Deregulation and Economic Growth: Did Reformers Underperform?

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Abstract

This paper looks at one of the ten Washington Consensus policies – the overall deregulation policy consisting of credit-, labor-market, and business deregulation – and studies its effects on economic growth in more than 70 economies over a period of 30 years. Using a difference-in-difference estimation in the spirit of Estevadeordal and Taylor (2008), this study finds that deregulation had a negative impact on economic growth. Thus, the paper contributes to the ongoing debate about the effect from the Washington Consensus policies, and to the remarkable variation of the results established so far on the impact of those reforms.

1 Introduction

Starting in the late 1970s, the developed countries around the world embarked on a way towards deregulation. This process was followed by the new democracies and many developing countries in the 1990s and continued in the 2000s. This paper looks

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at the effects from deregulation policies in capital and labor markets, and in business regulation, and answers the following main question: What is the overall effect from deregulation on economic growth? To answer this question, aggregate long-term data on economic growth and on deregulation policies is used over a period of 30 years for more than 70 developing and developed countries for which the prescriptions of the Washintgon Consensus were applied. A difference-in-difference approach is employed to look for the impact on deregulation on growth. That is, we analyze the difference between average growth rates of reformers and non-reformers in two periods: from 1975 to 1989, and from 1990 to 2004.

As the bulk of the empirical literature suggests, we find evidence that regulation reformers within each period did encounter higher economic growth rates which may be interpreted wrongly as a causation going from deregulation to economic growth. However, looking at the growth of the average GDP levels between the two periods of interest, we conclude that countries that deregulated more did not enjoy faster growth than non-reformers. To the contrary and very much to our surprise, laggards in deregulation reform enjoyed faster average economic growth. The latter finding is our main contribution and contradicts well established results in the literature, such as the paper by Djankov, La Porta, Lopez-de-Silanes and Shleifer (2002). They show how governments around the globe regulate the starting up of a firm, and how the differences in start-up regulation correlate with different economic results. They have one limitation: The changes of regulations over time are not considered as a factor for changing firm performance because both of them use cross-sectional data. This is taken care of in this work.

On one hand, many studies support Djankov et.al.'s hypothesis. For example, The World Bank (2007) report find some correlations between economic growth and level of regulatory reforms thus omitting the impact of policy *changes* on firm-level and economy-wide performance changes. Alesina, Ardagna, Nicoletti and Schiantarelli (2005) explore the OECD STAN and ISDB databases and match it with the OECD product market regulation database.[1] They establish a causal relationship between deregulation and investment in seven OECD industries, and find that deregulation has a positive and significant impact on investment in the transport, communication,

[1] http://www.oecd.org/eco/pmr

and utilities industries. An excellent review of the existing cross-country analyses on the effect of regulation on macroeconomic performance is the paper by Schiantarelli (2005). It reviews both the micro theory on the impact of regulation on firms and the empirical evidence based on some firm- and country-level data.

On the other hand, there are papers that do not find enough evidence that institutions matter for firm performance. A recent example is the paper by Commander and Svejnar (2007). In it, Commander and Svejnar link firm performance to a wide range of explanatory variables deemed to be determinants of the institutional environment. Contrary to many preceding empirical works, they do not find any impact of the institutional constraints on firm performance in the CEE. Babetskii and Campos (2007) for example summarize results from 43 studies in a detailed meta-analysis of the impact of reforms on economic growth. They conclude that the institutional impact on firm performance shows remarkable variation both in terms of sign and significance. The "remarkable variation" they document requires further investigation, and our work would deliver it.

A highly instructive paper on the impact of trade policy on growth is the paper by Estevadeordal and Taylor (2008). They use aggregate data on 71 economies over a period of 30 years and study the effects from one of the ten policies in the Washington Consensus – the trade liberalization. Since trade liberalization is a specific type of deregulation, the results from this work would be relevant for us as well. The use difference-in-difference estimation and regress the difference in growth rates of trade reformers and non-reformers in two consecutive periods: from 1975 to 1989 and from 1990 to 2004. They assert that these two 15-year periods are long enough to capture the dynamic effects from trade liberalization that many countries in the world have undergone in the 1990's. To identify the reformers and the non-reformers, they use the mean tariff rate from the Economic Freedom of the World (EFW) data. They define the reformers to be the countries with an above-median decrease in tariffs between 1985 and 2000, and find that trade liberalizers conformed to international trade theory and experienced higher economic growth, compared to non-liberalizers. This procedure bears a direct correspondence to our empirical design. Instead of measuring the impact of a direct change in regulation indices, which is easy to implement but whose policy impact interpretation is very hard and possibly misleading,

it is better to rather map those indices into three groups: reformers, non-reformers, and laggards, and define a treatment and control empirical problem in the spirit of Estevadeordal and Taylor (2008). The difference with their approach in our work will be to enrich the groups of reformers and non-reformers with the deregulation laggards (see equation (1) below). The advantages of our approach are explained below in the empirical section. Estevadeordal and Taylor find a significant improvement in economic growth for the trade liberalization reformers. Augmenting slightly their methodology and placing in into the context of deregulation would enable this paper to answer the following question: Did deregulation reformers improve economic growth in the 1990's? To jump ahead in the paper, the answer is no, they did not. In fact, laggards did better than reformers. Given the results in the paper by Acemoglu, Aghion and Zilibotti (2006), the results are not surprising.

2 Empirical strategy

2.1 Identification

In our empirical design, we utilize the variation in the data more efficiently than Estevadeordal and Taylor (2008). More specifically, instead of designing a treatment and control problem with only one treatment group, we introduce a second treatment group into the sample – those who lagged behind in their deregulation reform. Estevadeordal and Taylor designed their treatment and control problem based on the tariff variation in only one period: 1985 to 2000. In our sample, we have two periods of policy change, namely, 1975 to 1989, and 1990 to 2005, which enables us to use additional variation in the policy data. Precisely, we define reformers between 1975 and 1990 as those countries with an above-median increase in the EFW index of regulation, and non-reformers otherwise. Identically, we define reformers between 1990 and 2005 as countries with an above-median increase in the EFW index of regulation. Thus, three groups of countries emerge: 1) those who were non-reformers in the first period but were reformers in the second period are called reformers; 2) those who were reformers in the first period and turned into non-reformers into the second period are called laggards; 3) those who were either non-reformers or reformers in

both periods are called non-reformers.[2] Grouping the countries into two treatment groups and one control group has two advantage that we can answer properly the following question: Does deregulation improve economic performance?

2.2 Estimation Strategy

To answer the above question, we utilize the empirical approach by Estevadeordal and Taylor (2008), and improve on their definition of reformers and non-reformers by including a second treatment group of laggards in the following equation:

$$\Delta \log(GDP^{c,w})_{it} = \beta_1 + \beta_2 Laggard_{it} + \beta_3 Reformer_{it} + \beta_4 X_{it} + \Delta\varepsilon_{it}, \qquad (1)$$

where $\log(GDP^{c,w})_{it}$ is either the average GDP per capita for country i in period t, denoted by $\log(GDP^{c})_{it}$, or the average GDP per worker for country i in period t, denoted by $\log(GDP^{w})_{it}$; $Laggard_{it}$ is a dummy variable equal to 1 if the country was a reformer in the first period but a non-reformer in the second period, and equal to 0 otherwise; $Reformer_{it}$ is a dummy variable equal to 1 if the country was a non-reformer in the first period but a reformer in the second period, and equal to 0 otherwise; X_{it} is a given country characteristic, such as initial level of GDP in 1975 and 1990 to control for growth convergence, and various institutional dummy variables such as size of the government reformer and laggard, property rights reformer and laggard, freedom to trade internationally reformer and laggard which are constructed identically to the reformers and laggards in deregulation, a dummy equal to 1 for OECD countries controlling for the fact that developed countries may be inherently different from the rest of the world (e.g. they did not experience transformation recession in the beginning of the 1990's like many developing and transition countries); and $\Delta\varepsilon_{it}$ is an error term about which we assume that standard linear regression assumptions are satisfied. It is important to note that all the explanatory variables above except the OECD dummy and initial levels of GDP reflect switches between being a non-reformer and reformer or vice versa, and therefore are already presented in a differenced form.

[2] In a later project, we will differentiate between the two control groups.

The results from these estimations are presented in table 2 on page 8 which concludes our work in answering the question above. Does deregulation improve economic growth? In short, the results suggest that deregulation did *not* improve economic growth for countries that deregulated extensively after 1990.

2.3 Data

2.3.1 Economic Growth and Deregulation Data

Perhaps the most comprehensive source of a long-term economic growth data computed from the national accounts of 188 countries is the Penn World Table (PWT) 6.2.[3] That is why we use it for our dependent variable in the initial estimations of equation (1) on page 5. Our main dependent variables are the GDP per capita and the GDP per worker which are the RGDPCH and the RGDPWOK variables is the PWT. For every country in our sample, we construct the dependent variables as follows: we take the average log-level of GDP per capita or per worker for the first period (1975-1989), and difference it from the log-level of the respective GDP for the second period (1990-2004). As a result, for every country we have a datapoint indicating the difference in growth rates between the two periods.

Our explanatory variables on the changes of the index of regulation are taken from the Gwartney and Lawson (2007) index of Economic Freedom of the World (EFW) data, which traces back the economic policy development in 141 countries since 1970 in several policy areas: 1) Size of Government: Expenditures, Taxes, and Enterprises; 2) Legal Structure and Security of Property Rights; 3) Access to Sound Money; 4) Freedom to Trade Internationally; and 5) Regulation of Credit, Labor, and Business.[4] Our main explanatory variable is taken from the changes in the index of Regulation of Credit, Labor, and Business. We have a match between the PWT growth rates and the EFW index of regulation in 71 countries which is the final size of our sample. Table 1 presents summary statistics on the two variables of interest

[3]Heston A., Summers R., & Aten B. (2006). Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006. Retrieved Sept. 8, 2008 from http://pwt.econ.upenn.edu/

[4]For further detailed description of the EFW data see Gwartney and Lawson (2007), p.8-12

Table 1: Summary statistics

	Reformers		Non-reformers		Laggards	
	1975-1989	1990-2004	1975-1989	1990-2004	1975-1989	1990-2004
Log(GDP/c.)	8.183	8.333	8.859	9.041	8.734	9.076
Log(GDP/w.)	8.987	9.099	9.757	9.848	9.551	9.826
N	16	16	33	33	22	22

Source: Penn World Table 6.2, and Economic Freedom of the World data

for the reformers, non-reformers, and laggards in the two periods. The section below elaborates on them.

This section illustrates graphically how the deregulation policies developed since mid-1970s up to 2005. This fairly long period of following those policies escapes the risk of having almost no policy change within a shorter span.

3 Results

The results from OLS estimation of different versions of equation (1) are presented in Table 2 on page 8. The table demonstrates clearly that deregulation reformers, or those countries who lagged behind in their deregulation reform in the late 1970s and in the 1980s but accelerated the reform in the 1990s and early 2000s, underperformed with respect to the laggards. In all estimation equations but one the difference between laggards and reformers is significant. In model (1) we simply regress the difference in average $log(GDP/c.)$ between 1990 and 2004, and between 1975-1989, on dummy variables indicating deregulation laggards and reformers. In this estimation, and in all following estimations, the control group are the non-reformers as defined in the identification section. Model (1) produces a statistically significant difference of about 16% points of average GDP/c. growth for the entire period which corresponds to approximately 1% point growth difference per year in favor of the laggards.

Models (2), (3) and (4) gradually enrich the specification with control variables. In model (2) a dummy for OECD countries is included to account for some possible systematic differences between developing and developed countries. The OECD dummy is also interacted with the laggard and reformer dummies to control not only

Table 2: Laggards, Reformers, and Growth: 1975-2004

	Difference in GDP/c. growth				Difference in GDP/w. growth			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Laggard	.163**	.283**	.290**	.082	.183**	.303**	.297***	.119
	(.076)	(.129)	(.117)	(.141)	(.070)	(.117)	(.107)	(.137)
Reformer	-.027	.041	.045	-.222**	.019	.099	.103	-.165
	(-0.32)	(.106)	(.091)	(.107)	(.082)	(.099)	(.088)	(.119)
OECD		.263**	.045	.049		.260***	.077	.06
		(.101)	(.128)	(.114)		(.092)	(.111)	(.103)
Lag*		-.323**	-.311**	-.128		-.321**	-.301**	-.158
OECD		(.151)	(.139)	(.143)		(.139)	(.123)	(.135)
Ref*		-.162	-.115	.130		-.224	-.185	.068
OECD		(.147)	(.122)	(.123)		(.154)	(.111)	(.136)
RGDP-			-.000025**	-.000080***			-.000027***	-.000076***
1975			(.000010)	(.000016)			(.000010)	(.000014)
RGDP-			.000033**	.000055***			.000031***	.000055***
1990			(8.48e-06)	(8.68e-06)			(8.29e-06)	(8.46e-06)
SG-lagg.				-.024				-.024
				(.061)				(.060)
SG-ref.				-.112**				-.079
				(.054)				(.052)
PR-lagg.				-.008				-.015
				(.076)				(.075)
PR-ref.				-.001				.005
				(.087)				(.083)
FT-lagg.				.043				.004
				(.053)				(.044)
FT-ref.				.055				.048
				(.095)				(.088)
Const.	.178***	.09	.013	.346***	.092*	.005	-.049	.227*
	(.056)	(.071)	(.085)	(.123)	(.051)	(.063)	(.076)	(.123)
R-sq.	0.075	0.167	0.368	0.700	0.090	0.188	0.398	0.699
N	71	71	71	43	71	71	71	43

Notes: Robust standard errors in parentheses; RGDP -1975 indicates Real GDP per capita in 1975 for the regressions from (1) to (4) and Real GDP per worker in 1975 for the regressions from (5) to (8). OECD is a dummy variable indicating membership into the OECD, and Lag*OECD and Ref*OECD indicate an interaction between being deregulation laggard and that dummy, and deregulation reformer and the OECD dummy, respectively. The variables XY-lagg. and XY-ref'r are constructed identically to the Laggard and Reformer variables, with the exception that the feeding data is the EFW of XY, where XY is Size of Government (SG), Property Rights (PR), and Freedom to Trade (FT), respectively.

for the difference in growth between OECD non-OECD countries but also for the way deregulation affected the economies within the OECD countries. Contrary to the overall impact of deregulation, in OECD we evidence that laggards in deregulation reform also lagged behind in their average GDP/c. growth which emerges as about 30 average GDP/c. growth points for the entire 15-year period after 1990. In effect, this means that laggards within OECD lagged behind in their growth with about 2 percentage points per year. In model (3) we control for some possible growth convergence as well, and find that including the initial levels of GDP in 1975 and in 1990 improves significantly the goodness of fit of the model, and in addition, that the evidence of a convergence is significant, although almost negligible in terms of magnitude. In model (4) we control for other institutional variables that might affect economic growth, such as size of the government, property rights, and freedom to trade internationally. We acknowledge the fact that these variables are omitted from the previous models and thus the results in them are biased.

Models (5) through (8) in table 2 repeat the work from the previous four models on the right-hand side of the estimation equations but use the difference in $log(GDP/w.)$ as an explained variable instead. This is done not so much to add new arguments but to check for robustness using a closely related variable to GDP/c., and for completeness of the exposition. Similar conclusions in terms of sign, magnitude and significance can be drawn about the GDP/w. indicator. Controlling only for being a laggard or reformer in model (5), we find that countries who lagged behind in reforms in the 1990s but were reformers in the late 1970s and in the 1980s added at least another percentage point of GDP relative to countries who were non-reformers in both periods. Further, we believe that the results in column (5) are biased down because when other control variables are included in models (6) and (7), the coefficients increase magnitude to levels which are similar to the GDP/c. estimations. In addition, estimations retain significance, and improve the goodness of fit. The only exception in which we lose significance on the regulatory variable is the case when we control for other institutional variables in model (8). In this model, the signs on Laggards and Reformers are retained, however, both variables lose significance. Our F-test rejects the hypothesis that the parameter estimates on Laggards and Reformers are equal to each other. However, after an F-test for a joint significance, we find that there is

not enough evidence that the two parameters are jointly significantly different from zero. Therefore, we cannot find enough evidence in this particular specification that extensive deregulation in the 1990s hampered economic growth. The signs and magnitudes are retained for the estimations of the convergence parameters, and the rest of the controls too, which indicates that the relationship between them and economic growth is also robust.

The results above demonstrate with arguable consensus that deregulation reformers underperformed in terms of economic growth after 1990.

4 Conclusion

Using a difference-in-difference estimation in the spirit of Estevadeordal and Taylor (2008), this study finds that deregulation had a negative impact on economic growth. Thus, the paper contributes to the ongoing debate about the effect from the Washington Consensus policies, and to the remarkable variation of the results established so far on the impact of those reforms.

5 References

Acemoglu D., Aghion A. & Zilibotti F. (2007). Distance to frontier, selection, and economic growth. *Journal of the European Economic Association*, March 2006, 4(1), 37–74

Alesina A., Ardagna S., Nicoletti G., & Schiantarelli F. (2005). Regulation and investment. *Journal of the European Economic Association*, June 2005, 3(4), 791-825

Babetskii, I. and Campos, N. (2007). Does reform work? An econometric examination of the reform-growth puzzle. *CERGE-EI Working Paper No.322*. Retrieved 27 April, 2007 from http://www.cerge-ei.cz/pdf/wp/Wp322.pdf

Commander, S. and Svejnar, J. (2007). Do institutions, ownership, exporting and competition explain firm performance? Evidence from 26 transition economies.

IZA Discussion Paper No.2637. Retrieved 27 April, 2007 from ftp://repec.iza.org/RePEc/Discussionpaper/dp2637.pdf

Djankov S., La Porta R., Lopez-de-Silanes F., & Shleifer A. (2002). The Regulation of Entry. *Quarterly Journal of Economics*, Vol. 117, Feb., 2002, pp.1-37

Estevadeordal, A. and Taylor, A. M. (2008). Is the Washington consensus dead? Growth, openness, and the Great Liberalization. NBER Working Paper No. 14264. Retrieved Sept. 5, 2008 from http://www.nber.org/papers/w14264

Gwartney J. and Lawson R. (2007). *Economic Freedom of the World: 2007 Annual Report*. Vancouver: The Fraser Institute. Retrieved Oct. 23, 2007 from http://www.freetheworld.com

Heston A., Summers R., & Aten B. (2006). Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006. Retrieved Sept. 8, 2008 from http://pwt.econ.upenn.edu/

Schiantarelli F. (2005). Product market regulation and macroeconomic performance: a review of cross-country evidence. *Boston College Working Paper No.623*. Retrieved 4 July, 2007 from http://fmwww.bc.edu/ec-p/wp623.pdf

World Bank (2007). *Doing Business in 2007: How to Reform*. A co-publication of the World Bank and the International Finance Corporation. Retrieved 6 Oct., 2007 from http://www.doingbusiness.org/downloads/