

December 5, 2001

SUBJECTIVE AND OBJECTIVE MEASURES OF THE EXTENT OF GOVERNMENTAL REGULATIONS*

Abstract

In recent years three different quantitative studies measuring the extent of regulation in OECD nations have appeared. One analysis is based on an extensive review and quantification of laws and regulations; the other two are based on opinion data of those familiar with these regulations. Despite their very different methodologies and coverage of particular types of governmental regulation, the results of the three studies are significantly correlated, even though they differ in detail. The advantages and disadvantages of each of the three approaches are discussed.

JEL Classifications: L50, P11, P14, P52 Key words: government regulation, quantitative methods

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* We wish to thank Ellen Magenheim, Zora Pryor, Stefano Scarpetta, and F. M. Scherer for helpful comments on a draft of this essay.

SUBJECTIVE AND OBJECTIVE MEASURES OF THE EXTENT OF GOVERNMENTAL REGULATION*

Product and labour market regulations are likely to affect economic performance in significant ways (see, for instance, Blanchard 2000; Krueger and Pischke 1997; and Nickell 1999). However, lack of aggregative and comparative information on regulatory settings across countries, especially concerning the product market, has hindered empirical research on the effects of regulation on employment and growth. Recently, several attempts at building summary indicators of the regulatory environment, based on both “objective” and “subjective” estimation approaches, have appeared. “Objective measures” are based on the details of governmental regulation in various areas which are assembled, quantified, and condensed. “Subjective measures” are based on surveys of business people and experts, who express their views on the extent of government regulation in various areas. This comparison of subjective and objective indicators of regulation for a common set of OECD nations in the late 1990s has three purposes: to determine their degree of correlation; to specify more clearly the advantages and disadvantages of each type of measurement; and to point toward the derivation of more accurate measures of regulation which would allow a greater understanding of their economic consequences.

A. An Overview

The objective and subjective measures of the extent of government regulation are estimated in quite different ways. It is important to review briefly their respective advantages and disadvantages.

The most obvious advantage of the objective measure is that it does not greatly rely on the personal judgements of people unduly influenced by ideology, ignorance, a narrow focus on local or national regulation, or other distorting elements, such as business cycle conditions. We would expect, therefore, that

this measure would be exogenous to economic developments occurring at the time the data are collected, a desirable feature if they are to be used in empirical analyses of the economic effect of regulation. Moreover, the data can be deemed to be “exact” to the extent that they are free of noise other than (hopefully small) measurement errors.¹ The disadvantages, however, deserve note:

* Such measures require assembling a huge data base and assistance from a great number of governments to clarify particular points. Only international organizations can carry out such a task.²

* Such measures can, perforce, only focus on national regulations. Considerable regulation in federal countries is carried out by local governments. Moreover, aggregate measures of the extent of regulation depend on the range of regulations investigated, and such coverage can never be complete.

* Such measures can not indicate how the regulations are enforced and the extent to which enforcement is influenced by particular aspects of the legal system, such as the conflicts of law between different levels of government, the efficiency of regulatory procedures, and special features such as the “adversarial legalism” found in the U.S. (Kagen, 2000). For instance, Kagen found in his interview data that although regulations may be less in the U.S. than in other countries, U.S. employers are often much more cautious about taking such particular actions because of the possibility of expensive law suits. He also found that legal costs arising from such law suits and with negotiating with regulators at various levels of

¹ Such errors can occur, for instance, if there are differences in the interpretation of questions by government officials responding to a questionnaire; or if the regulations of particular nations have different degrees of specificity; or if, for political reasons, the responses by governmental authorities are deliberately distorted.

²The problem is not so great if one country is being studied over time. Moreover, certain shortcuts, such as measuring the number of pages of regulations or the governmental costs of the regulating bureaus can be used. These measures are briefly summarized in Pryor (2002, Chapter 11).

government seem higher in the U.S. than in other nations. As a result, we would expect the subjective indicators of regulation in the U.S. to be much higher than the objective indicators.

The most obvious advantage of subjective measures is that the data base can be more easily assembled, since a variety of international surveys on business and expert perceptions of the extent of government regulation have been carried out in recent years. Furthermore, the answers reflect the manner in which the regulations are enforced, since restrictive regulations that are enforced simply and unambiguously may prove less of a burden than less restrictive regulations where the regulated companies are subject to lawsuits from all directions and at all levels of the judicial system. Furthermore, such survey data can cover regulation at all levels of government, depending on the ways in which the questions are asked.

The obvious disadvantage, of course, is that they rely on personal judgements which, as noted above, may be flawed and influenced by factors that are unrelated to the actual regulatory environment. As a result, the comparability of answers between nations is problematic, especially since many surveys ask questions about particular countries only to residents of that country.³ The variability due to unrelated factors and measurement error is likely to be larger than in objective measures, and cross-country comparisons of subjective measures should therefore account for sampling error unless very large samples of informed respondents are used.

³ If the subjective estimates also require the respondent to rank the relative restrictiveness of various regulations, then such results may not reflect absolute differences and, thus, cannot be compared across nations. Neither S-P nor S-KKZ contained such questions.

B. Estimates of Government Regulation

1. Coverage and the Data Bases

In the last few years the OECD has assembled the requisite data base for calculating meaningful objective measures (Nicoletti, Scarpetta, and Boylaud 2000) (hereafter O-NSB) and has published the results for the OECD nations in a series of papers (see OECD 2001).⁴ At the same time two sets of subjective measures for the same group of nations have also appeared, one by a World Bank team of Kaufman, Kraay, and Zoldo-Lobatón (1999-a; 1999-b; 2000) (hereafter S-KKZ) and the other by Pryor (2001) (hereafter S-P). To analyze the extent to which these estimates yield the same results about the extent of government regulation, it is important to distinguish three ways of viewing the government's role in the productive sphere, because the three studies analyzed below include a variety of government actions and regulations influencing business activities, but in differing proportions.

One viewpoint of government influence focuses on the type of regulation. Legal-framework regulations act through civil and criminal law to define and limit property rights such as zoning restrictions; to specify contractual obligations; to set quality standards for goods and services through tort law; and to establish conditions defining fraud, discrimination, and improper or incompetent behavior by market participants. Industry-specific regulations apply only to particular industries and act to set prices (e.g., for electricity) or maximum profit rates; to determine eligibility for entering a market (e.g., production or occupational licenses); to use a particular resource (e.g., public lands or frequencies in the electromagnetic

⁴The OECD International Regulation Database and its documentation can be accessed through the OECD Website at <http://www.oecd.org/>. Recent data on labour market regulations can be found in OECD (1999a, 1999b).

spectrum); to provide special subsidies or taxes for particular industries; and to define prudent practices for specific types of businesses such as banks and other financial intermediaries. Administrative regulations define the ways in which business firms interact with the government. These include reporting requirements, general licensing regulations applying to all businesses, and similar activities; and general entry and exit procedures. Finally, general economic regulations deal with the specific economic activities of the economy as a whole and act to restrict pollution; to set rules for industrial relations (e.g. hiring and firing restrictions); to promulgate health and safety standards for workplaces; to limit the content of advertising; to establish antitrust policies; to determine fair business practices; and to formulate the rules for economic transactions with the rest of the world (tariffs, quantitative restrictions, and the like). All three studies under review focus primarily on administrative and general economic regulation. Nevertheless, O-NSB and S-KKZ also take into account some industry-specific regulations including barriers to foreign ownership, while these aspects are not covered in any detail in S-P. Moreover, both S-KKZ and S-P include certain legal framework issues pertaining to the actual enforcement of regulations.⁵

A second viewpoint is the extent to which the direct and indirect governmental influences on business activity are taken into account. O-NSB and S-KKZ take explicitly into account direct government intervention into business sector activities, such as public control of business enterprises, while S-P focuses exclusively on regulations that have a more indirect influence. In addition to federal regulation, two other types of indirect governmental influences on economic activity need to be considered - the methods by

⁵The OECD International Regulation Database and the papers in OECD (2001) provide details on specific regulations in several service industries.

which regulations are enforced (including the importance of expensive lawsuits in the process), and the various regulatory measures of governments below the federal level. Both are most likely to be taken into account in the subjective measures based on the responses of business executives (S-P), less likely to be included in the evaluations of experts (which are contained in S-KKZ) and are not reflected at all in the objective measures.

A third viewpoint is the coverage of the regulations that are taken into account in the calculations. Both O-NSB and S-P cover certain labour regulations, while S-KKZ ignores the labour market altogether. S-P also covers financial and environmental regulations, which the other two studies do not.

Turning now to more specific aspect of the three studies under consideration, all focus on the 1997 - 98 period. They differ considerably in the sources of data and the way in which the data are handled. These deserve brief attention.

O-NSB is based on a data-base covering around 1000 observations on central government regulations in product and labour markets in each OECD country. Of these, around 300 observations concern economy-wide regulations and the rest are industry-specific.⁶ Only a subset of the information contained in the database (amounting to 150 observations) was actually used in constructing the indicators, reflecting the focus on economy-wide regulations directly affecting product market competition. Industry-specific information was used in computing economy-wide regulatory indicators when i) it consistently spanned a large number of industries; ii) it concerned industries that account for a large share

⁶The database also contains observations on market and industry structure. Industry-specific data have been used in a series of supplementary studies of several utilities and service industries (OECD 2001; Nicoletti, 2000), but these will not be considered in this note.

of GDP (e.g. retail distribution); or iii) it was representative of the overall regulatory stance. O-NSB quantify the various legal provisions and, using subjective weights, calculate 17 indicators for particular types of product market regulations and 18 indicators for labour market regulations related to individual hiring and dismissals. These indicators are grouped into five regulatory domains: state control, barriers to entrepreneurship, barriers to trade and investment and restrictions on permanent and temporary labour contracts.⁷ The indicators included in the state control and barriers to entrepreneurship domains are also divided into two broad alternative areas: administrative regulations and economic regulations.

S-KKZ combines questions from 13 different surveys, both of business people and of experts. They group these observations into four broad areas: rule of law, regulatory burden, government effectiveness and corruption, from which they derive summary indicators for each. Here, we will focus on the regulatory burden indicator, which has an obvious overlap with the O-NSB and S-P measures. This indicator includes data from 61 questions (many of which were very similar to each other) on various aspects of general economic regulations including such areas as trade and finance. In contrast to S-P and O-NSB, it includes few questions on environmental or labor regulations.

S-P combines questions from two surveys of business people and includes 33 questions which

⁷ State control includes the following detailed indicators: scope of public enterprise sector, size of public enterprise sector, special voting rights, control of public enterprises by legislative bodies, use of command and control regulations (especially for particular industries, and price controls (also for particular industries). Barriers to entrepreneurship include: licenses and permits system, communication and simplification of rules and procedures, administrative burden for corporations, administrative burdens for sole proprietor firms, sector specific administrative burdens, legal barriers to entry in a wide range of industries, and antitrust exemptions for state-controlled enterprises. Barriers to trade and investment include ownership barriers, discriminatory procedures, regulatory barriers, and tariffs.

were deliberately selected to cover the foreign sector, labor markets, product markets (broadly defined, since regulations referring only to specific industries are omitted), financial markets, and the environment.

We should expect a certain correlation between subjective and objective measures of regulation of the three studies. Nevertheless, given the considerable differences in coverage and sources of data, we did not expect that the final results to be as highly correlated as they were, a result that gives certain grounds of confidence in both sets of measures.

2. Aggregation Methods and Other Statistical Details

The three studies use quite different methods to combine the subindices into an overall index of government regulation. In cases where subjective weights are used, they come from the authors of the various studies. S-P uses subjective weights throughout, while both O-NSB and S-KKZ use a mix of subjective weights and statistical techniques (described below). O-NSB use these techniques mainly as a tool for reducing the dimensionality of the data, S-KKZ uses them to derive probabilistic assessments on the reliability of the cross-country comparisons.

In particular, O-NSB uses subjective weights at the lowest level of aggregation to derive their basic indicators. Thereafter, they employ a principal components analysis to derive weights for combining the various indicators into summary measures of regulation in each domain.⁸ Then, the summary indicators are combined into indicators of product and labour market regulation using the same statistical technique. By way of contrast, S-KKZ gives a weight to each question which is derived from the results of latent variable

⁸ The sub-domains identified by principal components analysis are: public ownership, government involvement in business operation, regulatory and administrative opacity, administrative burdens on startups, barriers to competition, explicit barriers to international trade and investment and other barriers to trade.

regressions. S-P gives equal weight to each indicator to derive six broad areas of regulation. These are then combined in a single index, generally giving equal weight to each (excepting financial market and environmental regulations).

Underlying the choice of aggregating technique are some properties of the data. As noted above, an important difference between subjective and objective measures of regulation is that the former are likely to be subject to more random variation than the latter, notably because survey respondents are drawn randomly (if not, other sources of spurious variability such as selection bias may affect the basic data). This is consistent with the use of different statistical techniques by O-NSB and S-KKZ. O-NSB considers the basic information on regulatory provisions as essentially non-stochastic and uses principal components analysis merely as a device to classify and summarize the data. S-KKZ considers the replies to business surveys as random variables affected by residual “specific” variability (both within and across countries) that cannot be fully accounted for by the common factors, and estimates both the summary measures and their confidence intervals.⁹ Of course, the use of purely descriptive methods for summarizing objective measures is appropriate only if measurement error is minor. Subject to this assumption and the assumption that the objective measures are complete, cross-country comparisons of objective measures are likely to be relatively more reliable, especially if confidence intervals for subjective measures are large.

Aside from the statistical properties of the resulting summary indicators, both principal and unobserved components methodologies weigh each of the subindices according to the degree to which they

⁹ On the distinction between principal and unobserved components analyses see Everitt and Dunn (1991). It should be noted that objective measures too could be considered to be random across countries to the extent that countries are drawn from a larger population of national regulatory outcomes.

help explain the joint variance of all the subindices among the nations in the sample. This implies that two different regulations, one of which creates a heavy burden on industry, the other which is relatively unimportant, may be given roughly the same weight if they are included in the same factor. It should be noted, however, that the O-NSB summary measures (for overall product and labour market regulations and for the five regulatory domains) remain essentially unchanged if aggregation is made by simple average of the subindices included in each of the regulatory domains.¹⁰ The subjective approach to the weighting of the subindices in S-P contains an arbitrary element and the confidence intervals of the resulting summary indicators are unknown.

In brief, the aggregation methods of the three studies are quite different and this, in turn, should decrease the probability that the results will be correlated.

C. Empirical Comparisons

In order to gain a more concrete idea of the problems arising in the comparisons of objective and subjective indicators, it is useful to begin by comparing regulations in specific areas because they necessarily may not be correlated. For this purpose, we start with the product market, for which all three studies provide data. Then we turn to labor market, and finally we look at the summary measures combining both measures.

1. Product Market

Table 1 about here.

¹⁰ Of course results change substantially for the indicators corresponding to the sub-domains identified by principal components analysis.

Table 1: Product Market Regulations in Some OECD Nations: Objective and Subjective Measures

Panel A: Scores and Ranks

	Total product market					
	O-NSB		S-KKZ		S-P	
	Scores	Ranks	Scores	Ranks	Scores	Ranks
Australia	0.24	3	0.30	8	0.40	12
Austria	0.49	8	0.37	10	0.39	11
Belgium	0.80	17	0.50	17	0.74	18
Canada	0.54	11	0.41	14	0.24	6
Denmark	0.50	9	0.19	7	0.38	10
Finland	0.67	14	0.08	5	0.00	1
France	0.88	18	0.60	18	0.78	19
Germany	0.52	10	0.39	11	0.31	7
Greece	0.97	20	0.74	19	1.00	21
Ireland	0.20	2	0.06	3	0.32	8
Italy	1.00	21	0.75	20	0.87	20
Japan	0.58	12	1.00	21	0.61	15
Netherlands	0.49	7	0.08	4	0.15	4
New Zealand	0.43	5	0.00	2	0.13	3
Norway	0.97	19	0.34	9	0.60	14
Portugal	0.70	15	0.39	12	0.65	17
Spain	0.64	13	0.42	15	0.58	13
Sweden	0.49	6	0.43	16	0.37	9
Switzerland	0.76	16	0.40	13	0.01	2
United Kingdom	0.00	1	0.00	1	0.16	5
United States	0.28	4	0.09	6	0.62	16

Panel B: Correlation coefficients (R)

	O-NSB	S-KKZ	S-P
O-NSB	1.00	.64*	.55*
S-KKZ		1.00	.67*
S-P			1.00

Note: For S-P, the scores for product market, foreign trade sector, and general economic-administrative regulations are combined, with each given an equal weight. For S-KKZ, the overall regulation score is presented, since no labor market indicators are included. For the regressions, an asterisk designates statistical significance at the .05 level.

The three studies have the greatest similarity in coverage of regulations for the product market and so we start at this point. The basic data are presented in Table 1. In this and the other tables, the results of the three studies are standardized so that for each study, the rating of the country with the least regulation is set at zero, the rating for the country with the most regulation is set at one, and the other scores are adjusted using a linear transformation to fit between these extremes to derive a cardinal scale. We also rank the countries to provide an ordinal scale.

The comparison of the measures of product market regulation yields statistically significant correlations (at the .05 level) between all three indicators. These bivariate correlations also persist when we control for other factors.¹¹

Some useful information is gained by examining those nations where the three estimates differ the most, using as a criterion whether the ordinal rankings differ by more than six. Comparing S-P and O-NSB studies, the former shows much greater regulation in the U.S. and Australia, and much less regulation in Finland and Switzerland. Part of these differences can be explained by the different emphasis on public

¹¹ We tried several different types of statistical experiments. In one set of regressions, we tried to account for subjective biases by taking into account the state of the business cycle in the various countries (the gap between potential and actual output), particular biases in the English speaking world (a dummy variable of 1 if the nation is English speaking), and the subjective labor market assessments. Letting Prod-S-P stand for product market evaluations of the S-P sample; Prod-O-NSB for the product market evaluations in the O-NSB sample, Lab-S-P for the labor market evaluations in the S-P sample, OG for output gap, and ES for English speaking, we calculated the following regression (standard errors are below the coefficients, an asterisk designates statistical significance at the .05 level):

$$\text{Prod-S-P} = 0.027 + 0.853* \text{Prod-O-NSB} + 0.265 \text{Lab-S-P} + 0.066* \text{OG} + 0.098 \text{ES} \quad R^2 = 0.6083$$

$$(0.132) \quad (0.204) \quad (0.173) \quad (0.032) \quad (0.124) \quad n = 21$$

We also calculated a series of regressions holding per capita income, the logarithm of the population and ratio of foreign trade to the GDP constant, but these also continued to show a statistically significant relationship between the assessments of the extent of regulation in the three studies.

ownership, which is largely ignored in the S-P measures and contributes to explain the low degree of regulation of the U.S. and the high degree of regulation of Finland in the O-NSB indicator. The relatively high regulation in the U.S. shown in the S-P index reflects the climate of adversarial legalism in that nation, which, as noted in Section A, can only be picked up in the subjective indicators.

Comparing S-KKZ and O-NSB, the former rates Japan and Sweden as much more regulation; and Finland and Norway, as much less. These differences are difficult to explain; although they may rest, in part, on the degree of informal control that is not reflected in actual laws, especially regarding Japan where the tradition of informal “ministerial guidance” is strong. The four major differences between the rankings of S-KKZ and S-P (Canada, Sweden, and Switzerland, relatively more regulation shown in S-KKZ; U.S., relatively more regulation shown in S-P) also raise unsolved puzzles and may rest, in part, on the fact that S-KKZ included ratings of “experts” and they might not have legal costs into account in assessing the restrictiveness of regulations, while S-P included only business executives who must daily face such costs.

In contrast to the labor market regulations, the correlations between the overall ratings of the degree of governmental regulation in the product market do not seem to hold true when one looks at the indices of regulation in more specific areas. The data in Appendix Table 1 show that the ratings and correlations between two of these from the O-NSB and S-P studies. For both foreign trade and administrative regulations, the correlations between the indices are much lower than for summary indicators and are not significant at conventional levels. This is hardly surprising since it is precisely in these areas where it is most difficult to measure the regulatory burden - the direct and indirect costs of administrative compliance or the existence of informal barriers to trade and capital flows, and in which the gap between formal regulation

and enforcement can be largest. The O-NSB measure of administrative regulation is also considerably more detailed than the S-P measure.

2. Labor Markets

Only S-P and O-NSB provide separate data on labor market regulation. S-P includes seven different questions in four different areas: the perceived impact of minimum wage legislation on hiring labor, the flexibility of hiring and firing practices, the flexibility of the labor market (including adjustment of working hours in cases of change in product demand) and incentives to work (including trade-offs between social protection and work incentives). O-NSB focuses only on hiring and firing practices, but at a much greater level of detail than S-P. In particular, this former study includes the procedural inconveniences of dismissal (including delays to start notice of dismissal, definition of unfair dismissal, and difficulties of dismissal for employees with 20 years of tenure), direct costs of dismissals (including severance pay), and notice and trial period before dismissal. For temporary employment O-NSB also looks at procedures (including types of work for which temporary contracts are legal and the maximum number of successive contracts) and maximum duration of contract (including maximum cumulative duration). While the measures of O-NSB and S-P of hiring and firing practices are somewhat different, the coverage is much closer than in the case of regulation of foreign trade discussed above. The relevant data are presented in Table 2.

Table 2 about here

The comparisons of labor market regulation show higher correlations than the comparisons of product market regulation. All of the bivariate correlations are significant at the .05 level. Of greatest importance, the correlation coefficient between the S-P and the O-NSB measures of regulation of hiring and firing is .76, which is particularly high. We also tested whether the correlation between these measures

Table 2: Labor Market Regulations in Some OECD Nations: Objective and Subjective Measures

Panel A: Scores and Ranks

	<u>Total labor market</u>		<u>Just hiring and firing regulations</u>			
	<u>S-P</u>		<u>S-P</u>		<u>O-NSB</u>	
	<u>Scores</u>	<u>Ranks</u>	<u>Scores</u>	<u>Ranks</u>	<u>Scores</u>	<u>Ranks</u>
Australia	0.63	13	0.55	9	0.24	6
Austria	0.68	16	0.75	16	0.61	12
Belgium	0.91	19	0.81	17	0.53	9
Canada	0.28	6	0.28	6	0.12	3
Denmark	0.39	8	0.00	1	0.36	8
Finland	0.61	12	0.58	10	0.53	10
France	1.00	21	0.94	18	0.81	17
Germany	0.92	20	0.98	20	0.72	15
Greece	0.56	10	0.74	15	0.94	20
Ireland	0.36	7	0.46	8	0.22	4
Italy	0.86	17	1.00	21	0.87	19
Japan	0.25	5	0.43	7	0.69	14
Netherlands	0.68	15	0.61	11	0.61	11
New Zealand	0.12	3	0.17	4	0.23	5
Norway	0.65	14	0.72	14	0.76	16
Portugal	0.51	9	0.70	13	1.00	21
Spain	0.56	11	0.69	12	0.85	18
Sweden	0.90	18	0.96	19	0.63	13
Switzerland	0.00	1	0.01	2	0.30	7
United Kingdom	0.12	4	0.14	3	0.08	2
United States	0.11	2	0.19	5	0.00	1

Panel B: Correlation coefficients (R)

	S-P overall	S-P: hiring and firing	O-NSB: hiring and firing
S-P: overall	1.00	.91*	.64*
S-P: hiring and firing		1.00	.76*
O-NSB: hiring and firing			1.00

Note: For the correlation coefficients, an asterisk designates statistical significance at the .05 level.

of labor market regulation would hold if other variables were added to the equation. Similar to our experiments with the measures of product market, the relationship between the two ratings of hiring and firing practices continues to hold when we try to control for some of the factors unrelated to labour market regulation that may account for spurious cross-country variability in the S-P indicator.¹²

Looking at the ranking of nations and isolating those in which the rank differs by more than six in the two studies, we see that S-P finds much greater regulation of hiring and firing practices in Belgium and much less regulation in Denmark, Japan, and Portugal. These differences might be partly due to differences in coverage arising from the fact that the O-NSB study posed quite specific questions, while the S-P index focused on hiring and firing regulations in general and the answers may have been influenced by other types of labor market regulation (given the high correlation between hiring and firing regulations and overall labor market regulations). For instance, Belgium has relatively high minimum wage and unemployment benefits, compared to the rest of the OECD, while Japan has much lower; and these may influence the subjective ratings of hiring and firing regulations in general. Other differences may arise from differences in enforcement.¹³ For these labor market regulations, the legal climate in the U.S. does not seem

¹² Let S-P:H-F stand for the S-P index for regulation of hiring and firing; O-NSB:H-F, for O-NSB variable for regulation of hiring and firing; Prod-S-O for the S-O rating of product market regulation; OG, for output gap; and ES for English speaking. Following the same procedures as those outlined in the previous footnote, we derived the following relationships:

$$S-P:H-F = 0.075 + 0.782* O-NSB:H+F + 0.127 Prod-S-O - 0.002 OG + 0.044 ES \quad R^2 = .5874$$

(0.178) (0.330) (0.240) (0.035) (0.187) n = 21

We also calculated a series of regressions holding per capita income, the logarithm of the population and ratio of foreign trade to the GDP constant, but these also continued to show a statistically significant relationship between the assessments of the extent of regulation in hiring and firing.

¹³ Neither of the two studies includes a measure of the tightness in granting employment permits to foreign workers. If these were included, Switzerland would reveal a higher degree of labour market regulation.

to have made as much difference as in the product market.

3. Overall Ratings

As noted above, while all three measures deal with product market regulations, only S-P and O-NSB cover the labour markets, and only S-P covers other areas, such as finance or environment. Nevertheless, it is instructive to compare the rankings of these overall measures because they may summarize in different ways the policy approaches followed by OECD countries. Such data are presented in Table 3.

Table 3 about here

Panel B shows that the bivariate correlations between the broad measures of regulation are very strong and statistically significant, being highest for the O-NSB and S-P combined measures of product and labour market regulation. Both the objective and subjective measures seem to reflect the same reality. Surprisingly, all of the correlation coefficients (excepting the S-P: P+L and S-P: Total) are roughly the same - the two subjective rankings are not much more closely related than they are with objective ranking.

The comparisons of the largest differences in the ranking reveal that the two subjective measures do not deviate systematically from the objective measure in the same way. Turning first to the labor and product markets, the S-P: P+L and O-NSB: P+L rankings are quite similar and differ by more than six ranks only for Belgium and the United States, both of which show much greater regulation in the S-P estimates. The latter undoubtedly reflects the adversarial legalism that is found in the United States. S-KKZ shows much greater regulation than O-NSB: P+L for Belgium, Canada, and Japan; and much less regulation for Netherlands and Portugal. Undoubtedly differences in coverage of the two indices account for some of these divergencies. Finally, when looking at the two subjective ratings, S-KZZ shows much

Table 3: Overall Business Regulations in Some OECD Nations: Objective and Subjective Measures
Panel A: Scores and Ranks

	<u>Product market</u>		<u>Product and labor markets</u>				<u>All major areas</u>	
	<u>S-KKZ</u>		<u>O-NSB</u>		<u>S-P</u>		<u>S-P</u>	
	<u>Scores</u>	<u>Ranks</u>	<u>Scores</u>	<u>Ranks</u>	<u>Scores</u>	<u>Ranks</u>	<u>Scores</u>	<u>Ranks</u>
Australia	0.30	8	0.24	6	0.57	11	0.60	11
Austria	0.37	10	0.61	12	0.60	12	0.61	12
Belgium	0.50	17	0.53	9	0.93	19	0.98	20
Canada	0.41	14	0.12	3	0.29	4	0.33	5
Denmark	0.19	7	0.36	8	0.44	7	0.45	7
Finland	0.08	5	0.53	10	0.31	5	0.27	4
France	0.60	18	0.81	17	1.00	21	1.00	21
Germany	0.39	11	0.72	15	0.66	14	0.70	15
Greece	0.74	19	0.94	20	0.91	18	0.97	19
Ireland	0.06	3	0.22	4	0.38	6	0.36	6
Italy	0.75	20	0.87	19	0.98	20	0.97	18
Japan	1.00	21	0.69	14	0.50	10	0.48	9
Netherlands	0.08	4	0.61	11	0.44	9	0.46	8
New Zealand	0.00	2	0.23	5	0.14	2	0.16	2
Norway	0.34	9	0.76	16	0.71	17	0.73	17
Portugal	0.39	12	1.00	21	0.67	15	0.63	13
Spain	0.42	15	0.85	18	0.65	13	0.66	14
Sweden	0.43	16	0.63	13	0.69	16	0.72	16
Switzerland	0.40	13	0.30	7	0.00	1	0.00	1
United Kingdom	0.00	1	0.08	2	0.15	3	0.23	3
United States	0.09	6	0.00	1	0.44	8	0.51	10

Panel B: Correlation coefficients (R)

	<u>S-KKZ</u>	<u>O-NSB:P+L</u>	<u>S-P:P+L</u>	<u>S-P:Total</u>
S-KKZ	1.00	0.62*	0.61*	0.59*
O-NSB: P+L		1.00	0.72*	0.68*
S-P: P+L			1.00	0.99*
S-P: Total				1.00

Note: P+L = product and labour markets. The S-P calculations for all areas include, in addition to labor and product (foreign trade, general economic/administrative, and direct product markets), financial markets, and environmental regulation. For both the S-P and O-NSB indices for product and labor markets, the separate indices are combined according to the weighting methods employed in each study. In panel B, the asterisks designate statistical significance at the .05 level.

greater regulation in Canada, Japan, and Switzerland and much less regulation in Norway than the S-P:P+L estimates. Again, part of these differences appear to be explained by differences in coverage. Interestingly, Japan and Switzerland appear to be particularly difficult countries to evaluate, since their rankings differ considerably across not only objective and subjective measures but also across the latter. For Japan, part of the problem may lie in the differences between formal regulation and informal powers exercised by various parts of the government over economic activity; for Switzerland, differences in taking account of regulation by governments below the federal level may play a role.

To provide an idea of the cross-country patterns of regulation identified by the joint consideration of the three overall measures of regulation (S-KKZ, O-NSB:P+L and S-P: Total), we employed a hierarchical cluster analysis using Ward's methodology to group countries according to the similarity of objective and subjective assessments.¹⁴ Two large groups of countries emerge quite clearly: a relatively "liberal" group including all English-speaking countries, as well as Denmark, Finland, the Netherlands and Switzerland; and a relatively "regulated" group including most other continental European countries and Japan. Using a less restrictive distance criterion one can further isolate a group of "ultra-liberal" countries (the US, the UK, New Zealand and Ireland) and a group of "ultra-regulated" countries (France, Italy and Greece). These results are not surprising and accord with our a priori expectations.

D. A Brief Conclusion

This study looks at three quite different measures of the extent of regulation. O-NSB draws upon the largest data base of regulations; S-P, the smallest (but many of the questions used in the surveys from

¹⁴ For details on this clustering methodology, see Everitt (1993), pp. 55- 90. The full results are available from the authors upon request.

which the results are drawn cover several related regulations). Coverage is also different, with S-P including the broadest number of areas; although the exact coverage of S-KKZ is difficult to summarize, it does not include the labor market while O-NSB and S-P do. The aggregation approaches are different - use of statistical techniques by O-NSB and S-KKZ may allow a better picture of cross-country differences in the general thrust of regulation, while use of a more standard index technique in S-P may allow a better picture of the burden of regulation on private firms in individual areas to be seen.

Despite these differences, overall perceptions of government regulations by business leaders and experts and the objective assessment of formal regulations appear to be relatively well aligned in the areas of labour and product markets. No systematic differences appear among the three indices.

These results suggest that all three studies, even though they draw upon quite different data and handle the data using very different statistical techniques, point to the same economic reality, even though they differ in detail. This is our key conclusion from this comparative exercise. Such a result is important because it delineates fundamentally different roles of government and, in essence, different types of capitalist economic systems. Although such differences have been apparent on an intuitive level for many decades, the three studies under examination reveal the phenomenon in a quantitative fashion and show that the same reality can be revealed using quite different methods.

A important challenge for future research is to find ways to assess to what extent the cross-country differences in regulatory approaches suggested by the three measures capture differences in policies and their enforcement that are relevant for economic outcomes. Such an exercise raises more technical issues

in measuring regulation that would take us too far from the main theme of this essay.¹⁵

¹⁵ For instance, regulations that do not vary across countries cannot possibly explain differences in cross-country performance. Thus more weight should be given to subindices that vary the most across countries, and this, in turn, calls for aggregation methods that maximize the variance of the indicators.

Appendix Table 1: Two Subindices of Product Market Regulations in Some OECD Nations:
Objective and Subjective Measures

Panel A: Scores and Ranks

	<u>Only foreign trade</u>				<u>Only general administrative regulations</u>			
	<u>O-NSB</u>		<u>S-P</u>		<u>O-NSB</u>		<u>S-P</u>	
	Scores	Ranks	Scores	Ranks	Scores	Ranks	Scores	Ranks
Australia	0.00	2	0.57	13	0.24	3	0.52	9
Austria	0.06	5	0.20	3	0.44	11	0.68	16
Belgium	0.12	9	0.66	16	0.96	20	0.81	18
Canada	1.00	20	0.53	12	0.15	2	0.45	7
Denmark	0.06	6	0.13	2	0.25	4	0.67	15
Finland	0.12	10	0.49	11	0.65	14	0.00	1
France	0.35	16	0.86	18	1.00	21	1.00	21
Germany	0.06	7	0.26	4	0.83	17	0.58	12
Greece	0.52	19	0.64	14	0.56	12	0.99	20
Ireland	0.00	2	0.33	9	0.37	7	0.37	6
Italy	0.03	4	0.66	15	0.96	19	0.93	19
Japan	0.35	15	1.00	21	0.84	18	0.61	13
Netherlands	0.06	8	0.00	1	0.38	9	0.32	4
New Zealand	0.30	14	0.27	5	0.38	8	0.33	5
Norway	1.00	21	0.69	17	0.37	6	0.64	14
Portugal	0.37	17	0.37	10	0.40	10	0.76	17
Spain	0.15	11	0.89	20	0.67	15	0.54	10
Sweden	0.24	12	0.27	6	0.58	13	0.56	11
Switzerland	0.52	18	0.28	7	0.81	16	0.19	2
United Kingdom	0.00	2	0.30	8	0.00	1	0.22	3
United States	0.26	13	0.89	19	0.29	5	0.49	8

B. Correlations (R)

	O-NSB	S-P	O-NSB	S-P
O-NSB	1.00	.28	1.00	.40
S-P		1.00		1.00

Note: For S-P, the index is labeled “general economic regulations,” but the coverage is roughly the same as the “administrative regulations” of the O-NSB index. An asterisk designates statistical significance at the .05 level.

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