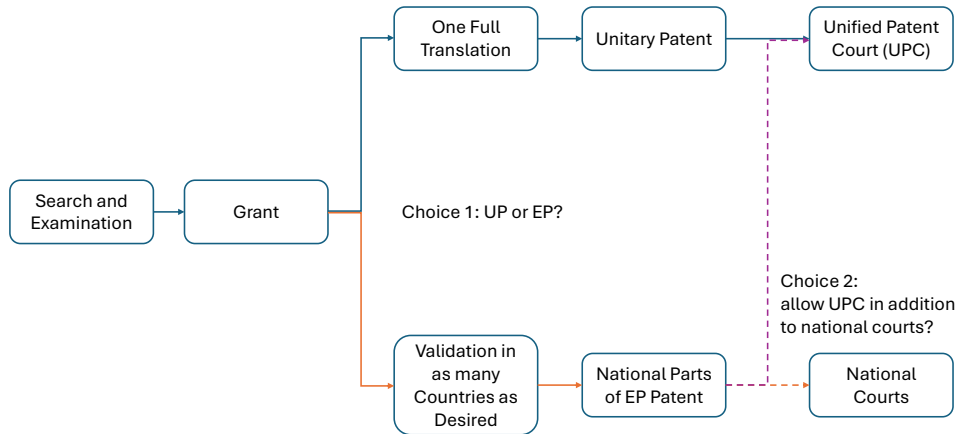
Two Patent Enforcement Routes in Europe



Two Patent Enforcement Routes in Europe



Two Patent Enforcement Routes in Europe



NEW: Key Institutional Contrast

	Traditional EP (opt-out)
Validation	Pay per country; translations; local agent(s)
Renewals	Separate annual fees per country
Litigation forum	<i>Each</i> national court (parallel risk)
	Unitary Patent (UP) (opt-in)
Validation	One request, one full translation
Renewals	Single scale ($\approx$ sum of top 4 countries)
Litigation forum	Unified Patent Court – single venue, new & untested

Default choice: National validations + combined jurisdiction of national courts *and* UPC (“EP+”). Except for the descriptive evidence, we focus on the starker EP vs. UP choice.

Research Question

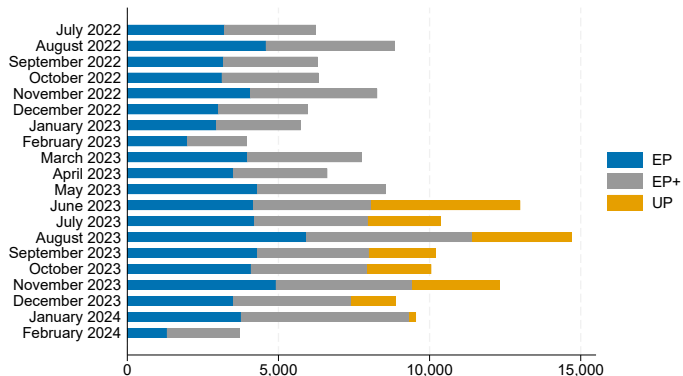
How much were patentees willing to pay in 2023 to *avoid* UPC jurisdiction?

- Observe recent grants and their validation choice; predict/assume renewal decisions
→ compute counterfactual fee savings $\Delta\text{ValCost}$.
- Translate avoidance behavior into an implicit “price of uncertainty”.
- Inform legislators, judges, and counsel on early perceptions of the UPC.

Data Snapshot

- **PATSTAT grants** Jun–Nov 2023: ≈ 92 k.
- For regressions: keep 17 k “domestic” (from UP countries), of which 10.5 k with clear binary choice (drop EP⁺) + long-enough assignee history (default: 10 pre-UP obs.).
- **Add to this:**
 - Fee schedules (EPO + national offices); default: assume 10-year maintenance
 - Practitioner quotes for translations & agents; default: assume agents used everywhere
 - Opposition rate by tech field → litigation risk proxy ρ (Martinelli et al., 2024)
 - Citations at grant → value proxy V
 - INPADOC licensing flag
 - Assignee country + indices of court efficiency & institutional trust
 - WIPO tech classes

UP Adoption in First 6 Months



- Only **25%** of grants validated as UP.
- EP majority paid extra to stay under national courts.

Avoidance Premium (Simple Accounting)

	Mean € / grant	Total (Jun–Nov 2023)
Counterfactual UP costs	€8,750	€140m
Extra paid to stay EP	€10,000	€160 m

Patentees were willing to spend $\approx$ € 10k per patent to avoid being first movers into the UPC.

Contributed via:

- €100m validated as EP
- €60m validated as EP⁺

These estimates do NOT consider possible cost savings via the UP – this is NOT the net cost of the UP system. For that, we must predict what would have happened to the UP validations absent the UP system!

Explaining the Premium

Binary choice: UP=1, EP=0, logit model:

$$P(UP_i = 1) = \text{logit}^{-1} (\beta_0 + \beta_1 \Delta ValCost_i + \beta_2 \rho_i + \beta_3 \rho_i V_i + \beta_4 \mathbb{1}_{L,i})$$

where:

$\Delta ValCost_i$	Difference in costs for patent maintenance UP vs EP
ρ	Probability of patent litigation
V	Patent value
$\mathbb{1}_L$	Indicator of geographically limited licensing

Explaining the Premium

Binary choice: UP=1, EP=0, logit model:

$$P(UP_i = 1) = \text{logit}^{-1} \left(\beta_0 + \beta_1 \Delta ValCost_i + \beta_2 \rho_i + \beta_3 \rho_i V_i + \beta_4 \mathbb{1}_{L,i} \right)$$

“Structural” interpretation:

$$\Delta \pi_i = \pi_i^{UP} - \pi_i^{EP} = \underbrace{-\kappa}_{\beta_0} + \beta_1 \Delta ValCost_i - \rho_i \underbrace{\Delta LitCost}_{-\beta_2} + \rho_i \underbrace{\delta_\theta (1 - \alpha)}_{\beta_3} V_i - \mathbb{1}_L \underbrace{\delta_{lic}}_{-\beta_4}$$

Marginal effects → translate into € by dividing β_x by β_1 .

$\Delta ValCost_i$	Difference in maintenance costs	κ	“Residual” hesitancy to use the UPC
ρ	Probability of patent litigation	$\Delta LitCost$	(expected) difference in litigation cost
V	Patent value	$\delta_\theta (1 - \alpha)$	(exp.) diff. in litig. outcomes × value of losing
$\mathbb{1}_L$	Licensing indicator	δ_{lic}	Value of licensing opportunity

Explaining the Premium: Key Marginal Effects

Driver	change by	€ EP-premium	Intuition
Cost gap (€)	+€1 k	−2 pp.	Maintenance cost matters
Litigation risk ρ	+1 pp.	+€780	UPC seen costlier / riskier
Patent value V (citations)	+1 pg cit.	+€19,000	Valuable patents hedge risk
Licensing flag	switch on	+€2,500	Need country-split exclusivity

Together explain >80 % of the raw premium (residual $\kappa < \text{€}150$).

Marginal effects from logit on 10.5k grants (full specification and results in paper).

Country Patterns

- **Pro-UPC:** Sweden, Denmark, Finland, smaller MS (Malta, Slovenia).
- **Anti-UPC:** Luxembourg, Italy, Netherlands.
- Explained by:
 - Domestic court efficiency (+UPC demand) — strong correlation with Judicial Efficiency measure!
 - Trust in EU institutions — reasonable correlation with trust measure from Eurobarometer.
 - Home-court advantage perceptions (?)

Results of adding country dummies – i.e., country-specific κ 's.

New: Technology Patterns

- **Pro-UPC:** ICT (1,000–2,000) — patents less important but frequently litigated
- **Weak anti-UPC:** instruments ($\sim 2,000$); mechanical engineering ($\sim 2,000$ –4,000)
- **Strong anti-UPC:** chemistry (4,000–7,000), esp. polymers (14,000) and nanotech (11,000) — patents highly important

Results of adding 35 WIPO tech dummies – i.e., tech-specific κ 's.

Results similar with and without controlling for litigation and licensing.

Managerial and Policy Implications

- Fee savings alone won't drive UPC adoption; litigation reputation (of the court) matters.
- Firms with high-value, high-risk portfolios likely to wait for precedents → UP/EP validation mix should move with reputation.
- Policymakers can accelerate uptake by signaling procedural predictability (guidelines, early judgments database).
 - In fact, most UPC rulings so far are about procedural questions.

Takeaways

- Early UPC uncertainty premium $\approx$ €10 k / patent. Aggregate €160 m (first 6 mo).
(*Conditional on counter-factual...*)
- Premium shrinks once we control for litigation risk, value, and licensing – points to *perceived* downside, not fee math (mistakes).
- Expect premium to decay with case-law learning;
- Future work: longer data + ML to refine predictions (validation, renewal, litigation risk (Juranek & Otneim 2024)).

Questions?

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