



Macroeconomic Development and Civil Litigation

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Abstract

This paper contributes to the explanation of the tremendous rise in civil litigation activity in Austria over the last four decades by analysing the influence of macroeconomic conditions on civil litigation. We find that the number of transactions per individual—proxied by the level of real per capita GDP—positively influences the amount of litigation per capita. Inertia in litigious behavior reinforces effects. In the short run, however, we observe a countercyclical pattern of litigious activity. Cointegration analysis confirms the short run negative association, and a long run cointegrating relationship between GDP and civil litigation. Several robustness tests corroborate our results. Rent-seeking interpretations, and possible detrimental effects on the long run growth prospects cannot be excluded.

Keywords: civil litigation, macroeconomic development, cointegration.

JEL Classification: K00, K41

1. Introduction

The annual number of civil litigation cases taken to Austrian courts rose from 544,000 in 1960 to 951,000 in 1995. At the same time the population remained almost constant. Similar trends can be observed in other countries as well. Obviously, it is not only of academic interest but also of considerable practical importance to identify the main determinants of litigation behaviour. A rigorous analysis of the relationship between civil litigation and economic and social development would not only allow better forecasts of material resources of the courts, but also to gain a deeper understanding of the interrelationships between law and economics.¹

This paper contributes to the explanation of the tremendous rise in litigation per capita by analysing the influence of macroeconomic conditions on civil litigation. In particular, we find that the number of transactions per individual as proxied by the level of real per capita GDP positively influences the amount of litigation per capita. The short run model, however, indicates a countercyclical pattern of litigious activity.

As there are also other determinants of the amount of annual litigations—discussed briefly in Section 3—focusing on macroeconomic variables needs further explanation: (1) The development of real GDP has long been hypothesized to influence the amount of litigation despite the ambiguity in the sign of the effect.

For example, F. Klein, the creator of the Austrian code of civil procedure, said in 1901, "... a reduction of the amount of cases [usually is] a side effect of increasing prices, strong market demand and general economic well being." On the other hand, Wollschläger (1989) writes, "the more contracts are signed, the more contracts can be broken. Consequently, economic growth must—*ceteris paribus* (!)—increase the workload of civil courts." (2) Data availability of macroeconomic indicators is much better than that of other (social) indicators which are most often not quantifiable and/or no consistent time series are available. (3) Available (scarce) international empirical evidence points to a relationship between GDP and the amount of litigation.²

As the above quotations indicate, it has been recognised for a long time that there are at least two—contradictory—effects of economic growth on litigation activity. First, an increase in GDP implies an increase in the number of transactions and, therefore, an increased potential for conflict. According to this line of reasoning, a positive long run association between GDP and litigation is expected. Second, however, in the short run countervailing tendencies can dominate this long run effect. A decrease in GDP leads to a deterioration of corporate cash flows and debt-paying ability, and bankruptcies are more likely in recessions. In booms, solvency is better and more outside opportunities exist for economic agents. According to this "short run" line of reasoning, a countercyclical association between GDP growth and civil litigation cases is expected.

To disentangle short run and long run effects, two approaches are taken. First, detrended levels of the variables show a positive association, and first differences exhibit a negative relationship. Second, cointegration analysis confirms the short run negative association and a long run cointegrating relationship between GDP and litigation. In particular, according to the estimated error correction model, any deviation from the equilibrium relationship between litigation and GDP is partially corrected in the subsequent period. While in the short run the countercyclical pattern of litigious behavior dominates, in the long run the two series move together.

These findings entail interesting interpretations with respect to the interrelationships between economic development and the law process. The short run negative association implies that when times are bad (good) more (less) contracts are broken. Accordingly, courts are used more (less) to settle disputes in recessionary (expansionary) periods. One way to interpret this finding is from a rent seeking perspective (as in Crain et al., 1985, see also Tullock, 1967). In recessions, when opportunities to create wealth are lower, returns to redistributive and rent seeking activities rise making them more attractive relative to wealth creating activities. This potentially prolongs recessions. The long run positive and cointegrating relationship, however, should alarm policy makers even more. On the one hand, if economic growth continues and if the co-integrating relationship is stable in the future, additional resources will be needed by courts to cope with rising demand for their services. On the other hand, Murphy et al. (1991) posit that, as rent-seeking sectors expand, the long run growth rate of the economy is diminished. Then a

stable relationship between economic growth and litigation per capita implies increasing demand for and supply of these rent seeking activities with possible detrimental effects on long run growth prospects.

The rest of the paper is organized as follows: Section 2 formulates our two main hypotheses about civil litigation and macroeconomic development, Section 3 shortly discusses other—economic and non-economic—determinants of civil litigation, Section 4 describes the data, Section 5 presents our main empirical findings, and Section 6 concludes.

2. GDP and civil litigation: the hypotheses

Although there are very few studies analysing the relationship between economic development and the frequency of civil lawsuits, it is often argued that economic growth induces more law suits (e.g. Wollschläger, 1989). As we will show theoretically in this section and empirically later on, this is likely to be true in a long-run perspective. However, in the course of short run business cycle fluctuations one would rather expect a countercyclical relationship between the state of the economy and the number of civil lawsuits (see e.g. Crain et al., 1985). In what follows, we combine the various arguments and discuss their plausibility. Then we formulate our hypotheses which are tested in Section 5.

2.1. Hypothesis 1: long run economic growth and civil litigation

Sustained economic growth implies an increase in the number of economic transactions and, consequently, in the number of disputes, for at least three reasons: (1) In a growing economy plant utilization and employment is larger, *ceteris paribus*, which enlarges the number of contracts in a given firm. (2) Usually, labor specialization increases in a dynamic economy, i.e. a larger amount of transactions is executed not within corporations but via markets.³ Although company mergers and pooling of resources may be offsetting forces, we expect that the former effect dominates. (3) Long run economic growth also implies a substantial built up of private wealth which enlarges potentials for conflict, e.g. conflicts over property rights.

As all effects point in the same direction, our first hypothesis is that real GDP positively influences the number of litigation cases in the long run.

2.2. Hypothesis 2: business cycle fluctuations and civil litigation

While we expect an unambiguous positive association between the two variables in the long run, short run business cycle fluctuations may entail both positive and negative effects. (1) As with long run economic growth there is an increase

(decrease) in transaction volume in booms (recessions). (2) Higher (lower) income levels in expansionary (recessionary) periods mitigate (aggravate) cash and wealth constraints to go to court and lead to more (less) civil lawsuits.

On the other hand, countercyclical effects are expected according to: (1) When the economy does well it is easier for economic agents to fulfill obligations (e.g. avoid or pay monitions). (2) In a boom, creditors can have more patience with borrowers due to positive expectations about repayment probabilities. (3) In upturns outside opportunities⁴ of economic agents rise and the need to go to court diminishes as the market substitutes more for courts in resource allocation and distribution. (4) The value of contracts hypothesis (see Crain et al., 1985) says that as the average value of contracts falls in recessions, the gains from breaking them rise at the margin. This implies more litigation in a downturn. (5) Many studies find more establishments and entry of new firms in booms which, however, experience very soon financial distress in economic downturns (see e.g. Audretsch, 1995). As there was no time to build up reputation, increased riskiness and asymmetric information in these young firms may lead more creditors to terminate the relationship and go to court in economic downturns.

As the preponderance of effects point to a negative relationship, we expect a short-run countercyclical pattern of civil litigation and GDP.

3. Other determinants of litigation

As already mentioned, macroeconomic development is certainly not the only determinant of litigation. In this section, we mention some other determinants and point to the interrelationships to the general economic development.

3.1. Demographic changes

a) Population growth: With a growing population the number of interactions per inhabitant and therefore the potential for conflict grows. At least potentially, interactions per capita increase even more than proportionately to population.⁵ We account for this determinant of litigation by scaling the two main variables by the number of inhabitants in a given year.

b) “Urban Agglomeration”: If people live in more concentrated areas, the potential for conflict is greater as interaction intensity is larger. This “urban agglomeration” is likely to continue in the future.

3.2. Socio-cultural changes

a) Changing moral values: Hand in hand with agglomeration and concentration in cities, moral values have changed. This has led to an increase in litigation cases (for example divorces).

b) Alienation of social relationships: At least two influences are worth mentioning. First, many activities that were organized in the large family in the past (e.g. housekeeping, old people's care, and child upbringing) are increasingly organized by markets. This implies that the form of conflict-management has changed. Second, anonymity implies a lack of social sanctions in case of non-performance and instead courts are involved.

c) Higher education: Finally, one would expect that better educated people are more likely to go to court to settle conflicts. In Austria, the number of students increased from 38,533 in 1960 (0.5 per cent of the population) to 222,095 in 1995 (2.8 per cent of the population).⁶

3.3. *Structural socio-economic changes*

a) Changes in labor contracts: A number of changes occurred in the labor market which are likely to induce more litigation. Generally, a decline of protected markets and a rise of competition (e.g. due to substantial privatizations and trade liberalization) have led to more job flexibility. The duration of labor contracts decreased substantially which induces more suits in the labour courts (see ÖSTAT-Rechtspflegestatistik).

b) The partial retreat of the state and, generally, more profit orientation in (mostly) state owned banks and other national enterprises have led to a higher propensity of firms to eventually go into bankruptcy in the case of financial distress.

c) Not only do multinationals engage in competition and globalisation, but the environment of small trade has changed as well, and with it the form of resolving conflicts.

Most of the above influences are likely to be correlated with the general macroeconomic environment. Since we must omit these variables for data availability reasons the estimated influence of GDP on litigation in Section 5 is likely to suffer from an omitted variables problem. However, any biases are reduced if economic growth itself is the causal force behind these developments.

4. **Description of the data**

To analyse the impact of economic development on litigious behavior we use real gross domestic product (GDP) as a proxy for the number of transactions executed in a given year.⁷ The total number of civil litigation cases in a given year measures litigious behavior. This aggregate time series best smoothes changes in legal categorizations of lawsuits, and is available in a consistent manner.⁸ Aggregate economic development has an effect on all categories of civil litigation so that it is also the theoretically correct variable. We restrict our analysis to the time period 1960 to 1995, since after 1960 the special influences of World War II on litigious behavior have largely ceased.

Figure 1 shows these time series as well as the population series. Table 1 provides summary statistics of the levels and the relative changes of the variables, over the whole period and broken down by decades. In Austria, real GDP grew almost in all years since 1960. Real per capita GDP more than doubled in the sample period. Macroeconomic development since 1960 can be described by positive but diminishing real GDP growth rates. Annual civil litigation cases rose by 75 per cent from 544,100 in 1960 to 951,500 in 1995. On average, litigation frequency per capita was 10 per cent during 1960 to 1995. This relative frequency increased from 7.8 per cent in the 1960s to 9.2 per cent in the 1970s and to 12.1 per cent in the 1980s. The first six years of the 1990s, however, show a decrease in litigation frequency per capita to 11.4 per cent. The largest growth rates in litigation activity have occurred in the 1970s (2.9 per cent per annum).

Panel A of Table 1 is consistent with hypothesis 1: prolonged economic growth implies more transactions and conflicts, and increases the number of civil lawsuits. Likewise, up-front costs of lawsuits⁹ are less deterring and liquidity constraints become less binding as income levels rise. Panel B of table 1 is less clearcut about the relationship between the growth rates of the variables of interest. While the growth rates of real GDP per capita decrease steadily over time, growth rates of per capita litigation first rise in the 1960s and 1970s and then decrease in the 1980s and 1990s. The following regression analysis should clarify the effects.

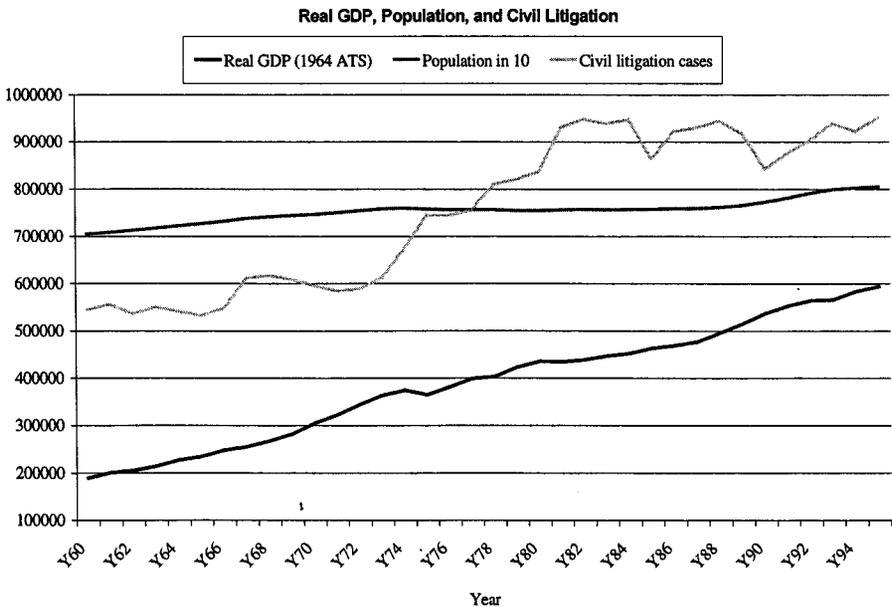


Figure 1. Real GDP, population, and civil litigation.

Table 1. Summary statistics: 1960 to 1995

Time series:	Real GDP	Population	Real per capita GDP	Litigation cases	Litigation cases per capita
PANEL A:			Levels		
Period	In Mio ATS, prices of 1995	In 1000	In ATS, prices of 1995	Number	In per cent
1960–1995	154,328	7,539	203,000	755,156	10.0
1960–1969	91,970	7,248	126,600	564,248	7.8
1970–1979	145,744	7,552	192,900	692,920	9.2
1980–1989	183,301	7,586	241,600	918,025	12.1
1990–1995	224,276	7,920	283,100	905,613	11.4
PANEL B:			Average annual relative changes		
Period	In per cent	In per cent	In per cent	In per cent	In per cent
1960–1995	3.4	0.4	3.0	1.6	1.2
1960–1969	4.8	0.6	4.2	1.3	0.7
1970–1979	4.0	0.1	3.9	3.0	2.9
1980–1989	2.0	0.1	1.9	1.1	1.0
1990–1995	2.4	0.8	1.6	0.6	–0.2

Source: WIFO Database; ÖSTAT—Rechtspflegestatistik; own calculations.

5. Results

In this section we present our econometric results. The time period is 1960 to 1995. Hypothesis 1 postulates, in short, a positive long run association between real GDP per capita and litigation cases per capita. Hypothesis 2 says that short run fluctuations in the two variables should be negatively associated.

5.1. Hypothesis 1

To test hypothesis 1 we estimate the following equation by OLS:

$$CASDET_t = \alpha + \beta \cdot CASDET_{t-1} + \gamma \cdot GDPDET_{t-1} + \varepsilon_t \quad (1)$$

where $CASDET_t$ and $CASDET_{t-1}$ denote detrended civil litigation cases per capita in period t and $t - 1$, respectively, $GDPDET_{t-1}$ is detrended real per capita GDP in period $t - 1$, α , β , and γ are coefficients to be estimated, and ε_t is an i.i.d. error term.¹⁰

The underlying rationale for specification (1) is as follows: The dependent variable civil litigation cases was scaled by population for two reasons. First, increased income per capita should increase litigation cases per capita because

transaction volume and the potential for breaking contracts has increased for a given individual. Second, rising income is likely to reduce liquidity constraints of individuals to go to court which again leads to increased litigation per capita.

The inclusion of an autoregressive term has also two reasons. First, theoretically, one would expect that a given volume of litigation cases today will induce litigation cases tomorrow. One example are follow up lawsuits. Another reason are sunk costs: going to court certainly involves sunk costs (e.g. information acquisition) which, once incurred, make future litigation cheaper and therefore more likely as now only marginal costs have to be borne. Likewise, psychological barriers to go to court are likely to diminish if lawsuits have already been carried out in the past. Second, the Durbin-Watson statistic (0.32) without a lagged litigation variable indicates strong and significant positive first order autocorrelation of the residuals. With the inclusion of a lagged dependent variable there is no autocorrelation in the residuals as shown by a Godfrey and Breusch test.

Real GDP per capita is one period lagged to account for time and information lags of the influence of increased transaction volume on the frequency of litigation cases.

A potentially more serious concern of Equation (1) is that the variables are certainly not stationary as can be seen from Figure 1. Regressing two nonstationary time series on each other potentially results in finding a "spurious" relationship (see e.g. Phillips, 1986; Greene, 1993). In this case, a significant relationship as evidenced by diagnostic test statistics may in fact be the result of regressing one (stochastic or deterministic) trend on another where no causal relationship exists. We control for this possibility in two ways. First, we use detrended variables. Both unit root tests, the Phillips-Perron (PP) and the Dickey-Fuller (DF) test, indicate that the variables are trend stationary.¹¹ Second, nevertheless, caution should be exercised as our time series are rather short. Also, assuming a deterministic linear trend in, for example, litigation cases per capita may be misleading. Therefore, in Section 5.3, we analyse hypotheses 1 and 2 simultaneously by showing that the two time series are indeed cointegrated, and that the data generating process can be represented by an error correction mechanism.

Column 2, Table 2 shows the results for Equation (1). Overall, the fit of the regression is not bad as 77 per cent of the total variation is explained solely by the lagged dependent variable and macroeconomic development. Real GDP per capita has a positive and significant effect on the number of litigation cases per inhabitant controlling for trend growth over time in the variables and the autoregressive process. This is established at the 1 per cent significance level (t -value of 3.1). The coefficient of 0.04 implies that a ATS 1000 increase in income per capita (in 1995 ATS) above trend growth increases lawsuits per capita by 0.04 percentage points above trend growth in the period 1960 to 1995. This is evidence in favor of hypothesis 1. The large and significant influence of the lagged dependent variable underlines the importance of inertia in litigious activity. Civil litigation is strongly self-reinforcing and "sticky." Once built-up, civil litigation is unlikely to decrease

substantially very quickly. As already mentioned, follow-up suits and reduced (economic and psychological) barriers to go to court may explain this finding.

5.2. Hypothesis 2

To test hypothesis 2, we explore whether contemporaneous changes in GDP per capita influence changes in litigation activity. The estimated equation is

$$\Delta CAS_t = \alpha + \beta \cdot \Delta GDP_t + \varepsilon_t \tag{2}$$

where ΔCAS_t and ΔGDP_t are the first differences of litigation cases and real GDP, both measured in per capita form. Column 3, Table 2, and Figure 2 show the results. The first differences in the variables are significantly negatively related. Accelerating economic growth decreases the growth of litigious activity. This verifies hypothesis 2. In booms, when income growth is accelerating there is less need to go to court, ceteris paribus. In the short run, countercyclical factors outweigh any cyclical effects. Among other reasons, it is easier for economic agents

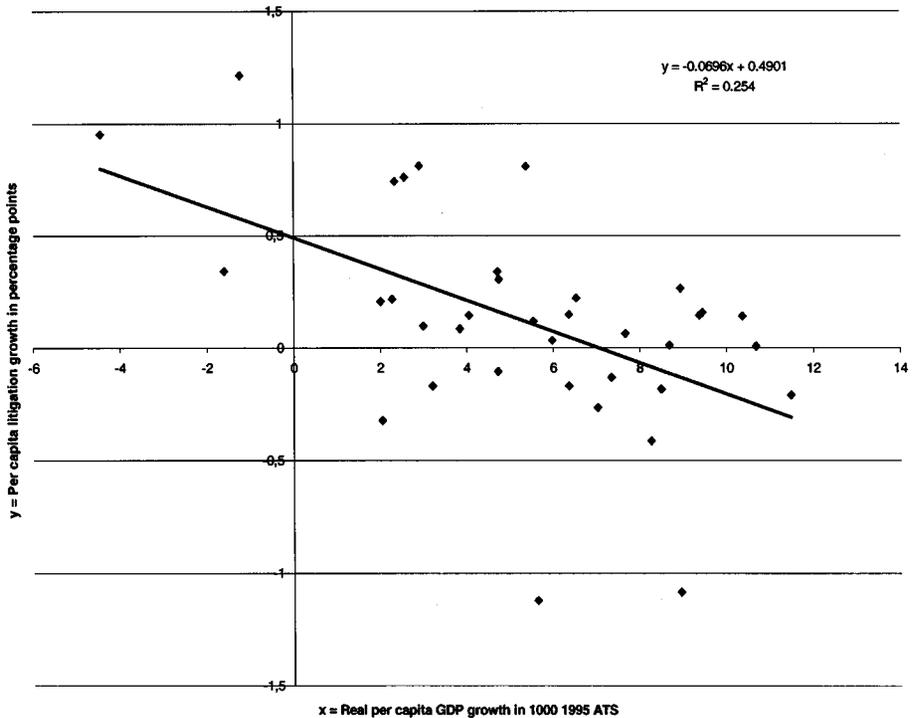


Figure 2. The short run relationship.

to fulfill obligations and outside opportunities rise when the economy does well. Bankruptcies are fewer as well as labour conflicts. In recessions, these arguments are reversed and economic downturns countercyclically induce more civil law cases.

Caveats with the results for specification (2) are the low R^2 -bar and the magnitude of the constant term. Clearly, other determinants of litigious activity than macroeconomic growth exist as discussed in Section 3. Two arguments defend our results. First, if these omitted variables are orthogonal to GDP the coefficient estimate is unbiased. Second, if GDP itself is the causal force behind possible omitted variables, GDP proxies for these, too, and the magnitude of the influence of economic growth is correctly estimated. Another caveat, of course, is the neglect of any long-run relationship between the variables. To correct for this we next perform a cointegration analysis simultaneously testing both hypotheses.

6. Cointegration analysis

Maybe the most important recent development of empirical modelling of time series was the introduction of cointegration analysis in the mid 1980s (see e.g. Engle and Granger, 1987). Cointegration analysis and in particular the error-correction representation is especially suited for the analysis of a long run equilibrium relationship allowing for short run deviations. Error correction mechanisms (ECM) provide a way of simultaneously modelling both short-run changes and long-run levels adjustment processes.

This is particularly suited for our analysis here. As already indicated, both hypotheses may be valid at the same time, i.e. short-run increases in GDP reduce the need to go to court, however, prolonged growth of GDP via an increased number of transactions and contracts increase the level of litigation in the long run. Levels regressions have the tendency to ignore the spurious regression problem (although we tried to control for it by detrending variables), and first differencing eliminates any information about long-run relationships.

One natural question to ask therefore is whether litigation per capita is cointegrated with GDP per capita. If an equilibrium relationship exists between these two variables so that a stationary linear combination exists one can be confident that, eventually, any disequilibrium deviations in the short-run are subsequently eliminated. Thus deviations from this long run path are stationary. If this is the case, the series are tied together by this equilibrium relationship. We employ the Engle-Granger (1987) two-step procedure to test for that.

First, it is to establish that CAS_t and GDP_t are integrated of the same order. To test whether the variables are $I(1)$, i.e. integrated of order one, we first difference the series and test whether the differenced series are stationary. Both the Phillips-Perron (PP) and the Dickey-Fuller (DF) test cannot reject a unit root in levels;¹² however, they clearly reject the null hypothesis of a unit root in first differences for both variables.¹³ We therefore conclude that litigation cases per capita as well as real GDP per capita are $I(1)$.

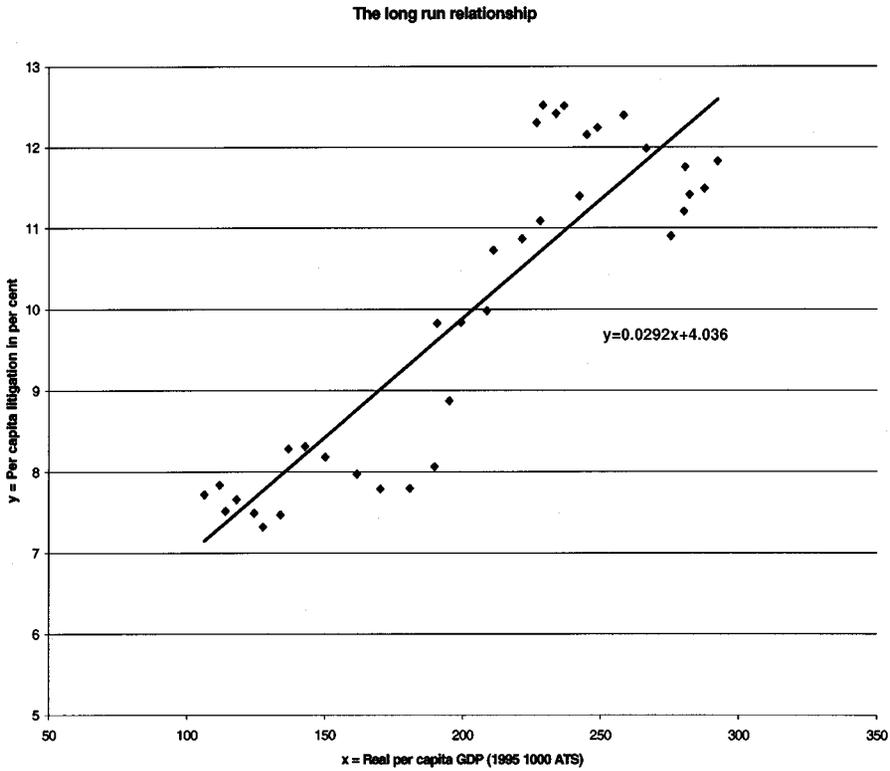


Figure 3. The long run relationship.

Next, we estimate the co-integrating vector from the hypothesized long run relationship (see also Figure 3):

$$\begin{aligned}
 CAS_t &= \varphi_1 + \varphi_2 \cdot GDP_t + u_t \\
 \hat{\varphi}_1 &= 4.04 & \hat{\varphi}_2 &= 0.029 & (3) \\
 (t = 7.34) & & (t = 11.23) & &
 \end{aligned}$$

The OLS estimates in (3) are consistent for all parameters. As evidenced by the Dickey-Fuller test (test statistic of -6.44), the ordinary least squares residuals (u_t) are stationary and show no unit root. Therefore, it is established that CAS_t and GDP_t are CI (1, 1), i.e. co-integrated of order 1, 1, and have the co-integrating vector $[1, -4.04, -0.029]$. The deviations u_t from the long run path are $I(0)$.

Finally, given the co-integrating relationship just established, a model in first differences incorporating an error correction mechanism (ECM) can be developed without running the risk of estimating a spurious regression because of the

presence of stochastic or deterministic trends. In particular, hypotheses 1 and 2 can be simultaneously tested by estimating

$$\Delta CAS_t = \alpha_1 + \alpha_2 \cdot \Delta GDP_t + \alpha_3 \cdot (CAS_{t-1} - \hat{\phi}_1 - \hat{\phi}_2 \cdot GDP_{t-1}) + \varepsilon_t \quad (4)$$

where $\hat{\phi}_1$ and $\hat{\phi}_2$ are the OLS estimates from (3). All variables are I(0) so that the condition of identical order of integration is met. Model (4) is the short run model incorporating a long run solution and an error correction mechanism when α_3 is negative. Hypothesis 1 is verified if $\alpha_3 < 0$, and hypothesis 2 is verified if $\alpha_2 < 0$.

As can be seen from Table 2, column 4, both hypotheses are verified. The error correction mechanism (ECM) term does not destroy parameter constancy from the short run model (2). The inclusion of the ECM increases the explanatory power of the regression substantially (R^2 -bar rises from 0.25 to 0.36). Economic variables,

Table 2. Empirical results: GDP and civil court litigation

Dependent variable	Equation (1)	Equation (2)	Equation (4)	Additional controls	
	$CASDET_t$	ΔCAS_t	ΔCAS_t	ΔCAS_t	ΔCAS_t
Independent variables					
Constant	-0.05 (0.68)	0.49 (3.93)***	0.50 (4.23)***	0.47 (4.20)***	0.52 (3.86)***
$CASDET_{t-1}$	0.86 (10.30)***	—	—	—	—
$GDPDET_{t-1}$	0.04 (3.10)***	—	—	—	—
ΔGDP_t	—	-0.07 (3.60)***	-0.07 (3.85)***	-0.07 (4.05)***	-0.07 (4.16)***
$ECM = u_{t-1}$	—	—	-0.19 (2.51)**	-0.22 (3.06)***	-0.23 (3.13)***
$\Delta WorkingAge_t$	—	—	—	0.36 (2.15)**	0.50 (2.58)**
$\Delta LAWYERS_t$	—	—	—	—	-0.07 (0.89)
Durbin-Watson	1.91	1.72	1.66	1.85	1.90
R^2 -bar	0.77	0.25	0.36	0.42	0.44
Degrees of freedom	32	34	32	31	30

t-statistics in parentheses

***significant at 1 per cent level; ** significant at 5 per cent level.

Note: The time period is 1960 to 1995. All variables are in per capita form. $CASDET_t$ and $GDPDET_{t-1}$ are detrended annual civil litigation cases and detrended real GDP one period lagged, respectively, ΔCAS_t and ΔGDP_t are the first differences of civil litigation cases and real GDP, u_{t-1} is the error term of Equation (3) one period lagged, $\Delta WorkingAge_t$ is the first difference of employable persons as a percentage of total population in Austria (i.e. all male persons between 15 and 65 years and all female persons between 15 and 60 years), and $\Delta LAWYERS_t$ is the first difference of the number of lawyers in Austria as a percentage of total population.

directly and indirectly, explain 36 per cent of the time series variation in litigation cases per capita over the 36 year period 1960 to 1995. This not only strengthens the confidence in the results obtained in Sections 5.1 and 5.2, but gives rise to interesting new economic interpretations.

Hypothesis 2 needs no further comment; all interpretations from Section 5.2 carry over. Let's go deeper into hypothesis 1. The error correction term has a coefficient that is reasonably substantial (-0.19) as well as statistically significant at conventional levels. This coefficient suggests that the greater is the excess of real GDP over litigation (both per capita) consistent with the long run relationship (3) in the previous period (i.e. the larger is u_{t-1}), the higher is the amount of litigation per capita this year. The coefficient of the ECM-term of -0.19 implies that after around 11 years a given disequilibrium is reduced to under 10 per cent of the initial amount. People may in any one year sue more or less than the equilibrium relation (3) would imply; however, this "error" in equilibrium behavior is partially corrected in the subsequent period. By adjusting litigation in this way, litigation per capita and real GDP per capita are positively tied together in the long run, despite the negative association in the short run. While in the short run the countercyclical pattern of litigious behavior dominates, in the long run the two series move together.

To check the robustness of our findings and to partly accommodate the discussion in Section 3, we add several control variables to our main specification (4).¹⁴

First, we introduce $\Delta WorkingAge_t$, the first difference of employable persons as a percentage of total population in Austria (i.e. all male persons between 15 and 65 years and all female persons between 15 and 60 years) as a demographic measure of the labour market and a measure of the age composition of the population. We expect that the more people are at the age to be potentially in the labour market, the more litigation cases will arise. This expectation is confirmed by our estimates (see column 5 in Table 2). The statistically significant coefficient of 0.36 implies that a 1 percentage point increase in the importance of this age segment relative to the total population increases litigation per capita by 0.36 percentage points. The other results are not altered; on the contrary, the magnitude and significance of the influence of GDP growth and the error correction term on litigious activity are actually *increased*.

Second, we add the variable $\Delta LAWYERS_t$, the first difference of the number of lawyers in Austria as a percentage of total population. One would expect that more lawyers induce more law suits, however, the direction of causation is not clear. Its coefficient is negative but insignificant (see column 6 in Table 2). (When we instrument this variable by its lagged value to partly accommodate for the endogeneity problem between number of litigation cases and number of lawyers, the results are not changed.) The important thing to note is, however, that our main results concerning hypotheses 1 and 2 are robust.

Third, we introduced the following additional variables with no significant effects but also no alterations of our main results: (first differences in) (1) the work force as a percentage of total population as a measure of labour market participation, (2)

the number of graduates at universities and colleges of arts as a percentage of total population as a proxy for the rising importance of higher education in Austria (see Subsection 3.2), and (3) the inflows to unemployment as a percentage of total population as another measure of economic conditions. When GDP growth is excluded, the variable (changes in) inflows to unemployment is significantly positive. This again corroborates the short run countercyclical pattern of litigious activity stated in hypothesis 2. The fact that GDP growth remains significant even in the presence of another measure of economic activity reassures its use as the right variable measuring general economic development.

We conclude that our main results are robust to adding more variables likely to influence litigious activity.

7. Conclusions

When analysing economic determinants of litigious behavior, a distinction between short-run and long-run effects is warranted. We find that economic development was a significantly positive determinant of litigation activity in Austria over the last four decades. In a short-run perspective, however, countercyclical effects dominate. While litigation per capita and real GDP per capita are positively tied together in the long run and cointegrated, a negative association prevails in first differences. While the number of transactions, contracts, and therefore the potential for conflicts rise with sustained economic development, short-run business cycle fluctuations entail other, countervailing phenomena. In economic upturns, solvency is better and more outside opportunities exist for economic agents. In downturns, corporate and individual debt-paying ability deteriorate, and bankruptcies are more likely. These effects induce a countercyclical relationship between litigation and GDP over the business cycle. Following Crain et al. (1985), this countercyclical relationship may prolong recessionary periods. Our results hold up to various robustness checks.

Although conclusions can only be tentative, the long run association of civil litigation and economic growth may harm the long run growth prospects of the economy. Murphy et al. (1991) posit that, as rent-seeking sectors expand, the long run growth rate of the economy is diminished. To the extent that litigious activity is mainly a redistributive activity as opposed to a “productive” activity, a stable relationship between economic growth and litigation implies an increase of rent-seeking sectors relative to productive sectors as economies expand. Moreover, inertia in the litigation process reinforces a once built-up level of litigation. This entails possible detrimental effects on long run growth prospects.

Future research certainly is necessary in the field of the determinants of litigious behavior as well as its effects. This will lead to a more thorough understanding of the interrelationships between law and economics. Comparative studies across countries on the macroeconomic level but also an analysis of the micro-economic determinants of civil litigation provide useful future avenues.

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Notes

1. In this respect, alternatives to dispute settlement in courts would lift excessive burdens of the judicial system. One example are consensual divorces which are still addressed in courts in many countries. Administrative bodies, however, can equally well substitute for these (as is the case in Denmark). Another example are default summons where amount and legitimacy of claims are evident. Numerous other examples can be found in Wollschläger (1989).
2. See Wollschläger (1989) or Crain et al. (1985). Posner (1997) analyzes the variance in the number of tort cases across U.S. states and finds that income, education and urbanization can explain much of the variance among different jurisdictions. For a general analysis of “law and economics” see Posner (1977).
3. In modern management science this is also called “outsourcing.”
4. For example, in economic upturns aggregate labour demand rises so that it is easier for employees to get other jobs in case of unemployment.
5. If there are n people and each person has exactly one interaction with each other person per period, there are $n(n - 1)/2$ interactions overall. This expression increases more than proportionately with n .
6. Source: ÖSTAT (Austrian Statistical Office): *Statistisches Jahrbuch für die Republik Österreich*, 1996.
7. Data source: WIFO database.
8. Data source: ÖSTAT-Rechtspflegestatistik.
9. For example, the duty to advance the costs of hearings of evidence.
10. Detrended series are obtained by regressing the levels series on a constant and a linear time trend.
11. The test statistics are: 6.79 (PP with a deterministic time trend and one lag) and 8.11 (DF with trend and one lag) for $CASDET_t$, and 8.39 (PP with trend and one lag) and 12.2 (DF with trend and one lag) for $GDPDET_t$. All statistics are larger than their critical values at the 1 per cent level, and we therefore reject the hypothesis of a unit root in the detrended series.
12. Test statistics (all without trend and without lag) are for CAS_t -1.87 (PP and DF) and for GDP_t -0.16 (PP and DF).
13. Test statistics are for ΔCAS_t -32.66 (PP and DF) and for ΔGDP_t -29.77 (PP and DF).
14. We thank a referee and the editor for their suggestions.

References

- Audretsch, D. B. (1995). *Innovation and Industry Evolution*, Cambridge, MA: The MIT Press.
- Crain, W. M., Tollison, R. D., and Kimenyi, S. M. (1985). “Litigation, the Business Cycle, and Government Growth.” *Zeitschrift für die gesamte Staatswissenschaft*. 141, 435–443.
- Engle, R. F. and Granger, C. W. J. (1987). “Co-Integration and Error Correction: Representation, Estimation and Testing.” *Econometrica*. 55, 251–276.
- Greene, William H. (1993). *Econometric Analysis*. Englewood Cliffs, NJ: Prentice-Hall International, Inc.
- Klein, F. (1958). “Zeit- und Geistesströmungen im Prozesse, Vortrag vor der Gehe Stiftung zu Dresden am 9.11.1901.” In *Deutsches Rechtsdenken*, Heft 13, pp. 1–28.

- Murphy, K. M., Shleifer, A. and Vishny, R. W. (1991). "The Allocation of Talent: Implications for Growth." *The Quarterly Journal of Economics*. CVI (2) 503–530.
- Phillips, P. C. B. (1986). "Understanding Spurious Regressions in Econometrics." *Journal of Econometrics*. 33, 311–340.
- Posner, R. A. (1977). *Economic Analysis of Law*, 2nd ed., Boston, MA.
- Posner, R. A. (1997). "Explaining the Variance in the Number of Tort Suits across U.S. States and between the United States and England." *Journal of Legal Studies*. 26(2), 477–489.
- Tullock, G. (1967). "The Welfare Costs of Tariffs, Monopolies, and Theft." *Western Economic Journal*. 5, 224–232.
- Wollschläger, C. (1989). "Die Arbeit der europäischen Zivilgerichte im historischen und internationalen Vergleich." In E. Blankenburg (ed.), *Prozeßflut? Studien zur Prozeßtätigkeit europäischer Gerichte in historischen Zeitreihen und im Rechtsvergleich*, pp. 21–114, Köln: Bundesanzeiger.