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Abstract We present suggestive evidence that new technology has reduced business regulation globally over the 2005-2019 period, in the areas of paying corporate taxes and starting a business. Lower-income countries and countries in the French civil law tradition have deregulated the most.

Introduction

Economic theory posits that regulations grow over time (Mulligan and Shleifer 2005), in part because vested interests benefit from existing rules (Olson 1982). There is however evidence that deregulation takes place in some countries (Williamson 1994; World Bank 2020). In particular, studies find that deregulation emerges in response to economic crisis (Agnello et al. 2015; Ranciere and Tornell 2015; Djankov, Georgieva and Maemir 2020), as a program for right-wing governments (Bortolotti et al., 2003; Akitoby et al 2020; Duval et al. 2020), and that regulatory change often takes place during the early "honeymoon" period of new governments (Bonfiglioli and Gancia, 2013).[2]

In this paper, using a sample of 169 economies over 15 years (2005-2019), we find that new technology renders some regulation obsolete. Our finding adds empirical support to the literature on productivity increases in government due to technological change. The earliest studies by Kuznets (1951) and Fabricant and Lipsey (1952) illustrate that the increasing number, widening variety, and improving quality of mechanical devices put to use by the US Postal Office, the Census Bureau and the Federal Bureau of Investigation raise productivity. The advent of online technology in public services that we describe in this paper is just the most recent example of this long-term trend.

We distinguish between technology that makes existing regulation faster or cheaper to administer; and technology as deregulation, where the procedures are reduced through legislative or regulatory change. In this paper we focus on the latter, as this setting gets us closer to the theoretical models in the literature on the size of government (Peltzman 1976).

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[2] There is divergence in the findings on the correlation between the political structure of government and regulatory change, with some studies (for example Williamson 1984) showing that authoritarian regimes deregulate more, while other studies (for example Amin and Djankov 2009) demonstrate that democracies are more likely to incite deregulation.

2. The Data

The analysis in this paper uses a World Bank dataset of business regulatory reforms, specifically in the areas of paying corporate taxes and starting a limited liability company. The data span fifteen years, 2005 to 2019, covering 169 economies. A reform is defined as a change in the number of required procedures that reduces the cost of doing business, by making it faster, easier, cheaper to conduct business (Djankov 2016). We narrow the previous definition of regulatory reform used by the World Bank, by limiting it to cases of reduction in the number of required regulatory procedures. This is an important distinction. In particular, if the implementation of a regulation becomes more efficient (faster or cheaper) due to the use of new technology, this eases the burden on the entrepreneur but does not constitute deregulation. If, in contrast, the procedure is made obsolete by the use of new technology and scrapped altogether, we count this as evidence of deregulation.

We select two areas of regulation – paying corporate taxes and starting a business - as they are prone to advances in online technology. Other regulatory areas, for example registering property or getting credit, have also been shown in previous research to be subject to advances in new technology (Shleifer et al. 2022). Coding the reduction in procedures in these areas is however more complicated in the World Bank dataset and hence the focus of our future research.

The most common feature of deregulation in paying corporate taxes over the sample period was the implementation of electronic filing and payment systems. In starting a business, the most common change over the sample period was the creation of an online registry and elimination or merging of several procedures that were previously used to ascertain that the entrepreneur meets various regulatory requirements. Sometimes new technology affects these two areas simultaneously. Singapore was the first economy to introduce an integrated and computerized company registration and tax administration system, effectively creating a one-stop shop for these public services in 1993, in the process eliminating seven existing regulations. Dozens of countries have followed suit.

New technology allows to merge or eliminate procedures altogether. In 2016, for example, Cyprus merged the process of registration for value added tax and corporate income tax. Likewise, Malta's Registrar and Inland Revenue department merged their operations to allow the automatic generation of tax identification numbers. In both countries, the number of procedures to start a business were reduced by one. As another example, in 2017 Indonesia mandated the use of an online system for corporate name reservation, thus rendering the previous procedure obsolete. In addition, a single online form to obtain company registration certificates and trading licenses became operational, cutting two further procedures. The same year Indonesia made paying taxes easier by introducing a single online system for filing corporate tax returns and paying health contributions. The use of this new technology shaved off two previous administrative procedures.

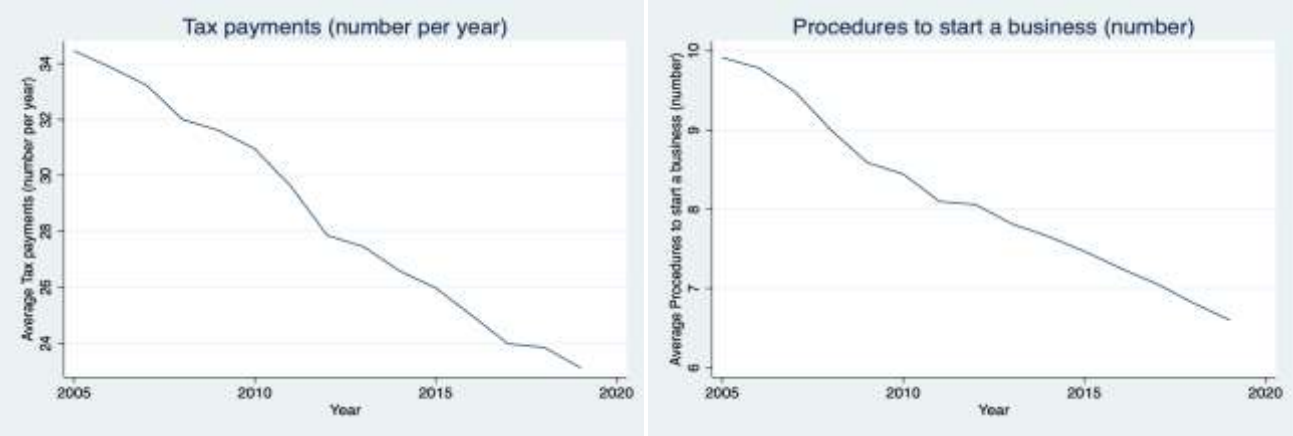
Some economies use new technology to redesign the regulatory process altogether. In 2018, Italy introduced mandatory online filing by business taxpayers for labor taxes and mandatory contributions, merging two separate procedures. In addition, employers are required to enter personal information about employees only once—at the beginning of their employment. This

information carries forward automatically to future periods—eliminating the previous monthly reporting requirements.

The low cost and easy upkeep requirements of the new technology enables developing countries to benefit from it as well. In 2018, Côte d'Ivoire introduced an online system for filing corporate income tax and value added tax returns, replacing for previous procedures. Togo made it faster to check company name availability by mandating the use of its online one-stop shop. In both countries, regulation from before the countries' independence from France – nearly six decades earlier - was rendered obsolete.

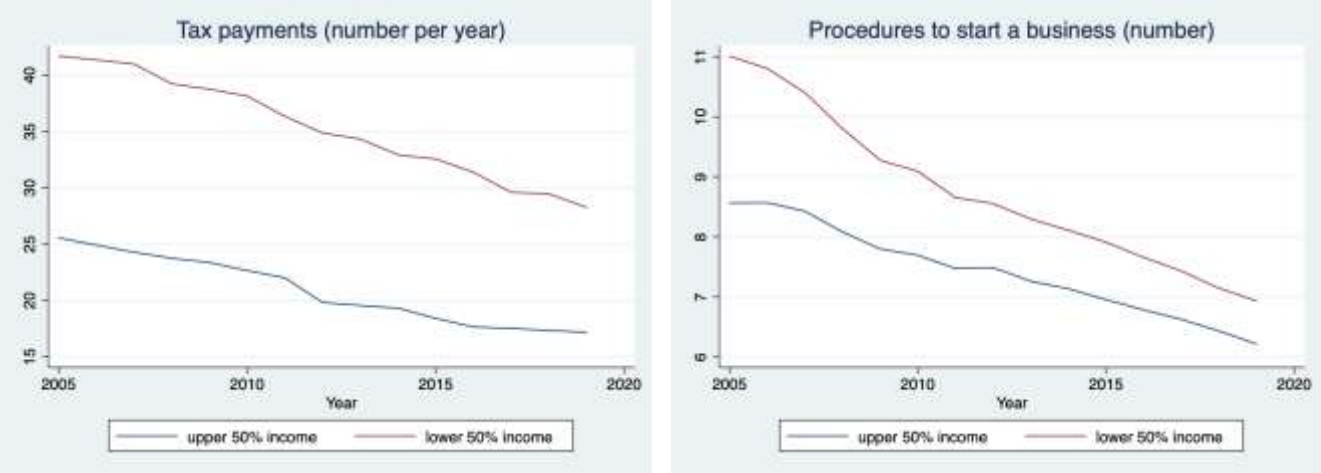
Figure 1 shows the reduction in administrative procedures in these two areas of business regulation during 2005 to 2019. The average number of procedures to pay corporate taxes fell by 11, or about 31 percent. The average number of procedures to legally start a business fell by 3.3, or a third.

Figure 1: Reduction in the Number of Regulatory Procedures, 2005-2019



Deregulation took place across the whole sample. In particular, 95 economies reduced the number of procedures in the area of paying taxes and 137 economies reduced the number of regulatory procedures to start a business. When we split the sample into upper and lower halves based on initial (2005) income per capita, we see that poorer countries saw more change, perhaps because they started from a state of over-regulation (Figure 2). This finding suggests that new technology allows for convergence across countries.

Figure 2: The Reduction in Procedures Takes Place Across the Sample



3. Correlates of Regulatory Change

We use data on deregulation in the areas of paying taxes and starting a business to relate the change in the number of procedures over time to country characteristics. We lack a direct measure of new technology adoption and instead use the change in internet penetration at the country level as a proxy. Internet penetration is defined as the share of individuals using the internet on a regular basis, sourced from the International Telecommunication Union and retrieved from the World Bank's World Development Indicators.

For the countries covered in our analysis, the average internet penetration rate was 19.5 percent in 2005, which jumped more than threefold to 64% in 2019. The variable is available for 125 among the 169 economies in our dataset. Among the, Sierra Leone, Ethiopia, Congo Dem, Rep., Bangladesh and Cambodia had the lowest penetration rate below one-half percent in 2005; Iceland had the highest penetration at 87 percent, followed by Sweden, Denmark, Norway, and Netherlands at over 80 percent. Between 2005 to 2019, the improvement in the internet penetration rate was most rapid in Oman and Saudi Arabia, at above 80 percentage points, followed by Kazakhstan and Bahrain at over 75 percentage points.

Table 1 shows the pairwise correlation between our two variables of interest (the change in the number of procedures to pay corporate taxes and establish a business) and several commonly-used correlates of the level of regulation. Deregulation is correlated with lower income per capita in starting a business (correlation coefficient -0.228, significant at the 1 percent level) but not in paying taxes. Countries in the French civil law tradition deregulate business entry more (coefficient of 0.320, significant at the 1 percent level), as do German legal origin countries in the case of paying corporate taxes (the coefficient is 0.157, significant at the 5 percent level).

Testing the hypothesis on the link between new technology and regulation, the change in internet penetration during the sample period is correlated to a reduction in the number of procedures in

both starting a business and paying taxes, with coefficients of 0.290 and 0.249, respectively, significant at the 1 percent level.

Table 1 Pair-wise Correlation Between Deregulation and Variables of Interest

	Change in Tax Payment procedures	Change in Procedures to start a business	2005 log GNI Per Capita	French Origin	German Origin	Scandinavian Origin	English Origin	Change in Internet Usage
Change in Tax Payment procedures	1							
Change in Procedures to start a business	0.366***	1						
2005 log GNI Per Capita	-0.082	-0.228***	1					
French Origin	0.125	0.320***	0.253***	1				
German Origin	0.157**	0.044	-0.226***	0.361***	1			
Scandinavian Origin	-0.037	-0.176**	-0.297***	0.173**	0.057	1		
English Origin	-0.221***	-0.302***	-0.0153	-0.759***	0.249***	0.119	1	
Change in Internet Usage	0.290***	0.249***	-0.136	-0.259***	0.076	0.303***	0.098	1

The first set of results demonstrates strong convergence in regulation, as previous studies using the same World Bank dataset find that civil law countries, in particular in the French legal tradition, and poor countries regulate more (Djankov et al 2002; Djankov et al 2010). Here we find that these are precisely the countries that have reduced regulation the most during the sample period. This is an important result because it shows how new technology can be used to catch up in the efficient delivery of public services aimed at businesses.

We next use multivariate analysis to test the robustness of these results (Table 2). Improvements in internet penetration reduce the number of procedures for paying taxes. The result is both economically and statistically meaningful: a ten-percentage point increase in penetration is associated with a reduction by four tax procedures. The correlation with the number of procedures for starting a business is also positive but statistically insignificant.

Lower-income countries see a bigger reduction in the number of procedures to pay taxes and start a business, though these results are often statistically insignificant. The pattern, however, in clear.

In all six specifications, the partial correlation between the reduction in the number of procedures and income per capita is negative: poorer countries deregulate more.

Consistent with the results in Table 1, countries in the civil law tradition experienced larger declines in the number of procedures for starting a business and paying corporate taxes. These findings are statistically significant for countries in the French legal tradition for the reduction in procedures for starting a business, and sometimes statistically significant in the reduction of procedures for paying taxes. In contrast, there is evidence for a statistically-significant reduction in the procedures for paying taxes in German civil law countries, and sometimes in the reduction of procedures for starting a business. For countries in the Scandinavian civil law tradition, there is weak evidence for a reduction in the number of procedures to pay taxes, while there is no evidence for a reduction in the procedures to start a business. The significance of these results is tempered when controlling for the effect of dominant religion.

Eastern Orthodox countries reduce regulation the most, consistent with earlier studies on economic reform in Eastern Europe and the ex-Soviet bloc (Shleifer and Treisman 2014). There is some evidence that Muslim countries reduce regulation more too, as do Nonreligious countries.

While the results on initial income per capita, legal origin and dominant religion can be taken as causal, given the historical nature of these explanatory variables, the relation between technology change (as proxied by the change in internet penetration) and deregulation is contemporaneous. We interpret it carefully as correlation, not causation. It could be that countries that deregulate are also more open to the advent of new technology. Further work is needed to pinpoint the direction of causation.

The findings in this section contrast with the findings in Mulligan and Shleifer (2005) and Hahn and Litan (2005) who find expanding regulation across US states. This difference may be explained by the measures used to proxy for the level regulation: while previous researchers use the number of pages in the law as well as the number of time words like “must” or “should” appear in regulatory texts, we have a more direct measure of deregulation (the change in the number of procedures). Also, previous studies measure the overall level of business regulation, including in areas such as environmental regulation. We, in contrast, focus on regulation in two narrowly-defined areas of business activity.

Table 2 Multivariate Regression of Deregulation from 2005 to 2019

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Change in Tax Payments			Change in procedures to start a business		
2005 log GNI Per Capita	-1.420	-2.778***	-1.210	-0.343*	-0.407**	-0.158
	(0.910)	(1.030)	(0.924)	(0.187)	(0.187)	(0.189)
French Origin	9.742***	4.222	4.410	2.337***	1.304*	1.575***
	(3.351)	(3.745)	(2.841)	(0.501)	(0.751)	(0.573)
German Origin	18.891***	11.320***	10.258*	2.139**	0.793	0.911
	(6.408)	(3.262)	(5.748)	(0.947)	(0.895)	(0.918)
Scandinavian Origin	6.441	16.243**	6.966	-0.950	-1.143	-0.391
	(4.845)	(6.514)	(7.067)	(0.771)	(0.848)	(0.727)
Change in internet usage		0.406***			0.033	
		(0.129)			(0.022)	
Religion = 2, Christian			-8.196*			-0.426
			(4.401)			(1.179)
Religion = 3, Hindu			0.600			-0.084
			(12.273)			(1.177)
Religion = 4, Muslim			1.507			2.323**
			(4.455)			(1.008)
Religion = 5, Nonreligious			1.129			4.660***
			(10.828)			(1.083)
Religion = 6, Orthodox			31.995**			3.466**
			(13.322)			(1.445)
Religion = 7, Other			-2.898			1.540
			(5.427)			(1.108)
Religion = 8, Protestant			-3.043			-0.695
			(6.220)			(0.891)
Religion = 9, Roman Catholic			-0.301			0.056
			(4.143)			(0.860)
Constant	15.310*	14.646*	15.559*	4.652***	5.098***	2.790*
	(7.946)	(8.455)	(8.183)	(1.466)	(1.619)	(1.582)
Observations	169	117	168	169	117	168
R-squared	0.078	0.141	0.219	0.168	0.175	0.308

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

4. Conclusions

Deregulation is most often associated with significant events external to the regulatory regime, for example economic crises and political transitions. In this paper, we provide some suggestive evidence that technology advancement also has a powerful association with regulatory change, and one that comes into play absent any disruptions in the workings of the government.

Our findings may spur further work in the area of measuring productivity increases in both the public administration – due to the reduction of regulation – and in private business that has fewer regulatory responsibilities to deal with. The findings also enhance the literature on deregulation and anti-corruption efforts, as we show that deregulation can be achieved, albeit in certain areas, without expending significant political capital (Alesina et al., 2006).

References

Agnello, Luca, Vitor Castro, João Tovar Jalles and Ricardo M Sousa (2015), "What determines the likelihood of structural reforms?", European Journal of Political Economy 37(C): 129–45.

Akitoby, B., Baum, A., Hackney, C., Harrison, O. (2020), "Tax revenue mobilization episodes in developing countries", Policy Design and Practice, 3 (1).

Alesina, A., Ardagna, S., Trebbi, F. (2006), "Who adjusts and when? On the political economy of reforms. NBER Working Paper No. 12049.

Amin, M. and S. Djankov (2014), "Democratic institutions and regulatory reforms." Journal of Comparative Economics, 2014, vol. 42, issue 4, 839-854.

Bonfiglioli, A., and Gancia, G. (2013), "Uncertainty, electoral incentives and political myopia", Economic Journal 123(568), 373-400.

Bortolotti, B., Fantini, M. and Siniscalco, D. (2003), "Privatization around the world: evidence from panel data". Journal of Public Economics 88, 305–332.

Djankov, S (2016), The Doing Business Project: How It Started: Correspondence. Journal of Economic Perspectives, 30(1), 247-48.

Djankov, Simeon, Rafael LaPorta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2002). "The Regulation of Entry." Quarterly Journal of Economics 117 (1): 1-37.

Djankov, Simeon, Tim Ganser, Caralee McLiesh, Rita Ramalho, and Andrei Shleifer (2010). "The Effect of Corporate Taxes on Investment and Entrepreneurship." American Economic Journal: Macroeconomics 2 (3): 31-64.

Djankov, Simeon, Dorina Georgieva and Hibret Maemir (2020), "Regulatory reforms after COVID-19", in Simeon Djankov and Ugo Panizza (eds.), Covid-19 in Developing Economies, VoxEU eBook.

Duval, R., Furceri, D., Miethe, J. (2020), "Robust political economy correlates of major product and labor market reforms in advanced economies: evidence from BAMLE for logit models", Journal of Applied Econometrics.

Fabricant, S. and R Lipsey (1952). "Productivity in Government and the Output of Government Services." In *The Trend of Government Activity in the United States Since 1900*. NBER volume, p. 84 – 111.

Hahn, R. and R. Litan (2005). "Counting Regulatory Benefits and Costs: Lessons for the U.S. and Europe," Journal of International Economic Law 8, no. 2: 473–508.

Kuznets, S (1951). "Government Product and National Income", International Association for Research in Income and Wealth, Income and Wealth, Series I, Bowes and Bowes, Cambridge, MA.

Mulligan, C, and A Shleifer (2005). “The Extent of the Market and the Supply of Regulation.” Quarterly Journal of Economics 120 (4): 1445-1473.

Peltzman, S. (1976). “Toward a More General Theory of Regulation,” Journal of Law and Economics, XIX, 211–240.

Ranciere, Romain, and Aaron Tornell (2015), “Why do reforms occur in crises times?”, working paper, Economics Department, University of California at Los Angeles, August.

Shleifer, Andrei, and Daniel Treisman (2014). “Normal Countries: The East 25 Years After Communism.” Foreign Affairs.

Shleifer, Andrei, Edward L. Glaesar, Simeon Djankov, and Valeria Perotti (2022). “Property Rights and Urban Form.” Journal of Law and Economics. April.

Spolaore, E and R Wacziarg (2018), Ancestry and Development: New Evidence, Journal of Applied Econometrics, 33 (5), 748-762.

Williamson, J (1994), The Political Economy of Policy Reform, Peterson Institute for International Economics, Washington DC.