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Regulation in Germany: Some Stylized Facts About Its Time Path, Causes, and Consequences

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Abstract

The alleged ever increasing amount of “red tape” is one of the factors held responsible for the decline in German economic performance since the 1970s. However, little is known about the actual development of regulatory activity. The paper sets out to establish stylized facts about the time path of German regulation based on the analysis of labor and capital market policies as well as environmental policy since the early 1950s. It turns out that regulatory activity in Germany increased less steadily than expected and that significant parts of its variation can be attributed to political and to economic variables. The impact of regulation on the economy is analyzed using an endogenous growth setting. There is evidence of a negative growth effect.

Zusammenfassung

Die scheinbar beständig zunehmende Regulierung der Märkte ist eines der Schlagworte, das regelmäßig mit fallenden Wachstums- und steigenden Arbeitslosenraten in Verbindung gebracht wird. Tatsächlich weiß man aber relativ wenig über die Entwicklung der Regulierungsaktivität. Das vorliegende Papier zeichnet den Zeitpfad der Regulierung auf dem deutschen Arbeits- und Kapitalmarkt sowie auf dem Gebiet der Umweltpolitik nach. Es wird deutlich, daß die Entwicklung erstaunlich ungleichmäßig verlief. Ein Teil der Varianz in der Regulierungsaktivität läßt sich auf politische und ökonomische Variable zurückführen. Umgekehrt zeigt sich, daß die Regulierung negative Rückwirkungen auf das Wirtschaftswachstum hat.

Keywords: Regulation, Capital Market, Labor Market, Environment, Endogenous Growth, Germany

JEL: L51, K2, G28, J38, Q28, N1

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(In Germany) labor contracts are more secure than marriages¹

1. Introduction

Despite the fact that regulatory activity, or “red tape”, and its “hidden costs” are often taken to be responsible for the relatively bad performance of many economies in recent years, there has been little empirical investigation into the evolution and determinants of regulation.² In the German case, economists have claimed that the alleged increase in the amount of “red tape” – and not so much the end of the *Wirtschaftswunder*, the distinctive post war phenomenon of catch-up and convergence growth – is the major reason behind the fall in real growth rates from the 1970s (Giersch, Paqué, and Schmieding (1992)).³ However, the claim rests mainly on anecdotal evidence about the development of regulatory activity alone. On the same basis, Carlin (1996) argues that, quite to the contrary, regulation was at the core of the success of the “German model” in the 1950s and 1960s. Information about the time path of regulation will be useful for evaluating these and other competing hypotheses.

Recently, Saint-Paul (1996) and Koedijk and Kremers (1996) have tackled the issue of measuring regulatory intensity using cross-country methods. However, the pitfalls of dealing with the institutional details of a multitude of countries are well known and the approach completely ignores the time dimension of the data available.⁴ One way of dealing with these problems is to look for time-varying indicators of regulatory activity in a single-country setting. A tentative first step toward that end could be recognizing that regulation has to do with issuing instructions in the form of laws and ordinances in order to influence the way economic agents behave, and compliance with these instructions is controlled by state bureaucracies. In his study of US regulation, Goff (1996) uses, among other things, the annual number of pages in the Federal Register and state employment figures to describe the time path of the “latent variable” regulatory activity. Clearly, this approach

¹ “Arbeitsverhältnisse besser geschützt als Ehen” (Süddeutsche Zeitung (1996)).

² The Economist (1996b). For recent overviews of the theory, politics, and effects of regulation see Dewatripont and Tirole (1994), Laffont and Tirole (1993), Noll (1989), and Joskow and Rose (1989), respectively.

³ The argument is quite popular. For similar connection between Germany's declining economic performance and regulation see, for instance, Newsweek (1996) (“Sick At Heart?”) and The Economist (1996a) (“Is the Model Broken?”). Also compare The Wall Street Journal's (1996) coverage of the “Index of Economic Freedom” produced by the Heritage Foundation. Germany ranks only 20. On German post-war growth also see Crafts and Toniolo (1996).

⁴ On the the problems of cross country index-building in the debate on central bank independence see, for instance, the survey by De Haan and Eijffinger (1996).

yields only a very rough picture of the development of regulatory activity. Nevertheless it may contain some useful information. Figure 1 produces comparable time series for Germany.

(Figure 1 about here)

Interestingly enough, state employment in percent of total employment and the numbers of pages in the German Federal Register (*Bundesgesetzblatt*) do exhibit some of the same characteristics.⁵ The series display an upward trend in the time period before the mid 1970s and more stationary behavior since then. This behavior seems more or less compatible with the idea that a change in the intensity of regulation is behind the secular decline in German economic performance. However, there are also some notable differences in the data. For example, the upward shift in the indicator of federal legislative activity is preceded by the shift in the state employees series. In addition, the latter series does not show the election oriented cyclical pattern so prominent in the movements of the former.

Instead of jumping to conclusions based on the information displayed in figure 1, the present paper sets out to qualify and supplement such general indicators by analyzing three specific areas of economic policy in some detail: labor and capital market regulation and regulation in environmental policy (Sections 2 to 4). It turns out that the time paths of specific and general regulatory activity do indeed have much in common, that regulatory activity in Germany increased less steadily than expected, and that significant parts of this variation can be attributed to both political and economic variables. Sections 5 and 6 will then use the stylized facts previously established to investigate a set of hypotheses on the causes and repercussions of regulatory activity. Section 7 concludes.

2. Labor Market

Most recent studies of the current labor market failure in Western Europe at some point or another make a connection with the extensive regulation of labor market relations (OECD (1994), Bertola and Rogerson (1996)). Even though there are different interpretations, like efficiency wages (Yellen (1984)) or the disinflation policies of the 1980s and hysteresis (Ball (1996)), most observers agree that the subject of regulation should play a major role in the debate.⁶ In the German case, the discussion of the unemployment problem has become more intense since the unemployment quota

⁵ The time path of wages paid to state employees in percent of GDP followed employment until the mid 1970s. Since then the former is slightly decreasing. Source: Statistisches Bundesamt (Yearbook, various issues), own calculations.

⁶ An exception is Dörsam (1997), who draws her objections from new institutional labor market theories.

reached a dramatic high of more than 10 percent even in the West - numbers unheard of since the immediate postwar years. Among the main issues examined are working time flexibility, the autonomous system of collective bargaining between unions and employer federations and the regulations concerning lay offs. There is a general agreement that these elements of German labor regulation make the market inflexible compared to, for instance, the United States (Franz (1994), Soltwedel et al. (1990)). Moreover, the debate indicates that intertemporal changes in the regulatory framework may have contributed to the decline in German economic performance since the mid 1970s.

In order to evaluate these arguments, it is helpful to take a more detailed look at the evolution of labor market regulation in Germany.⁷ As far as the collective bargaining is concerned, it is not so much the bargaining itself as the economic and political setting under which it functions that has changed. Today's bargaining system is essentially that of the 1950s. As early as 1949, the German constitution in its art. 9(3) re-established the right of employees and employers to organize themselves into unions and federations and the Collective Bargaining Act of 1949 bargaining about wages and working conditions between these groups without government interference (*Tarifautonomie*). In theory, unions are also allowed to contract with individual employers, but this rarely happens. As a rule, bargaining takes place in the different regions at an industry-wide level between the regional union and employers association.⁸ Often the agreement reached for an industry in one region serves as a coordinating signal for the bargaining in other regions, so the actual degree of centralization is even higher. Where the contract does not provide exclusions for individual firms (which it seldom does), all members of the employers federation are obliged to set wages and working conditions according to the collective contract. Such firms can offer higher wages and more generous conditions but never less (*Günstigkeitsprinzip*). In addition to providing discipline for the members of unions and employer associations, the existing system also restricts non-members. Even though firms are, in principle, allowed to hire non-union members for lower wages, this almost never occurs because potential employees cannot credibly commit themselves to not joining the union later. In addition, according to par. 5 of the Collective Bargaining Act, the federal government can declare any collective contract compulsory for the industry in a region as a whole, if

⁷ For a more extensive description of legislative labor market regulation in Germany see, e.g., Franz (1994), Richardi and Wlotzke (1992), and Soltwedel et al. (1990).

⁸ With the exception of some industries in the new *Länder* of East Germany, the overwhelming majority of German firms is organized in employers associations (Rüthers (1995)).

it deems this to be in the "public interest" and the members of both labor market cartels agree (*Allgemeinverbindlichkeitserklärung*).⁹ The constant threat of compulsory contracts helps to explain the importance of the collective bargaining system for the overall wage level and working conditions in Germany.

As already mentioned, the bargaining system has itself remained more or less unchanged throughout the years, and it might be hard to attribute the deficiencies of the post-1970s labor market to the same institutions that contributed to the astonishing growth and employment rates of the 1950s and 1960s. Yet, authors like Bickenbach and Soltwedel (1998) argue that, in an economy that shifts from centralized to forms of production that are more flexible (Milgrom and Roberts (1990)), a institutional framework that was once efficient will become an obstacle to growth. The government's compulsory wage contract policy all but helped this transformation. Instead of lessening the grip of the collective bargaining system in line with changing economic demands, labor market policies rendered it more restrictive. The number of compulsory contracts tripled from 200 in the 1960s to 600 in the early 1980s, when it involved approximately 20 percent of all employees. Since then, the number for Western Germany has fallen to about 500 compulsory contracts, while more than 100 new ones have been added for the new *Länder*. For Germany as a whole the percentage of employees involved in compulsory contracts was still about 15 percent in 1995.¹⁰ It seems that especially the social democratic governments of the 1970s were willing to interpret this forced cartelization of the labor market as being in the "public interest".

In fact, the restrictive change in the compulsory contract policy was part of a major shift in labor market related policies. In a surge of activity, the late 1960s and 1970s brought a set of new laws that strengthened the position of the unions in the existing institutions of codetermination, enhanced worker representation on supervisory boards, and established a much more active labor market policy.¹¹ In 1972 a new version of the Works Constitution Law of 1952 was enacted which introduced *Sozialpläne* (social plans or compensation schemes) for employees who faced major

⁹ Another legal constraint is that at least 50 percent of the employees in the region must be union members (par. 5(1.1) Collective Bargaining Act). The constraint is sometimes binding. As of 1994, only about 31.2 percent of all employees were registered union members (Statistisches Bundesamt (Yearbook 1995) and own calculations).

¹⁰ Of the 5.5 million employees involved in compulsory contracts in 1995 1.2 million (about 22 percent) were not union members. Data from the Federal Ministry of Labor and Social Affairs, Soltwedel (1984), Clasen (1996), and own calculations.

¹¹ On works councils see also Addison, Schnabel, and Wagner (1996).

restructuring in their workplace such as a change in the firm's production technology or a partial or complete shut down (Soltwedel (1984)). The social plans immediately translated into higher firing costs for firms. Earlier, in 1967, the new Stabilization Law had explicitly established full employment as one of the goals of fiscal policy.

All in all, the shift in labor market related policies, especially the fact that the state took greater responsibility for the unemployed, significantly softened the bargaining constraint of the unions and encouraged a change in their contractual behavior.¹² The union leaders of the *Wirtschaftswunder* period had concentrated more on constitutional issues, but their successors steered a much more aggressive course aimed at higher wage bills (Bergmann, Jacobi, and Müller-Jentsch (1975)).¹³ As a consequence, the average annual increase in nominal wages over productivity per employee almost doubled from about 2.5 percent in 1950-67 to 5 percent in 1968-82. However, since more expansionary demand side policies allowed inflation to increase as well, the aggregated real impact of the new course on average real wage costs (-.5 and +.1 percent, respectively) looks less radical.¹⁴ Of somewhat greater consequence for the performance of the German labor market was the convergence in regional and industrywide labor costs which took place during this period. The union driven harmonization of wage levels introduced de facto national minimum wages across the German *Länder* and industry branches, because the *Günstigkeitsprinzip* described above rarely allowed firms and workers to agree on salaries lower than the union wages (Höhmann (1992)). This observation adds to the explanation of the regional divergence in unemployment rates, i.e. structural unemployment, observable after the supply shocks of the 1970s.¹⁵

Another, probably even more important, factor contributed to these changes in the institutional setting of the German labor market. As noted by Rütters (1995) and Franz (1994), the end of the first conservative era also produced a radical switch in the way labor courts interpreted

¹² This is, of course, not a peculiarly German phenomenon. See, for instance, Broadberry and Crafts (1996) for a similar story for the UK in the early postwar period.

¹³ An alternative view is that wage policy in the 1950s and early 1960s was as aggressive as in later periods, but that the wage increase was overcompensated by an extraordinary rise in productivity. There is, however, a marked difference in the nominal wage increase before and after the mid-1960s (see text).

¹⁴ The numbers are taken from Glastetter, Högemann, and Marquardt (1991). Expectations of expansionary demand policies, which compensated for much of the increase of nominal wages over productivity, explain why in the bargaining process the employer associations did not prevent nominal wages from rising in the first place.

¹⁵ See Soltwedel et al. (1990), Huckemann and Suntum (1994), and Blanchflower and Oswald (1994).

existing laws on employment protection by the early 1970s. The basic Protection Against Dismissal Law was enacted as early as 1951. Contrary to the German tradition in other legal fields, it places only mild restrictions on court decisions. Dismissals are to be considered illegal, if they are "socially unjustified" and lack an "important" reason, but both terms have to be interpreted case by case by the labor courts (Richardi and Wlotzke (1992)). The Labor Court Act of 1953 ensured that the courts not only had a lot of discretionary power but that they were also highly accessible to workers: court fees were set very low, employees were allowed to call upon unions for advice before the courts, and – again contrary to rules in other legal fields – the defeated party was never to be charged with the legal costs of the opposition (par. 11, 12, and 12a). At some point in the early 1970s, a new generation of judges seems to have drifted towards an even more employee-friendly interpretation. Rütters (1995, p. 328) even detects elements of a Marxian "class struggle" in this behavior. As a consequence, firms found it decidedly more difficult to dismiss workers, which, in turn, led to another non-voluntary, unanticipated, and sharp increase in firing costs (Soltwedel (1984)).¹⁶ At the same time, the overall number of labor court cases, especially that of dismissal-related labor court cases, skyrocketed.

(Figure 2 about here)

Figure 2 reproduces the annual number of (closed) labor court cases dealing with dismissals as a percentage of (closed) civil court cases.¹⁷ One reason for the rise in labor court cases was the negative supply side shocks of the 1970s which raised the average level of unemployment from near zero to about 5 percent of the workforce. It is indeed to be expected that the demand for dismissal-related court activity would increase when there is a positive change in the number of unemployed and vice versa. However, this does not explain the fact that numbers of court cases remained high afterwards.¹⁸ The main reasons for the permanent upward shift were the courts themselves, because

¹⁶ While a firm might voluntarily increase firing costs to overcome commitment problems towards workers that, e.g., hinder the accumulation in firm specific investment, non-voluntary, excessive, and unpredictable increases are likely to be highly inefficient. See Soltwedel (1997).

¹⁷ The denominator does *not* include labor court cases and is, in principle, insensitive to changes in the relevant regulatory activity. Thus the doubling of the ratio of dismissal related labor court cases to civil court cases is due to the increase in the numerator. In addition, the number of new dismissal cases arriving at the courts behaves in a similar manner to the number of finished cases. That is, the change is not due simply to an increase in capacity. On the problem of capacity see also Soltwedel (1984).

¹⁸ The demand for labor court action should be positively correlated with changes of unemployment or deviations from its trend, i.e. the flow of people dismissed not the stock of people out of work. As a matter of fact, the annual number of dismissals decreased as German unemployment rates rose (Soltwedel et al. (1990)).

employees dismissed had more to gain from legal action when the judges went ahead with their systematic increase in firing costs. In addition to alleged ideological reasons, there is anecdotal evidence that the labor courts aimed at protecting existing work contracts as unemployment grew (*Bestandsschutz*) (Franz (1994)). So the trend in economic development might enter into the explanation of the increase in court activity from the supply side.

The downturn of the German business cycle in the early 1980s again caused dismissal-related labor court cases to rise. This time, however, the effect was not permanent. As the demand for court activity decreased with the flow of dismissals, labor court cases returned to the level reached in the mid 1970s. In the light of what previously has been said about the upward shift, the reason for the renewed stationarity of the series seems to be that courts stopped raising the level of employment protection, i.e. firing costs, further. The small decrease in court activity since the mid 1980s is harder to evaluate, but it coincides with efforts by the new conservative government to reduce the discretionary power of the judges. In 1985 the Employment Security Act (*Beschäftigungssicherungsgesetz*) was enacted. The new law authorized temporary work contracts¹⁹, which were highly restricted in their use both by legislative and labor court regulation, and reduced the obligation of new firms to provide social plans for their staff in cases of restructuring or lay-off. In addition, it introduced legal constraints on labor court decisions about the applicability of social plans according to the Work Constitution Act. Instead of being determined solely by the courts, applicability was now made a predictable function of firm size and the number of employees affected. Just recently the Protection Against Dismissal Act has been amended to exclude small firms with less than 10 (previously 5) employees. While not all of these changes would directly affect the number of dismissal-related court decisions as measured in Figure 2, they might well help to explain why overall labor court activity declined in the late 1980s. There are other signs of a change, too. Despite the fact that, immediately after reunification, West Germany's unions and employer federations worked hand in hand to extend the rigidities of their collective bargaining system to the new *Länder*, the labor market institutions of the East show some marked differences. The participation rate of employers in collective bargaining action is significantly lower than in West Germany (Franz (1994)), not least because of the high wages agreed upon by Western unions and Western employer associations on behalf of their future competition in the early

¹⁹ The part of the law dealing with work contracts was first enacted temporarily and later extended.

bargaining rounds after unification (Sinn and Sinn (1992)). Even in the old *Länder* the collective bargaining system is showing signs of instability, as more firms and workers agree on firm-specific wage agreements outside the existing regional contracts. In a much debated recent case, a labor court denied a union the right to take legal steps against such an agreement.²⁰ As already mentioned, the government has refrained from compensating the lack of cartel discipline by making more collective contracts compulsory.

Summing up, a stylized picture of the time path of labor market regulation looks very much like the time series of dismissal-related labor court cases in Figure 2.²¹ It has been argued that the series itself is an indicator of the variation in firing costs caused by labor courts. Moreover, there are indications that the labor market regulation initiated by the federal government and the institutions organizing the German collective bargaining system have changed in a broadly comparable manner – the 1950s and the early 1960s was a period with relatively low regulatory activity, while overly restrictive labor market regulation increased dramatically in the early 1970s. Later, the rise gave way to more stationary time path. By the late 1980s there was a slight downturn in regulation. In general, both economic and political variables seem to have influenced this development, as, for instance, labor court activity moved with the business cycle and the social democrats came into power before the major regulatory shift just described. After a look at the regulation of the German capital market and environmental policy, Section 5 will explore the significance of these and other observations.

3. Capital market

The structure of Germany's capital market has been called the "archetype" of a credit-based system of corporate finance (OECD (1995b)). Compared to other OECD countries, Germany's stock market is extremely small, its ownership structure is highly concentrated, and companies depend to a much larger extent on financing by banks.²² While the credit-based system might have its

²⁰ The influential industrial union *IG Metall* had asked the labor court to declare the agreement illegal and replace the members of the firms' workers committee by personnel closer to the union (Der Spiegel (1996)).

²¹ It is interesting to note that the time path of German labor market regulation is not idiosyncratic but very similar to the French case described in Caballero and Hammour (1997).

²² The sum of all share capital quoted on German stock exchanges as a percentage of GDP is about 25 percent - which is, for instance, less than half the volume of the stock market in the Netherlands (62 percent). The numbers for the US and the UK are 76 percent and 108 percent respectively –1994 data. See Kaufmann and Kokalj (1996), Gerke et al. (1995), OECD (1995a). Another feature of the German financial system is that the combined asset value of the three largest banks is more than 33 percent of GDP, whereas the equivalent figure for the US is way below 10 percent (OECD (1995b), Kaufmann and Kokalj (1996), Mayer (1990) – 1991 data).

advantages and disadvantages (Edwards and Fischer (1994)), it is a stylized fact resulting from the comparative analysis of financial institutions that it is characterized by a much higher level of state intervention than market based systems (OECD (1995b)). As it turns out, the existing capital market structure is indeed heavily influenced by regulation.

The postwar period in Germany was not one of experiments or fundamental reform (OECD (1995b)). The federal government relied heavily on the established German banking sector for financing the reconstruction of the economy. For instance, up to the mid 1950s bond and stock issues were planned centrally by a joint committee of private banks, the *Bundesbank*²³, the Minister of Commerce, and the Treasurer. The committee discriminated strongly against issues by firms (both in terms of volume and prices) in favor of government bonds and paper issued by banks involved in the financing of construction and housing. Following the liberalization of the market in the mid 1950s, a similar institution dominated by private banks (*Zentraler Kapitalmarktausschuß*) has coordinated the issues on a voluntary basis. Notwithstanding the formal change, the new institution was influential and had essentially the same policy bias as the planning committee had previously (Gutmann, Hochstrate and Schlüter (1964)). In addition, until 1990, the issuing of industrial securities required the consent of the Federal Treasury and *Länder* governments. Early on, tax policy, too, was used to steer scarce capital to the public and housing sectors and to support self-financing by firms. It took until 1969 for equity to be included in the major savings subsidy scheme. In general, the tax system discriminated (and partly still discriminates) against external financing by limited liability firms. It was not until 1977 that the double burden of the classic corporate tax on *AGs* and *GmbHs* was lifted altogether, and other taxes, such as the wealth tax or the inheritance tax, still work against limited liability firms. In addition, these taxes discriminate against the few limited liability firms which are quoted on the stock exchange (Gerke et al. (1995)).

The bias towards the credit based system of corporate finance in federal competition policy was even more pronounced than it was in tax policy or in the direct regulation of security issues. Only two years after the war, the Allied High Commission had essentially dismantled the three leading German banks (*Deutsche Bank*, *Commerzbank*, and *Dresdner Bank*) into several *Länder* based baby banks (Horstmann (1991)). However, as soon as the Allied rule over German jurisdiction ended, the conservative German government effected the resurrection of the prewar

²³ Until 1957 called the *Bank deutscher Länder - BdL*.

status. In 1952 some cooperation at the national level was formally allowed and in 1957 all remaining restrictions were lifted. German legislators were so convinced that restoring the market power of this oligopoly was a necessary condition for the health of the economy that they excluded the banking sector from the general no-cartel provision of the – otherwise much praised – German Competition Law of 1957 (*Gesetz gegen Wettbewerbsbeschränkungen – GWB*). According to the *GWB*, banks are allowed to collude contractually on service prices and interest rate suggestions, if such contracts "enhance the strength of the participating firms" and the loss of competition is "reasonably" small (*GWB*, par. 102(1)) compared to this effect. The specific rationale given for the special position of the banking sector was the fear that excessive or cutthroat competition would lead to individual bank failures which, in turn, would increase the risk of a run on the banking system as a whole (Softwedel et al. (1986)) – even though the cost function associated with this argument is unlikely to be found in the banking sector.²⁴ A direct consequence of the exception the *GWB* made for the banking sector was that the interest rate cartel between banks, which had been re-established immediately after the war, kept operating for ten more years. The cartel set maximum rates for the interest German banks paid for savings deposits which depended on the official discount rates charged by the *Bundesbank* for short term bank lending through the discount window.²⁵ Even after 1967 public banks kept on issuing interest rate "guidelines", a method of coordinating price policies forbidden in other sectors of the economy, and it was not until 1992 that the German banking market was really opened to foreign competitors. The exception of private banks from the restrictions of the Competition Law is also visible in the bond market. The *Zentraler Kapitalmarktausschuß* still exists and is, in principle, able to coordinate bond issues on a voluntary basis.²⁶

A similar feature of the regulation of the German capital market is that banks are able to discriminate directly against non-credit investment financing. Whereas in the US the introduction of

²⁴ With the existence of large fixed costs and excess capacities in a market, so the argument goes, competition might force prices below average costs. However, in contrast to, for instance, the telephone industry, fixed factors play only a minor role in the financial business. See also Breyer and MacAvoy (1988).

²⁵ The interest rate cartel was founded in the 1930s and reactivated after 1945. It was essentially a binding contract between the leading bank associations that defined maximum rates for savings deposits (also, but obviously of less relevance, maximum rates for credits) and restricted, among other things, competition by means of advertising. See Gutmann, Hochstrate and Schlüter (1964).

²⁶ As in the late 1950s, the committee still consists of high ranking private and public bank board members. It meets 3-5 times a year. There are no official minutes and results are seldom discussed in public. The *Bundesbank's* vice president is present at these meetings as a "permanent guest".

new firms is handled by a number of smaller non-bank institutions, German law requires firms to have the assistance of a regular bank or an investment house with a full bank license to be allowed to enter the stock exchange.²⁷ Existing regulation makes bank licenses both hard to get and very expensive because of the capital requirements involved. In addition, the financial institutions which organize the issuing of new stocks are traditionally expected to prepurchase the stock and resell it later. Since this leaves the issuing risks with the bank or the investment house and requires sufficient capital, the tradition helps raise the barriers to entry to this market. Therefore, as a rule, issues are handled by the larger German universal banks. However, trying to keep their reputation in the stock exchange and, of course, their strong position in the wider market for corporate finance as providers of credit financing, these banks tend to be very restrictive in their support for new issues (Soltwedel et al. (1986), Baums (1996), Gerke et al. (1995)).²⁸ The necessary assistance of banks is also expensive. Up to 10 percent of the capital raised by the equity issues of smaller firms is kept by the banks (Schmidt (1984)). This adds to the administrative costs (issuing charges, provision of information) directly enforced by the authorities on the issuing firms, estimated by Schmidt (1984) as 2-3 percent of the new capital.²⁹ In recent years, the number of new issues on Germany's stock markets has increased slightly, but the average number of newcomers to the stock markets is still very low compared to most European countries or the US.³⁰

There is, thus, little doubt that regulation helped the financial intermediaries to sustain a strong position in the German capital market for most of the earlier postwar history. As argued further above, there was a tendency towards de-regulation in the late 1960s. It is, however, easily overestimated as Germany's large public banking sector was only marginally affected by the political changes at the federal level. On the contrary, the late 1960s and early 1970s witnessed the birth of many *Landesbanken*, larger public banks owned by regional authorities. Most of these banks were founded on the basis of existing clearing institutions (*Girozentralen*) organized by

²⁷ See par. 36 Stock Exchange Law (*Börsenzulassungsgesetz*).

²⁸ Recently the Ministry of Commerce's advisory council has made a similar point (*Süddeutsche Zeitung* (1997)).

²⁹ Another consequence of the role played by private banks in the equity issues is that firms approach the equity market rather late in their history. The average age of newcomers to the stock market in Germany is, if the software industry is excluded, about 49 years. In the US, the initial public offering is usually made after only six years. See *Managermagazin* (1996) for a recent comparison.

³⁰ This is the case in absolute and relative terms. The average flow of newcomers as a percentage of the stock of listed companies in Germany between 1987 and 1994 was just 2.7. The ratio was much higher in the US (19.1 - NYSE), the UK (7.3), the Netherlands (6.4), and France (3.3) (Kaufmann and Kocalj (1996)).

public savings banks. Like the end of the interest rate cartel, this may have resulted in an increase in banking competition for private banks, but it also helped to stabilize the given institutional setting by reducing the need for stock market reforms to facilitate risk allocation. As Sinn (1997) has shown, it is, to some extent, the large public banking sector that organizes the allocation of risk in Germany. State owned banks handle about 50 percent of the total banking turnover. Since public banks operate with an, in principle, unlimited taxpayer liability, they de facto (inefficiently) redistribute risk from firms to households through the tax system. There is some evidence that public sector banks are both willing and able to take more risks than private banks both in domestic and international markets.³¹

(Figure 3 about here)

Figure 3 illustrates that, due to the rise of public banks and a series of laws that enhanced the supervisory power of the government over private banking in general, the overall level of capital market intervention by the state may actually have been increasing in the late 1960s. It gives an, albeit very crude, index of regulation based on a synopsis of legal action.³² Legal changes are roughly weighted (+1 for changes increasing and -1 for changes decreasing regulation) and cumulated. As with labor market regulation, the end of the conservative era seems to have been accompanied by an upward shift in regulation.

Summarizing, it appears that the time path of regulation in the German capital market bears some resemblance to labor market regulatory activity. Even though quantitative indicators are less easily found here, there is evidence that points towards an overall increase in state intervention by the early 1970s. While the governments of the 1950s had relied on rather short lived regulatory activity to control investment and savings, later administrations significantly increased the basic intervention level. Only recently have efforts been made to deregulate financial markets.

³¹ State liability is most visible in the excellent rating the *Landesbanken* receive from agencies such as Standard & Poor or Moody's. Of the 25 most safe banks in the world, 12 are German public banks. Moreover, the public banking sector yields a much lower rate of return than private banks, which hints at the fact that it forgoes the premium that is usually associated with accepting higher risk. In addition, public banks overinvest in a rather tight network of local branches and are often misused as regional policy instruments (Sinn (1997)).

³² Synopsis of capital market regulation available on request. In the light of the asymmetries between stock and credit market regulation, changes which allow a higher degree of concentration in the banking sector have been marked as an increase. Also included in the index are relevant changes in laws on codetermination (see Section 2). As Claussen (1995) shows, these laws still discriminate against joint stock companies. On the evolution of German capital market regulation see OECD (1995a), Wolf (1993), Pohl (1986), Soltwedel et al. (1986), Wittmann (1973), Gutmann, Hochstrate and Schlüter (1964).

4. Environmental Policy

German private industrial expenditure for environmental pollution abatement, measured by annual investment and expenditure, is much higher than in almost any other country in the world. According to the Umweltbundesamt (1992), German firms spent about US \$ 16 bill., or almost 1.1 percent of GDP, for the environment in 1991 in current prices. The respective figures in other countries, such as the US, the UK or the Netherlands (.8 to .3 percent), are much lower.³³ Given the external effect involved, the basic reason for the exceptional activity of German firms is regulation. As in most other OECD-countries, in Germany regulatory action is the principal approach to environmental policy (OECD (1991)). Deviations from this course in favor of more market based instruments, like the Effluent Emissions Act (*Abwassergesetz*) in 1976, that introduced a levy on effluents, were never really more than experiments. The numbers reported are likely to even underestimate the level of the compliance costs in the German economy, as the firms' efforts in connection with the complicated German licensing and surveillance procedures for industrial installations do not appear in the statistics.³⁴

Compared to the regulation of the capital and labor markets the issue of the industrial use of natural resources or environmental pollution arrived relatively late on the German political agenda. With the possible exception of the basic Water Management Act (*Wasserhaushaltsgesetz*) of 1957 and few other related laws, which set the basis for greater public and, to a lesser extent, private investment in cleaning waste water, the relevant regulatory acts of the 1950s and 1960s were more concerned with issues of workers safety than with the environment (Peacock et al. (1984)). However, by steadily increasing the number of regulations and establishing an ever tighter network of official and semi-official agencies and inspectorates both outside and inside industrial firms, this period set the tone for the regulatory approach to environmental pollution in the 1970s.

The water laws of the 1950s were driven by a consensus of private households, local authorities, and even industrial lobbyists who feared the loss of usable water resources. The upsurge of environmental policy in the 1970s was the result of major political changes and the growth of an influential grass roots movement of green local action groups (Wey (1982)). Influenced by the

³³ The numbers reported are not without problems. The numbers given by the Umweltbundesamt (1992) and the Statistisches Bundesamt (FS 19, various issues) differ. See also OECD (1993).

³⁴ There is, in addition, no information about the opportunity costs that arise when firms switch technologies to adapt to environmental regulation. Also note that the figures do not include expenditures in the non-industrial sectors or expenditures by households (Statistisches Bundesamt (1994)).

growing concern about the issue of environmental pollution, the new social democratic government almost immediately resulted into a much more activist environmental policy. Against fierce opposition from interests such as the influential *Bundesverband der Deutschen Industrie*, the major German industrial pressure group, the new administration introduced a whole set of new laws and ordinances that covered areas such as waste management, aircraft noise, or unleaded gasoline. The most important legislative act of this era was the 1974 Law for the Regulation of Air Emissions Act (*Bundes-Immissionsschutzgesetz – BImSchG*). The law enforces a compulsory licensing process for industrial plants likely to cause serious environmental damage. From then on an official license for the construction and operation of such a plant was only to be granted if "state of the art" abatement technologies were used (par. 5 *BImSchG*). Licenses usually include specific regulation of the abatement technology to be used and the maximum emissions allowed. These can be changed after the plant has been built, and the procedure applies to plants already in operation as well as to new or replacement investments. Equally important for the consequences of the new law for firms is the extent to which the public is allowed to intervene in the licensing process. In many cases, public hearings are required and, as a rule, formal objections by individual citizens can stop or at least prolong the licensing procedure. Without a doubt, the introduction of the Regulation Act and its follow up ordinances such as the Technical Ordinance Air (*Technische Anweisung Luft*) were responsible for a strong upward trend in abatement expenditure after the mid 1970s.³⁵

To illustrate the time path of regulatory activity, Figure 4 shows private industrial expenditure on pollution abatement weighted by GDP³⁶ and an index of environmental regulation. The index is based on the synopsis of legal action and has been computed in a similar fashion to Figure 3 above.³⁷

(Figure 4 about here)

³⁵ This development is nicely illustrated by the steadily increasing stream of information produced by the Federal Environment Agency (*Umweltbundesamt*) founded in 1974 on the model of the Environmental Protection Agency in the US. Also see the survey by Gawel (1994).

³⁶ In order to compute the expenditure series, the 1991 figure from the *Umweltbundesamt* mentioned in the text was used to calibrate the time series given by the *Statistisches Bundesamt*. Both expenditures and GDP are in nominal terms. The picture does not change much if real measures are employed instead.

³⁷ Synopsis available on request. Environmental and safety regulation are almost indistinguishable as far as workplace regulation is concerned. Therefore the latter policy field has been included in constructing the index as well. On the evolution of German environmental regulation see OECD (1993), Wicke (1993), *Bundesumweltministerium* (1992), Jäger, Wentzel, and Brandt (1989), Peacock et al. (1984), Wey (1982).

There is a difference between the behavior of the index and expenditure series. While the latter – like the indicators for capital and labor market regulation in Figures 2 and 3 above – displays a recent decline, the change is not as visible in the index. The reason is in the way the regulatory norms measured by the index were interpreted by the administration. As Peacock et al. (1984) argue, there is a permanent bargaining process going on between firms and administrators about the way the environmental rules should be implemented. What is perceived as a "state of the art" abatement technology (see above) will certainly vary with circumstances, for instance with the development of with the economy or political changes. This not so obvious flexibility in environmental policy by regulation partly explains why it is preferred to more efficient policy instruments by both the regulators and the regulated (Frey (1992)). Figure 4 makes it clear that since the late 1980s the results of the bargaining processes have been biased in the interest of the regulated.³⁸ As a consequence, current observers of German environmental policy report an increasing implementation lag for formal regulatory norms due to informal administrative concessions, which lower compliance and compliance costs (Gawel (1994)).

Most recently the tacit was made more explicit by a set of new laws that, for the first time since the early 1950s, actually aimed at reducing the level of environmental regulation. One rationale that could be given for this move was that the Environmental Liability Act (*Umwelthaftungsgesetz*) of 1990 had shifted the liability for some environmental accidents to the producers, and this helped internalize some of the external effects which up to then had been covered by regulation (Bauer and Böventer (1989)). However, the most important motive probably was the need to bring the legal setting in line with administrative reality. In 1993 the Investment Deregulation Act (*Investitionserleichterungsgesetz*), among other things, reduced the participation and objection rights of citizens on grounds of the Regulation Act of 1974, and most recently the German parliament passed a whole set of laws (*Beschleunigungsgesetze*) aimed in the same direction. The change of rules abolishes the suspensive effect of citizen objections, reduces the number of public hearings necessary, speeds court procedures, and introduces exceptions to the

³⁸ The data refers to West Germany alone, so the break of the expenditure series in Figure 4 cannot be explained by lags of environmental policy implementation in the East. The fact that firms became more flexible in their choice of abatement technologies may have added to the change in regulatory activity. Whereas in the short run the production process is fixed and changes for meeting environmental regulation will be expensive, in the long run the elasticity of substitution between factors is much higher.

licensing procedure for existing installations.³⁹ Even though most experts doubt that the new set of "deregulatory" laws will actually make the regulatory process faster than the changes due to administrative behavior (WIB (1996)), the effort reinforces the impression that the recent negative trend in environmental regulation will persist.

All in all, the time path of regulation in the field of environmental policy seems to have followed a track at least partially comparable to the other regulatory activities analyzed above. Here, too, it would be interesting to see which economic and political variables will add to the understanding of the reasons for this behavior.

5. Determinants of Regulatory Activity

Regulatory activity in Germany, especially labor market and capital market regulation, increased all but steadily during the last 50 years. But what is behind the stylized time path of regulation described in the previous sections? One of the more historical interpretations is Olson's (1982) sclerosis hypothesis. Regulatory activity was low in the 1950s, so the argument reads, because of the cleansing effect of the immediate post-war years.⁴⁰ Later, as the interest groups re-organized, regulation increased again – possibly following some time path dependent process (North (1991)). Even though the historical perspective adds to our understanding of the particularities of the political process that drives the development of regulation over time, open questions remain. Why, for instance, did it take until the 1970s for labor market regulation to recover from the Olsonian shock? And what explains the recent slowdown in regulation growth? To answer these questions it seems worthwhile to explore a more general set of determinants of regulatory activity. Consequently, the remainder of the section discusses and tests some of the more important arguments found in the theoretical literature on the political economy of regulation as well as possible explanatory factors derived from the observations made above.

H1: Regulatory activity increases as economic activity decreases

Regulation, just like budget related policy instruments, is a means of redistributing assets and income and of influencing the way economic agents behave (Stigler (1971), Peltzman (1976)). However, a widely held view is that the costs of regulation are hidden and thus less likely to be noticed immediately (The Economist (1996b)). It follows that, because public resistance to tax-

³⁹ See the Bundestag (1996) debate in June 1996.

⁴⁰ The hypothesis has recently been criticized by Paqué (1993), who – not without reason – argues that most German interest groups were surprisingly quick to re-group after the war.

financed redistributive measures is likely to be a negative function of the strength of the economy, a non-benevolent government will be more tempted to fall back on regulation as a policy instrument when the economy is weak. For instance, the German government tolerated the move by labor courts towards higher firing costs as unemployment reappeared on the economic agenda.⁴¹ The opposite hypothesis would be that regulatory activity is positively correlated with growth simply because the volume and number of transactions grow with the economy and a benevolent government would provide the regulation needed for the legal system to cover them.

H2: Regulatory activity is higher before elections and lower after them

The argument that leads to the hypothesis that elections will matter for regulatory activity is that governments are opportunistic and use all instruments available to generate a positive climate for reelection (Downs (1957)). A specific regulatory mix will help maximize support before an election. This, in turn, should lead to an increase in regulatory activity in pre-election periods. Consequently, there should be less regulation implemented afterwards.

H3: Regulatory activity is higher under left governments than under right ones

Interventionism is one of the classic characteristics usually associated with the reign of left administrations (Saint-Paul (1996)). Thus, regulatory activity should be higher in times of social-democratic governments.

H4: Regulatory activity increases with the capacity of the legal system

Hau and Thum (1997) argue that, if lawyers and regulation are complementary factors, a benevolent government will produce regulation in accordance with the supply of lawyers. As a consequence, a positive correlation between the capacity of the legal system and regulatory activity should be observed. However, such a correlation could also be explained by lobbying efforts or, in the case of labor market regulation via courts, supply-induced demand for legal services. In both scenarios more lawyers would induce more regulatory activity.

H5: Regulatory activity increases as revenue decreases

Regulation and budgetary measures are likely to be substitutes in the political process. A certain interest group may opt for non-monetary, regulatory measures in times of hard budget constraints and vice versa. As a consequence, revenues and regulation should be negatively correlated.

⁴¹ See Section 2. The same is true for capital market regulation. Also, market based instruments in environmental policy such as taxes are also less likely to be introduced into a weak economy.

Table 1 presents the results of a simple econometric test of hypotheses H1 to H5. The data considered as indicators for regulation are the series already discussed in Figures 1 to 4 above. One exception is the expenditure series from Figure 4. While all other series cover annual observations for the period 1950 to the early 1990s (or about 40 observations), the expenditure series offers less than half the number of observations and therefore had to be omitted from the tests. The data associated with the hypothesized determinants of regulation are described in the appendix. All five indicators of regulatory activity (as well as the most explanatory variables) are transformed into logs and, when necessary, de-trended or differentiated to guarantee stationarity.⁴² The estimated models include a lagged endogenous variable (r_{t-1}) to capture the possible time-path dependency of regulation. As the indicators are likely to be affected by similar policy shocks, the models are estimated jointly using the seemingly unrelated regressions method (SUR).

(Table 1 about here)

The variable taken to represent economic development is real per capita GDP growth. To be able to distinguish between long term and short term movements of the GDP series, the long-term movements were extracted using the Hodrick-Prescott (HP) procedure (*activity* in Table 1). *Cycle* is simply the deviation of the original GDP series from the HP series. Turning to the regression results, Table 1 provides some weak evidence that regulation is decreasing with long term economic activity as hypothesized in H1. *Activity* has the expected negative and significant effect in column (5), i.e., bureaucratic capacity is increased as economic activity decreases, but the estimated coefficients are non-significant and positive in columns (1) to (4). H1 is supported, however, when the models are re-estimated under the restriction that the coefficients of the common explanatory variables are equal across all equations (results reported in column (6)). The same can be said for the correlation between regulation and the cyclical component of economic activity (*cycle*). With the exception of environmental policy, the coefficient estimates are both significant and negative. For instance, as expected, labor market regulation rises significantly as real per capita GDP decreases in cyclical downturns.

The quantitative evidence on the more political determinants of regulation is somewhat mixed. For example, the federal register (that is, central legislative activity in a very narrow sense),

⁴² Unit root tests not reported. All regulation series' but the capital market regulation indicator and the federal register series have been difference-filtered after taking logs. The state employees, the environmental policy, and the federal register series' have been detrended. See the appendix for the explanatory variables.

alone exhibits the significant *election* cycle predicted by H2. State employment, on the other hand, seems to be significantly lower than average both in the pre- and the post-election periods. The result that regulatory activity is lower both before and after elections also re-appears in the joint estimates in column (6). Only in columns (1) and (3) the change in the number of *lawyers* (as a percentage of the total population) has a noticeable influence on regulatory activity. The impact, however, is negative and not positive as predicted by H4. The estimated parameter is not significantly different from 0 in column (6).⁴³

The impact of the remaining political variables is a little clearer. *Left* ideology is represented by a dummy (active during the periods of social democratic federal governments) weighted with the percentage of votes won by the social democratic party at the federal level. Left governments seem to have had a significant and positive influence on 3 out of 5 indicators, the exception being state employees and environmental policy (both negative and insignificant). Behind the latter outcome might be the fact that the simple index computed in Section 4 gives as much weight to the regulatory activity in the late 1950s and 1960s as to the – conceptually different – activity in the 1970s. However, since applying different weights to legislative changes would introduce a high degree of arbitrariness in the quantitative procedure, this qualification must suffice at this point. All in all, however, the results confirm both H3 and the observations made in the qualitative assessment in previous Sections. The same can be said about the effect the *revenue* variable (federal government revenues in percent of GDP) has on regulatory activity: as predicted by H5, there is a negative correlation between revenue flows and regulation. The hypothesis that regulatory activity is the larger the tighter the budget is significant at conventional levels in columns (1) and (4) as well in the joint test in (6). Only column (2) reports a positive sign.

Given the makeshift nature of some of the indicators used in the exercise, the results should be interpreted with some caution. Nevertheless it is interesting to note that the hypotheses considered have considerable explanatory power. The notions that regulation may substitute budgetary measures when revenue becomes scarce, that ideology influences the level of regulatory activity, and that politicians turn to regulation in economically “bad” rather than in “good” times proved to be important determinants of German regulation from the 1950s to the early 1990s.

⁴³ A possible explanation would be that lawyers are a substitute (rather than a complement) for the more direct means of regulation measured by the indicators used in the regressions (van Waarden (1997)).

6. Some Speculation on the Impact of Regulation on the German Economy

In general, regulatory activity seems to have declined in recent years. What will be the repercussions on the economy? As a first step it might be interesting to see whether the time path of regulatory activity adds something to a simple time series approach to the explanation of real per capita growth. Consider an autoregressive model

$$(1) \quad \Delta y_t = \alpha + \sum_{i=1}^p \beta_{yi} \Delta y_{t-i} + \mathbf{b}\mathbf{r}_{t-1} + \varepsilon_t,$$

where y is the log of German real per capita GDP (see appendix for the data), α is a constant, \mathbf{r} represents the (5x1) vector of the regulatory indicators discussed above, and ε is a random term following standard assumptions. As it is unlikely that changes of regulation will have an immediate effect on the economy, the indicators enter with a one-period lag. To control for the possible simultaneity between regulation and economic activity the model is estimated using instrument variables (IV).⁴⁴ If the view that regulation is harmful for growth is true, the elements of the (1x5) coefficient vector \mathbf{b} should be significant and have a negative sign. The results are reported in Table 2.

(Table 2 about here)

Given the simple nature of the times series model, the rather low R_{adj}^2 (see the notes to Table 1) is not surprising. As to the estimated coefficients, an increase in capital and labor market regulation as well as a rise in the number of state employees seem to lower growth, while environmental policy and the federal register show positive signs.⁴⁵ However, the model is not convincing in statistical terms and, more important, the approach fails to control for input growth. Results may change if a structural growth model is used.

⁴⁴ There are hints at both implementation and compliance lags in the previous sections. This implies simultaneity between (one-period) lagged regulation and (two-period) lagged Δy in the AR part of model (1). Note that this lag structure might also give rise to a simultaneity problem in the regressions in section 5 explaining regulation. However, instrumenting economic activity by the arguments introduced in the present section does not alter the results in Table 1 above.

⁴⁵ Standard TFP measures yield qualitatively comparable results. Applying the same approach to a (smoothed) aggregate TFP series provided by Jorgensen (1995) and van Ark (1998) changed only the sign for the federal register (to negative). Results available on request. However, such measures depend on rather rigid technological assumptions and are often based on fairly narrow input concepts. Another problem is their strong cyclical behavior (Flaig and Steiner (1993)).

Models of endogenous growth provide a natural structural approach to capturing the effects of regulation on the economy.⁴⁶ Consider, for instance, the model Kocherlakota and Yi (1997) have recently applied to US and UK time series data. The model is based on an AK production function of the Barro (1990) type:

$$(2) \quad y_t = a_t + \gamma k_t + (1 - \gamma)g_t .$$

$0 < \gamma < 1$ is a constant, a is a – yet to be discussed – efficiency term, k is private capital in a very wide sense (including real as well as human capital), and g is the share of public capital in output, y .⁴⁷ All variables are in logs. g is assumed to be financed out of the proceedings of a contemporaneous flat rate tax on output, τ , net of an exogenous waste component. There are adjustment costs for private capital so that k accumulates according to

$$(3) \quad k_t = z + (1 - \delta)k_{t-1} + \delta i_t ,$$

where z and $0 < \delta < 1$ are constants and i is the log of investment. Kocherlakota and Yi (1997) show that, in such an environment, a representative agent maximizing an expected logarithmic utility function will choose investment so that

$$(4) \quad i_t = s + \log(1 - \tau_t) + y_t ,$$

with s collecting parameters from the agent’s utility function as well as from equations (2) and (3). Consequently, the change in output can be written as

$$(5) \quad \Delta y_t = c + \sum_{i=0}^{\infty} b_{gi} g_{t-i} + \sum_{i=0}^{\infty} b_{\tau i} \log(1 - \tau_{t-i}) + \sum_{i=0}^{\infty} b_{ai} a_{t-i} ,$$

with c again capturing parameters.⁴⁸ That is, output change is a positive function of current and lagged values of public capital and the efficiency parameter but a negative function of the current and lagged tax rate.⁴⁹

⁴⁶ For the recent debate on endogenous and exogenous growth models see, e.g., Mankiw, Romer, and Weil (1992), Jones (1995), Levine and Renelt (1992), Crafts and Toniolo (1996). Barro and Sala-i-Martin (1995) offer a general discussion of the role of government in such models. See Engen and Skinner (1996), Atkinson (1995), Barro (1991) on the same issue.

⁴⁷ See Aschauer (1989) for a production function approach based on an equivalently broad input concept. The present model has the advantage, however, that it easily extends into a more general approach (with similar empirical implications) which allows being “agnostic about the form of the production function and private capital stock inputs” (Kocherlakota and Yi (1997, p. 240)).

⁴⁸ For the derivation of (5) see Kocherlakota and Yi (1997, Appendix 2). That there are contemporaneous as well as lagged variables on the right hand side is essentially due to the adjustment process in (4).

⁴⁹ For a given waste component in the budget this implies an inverted-u-shaped relationship between government revenue/expenditure and growth. See, e.g., Barro and Sala-i-Martin (1995).

A plausible way to extend the standard model and to integrate regulatory activity is to disaggregate the efficiency term a into a stochastic element following standard assumptions, u , and a systematic component that represents the (again lagged) effects of the vector of regulatory activity, \mathbf{r} , on the marginal productivity of private capital⁵⁰:

$$(6) \quad a_t = f(\mathbf{r}_{t-1}) + u_t.$$

Regulation clearly influences productivity as it, for instance, tends to reduce the flexible use of the existing capital stock (labor market regulation) or to introduce additional costs to production (capital market and environmental regulation). The specific characteristics of $f(\cdot)$, however, are open to discussion. On the one hand, the widespread complaints about “red tape” seem to imply that an increase in regulation is inefficient *per se*, which would suggest $f' < 0$.⁵¹ On the other hand, basic regulation could raise efficiency, and thus real economic activity (Dörsam (1997)), while only excessive regulation might be expected to have a negative impact on the economy (Koedijk and Kremers (1996)). From Sections 2 to 4 the conclusion could be drawn that much regulatory activity in the fields under scrutiny qualifies for the adjective excessive, but in the end this is an empirical question. Assuming, in a first step, that $f(\cdot)$ is linear, variants of the following equation are estimated for German real per capita GDP:

$$(7) \quad \Delta y_t = c + \sum_{i=0}^n b_{gi} g_{t-i} + \sum_{i=0}^n b_{\tau_i} \log(1 - \tau_{t-i}) + \sum_{i=0}^n \mathbf{b}_{ri} \mathbf{r}_{t-1-i} + v_t.$$

Equation (7) represents (5), except that the number of lags is finite and the unobservable error term v stands for the moving average of the productivity shock u , assumed to be independent of the policy variables.⁵² The exact lag structure of the right hand terms is determined empirically using standard methods. Table 3 presents the estimated coefficients with autocorrelation consistent

⁵⁰ The costs of regulation can be thought of as being covered by the same taxes as government capital expenditures.

⁵¹ Bertola and Ichino (1995) argue that the impact of a change in regulation will be influenced by the credibility of the change. In the German case credibility seems to be a plausible assumption. As to the reasons why the government might want to lower efficiency see Section 5.

⁵² To derive (7), simply rewrite (6) as $a_t = \tilde{\mathbf{b}}\mathbf{r}_{t-1} + u_t$, substitute into (5) and define $\mathbf{b}_{ri} \equiv b_{ai} \tilde{\mathbf{b}}$. Restricting

$b_{a0} = 1$, $\sum_{i=0}^n b_{ai} u_{t-i} \equiv v_t$ is a $MA(n)$ process. Under these assumptions, OLS and IV provide consistent coefficient estimates. As already mentioned, the covariance matrix is estimated allowing for serial correlation in the error term (Newey and West (1987)). Model specifications using a Cochrane-Orcutt transformation of equation (7) yield similar results.

standard errors. With the exception of column (1), which reports standard OLS estimates, all results are estimated using IV.

As a base case, column (1) of Table 3 includes none of the regulatory indicators, which reduces equation (7) to the model estimated by Kocherlakota and Yi (1997) for the US and UK. If there are economies of scale for public and private capital, the sums of coefficients for public capital as well as for taxation should be positive.

(Table 3 about here)

As a matter of fact, both the sums of the coefficients associated with public capital and direct taxation are positive and significant at conventional levels, which may be interpreted in favor of endogenous growth theory.⁵³ Results for the \mathbf{b}_i coefficients are slightly more various.

Columns (2) to (6) of Table 3 present the estimates when the regulatory indicators are introduced into the model individually, column (7) reports the outcome when all indicators are included in the model. There are only small changes between columns. As in the time-series model, the estimated coefficients for both environmental regulation and the federal register series have a positive sign.⁵⁴ A possible interpretation is that there is a non-linear relationship between these particular regulatory activities and that both (still) fall into category of “basic regulation” which might exhibit a positive influence on growth. This could, of course, be true for all types of regulation. However, a model containing both squared and non-squared regulatory indicators brought only scant evidence that the relationship between regulatory activity and growth has indeed the form of an inverted u and none of the coefficients was significant at conventional levels.⁵⁵

Contrary to environmental regulation and the federal register series, increases in labor and capital regulation as well as in the state employees series have a negative impact on real per capita growth. Compared with the time series model, the case for capital and labor market regulation hurting the economy is stronger in statistical terms: the coefficients are now significant at marginal and conventional levels, respectively. In quantitative terms, a standard deviation increase in the

⁵³ The result is in line with Kocherlakota's and Yi's (1997). Note, however, the difference in sample length. Their longest data set extends from 1891 to 1991. Table 3 is based only on about 40 observations.

⁵⁴ The estimated coefficient for environmental regulation even becomes marginally significant in the last column. Note that substituting the (albeit short – see Figure 2) abatement expenditure series for the indicator used above does not change the results. The estimated coefficient in column (4) becomes .006 (T-statistic: .18).

⁵⁵ This is true for the individual as well as for the joint (squared and non-squared) indicator variables. The estimated signs point to a concave relationship only for the general regulation indicators (federal register and state employees). Results available on request.

capital market regulation series as used in the regression (raw series in logs) translates into a .8 percent lower growth rate of real per capita GDP in any given year.⁵⁶ A similar increase in labor market regulation (change of raw series in logs) leads to a growth loss of about .14 percentage points.⁵⁷ The equivalent figure for the, albeit not significant, state employees series reads 2.6 percentage points. Whether the impact is “large” in quantitative terms or not, depends to some degree on the observer’s judgement. All in all, however, it would seem that the evidence suggests a non-negligible detrimental growth effect of these indicators. This is in line with some of the recent results coming from cross-country regressions (Koedijk and Kremers (1996)).

7. Conclusion

The paper has established some stylized facts about the time path of regulation in Germany in the post-war period. First, in most cases regulatory activity did increase over the years, but it did not increase steadily (Sections 2 to 4). Labor and capital market regulation especially showed signs of acceleration during the 1970s and some decrease during the 1980s. Second, a significant part of the variation in regulatory activity can be attributed to the tightness of the federal budget (regulation substitutes budgetary measures as revenue declines), the partisan beliefs of the government (left administrations tend to regulate more), and economic activity (regulation increases in “bad” times) (Section 5). On the other hand, there is evidence that more regulation, especially in the fields of capital and labor markets and less so in environmental policy, hurts the economy (Section 6).

Given the makeshift nature of the indices on regulation used, these outcomes should be taken with a pinch of salt. Further research could aim at establishing additional indicators of regulatory activity and provide an analysis of the effects of regulation at the micro level. For instance, it might be worthwhile to study and test the role of labor and capital market regulation in investment decisions with panel data rather than with highly aggregated time series. But still, to the extent that the results discussed above point in the right direction, where do we go from here?

The result in Section 6 suggests that deregulation might be growth enhancing. Looking back to the institutional details that underlie the indicators used in this study, some more specific policy implications are available as well. For instance, the analysis tentatively suggests that two of the

⁵⁶ Jayaratne and Strahan (1996) find a significant negative correlation between the regulation of the banking sector and subsequent growth in US states as well.

⁵⁷ Addison, Schnabel, and Wagner (1996) report a roughly comparable result. They find a significant negative relationship between worker codetermination and firm profits (but not innovation) in German panel data.

more important factors behind the detrimental effects of capital market regulation are the high barriers to entry to the stock market and the artificially large role of the public banking sector. As far as the labor market is concerned, the appropriate remedy against the upsurge in non-voluntary firing costs since the 1970s is obviously to curb the discretionary power of labor courts. Another implication would be to reduce the number of compulsory wage contracts which has been moving roughly in line with labor court activity over the years. This would allow more flexible and firm specific labor market arrangements to meet the needs of a changing economic environment.

What are the odds for major deregulation in these and other areas? Some recent efforts in capital market deregulation have already been hinted at. However, the OECD (1997), a careful observer of changes in German institutions, notes that the pace of reforms, especially in the labor market, is rather slow. This is hardly a surprise, as almost all determinants of regulatory activity currently work (and will probably continue to do so) into the opposite direction. For example, the political incentive to use regulatory instead of budgetary measures will remain high as revenue will remain scarce. This points to the potentially beneficial role for external pressure such as the European Union's commitment to further open the financial sector to competition and to tackle labor market rigidities.

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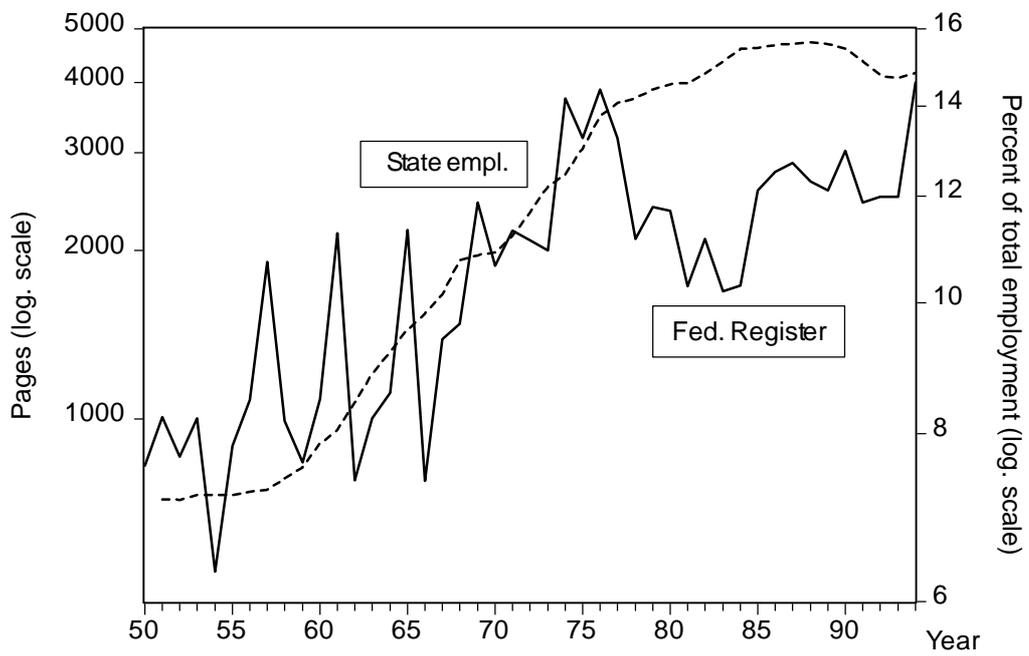
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Appendix: Data

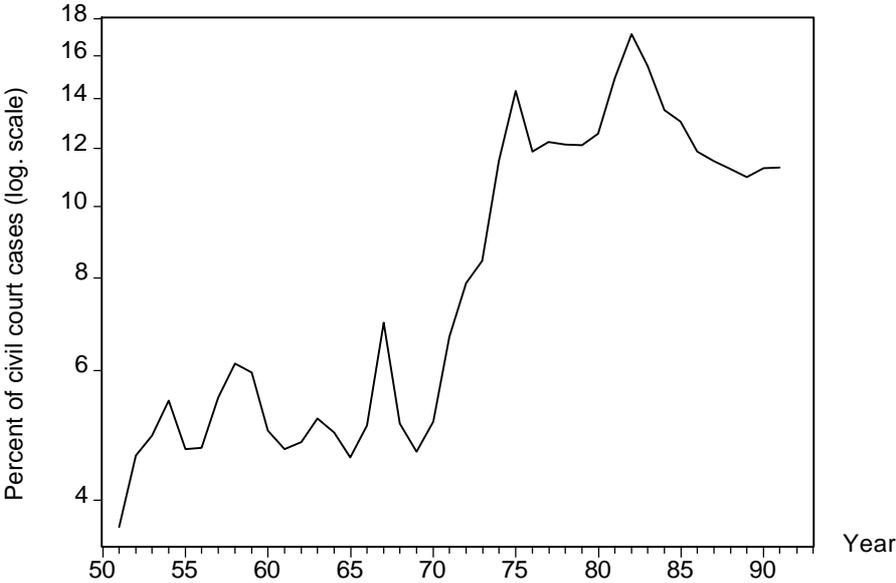
<i>r</i>	Regulatory activity. The variables are described in the text (see Figures 1 to 4 and Section 5).
<i>Activity</i> , <i>Cycle</i>	Both series are based on the change of real per capita GDP in logs (Statistisches Bundesamt (Yearbook, various issues)). The <i>activity</i> component is extracted using the Hodrick-Prescott procedure with the smoothing parameter set to 100. In addition, the series has been detrended. <i>Cycle</i> is simply the difference between the original series and this <i>activity</i> series.
<i>pre-election</i> , <i>post-election</i>	The pre-election dummy is 1 during regular election years (i.e. not in 1972, 1982, and 1990 where elections were held premature) and 0 otherwise. The post-election dummy is 1 during the first two years following an election and 0 otherwise. The data is from Statistisches Bundesamt (Yearbook, various issues).
<i>Left</i>	The variable is computed as the product of an ideology dummy and the percentage of votes in favor of the social-democratic party in the relevant election. The ideology dummy is 1 if a government was lead by the social democrats and 0 otherwise (Grand Coalition excluded). The data is from Statistisches Bundesamt (Yearbook, various issues).
<i>Lawyers</i>	Second difference of the log. of the number of lawyers as a percentage of the population as reported by Thum and Hau (1997).
<i>Revenue</i>	Central government revenue (excludes social security) from national accounts in percent of nominal GDP in logs (Statistisches Bundesamt (Yearbook, various issues)), detrended. The 1953 figure has been corrected for accounting changes with respect to existing government debt (Sachverständigenrat (1965)).
<i>Y</i>	Real per capita GDP in logs (Statistisches Bundesamt (Yearbook, various issues)), detrended.
<i>g</i>	Real public capital stock in percent of real GDP in logs. The series has been generated by perpetuating the state owned gross capital stock in 1950 with gross investment figures generated by German national accounts (Statistisches Bundesamt (Yearbook, various issues)).
τ	Total revenues (all government levels) from direct taxation in percent of nominal GDP (Statistisches Bundesamt (Yearbook, various issues)). The series excludes social security revenues.

Figure 1: General Indicators of Regulatory Activity



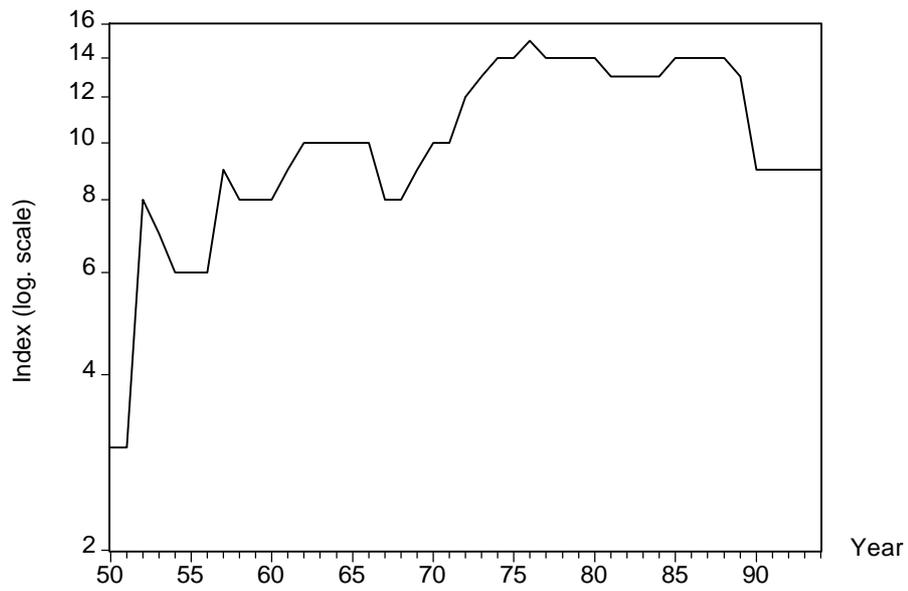
Source: Federal Register, Statistisches Bundesamt (Yearbook, various issues), Sachverständigenrat (1994), own calculations.

Figure 2: Labor Market Regulation



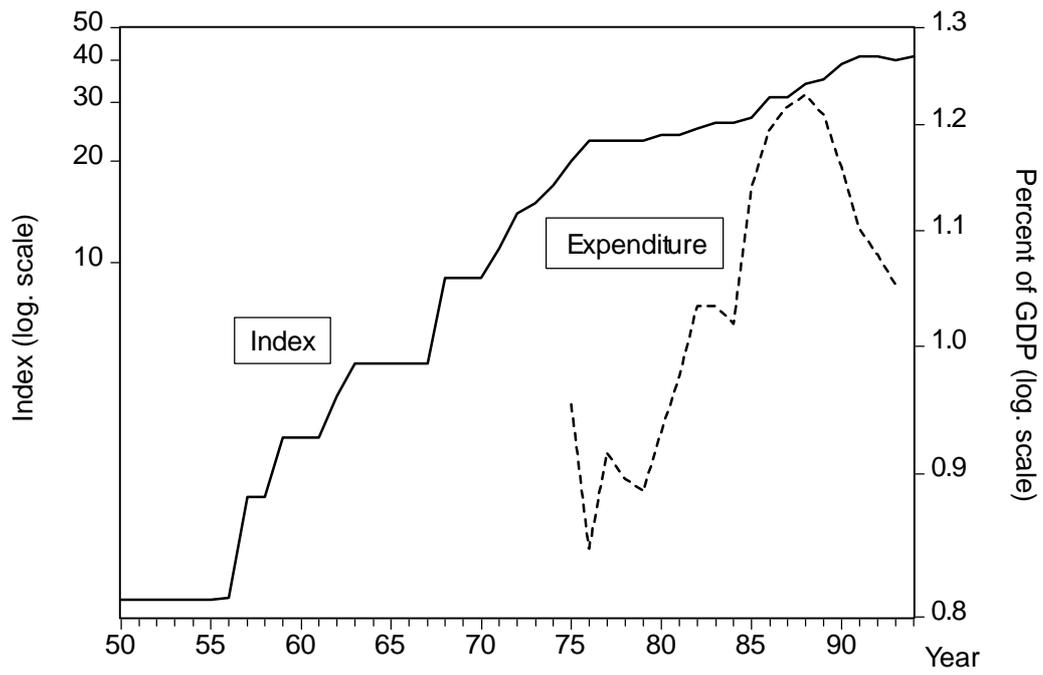
Source: Statistisches Bundesamt (Yearbook, various issues) own calculations.

Figure 3: Capital Market Regulation



Source: See text.

Figure 4: Regulation in Environmental Policy



Source: Umweltbundesamt (1992), Statistisches Bundesamt (FS 19, various issues), own calculations. See text on index.

Table 1: Regulation and some explanatory variables

	(1) labor market	(2) capital market	(3) environ- mental policy	(4) federal register	(5) state employees	(6)
α	-0.04 (1.42)	0.70*** (5.45)	0.08* (1.74)	-0.08 (1.06)	0.01*** (2.89)	
<i>activity</i>	6.43 (1.26)	1.62 (0.28)	1.06 (0.20)	3.30 (0.18)	-2.22*** (2.77)	-1.77*** (2.84)
<i>cycle</i>	-8.75*** (4.00)	-4.80 (1.57)	-6.01** (2.12)	-3.65 (0.76)	-0.48* (1.76)	-0.89*** (4.52)
<i>pre-election</i>	0.02 (0.45)	-0.02 (0.37)	-0.09 (1.27)	0.32*** (3.74)	-0.01*** (3.01)	-0.01** (2.35)
<i>post-election</i>	0.07* (1.89)	-0.12** (2.11)	-0.08 (1.46)	-0.15** (2.00)	-0.01*** (3.19)	-0.01* (1.72)
<i>left</i>	0.02*** (2.92)	0.03*** (2.77)	-0.01 (0.33)	0.10*** (3.24)	-0.001 (0.02)	0.001* (1.94)
<i>lawyers</i>	-1.90** (2.23)	-0.04 (0.03)	-3.22*** (2.83)	0.18 (0.10)	0.15 (1.51)	-0.01 (0.10)
<i>revenue</i>	-0.56** (2.57)	0.33 (1.07)	-0.39 (1.43)	-1.24** (2.36)	-0.01 (0.61)	-0.04** (2.47)
r_{t-1}	0.18* (1.92)	0.72*** (12.55)	0.37*** (2.63)	-0.28** (2.36)	0.31*** (2.79)	
<i>obs.</i>	39	40	39	40	39	
R_{adj}^2	0.51	0.66	-0.11 ^a	0.48	0.55	

a: R^2 is 0.15.

Notes: ***/**/* stands for significance at a 1/5/10 percent level. Absolute T-statistics are in brackets below coefficients. Models (2), (3), and (5) are estimated including an AR(1) term to capture the autocorrelation of the residuals. Column (6) reports the results of an estimate of models (1) to (5) with the added restriction that the coefficients of the common explanatory variables are equal across all equations. Individual constants and lagged variables not reported. Q-statistics (at lag one) do not allow rejection of the hypothesis that residuals are white noise on conventional levels. See the appendix and text for data descriptions. Estimation by SUR.

Table 2: Time series model

	labor market	capital market	environmental policy	federal register	state employees
\mathbf{r}_{t-1}	-0.01 (0.83)	-0.001 (0.18)	0.01 (0.76)	0.005 (1.11)	-0.30** (2.73)

Notes: Newey-West HAC standard errors and covariance. ** stands for significance at the 5 percent level. Absolute T-statistics are in brackets below coefficients. R^2_{adj} is 0.15. The F-statistic implies significance at the 16 percent level only. Constant and autoregressive part not reported. p has been set to 6 following standard techniques. Q-statistics (at lag one) do not allow rejection of the hypothesis that residuals are white noise on conventional levels. See appendix and text for data descriptions. Estimation by IV using the lagged explanatory variables in Table 1 as instruments for \mathbf{r}_{t-1} .

Table 3: Endogenous growth model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>labor market</i>		-0.01* (1.95)					-0.01 ^a (1.55)
<i>capital market</i>			-0.01*** (2.26)				-0.02** (2.71)
<i>environmental policy</i>				0.004 (0.73)			0.01* (1.82)
<i>federal register</i>					0.001 (0.13)		0.002 (0.97)
<i>state employees</i>						-0.10 (0.96)	-0.08 (0.87)
<i>c</i>	0.11*** (3.32)	0.10*** (3.18)	0.12*** (4.13)	0.11*** (3.39)	0.11*** (2.99)	0.11*** (3.14)	0.11*** (3.85)
$\sum b_{gi}$	0.06*** [7.00]	0.05*** [8.00]	0.06*** [8.78]	0.06*** [6.66]	0.06*** [4.62]	0.05*** [11.09]	0.05*** [9.53]
$\sum b_{\tau i}$	0.48** [5.04]	0.44** [5.06]	0.26* [3.14]	0.47** [5.26]	0.49** [4.52]	0.48*** [5.88]	0.15** [4.09]
<i>obs.</i>	40	38	40	40	40	40	38
$R^2_{adj.}$	0.34	0.32	0.40	0.32	0.32	0.34	0.40

a: significant at the 14 percent level.

Notes: Newey-West HAC standard errors and covariance. ***/**/* stands for significance at a 1/5/10 percent level. Absolute T-statistics are in ()-brackets below coefficients, F-statistics for the sum of lagged coefficients are in []-brackets. All regulatory indicators enter with a lag of one period ($i=0$). g_{t-i} and $1-\tau_{t-i}$ enter with lags ($i=1,4,5$) and ($i=2,4$). With the possible exception of the federal register coefficient, which turns negative for some alternative specifications, results are robust across alternative lag lengths'. Q-statistics (at lag one) do not allow rejection of the hypothesis that residuals are white noise on conventional levels. The Wald test for the hypothesis that the five regulatory variables in column (7) are jointly 0 can be rejected at the 7 percent level. See appendix and text for data descriptions. Estimation by OLS (column (1)) and IV using the lagged explanatory variables in Table 1 as instruments.