WPS3623

THE IMPACT OF REGULATION ON GROWTH AND INFORMALITY

CROSS-COUNTRY EVIDENCE *

Norman V. Loayza
The World Bank

Ana María Oviedo
University of Maryland

Luis Servén
The World Bank

* This research has been supported by the World Bank's Latin America Regional Studies Program. We are very grateful to Basudeb Guha-Khasnobis, Patricia Macchi, Janis Vehmaan-Kreula, and participants in the EGDI-WIDER Conference on the Informal Sector (Helsinki, 2004) for useful comments.

THE IMPACT OF REGULATION ON GROWTH AND INFORMALITY: CROSS-COUNTRY EVIDENCE

May 2005

Abstract

This paper studies the effects of regulation on economic growth and the relative size of the informal sector in a large sample of industrial and developing countries. Along with firm dynamics, informality is an important channel through which regulation affects macroeconomic performance and economic growth in particular. The paper concludes that a heavier regulatory burden --particularly in product and labor markets-- reduces growth and induces informality. These effects are, however, mitigated as the overall institutional framework improves.

***JEL** classification:* K20, K30, H11, O40, O17.
Keywords: Regulation, government performance, economic growth, informal economy.

Norman V. Loayza
The World Bank
nloayza@worldbank.org

Ana María Oviedo
University of Maryland
Oviedo@econ.umd.edu

Luis Servén
The World Bank
lserven@worldbank.org

I. Introduction

The enactment of regulation follows a process where valid social goals are combined with the objectives of particular interest groups (see Djankov, La Porta, López-de-Silanes, and Shleifer 2002). Whatever their justifications and objectives, regulations are bound to have an impact beyond their area of control and exert an effect on the overall economy. This effect has two basic channels: the dynamics of firm restructuring and the formation and evolution of the informal sector. Using a large sample of industrial and developing countries, this paper examines empirically the overall effect of business regulation on economic growth and on the relative size of the informal sector, thus starting an exploration of the informal-sector channel of regulation.[1]

The key to a healthy economy is the flexibility to manage negative shocks and take advantage of growth opportunities. Intentionally or not, regulation can impose rigidities and distort the incentives for factor reallocation, capital accumulation, competition, and innovation. For those firms that abide by the regulatory environment, this distorts the normal process of firm creation, growth, and disappearance –the Schumpeterian process of "creative destruction." Through this firm-dynamics channel, regulation can have a macroeconomic impact by both worsening recessionary periods and reducing trend growth. This is not, however, the whole impact of regulation. In the absence of perfect monitoring and compliance, some firms will find it optimal –or simply necessary—to evade regulations and work outside the strict legal regime. Avoidance of regulations, however, does not mean that they cease to have an effect.

The informal sector –the result of the loose aggregation of firms and activities outside the regulatory framework—is the second-best response of an economy facing shocks and trying to grow.[2] The response is second-best because it entails losing, at least partially, the advantages of legality, such as police and judicial protection, access to formal credit institutions, and participation in international markets. Moreover, trying to escape the control of the state forces many informal firms to remain sub-optimally small, use

[1] We explore the firm-dynamics channel in a related paper (Loayza, Oviedo and Servén, 2005b).

[2] For an excellent review of the causes and consequences of the informal sector, see Schneider and Enste (2000). Drawing from a public-choice approach, Gerxhani (2004) provides an interesting discussion of the differences of the informal sector in developed and developing countries. The classic study of informality is, of course, De Soto (1989).

irregular procurement and distribution channels, and constantly divert resources to mask their activities or simply bribe officials. Therefore, as compared with a first-best response, the expansion of the informal sector often represents distorted and insufficient economic growth.[3] In addition, the informal sector can generate a negative externality that compounds its adverse effect on growth: by avoiding taxes, informal activities use and congest public infrastructure without helping to replenish it. If public infrastructure complements private capital in the process of economic growth, a larger informal sector will imply smaller growth.[4] The simple cross-country comparison presented in Figure 1 suggests that countries where the relative size of the informal sector is larger tend to grow at a slower pace.

In assessing the impact of regulation, it is essential to consider that this impact is likely to depend not only on the quantity of regulation, but also on its quality. There are good reasons for this. On analytical grounds, certain types of regulation – such as those designed to enhance competition in goods or financial markets – should be expected to exert beneficial effects on economic performance, rather than adverse ones. More generally, countries with better institutions tend to create regulatory environments genuinely aimed to improve business conditions rather than privilege a few interest groups.[5] They are also more likely to enforce regulation in a transparent and even-handed manner, limiting the regulator's margin for arbitrariness and corruption that can place many firms at a disadvantage. All these arguments suggest that the quality of regulation is likely to be closely related to overall governance quality, and thus in our experiments we use standard governance indicators to capture and examine the importance of regulatory quality.

The rest of the paper is organized as follows. Section II describes the synthetic regulation indicators and presents some stylized facts concerning the patterns of regulation

---

[3] This does not necessarily mean that informal sector firms are not dynamic or lagging behind their formal counterparts (see Maloney 2004 for evidence on the dynamism of Latin American informal firms). In fact, in equilibrium the risk-adjusted returns in both sectors should be similar. The stagnation arguments presented in the text are relative to the first-best response and not with respect to a sclerotic economy unable to circumvent its regulation-induced rigidities.

[4] See Loayza (1996) for an endogenous-growth model highlighting the negative effect of informality through the congestion of public services.

[5] This is the argument in Claessens and Klapper (2002).

across countries. Section III reports estimates of the impact of regulation on economic growth and the size of the informal sector. Section IV offers some concluding remarks.

II. Measuring Business Regulation

In this section, we briefly describe our measures of regulation and their sources. We also discuss differences in regulation intensity across countries for different levels of economic development.

We construct indices to measure business regulation in the following seven areas: firm entry, labor markets, fiscal burden**,** trade barriers, financial markets, contract enforcement, and bankruptcy regulation. Each index is obtained as an average of related components, normalized to vary within a unit interval with higher values representing heavier regulatory burden.[6] The components used to construct the seven synthetic indices are obtained from the following data sources: Doing Business (The World Bank Group), Index of Economic Freedom (The Heritage Foundation), Economic Freedom of the World (The Fraser Institute), Labor Market Indicators Database (M. Rama and R. Artecona, 2000), The Corporate Tax Rates Survey (KPMG), and International Country Risk Guide (The PRS Group). These sources cover the largest number of countries and areas under regulation, and their measures use a clear methodology and are straightforward. Except for the Labor Market Indicators Database, all sources are public. Our sample covers 75 countries.

In most cases, data are based on surveys conducted in a single year (in the late 1990s) in a large group of countries; for components with observations for more than one year, we use average values over the period. Therefore, our indices should be interpreted as average regulation levels in the late 1990s. We should note, however, that regulation tends to stay constant over long periods of time.

Table 1 shows simple correlations between the seven regulation indices. The strongly positive correlations among all but the fiscal burden and labor indices suggest that regulation policy comes in "packages." Judging from these correlations, we can distinguish three regulation categories: fiscal, labor, and product-market regulations, where

[6] We refer the interested reader to Loayza, Oviedo and Servén (2005a) for details on the construction and components the business regulation indices.

the latter is a composite of the entry, trade, financial markets, bankruptcy, and contract enforcement indices. We obtain the *product-market* index by averaging the scores of the five components.[7] We also compute an *overall regulation* index by averaging the scores of all seven components. We choose to give equal weights to all components despite the strong correlation among the first five because we don't have any priors about the importance of labor market or fiscal regulation relative to the others.

Figure 2 depicts scatter plots of the overall, product-market, labor, and fiscal regulation indices against the (the log of) GDP per capita of all countries in the sample. The product-market regulation index is strongly negatively related to average income, and so is the overall regulation index, reflecting the fact that it loads heavily on product-market regulations. Labor regulation also has a negative correlation with average income, but it is smaller and not statistically significant. The relationship between fiscal regulation and income is strong but of the opposite sign as those of the other types of regulation: richer countries tend to have heavier fiscal regulation.

Finally, we use a governance index in order to assess the quality of regulation itself and the general context that determines how regulation functions. We construct this index using three measures from the International Country Risk Guide: absence of corruption in the political system, prevalence of law and order, and level of democratic accountability. The last panel of Figure 2 shows the close connection between our governance index and per capita GDP.

III. Regulation, Economic Growth, and Informality

Having described how the regulatory environment varies across countries, our objective for this section is examining whether regulations have an impact on economic growth and the size of the informal sector. Establishing the connection between regulation and informality is a first step in understanding how regulation affects economic growth. In assessing the effect of the regulatory environment, it is important to consider that the quality of regulation is profoundly affected by the institutional context in which it is imposed. Thus, regulation's ultimate impact is likely to be affected by the country's level

[7] The term "product-market regulations" is taken from Nicoletti et al. (2000).

of institutional development. In order to explore the interaction between institutional progress and regulatory environment, we extend the basic empirical analysis by allowing the effects of regulation to vary with the measure of governance described above.

Sample and specification

Our empirical methodology is based on cross-country regression analysis. We conduct separate regressions for each dependent variable of interest, namely, economic growth and the size of the informal sector. In each case, we use as explanatory variables a measure of regulation and a set of basic control variables. Table 2 presents descriptive statistics of all variables used in the paper.

The sample consists of 72 - 75 countries, depending on the regression exercise. In the largest sample, we have 22 developed and 53 developing countries, of which 21 belong to Latin America, 22 to Africa and the Middle East, and 10 to Asia. Country observations for each variable correspond to averages for the 1990s. We are constrained to this decade because internationally comparable regulation measures are available only for this period.

The dependent variables are defined as follows. Regarding economic growth, its measure is standard in the literature and is given by the average annual growth rate of real GDP per capita. For our second dependent variable --the size of the informal sector-- there is no standard measure. To the contrary, there is much dispute as to what exactly the informal sector is, and this controversy naturally extends to all attempts to measure it (see Schneider and Enste, 2000). The definition we use in this paper identifies informality with regulation evasion. This definition is not only the most relevant given the focus of this paper, but it has also become the most popular since the seminal work by De Soto (1989). The informal sector thus defined is a shadow economy whose size is best represented as a latent variable. This is the approach taken by Schneider (2004) to provide estimates of the size of the informal sector --as production in percentage of GDP-- for 145 countries for the period 2000-2003.[8]

Schneider's study combines the DYMIMIC (dynamic multiple-indicators-multiple-causes) with currency-demand-based approaches to the estimation of the informal sector as a latent variable. More precisely, the informal sector comprises (non-criminal) economic activities that go undeclared specifically in order to avoid compliance with costly

[8] Loayza (1996) uses a similar approach for his estimates of the informal sector in Latin American countries.

regulation (in particular employment protection laws), tax payments, and social security contributions. It, therefore, excludes criminal activities and home-based production. We use Schneider's estimates because, first, they are the most comprehensive estimates obtained using a unified method, and, second, they are used by a number of other studies. However, as with the measurement of any other latent variable, these estimates of the size of the informal sector should be considered with caution. They are likely to pick up a large amount of measurement error; and in the particular case of the DYMIMIC procedure, the estimates depend largely on the theoretical relation between the variable of interest and the indicators, which may be subject to debate. Although highly important and interesting, a detailed discussion of the estimation of the informal sector is beyond the scope of this paper.

As described in the previous section, our explanatory variables of interest in the growth and informality regressions are indices that quantify a country's regulatory burden. We consider, in turn, the overall regulation index and its three main components-- the product-market, labor, and fiscal regulation indices. In extensions to the basic specification, we interact the regulation index with a governance proxy, which as already noted is constructed from information on experts' perceptions on public accountability, absence of corruption, and rule of law, as reported by the International Country Risk Guide.

The set of control variables for the growth regressions consists of the initial level of per capita real GDP (to account for convergence effects), the initial rate of secondary enrollment (as proxy for human capital investment), the initial ratio of private domestic credit to GDP (to account for financial depth), and a Sub-Saharan dummy variable (to control for the particular conditions of civil conflict, mismanagement, and disease affecting this region).[9] For the regressions of the size of the informal sector, the control set is quite parsimonious consisting only of initial real GDP per capita. Despite its parsimony, this variable summarizes most elements of economic development and is crucially important as a control given its strong relationship with both informality and regulation (see, as illustration, the corresponding bivariate correlations in Table 2).

[9] The "Africa dummy" has a long tradition in empirical growth studies; see for example Easterly and Levine (1997).

Results and discussion

We start with a visual exercise. Figures 3 and 4 show scatter plots that represent the simple relationship between the regulation indices and, respectively, economic growth and the size of the informal sector. The graphs using overall regulation consistently suggest that more heavily regulated economies tend to grow less and be more informal. Observations reflecting poor economic growth, large informality, and high overall regulatory burden belong mostly to developing countries, while developed economies tend to occupy the other end of the distribution. These links with overall regulation seem to be driven by product market regulation and, to a lesser extent, labor regulation. Conversely, the connection with fiscal regulation appears to go in the opposite direction, so that economies with larger fiscal regulation show somewhat better economic growth and smaller informal sector. We shall see if the opposite behavior of fiscal regulation survives the scrutiny of regression analysis.

A more formal evaluation of the link between the regulation indices, growth, and informality requires multiple regression analysis, to which we turn now. The regression results are organized as follows. We first present the results on economic growth and then those on the relative size of the informal sector as dependent variables. For each of them we start with a basic specification where the effect of regulation is unrelated to governance. Then, we allow for the effects of regulation to vary with the quality of governance.

Table 3.A presents the basic specification results on economic growth. The overall index of regulation has a negative and significant association with economic growth, and so do the product market and labor regulation indices, while the index of fiscal regulation has no significant relation.

Table 3.B presents the estimation results when we allow for the effect of regulation on growth to vary with the quality of governance. The overall, product market, and labor regulation indices all carry significantly negative signs and their interaction terms with governance show a positive and significant coefficient. Thus, the negative association of these regulation indices with economic growth appears to be mitigated when the quality of governance rises. As to fiscal regulation, neither its direct coefficient nor the coefficient on the interaction term is statistically significant in the growth regression.

How large or economically important are the growth effects of regulation? Using the point estimates of the regression that accounts for governance interactions, we can perform some illustrative exercises. If a country's index of labor regulation were increased by one standard deviation in the cross-country sample (0.16) and its level of governance is equal to the world median (0.46), then its annual rate of per capita GDP growth would decrease by 0.3 percentage points. More remarkably, if a typical developing country were to decrease its product-market regulation to the median level of industrial countries (that is, from 0.51 to 0.17) while maintaining its level of governance (equal to the median of developing countries, 0.37), then its annual growth rate would rise by about 1.7 percentage points.

The point estimates of the coefficients are such that if the quality of governance is sufficiently high, the negative growth effect of an increase in regulation can be nearly cancelled. For product-market regulations this threshold level is quite high and could only be approximated by countries like Switzerland, Sweden, or Canada. For labor market regulations, the threshold is somewhat smaller and comparable to that of Ireland or Portugal.

We now turn to the regressions where the dependent variable is the relative size of the informal sector (in terms of informal production as percentage of GDP). Table 4.A presents the basic specification results. The product-market and labor regulation indices carry positive and significant coefficients, suggesting that these types of regulation lead to more extensive informality. The coefficient on overall regulation is also positive but fails to be statistically significant. This weakened effect is apparently due to the inclusion of fiscal regulation in the overall index; indeed, fiscal regulation by itself carries a significantly negative coefficient. This last result may seem rather puzzling, and we return to it below. Regarding the control variable, as expected, the level of income per capita carries a significantly negative coefficient. This indicates that, other things equal, informality is more prevalent in poorer countries.

Table 4.B presents the results of the informality regressions when we include the interaction between regulation and governance as an additional explanatory variable. The coefficients on overall, product-market, and labor regulation indices are positive and statistically significant. Their corresponding interaction terms with the governance index

carry a statistically negative coefficient. Taken together, these results have a similar interpretation as those related to the growth regression: For low levels of governance (implying poor regulatory quality), an increase in product-market or labor regulation leads to an expansion of the informal sector. As governance improves, the amplifying effect of these types of regulation on informality diminishes until it disappears. This happens at moderately high levels of governance, the threshold value corresponding roughly to those of Greece, Spain, and Japan. Regarding fiscal regulation, its direct coefficient is positive, changing signs with respect to that in the basic specification; it, however, fails to be statistically significant, and now it's the interaction term with governance which carries a significantly negative coefficient. This indicates that for low levels of governance (up to those roughly corresponding to Colombia and Pakistan), the impact of fiscal regulation on the size of the informal sector is zero; but as governance improves, higher fiscal regulation actually leads to a reduction in informality. We can understand the puzzling negative relationship between fiscal regulation and informality by considering that the increase in fiscal burden not only makes evasion more attractive (which implies a positive relationship) but can also generate better public services and more resources for enforcing tax compliance (both of which make formality attractive). When governance is sufficiently good, the formality-inducing effect of fiscal regulation prevails.

As in the case of growth, we can use the estimated coefficients to ascertain how economically important the informality effects of regulation are. Using the point estimates of the regression that accounts for governance interactions, let's consider the changes in the size of the informal sector brought about by changes in labor and product-market regulations. If a country's index of labor regulation were increased by one standard deviation in the cross-country sample and its level of governance is equal to the world median, then the size of the informal sector relative to GDP would increase by nearly 3 percentage points. If a typical developing country decreased its product-market regulation to the median of industrial countries while keeping its level of governance, then its informal sector would decrease by close to 7 percentage points of GDP.

IV. Concluding Remarks

Regulation is becoming a core policy factor to explain the bottlenecks to economic growth in many countries around the world. Using a large sample of industrial and developing countries, this paper provides an evaluation of the impact of business regulation on economic growth and informality.

Our regression analysis suggests that high levels of regulation are associated with lower growth. This is clearly the case for product and labor market regulation. However, the quality of regulation – as captured by the overall institutional framework – makes a big difference: in most instances we find that better institutions help mitigate, and even eliminate, the adverse impact of regulation on economic growth.

The literature indicates two main channels through which regulation can have a negative impact on economic growth. The first –and most popular—is the distortionary effect of regulation on the Schumpeterian process of firm dynamics. The second –to which we devote our attention in this paper—is the incentive that regulation may create for firms to work outside the legal framework. We start an exploration of the informality channel by assessing the effect of regulation on the size of the informal sector relative to GDP. We find that an increase in either product-market or labor regulation leads to an expansion of informality. As in the case of growth, this pernicious effect is gradually mitigated as governance --and thus regulatory quality-- improves. Fiscal regulation has a different effect on informality (which may explain why we do not find a clearly negative impact of fiscal regulation on economic growth): when governance is not too low, an increase in fiscal regulation brings about a decrease in informality. This can be explained by considering that an increase in fiscal regulation not only makes evasion more attractive but can also generate better public services and more resources for enforcing tax compliance. Theoretically, analogous positive effects could also apply to other product-market and labor regulation, but they are not discernible in the cross-country sample we study.

Does the negative growth effect of regulations imply that they should be eliminated altogether? This paper does not intend to assess the impact of regulation on social goals that could be beyond the strict sphere of economic growth – broad goals such as social equity and peace, or narrow ones such as worker safety, environmental conservation, and

civil security, which typically motivate specific regulations. Thus, our conclusions on the role of regulation must necessarily be evaluated in a more comprehensive context before drawing definitive social welfare implications. At any rate, to the extent that economic growth is quite an important goal, our findings imply that streamlining regulation and strengthening governance in highly regulated countries could have a significant payoff.

References

[1] Claessens, Stijn and Leora Klapper, "Bankruptcy Around the World: Explanations of its Relative Use," World Bank Working Paper No. 2865, The World Bank, Washington DC (2002).

[2] De Soto, Hernando, *The Other Path: The Invisible Revolution in the Third World*, (HarperCollins, 1989).

[3] Doing Business, The World Bank, Washington DC. http://rru.worldbank.org/doingbusiness

[4] Easterly, William and Ross Levine, "Africa's Growth Tragedy," *Quarterly Journal of Economics*, 112 (1997) 1203-1250.

[5] Gerxhani, Klarita, "The Informal Sector in Developed and Less Developed Countries: A Literature Survey," *Public Choice*, 120, 267-300 (2004).

[6] Gwartney, James and Robert Lawson, "Economic Freedom of the World - 2002 Annual Report," The Fraser Institute (2002).

[7] International Country Risk Guide – *ICRG, Brief guide to the rating system*, ICRG (1999) http://www.icrgonline.com

[8] KPMG, Corporate Tax Rate Survey, March 1998 – January 2003.

[9] Loayza, Norman, "The Economics of the Informal Sector: A Simple Model and Some Empirical Evidence from Latin America," *Carnegie-Rochester Conference Series on Public Policy*, 45, 129-62 (1996).

[10] Loayza, Norman, Ana María Oviedo, and Luis Servén, "Regulation and Macroeconomic Performance," World Bank Policy Research Working Paper No. 3469 (2005a).

[11] Loayza, Norman, Ana María Oviedo, and Luis Servén, "Regulation and Firm Dynamics," mimeo, The World Bank (2005b).

[12] Maloney, William, "Informality Revisited," *World Development*, 32(7), 1159-78 (2004).

[13] Nicoletti, Guiseppe, Stefano Scarpetta and Olivier Boylaud, "Summary Indicators of Product Market Regulation With an Extension to Employment Protection Legislation," Economics Department Working Paper No. 226, Organisation for Economic Co-operation and Development (2000).

[14] O'Driscoll, Gerald, Edwin Feulner and Mary O'Grady, 2003 Index of Economic Freedom, The Heritage Foundation and The Wall Street Journal (2003).

[15] Rama, Martin and Raquel Artecona, "A Database of Labor Market Indicators Across Countries", unpublished, The World Bank, Washington DC (2002).

[16] Schneider, Friedrich, "The Size of the Shadow Economies of 145 Countries all over the World: First Results over the Period 1999 to 2003," IZA DP No. 1431 (2004).

[17] Schneider, Friedrich and Dominik H. Enste, "Shadow Economies: Size, Causes, and Consequences," *Journal of Economic Literature*, 38, 77-114 (2000).

Tables and Graphs

Table 1: Correlation Coefficients Between Regulation Indices

	Entry	Financial Markets	Contract Enforcement	Trade	Bankruptcy	Labor	Fiscal	Governance
Entry	1							
Financial Markets	0.66***	1						
Contract Enforcement	0.66***	0.58***	1					
Trade	0.63***	0.73***	0.62***	1				
Bankruptcy	0.52***	0.44***	0.53***	0.51***	1			
Labor	0.39***	0.1	0.44***	0.05	0.14	1		
Fiscal	-0.50***	-0.27**	-0.57***	-0.33***	-0.38***	-0.16	1	
Governance	-0.70***	-0.64***	-0.79***	-0.79***	-0.57***	-0.14	0.51***	1

	Product Market	Labor	Fiscal	Overall	Governance
Product Market	1				
Labor	0.26**	1			
Fiscal	-0.49***	-0.16	1		
Overall	0.97***	0.42***	-0.31***	1	
Governance	-0.86***	-0.18	0.52**	-0.80***	1

*Notes: *,**, and *** denote significance at the 10%, 5%, and 1% level, respectively.*
Source: Authors' estimation

Table 2: Descriptive Statistics

Years: 1990-2003, 72-75 countries

(a) Univariate statistics

Variable	Mean	Median	Standard Dev.	Minimum	Maximum
Growth rate of GDP per capita (%)	1.53	1.78	1.67	-2.71	6.22
Informal sector output (% of GDP)	33.64	34.55	14.69	8.60	67.83
Log of GDP per capita in logs in 1990	7.83	7.60	1.61	4.98	10.74
Log of secondary enrollment rate in 1990	3.86	3.97	0.69	1.89	4.78
Log of private domestic credit / GDP in 1990	3.42	3.35	0.93	0.68	5.29
Overall regulation index	0.44	0.46	0.12	0.16	0.69
Product market regulation index	0.42	0.45	0.18	0.08	0.77
Fiscal regulation index	0.53	0.52	0.19	0.10	0.92
Labor regulation index	0.47	0.48	0.16	0.13	0.78
Governance index	0.52	0.46	0.26	0.05	1.00

(b) Correlation coefficients between dependent variables, control variables, and regulation indices

	Growth rate of GDP per capita	Informal sector output (% of GDP)	Log of GDP per capita in logs in 1990	Log of secondary enrollment rate in 1990	Log of private domestic credit / GDP in 1990	Overall regulation index	Product market regulation index	Fiscal regulation index	Labor regulation index
Growth rate of GDP per capita	1								
Informal sector output (% of GDP)	-0.32***	1							
Log of GDP per capita in logs in 1990	0.33***	-0.69***	1						
Log of secondary enrollment rate in 1990	0.40***	-0.55***	0.83***	1					
Log of private domestic credit / GDP in 1990	0.31***	-0.63***	0.73***	0.55***	1				
Overall regulation index	-0.41***	0.62***	-0.80***	-0.67***	-0.66***	1			
Product market regulation index	-0.42***	0.67***	-0.87***	-0.73***	-0.69***	0.97***	1		
Fiscal regulation index	0.17	-0.51***	0.49***	0.49***	0.41***	-0.31***	-0.49***	1	
Labor regulation index	-0.14	0.24**	-0.08	-0.11	-0.23**	0.42***	0.26**	-0.16	1
Governance index	0.35***	-0.78***	0.86***	0.68***	0.65***	-0.80***	-0.86***	0.51***	-0.14

*Notes: *,**, and *** denote significance at the 10%, 5%, and 1% level, respectively.*

Source: Authors' estimation

Table 3. Economic Growth and Burden of Regulation
Sample: 73-75 countries, 1990 - 2000 *Method of estimation: Ordinary Least Squares*

Dependent variable:
Economic growth: Average annual growth rate of GDP per capita, 1990-2000

A: Basic specification

	Type of regulation index:			
	Overall	Product Market	Labor	Fiscal
	[1]	[2]	[3]	[4]
Regulation	-5.71	-5.37	-1.71	0.75
(index ranging from 0 to 1, higher meaning more regulated)	-2.43	-2.67	-1.86	0.61
Control Variables:				
Initial GDP per capita	-0.52	-0.67	-0.17	-0.26
(in logs)	-2.22	-2.65	-0.78	-1.15
Initial education	0.53	0.46	0.47	0.52
(log of secondary enrollment rate in 1990)	1.23	1.14	1.02	1.03
Initial financial depth	0.22	0.22	0.24	0.34
(log of private domestic credit / GDP in 1990)	0.80	0.75	0.84	1.21
Sub-Saharan Africa dummy	-1.71	-1.80	-1.80	-1.71
(1 if country belongs to Sub-Saharan Africa and 0 otherwise)	-3.59	-3.86	-3.53	-3.12
Constant	5.70	6.91	1.44	0.34
	2.78	3.03	1.06	0.24
No. of observations	75	75	73	75
R-squared	0.34	0.36	0.29	0.28

B: With governance interactions

	Type of regulation index:			
	Overall	Product Market	Labor	Fiscal
	[1]	[2]	[3]	[4]
Regulation	-7.68	-7.70	-4.14	0.63
(index ranging from 0 to 1, higher meaning more regulated)	2.13	-3.69	-2.79	0.39
Governance-Regulation interaction	6.80	7.45	5.02	0.21
(Governance index * Regulation index)	2.13	2.64	2.31	0.12
(Gov. index ranges from 0 to 1, higher meaning better governance)				
Control Variables:				
Initial GDP per capita	-0.81	-0.87	-0.47	-0.28
(in logs)	-3.11	-3.51	-1.95	-0.92
Initial education	0.57	0.47	0.44	0.53
(log of secondary enrollment rate in 1990)	1.51	1.33	1.09	1.07
Initial financial depth	0.27	0.29	0.22	0.34
(log of private domestic credit / GDP in 1990)	0.86	0.90	0.68	1.20
Sub-Saharan Africa dummy	-1.71	-1.72	-1.94	-1.71
(1 if country belongs to Sub-Saharan Africa and 0 otherwise)	-3.75	-3.78	-4.31	-3.09
Constant	7.10	7.83	3.98	0.46
	3.26	3.32	2.57	0.22
No. of observations	75	75	73	75
R-squared	0.39	0.43	0.35	0.28
P-value of Ho: sum of regulation coefficients = 0	0.79	0.92	0.52	0.57

Notes:
a) Standard errors are robust to heteroscedasticity (Newey-West).
b) t-Statistics are presented below the corresponding coefficient.
Source: Authors' estimation

Table 4. Informality and Burden of Regulation
Sample: 72 countries, 1990-2003 *Method of estimation: Ordinary Least Squares*

Dependent variable:
Informal sector output (% of GDP), 2000-2003

A: Basic specification

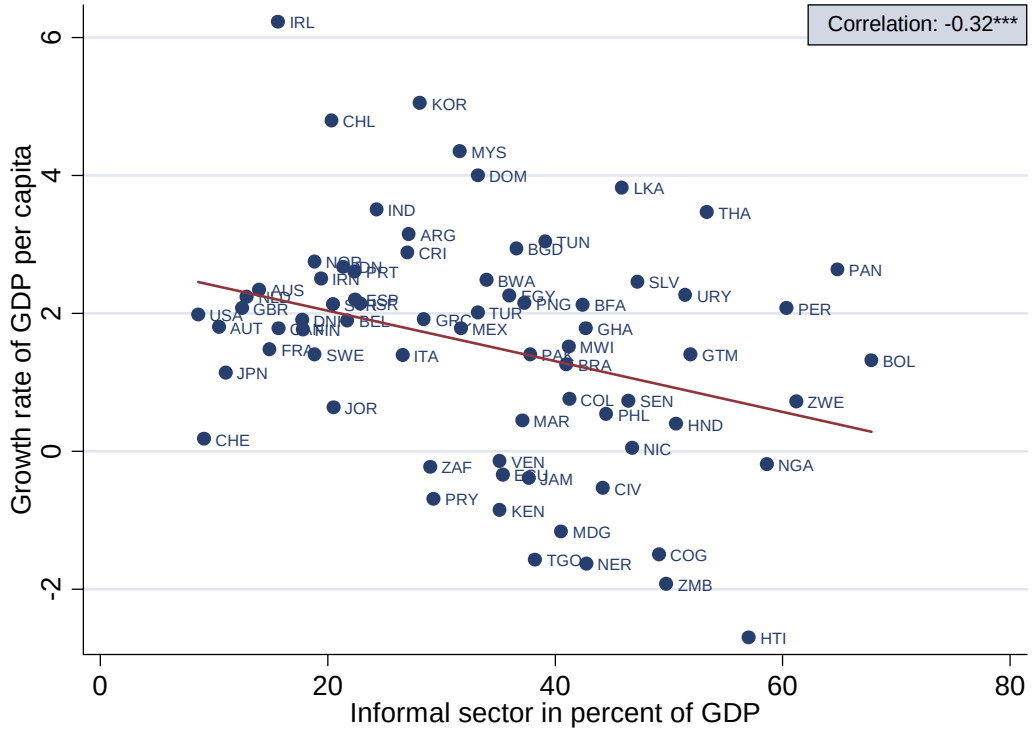
	Type of regulation index:			
	Overall	Product Market	Labor	Fiscal
	[1]	[2]	[3]	[5]
Regulation	21.67	21.61	17.03	-16.62
(index ranging from 0 to 1, higher meaning more regulated)	1.39	1.74	2.10	-1.96
Initial GDP per capita	-5.04	-4.28	-6.25	-5.40
(in logs)	-4.65	-3.20	-10.08	-6.10
Constant	63.49	58.07	74.45	84.69
	4.32	3.80	10.37	15.83
No. of observations	72	72	72	72
R-squared	0.49	0.50	0.52	0.52

B: With governance interactions

	Type of regulation index:			
	Overall	Product Market	Labor	Fiscal
	[1]	[2]	[3]	[4]
Regulation	41.21	37.87	39.39	7.73
(index ranging from 0 to 1, higher meaning more regulated)	2.55	2.87	3.51	0.63
Governance-Regulation interaction	-65.84	-50.16	-48.76	-42.91
(Governance index * Regulation index)	-3.37	-3.03	-3.74	-3.03
(Gov. index ranges from 0 to 1, higher meaning better governance)				
Control Variables:				
Initial GDP per capita	-2.52	-3.01	-3.31	-1.93
(in logs)	-1.93	-2.22	-3.09	-1.33
Constant	48.41	50.18	52.45	57.50
	3.28	3.38	5.13	5.53
No. of observations	72	72	72	72
R-squared	0.56	0.54	0.59	0.57
P-value of Ho: sum of regulation coefficients = 0	0.22	0.44	0.25	0.00

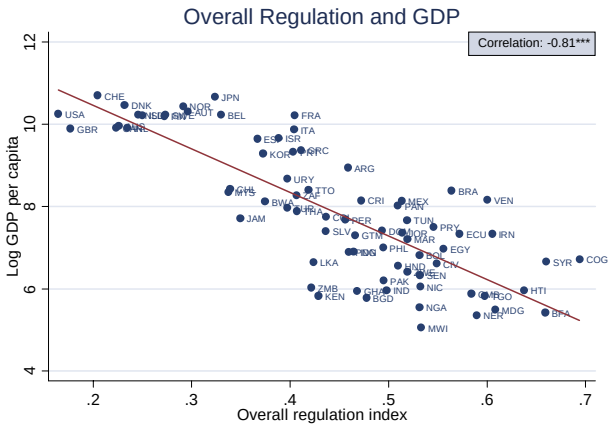
Notes:
a) Standard errors are robust to heteroscedasticity (Newey-West).
b) t-Statistics are presented below the corresponding coefficient.
Source: Authors' estimation

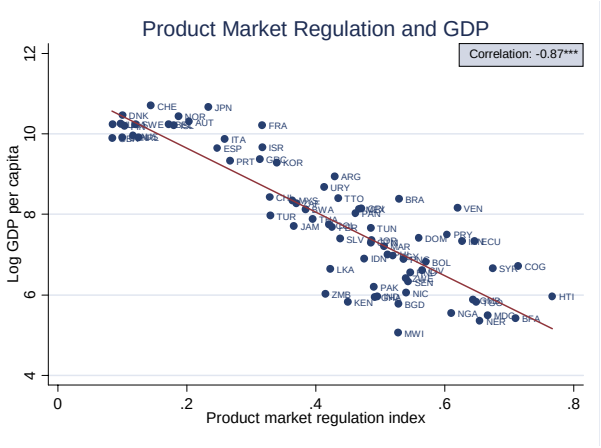
Figure 1: The Informal Economy and Growth

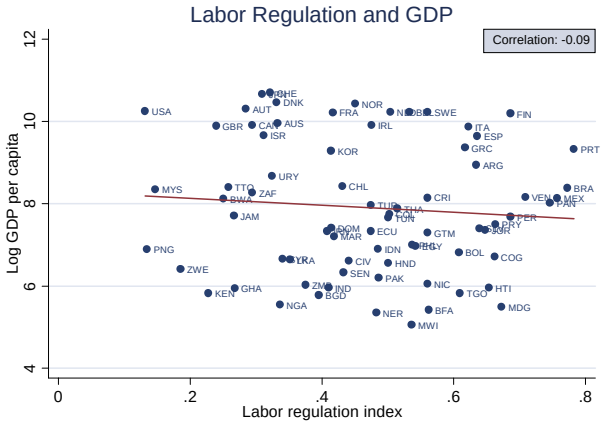


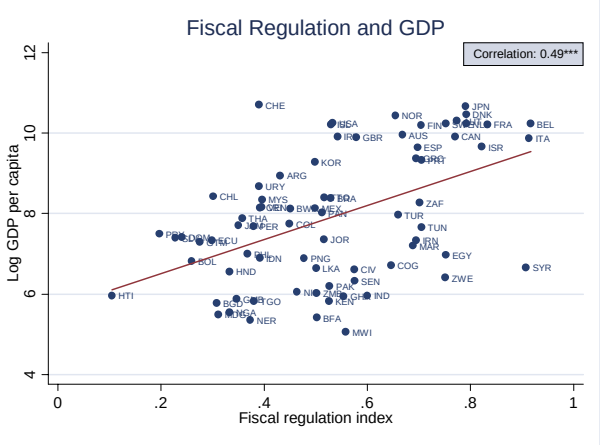
*Note: *** denotes significance at the 1% level.*

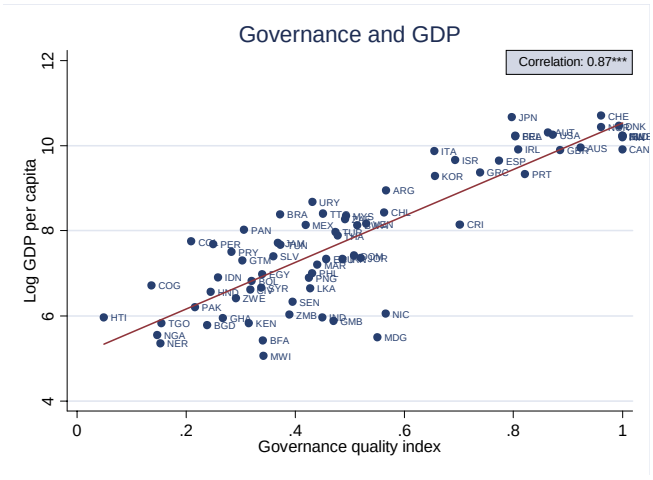
Figure 2: GDP per Capita vs. Regulation Indices





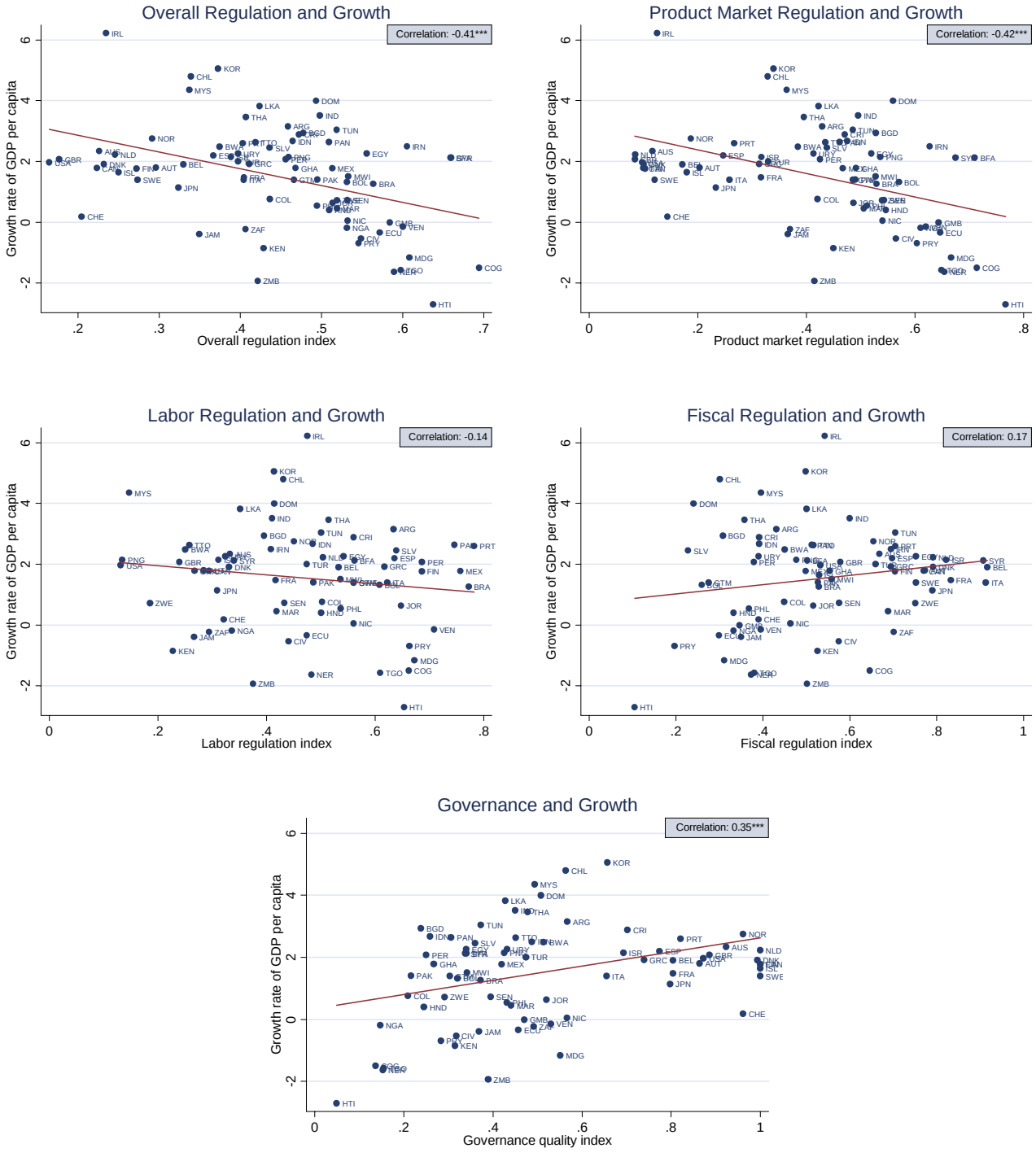






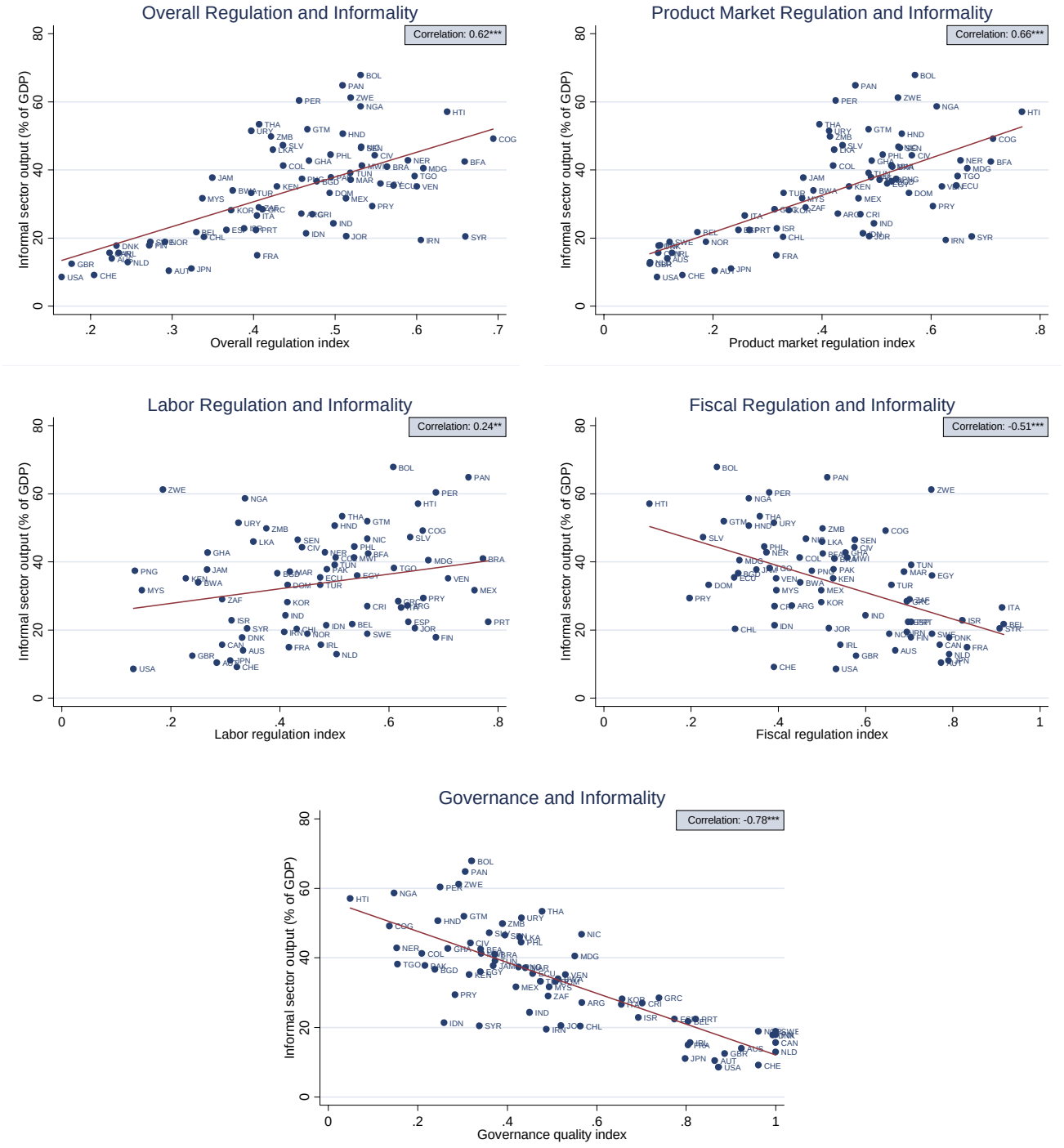
*Note: *, **, and *** denote significance at the 10%, 5%, and 1% level respectively.*

Figure 3: Growth of GDP per Capita vs. Regulation Indices



*Note: *, **, and *** denote significance at the 10%, 5%, and 1% level respectively.*

Figure 4: Informality vs. Regulation Indices



*Note: *, **, and *** denote significance at the 10%, 5%, and 1% level respectively.*