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Determinants of Regulatory Reform

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Abstract Using panel data for 189 economies from 2004 to 2016, we show that regulatory reform is associated with periods of fiscal imbalances. This association is significant in advanced economies and in post-communist countries. The presence of IMF programs in developing countries, a consequence of fiscal pressures, encourages regulatory reform. However, the effect of fiscal imbalances on reform weakens when governments can rely on low borrowing costs. Fiscal imbalances spur political change too, though the latter also has a significant independent effect on the proclivity for regulatory reform.

JEL classification: H12; H62.

Keywords: Regulatory reform; determinants, fiscal imbalances, political change.

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Introduction

Countries differ significantly in how they regulate business activity. Numerous studies show that a poor regulatory environment raises the cost of doing business, with deleterious effects on the size of the formal economy, employment, output, investment, productivity, and living standards. A question hotly disputed among economists is when change in regulation is made possible. Two distinct theories have been advanced to understand the timing of regulatory reform.

The first theory predicts that governments resort to regulatory reform in difficult times, when their fiscal balances deteriorate (Drazen and Grilli, 1993; Ranciere and Tornell 2015). The empirical evidence on the effect of fiscal imbalances on regulatory reform is however based mostly on country case studies. According to Anne Krueger, economic reforms in Latin America in the 1980s were undertaken when "economic conditions deteriorated sufficiently so that there emerged a political imperative for better economic performance" (1993, p. 109). "The 'golden rule' of recent Spanish economic history," writes Guillermo de la Dehesa "is: 'Only when the level of reserves was sufficiently low and/or the current account balance was in large deficit have necessary economic adjustment and structural reform measures been taken' . . ." (in Williamson 1994, p. 137). Bruno (1993) examines the high inflation processes of the 1970s and 1980s in Argentina, Brazil, and Israel, and concludes that fiscal imbalances compelled lobbying groups to concede to far-reaching reforms.

Tornell (1995) uses the case of Mexico in the 1980s to raise the question of why trade reform was implemented at a time of economic crisis rather than at a time of fiscal surpluses, when the country might have been able to "afford" the short-term costs more easily. Tornell's explanation is the divisive influence of fiscal imbalances on lobbying interests. In Mexico, the two major interest groups that blocked trade liberalization during the 1970s were the import-competing, private sector elite and the state-owned companies. Through the political process, these groups had almost unlimited access to fiscal revenue. They enjoyed subsidized inputs and profited from burdensome regulations and high trade barriers, which had the effect of increasing the profitability of the fixed factors in these sectors. Trade liberalization left both groups in a worse situation than the one they enjoyed under the status quo.

When fiscal revenue was high in Mexico, subsidies to both interest groups were high. Thus an equilibrium existed between these two groups, and both blocked trade liberalization. However, when fiscal revenue plummeted, the equilibrium broke down, as it became profitable for each group to undertake actions to diminish the power of the other group, and thus secure a greater share of fiscal revenue for itself. Support of trade liberalization was one such action.

Several papers model the interaction between lobbying groups and government reformers. Femandez and Rodrik (1991) present a model where uncertainty regarding the probable winners and losers from reform leads to a bias toward the status quo. Thus reforms that would have been blocked might find support if the status quo is interrupted by a period of fiscal imbalances. Alesina and Drazen (1991) use a war-of-attrition model to analyze delays in regulatory reform. In a war of attrition, fiscal pressure urges the weaker side to take action.

Other evidence questions the impetus for regulatory reform arising from fiscal imbalances. Williamson and Haggard (1994) point to examples of reforms in the absence of a fiscal imbalance, for example in Australia, Colombia and Portugal. Abiad and Mody (2005) find that while balance-of-payments crises spur reforms, banking crises lead to reform reversals. Duval (2008) shows that fiscal surpluses

encourage regulatory reforms in OECD countries. Agnello et al. (2014) measure the impact of fiscal consolidation on the likelihood of reforms and find a positive correlation. Dewatripont and Roland (1995) use the early reform experience in Eastern Europe to argue that crisis-induced reforms reduce the constituencies for further reforms.

A second strand of the literature attributes reform to political change in government and the ensuing "honeymoon period" (Williamson 1994). This effect is enhanced when governments with a reformist ideology take power (Alesina and Cukierman 1990) or in the presence of committed reform leaders (Harberger 1993). Harberger argues that: "Men make history and not the other way around. In periods where there is no leadership, society stands still. Progress occurs when courageous skillful leaders seize the opportunity to change things for the better" (p. 344).

"This government will be austere, uncompromising, and unpopular if that is what is required to achieve economic recovery," declared Mario Soares in 1983 upon taking office as prime minister of Portugal (Rodrik 1996). "[T]he period of 'extraordinary politics' was short-lived and . . . one should use it to introduce tough economic measures," adds Balcerowicz (2016). Regulatory reforms often turn out to be good politics, but only after a period of time. The time lag can be long enough for the relationship not to be exploitable for electoral gain by would-be reformers. "We all know what to do, we just don't know how to get re-elected after we've done it," Jean-Claude Juncker, prime minister of Luxembourg, quipped in 2007.[2]

A related literature posits that countries where the political elites change significantly are more willing to do regulatory reform. This hypothesis has been tested in the context of post-communist economies (Mukand and Rodrik 2003) and in the context of developing economies (Rodrik 1996). In effect, it is another test of the Williamson theory as political change is not simply due to elections but due to a broader political transformation in society.

Using panel data for 189 economies from the World Bank's Doing Business project from 2004 to 2016, we test the predictive power of these two distinct theories. Changes in insolvency, labor law and minority shareholder protections are taken as proxies for regulatory reform, and we also use an overall World Bank measure of change in regulations towards making it easier for businesses to operate. Sometimes regulation is changed for the worse, to impede business. We code this incidence as a reform reversal and use it in the robustness analysis.

We find significant support for the Drazen and Grilli view that fiscal imbalances spur regulatory reform. The effect of fiscal imbalances on regulatory reform mostly comes from advanced economies. The effects in developing countries are positive but often statistically insignificant. In these countries, the presence of IMF programs overwhelms the significance of fiscal imbalances per se, perhaps suggesting that governments rely on the International Monetary Fund to design unpopular reforms and that the presence of such programs – though as a consequence of fiscal imbalances - dominates other determinants of reform. Also, the effect of fiscal imbalances on reform mostly disappears when interacted with low borrowing interest rates. The exception is reform in labor law, where the effect is impervious to changes in monetary policy. These findings suggest that some countries avoid unpopular reforms by relying on looser monetary policy.

[2] The Economist (2007), "The Quest for Prosperity", March 15th.

Political change is also a determinant of regulatory reform, though mostly in advanced economies. Political change is particularly associated with reform in labor regulation. In contrast, political shifts in developing countries do not correlate with reform, perhaps suggesting that such changes are not on ideological grounds as regards economic policy.

We next test the link between the two existing theories of regulatory reform. In particular, an expanding political science literature posits that fiscal imbalances bring political change, which in turn may bring reform. If we find evidence for this channel of influence, the political change theory also manifests itself as a link in the chain of the fiscal imbalances theory. From the French Revolution (Neal 1991) to the end of long-run rule in East Asia in the 1990s (Freeman 2005), to the Arab Spring (Soliman 2011) and the decline of Hugo Chavez's regime in Venezuela (Sanchez 2016), political change is shown to emerge after a period of fiscal difficulty. The evidence here supports this hypothesis: using event study methodology we show that political change is more likely to take place in periods of fiscal imbalances, and that relationship is statistically significant. In contrast, political change does not seem to explain fiscal imbalances: such imbalances accumulate similarly before as well as after political change. These results reconcile our findings with the previous literature on political determinants of structural reform.

The rest of the paper is organized as follows. Section 2 describes the data sources. Section 3 tests the endogeneity between fiscal imbalances and political change and finds that political change tends to be associated with periods of fiscal imbalances. This result implies that the first-order determinant of regulatory reform is fiscal constraints. Section 4 details the empirical strategy and presents the main results. Section 5 provides a robustness check by including a measure of monetary policy to gauge the effect on reforms. Section 6 provides additional robustness tests. Section 7 concludes.

2. The Data

This section details the construction of the dependent variables, the sources for independent variables and highlights some Bonferroni-adjusted correlations between the main variables of interest.

a. Regulatory Reform

As proxies for the incidence of regulatory reform we use the World Bank's Doing Business data, first published in 2003. How start-up regulations affect entrepreneurs and businesses is described in Djankov, La Porta, Lopes-de-Silanes, and Shleifer (2002). Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) create indicators on enforcing contracts: the procedures, time, and cost required to enforce a debt contract. Djankov, McLiesh and Shleifer (2007) measures the strength of legal rights, which encompass the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders, and the depth of sharing credit information. Botero, Djankov, Porta, Lopez-De-Silanes, and Shleifer (2004) measures the ease with which workers can be hired or made redundant and the rigidity of working hours. Djankov, Hart, McLiesh, and Shleifer (2008) constructs indicators of the time, cost, and percentage recovery rate involved with bankruptcy proceedings.

The initial set of Doing Business indicators expanded from five to ten in 2005. The new additions were: Djankov, Freund, and Pham (2010) measure on the efficiency of trade regulation; Djankov, Ganser, McLiesh, Ramalho, and Shleifer (2010) estimates the effect of different tax regimes on entrepreneurship; while Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008) studies minority

shareholder protections. Also, regulatory indicators on registering property and getting electricity were added to complete the Doing Business data (Djankov 2016).

The methodology followed for each of the topics in Doing Business employs several assumptions. The business under study is a limited-liability company. If there is more than one type of limited-liability company in the country, the type most popular among domestic firms is chosen. In the case of protecting minority investors, the business is a publicly traded corporation listed on the economy's most important stock exchange market. The business operates in the country's most populous city; is 100 percent domestically owned and has five founders, none of whom is a legal entity; has start-up capital of a given multiple of income per capita, paid in cash; performs general industrial or commercial activities, such as the production and sale of products or services to the public; leases the commercial plant and offices; and does not qualify for investment incentives or any special benefits.

In addition, the firm has up to 50 employees one month after the start of operations, all of them nationals; has turnover of at least 100 times income per capita; and has a company deed 10 pages long. In the case of protecting minority investors, the business has a supervisory board (applicable to economies with a two-tier board system) on which 60% of the shareholder-elected members have been appointed by the controlling shareholder who is also a member of buyer's board of directors. Resolving insolvency assumes that the business has 201 employees and 50 suppliers, each of which is owed money for the last delivery. The assumptions are chosen to enhance cross-country comparability.

To make the legal and administrative procedures comparable across countries, three further assumptions are employed: A procedure is defined as any interaction of the business founder with external parties (government agencies, lawyers, auditors, notaries). Interactions between company founders or company officers and employees are not considered separate procedures. Second, the business founders complete all procedures themselves, without facilitators, accountants, or lawyers, unless the use of such third parties is required. Third, procedures not required by law are ignored. For example, obtaining exclusive rights over the company name is not counted in a country where businesses are allowed to use a number as identification.

The methodology of constructing the Doing Business data has been subject to intense scrutiny. The most comprehensive survey is Besley (2015), who argues that "the mapping from the Doing Business indicators to the conceptual categories that economic theory suggests ought to be important. Because so many researchers appear to equate "empirical evidence" with interpreting regression coefficients, this point merits discussion." (p. 100).

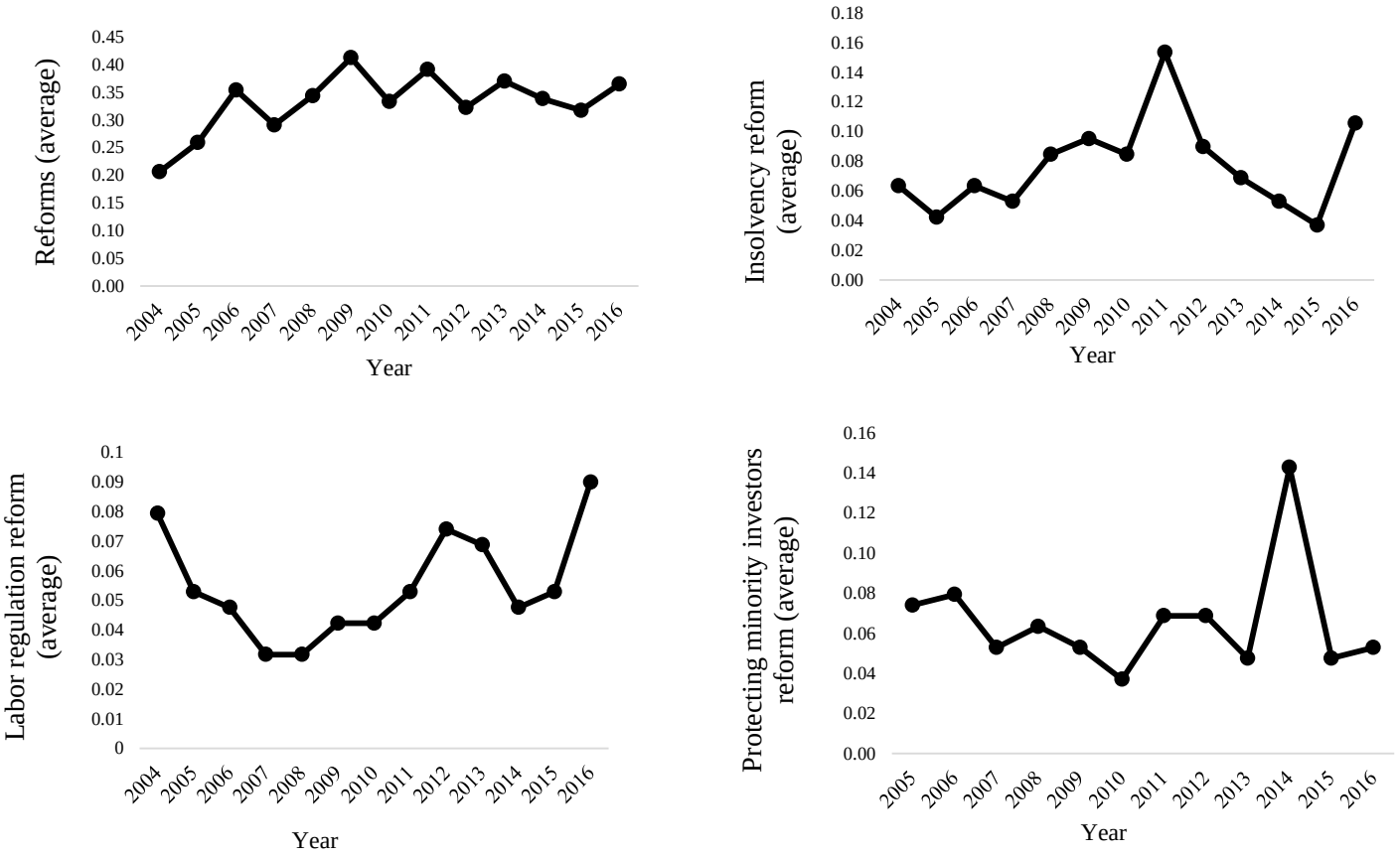
We use the Doing Business data in three ways. First, we construct as a dummy *Reforms* variable which equals 1 if a country implemented two or more reforms during the year, and 0 otherwise. A reform is defined as a legal or regulatory change that reduces the cost of doing business (Table 1). For example, in 2015 Myanmar implemented two reforms in reducing the costs of starting a business and getting electricity. This implies a score of 1 for the Reforms variable. Over 61% of countries in our sample register one or more reforms a year. Hence we choose a stricter threshold for our Reforms variable, with two or more reforms a year. The mean of the newly-constructed Reforms variable is 0.33.

[Table 1 here]

Figure 1 maps out the Reforms variable over time. The incidence of reforms peaks in 2009, when the global financial crisis had gathered speed. That year a total number of 298 reforms were recorded, with 9 (out of 10) Doing Business indicators seeing an increase in reforms compared to previous years.

Third, we use data in three areas - resolving insolvency, minority shareholder protections, and labor regulation – as specific measures of regulatory reform. These alternative reform indicators are constructed as dummy variables which equal 1 if a country implemented a reform during the year, 0 otherwise. The correlation between the four reform variables ranges from 0.017 to 0.305, with high correlation between resolving insolvency and the overall reforms proxy. Reforms of labor regulation are less correlated with other reforms, supporting earlier results in Duval (2008) that such reform also happens when labor demand exceeds labor supply, i.e., during economic booms.

Figure 1: **Reforms by Year**



Each variable has a different reform peak in the data. Insolvency change peaks in 2011, driven in part by the many reforms in Europe at the height of the Eurozone crisis. For example, in 2011, Belgium introduced a new law which aimed at promoting and facilitating the survival of viable businesses experiencing financial difficulties. Similarly, Hungary introduced amendments to its bankruptcy law with the goal of encouraging insolvent companies to consider reaching agreements with creditors out of court so as to avoid bankruptcy.

The Czech Republic implemented a series of reforms related to insolvency proceedings in the span of four years. First, in 2008, a new insolvency law was introduced. The Insolvency Act replaced the Act on Bankruptcy and Composition from 1991, which was criticized for lengthy bankruptcy proceedings, for the low level of protection given to creditors, and for its tendency to encourage the liquidation and piecemeal sell-off of the debtor's assets rather than the reorganization of insolvent enterprises. Second, in 2010, several important changes were introduced to the Insolvency Act. Specifically, the law prohibited the set-off of mutual receivables of the creditor and debtor during the moratorium and reorganization, and in case the debtor is not in liquidation, the law stipulated that there was no obligation for the debtor to file the insolvency petition in case of overindebtedness (the obligation was suspended temporarily between July 20, 2009 and January 1, 2012). Furthermore, in 2011 additional adjustments were introduced, extending the rights of creditors and finally in 2012, the Act was amended so that creditors were now entitled to challenge claims of other creditors registered and also the law specified in greater detail the impact of insolvency proceedings on close-out netting arrangements.

Countries in East Asia and Pacific and Sub-Saharan Africa also made changes to their insolvency laws. In 2011, Malaysia established dedicated commercial courts to handle foreclosure proceedings, while the Philippines passed a new law that provided a legal framework for liquidation and reorganization of financially distressed companies. In 2009, Malawi enhanced its insolvency process through a new law limiting the liquidator's fees and subsequently in 2011 adopted new rules on procedural requirements and time frames for winding up a company (previous rules dated back to 1984). Namibia made a step forward on issues related to liquidation proceedings and qualification requirements for liquidators by adopting a new Company Act in November 2010.

Labor regulation reform peaked a year later, in 2012, when OECD high-income countries and postcommunist countries led the reform effort. Spain has been one of the more active reformers in the area of employment regulation. Since 2007 a sequence of big and small changes to the Workers' Statute have been introduced, some supporting employers' flexibility, while others promoting workers' protection. In 2007, the law was generous to workers and made it such that it is easier for them to obtain an open-ended contract. In 2008, the gap in the law related to self-employed workers was addressed with the creation of a new concept "financially dependent self-employed worker" with a specific regime applicable to self-employed workers who obtain at least 75% of their earnings from the same client. Subsequent amendments in 2010 and 2012 reduced the notice period applicable in case of redundancy dismissals from 30 to 15 days for all tenures and temporarily allowed unlimited duration of fixed-term contracts.

In 2012, almost half of the countries which reformed made changes related to the usage and duration of fixed-term contracts. In 2012, the Czech Republic increased the maximum duration of fixed-term contracts from 24 to 36 months, allowing its renewal up to two times, and reduced the severance pay applicable in cases of redundancy dismissals of employees with one year of service. The same year, Montenegro passed amendments to its Labor Code restricting maximum duration of fixed-term contracts, increasing paid annual leave, while simultaneously lowering redundancy costs. Portugal had two major labor reforms that year – increased exceptionally the maximum cumulative duration of fixed-term contracts from 36 to 54 months and reduced the severance pay applicable in cases of redundancy dismissals.

Legislative reform to support minority shareholder protections was most active in 2014, when 17 West African countries simultaneously changed their legislation under the OHADA initiative. The Revised Uniform Act on Commercial Companies and Economic Interest Groups introduced a number of changes in the area of corporate law. One specific improvement was to increase the requirements for directors to disclose their conflict of interest and grant shareholders the right to access and obtain copies of all documents pertaining to related-party transactions.

In 2014, India also enacted a new Companies Act. It required directors to make a detailed disclosure on their conflicts of interest to the board of directors and laid out the authority of the court to order the payment of damages and disgorgement of profits in case of breach of director duties. The Act also affirmed the right of shareholders of privately-held companies to approve the issuance of new shares and their priority thereon. The same year, Dominican Republic introduced new regulations on its Securities Market Law which made it possible for shareholders representing 10% of more of the outstanding shares to call for an extraordinary meeting of shareholders. Additionally, companies were required to have their annual financial statements audited by external auditors, which ensures greater transparency. Egypt adopted Securities and Exchange Commission Resolution related to listing and delisting rules on the Egyptian stock market. The new resolution required specifically the approval of the general meeting of shareholders for all related-party transactions, and the disclosure by the company to the Securities and Commodities Authority of all information pertaining to such related-party transaction.

Finally, we construct a Reversals variable, which captures changes in laws and regulations that make it more difficult for businesses to operate. For example, in 2006 Uzbekistan amended its legislation to demote secured creditors to second-class status if the pledge covers all of the debtor's assets and to allow a bank creditor to withhold the debtor's property as payment for the debts, if those debts constitute more than 70% of the total debt. In 2008, Bolivia suspended applications for voluntary restructuring, leaving as the only option an unwieldly bankruptcy procedure that typically takes six years. In 2011, Belgium established additional requirements for commencing reorganization proceedings, including the submission of documents verified by external parties, making the process of resolving an insolvency case more cumbersome.

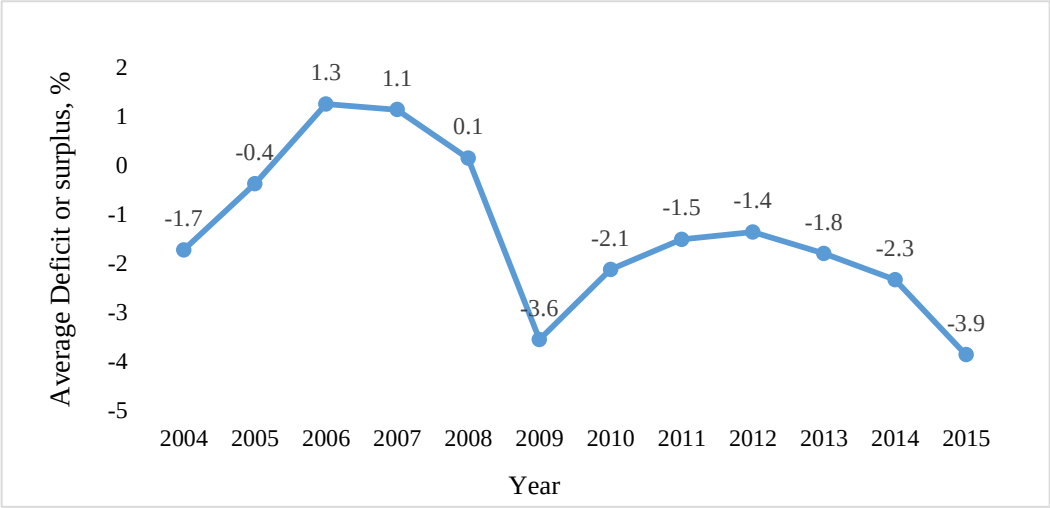
In the area of minority investor protection, Qatar and Sudan weakened their laws in 2015, by reducing the rights of shareholders in major corporate decisions.

Reversals in the area of labor regulation often relate to the prohibition of usage of fixed-term contracts for permanent tasks or the increase in redundancy costs. The former was a reversal implemented in Ecuador in 2015 and in Zambia in 2016. The latter took place in 2010, when Vanuatu increased severance pay from 2,10 and 21 weeks to 4.3, 21.6 and 43.33 weeks of salary for workers with 1,5, 10 years of experience respectively. In 2014, Georgia introduced notice period for redundancy dismissal. In 2016, Saudi Arabia increased the length of notice period to 60 days (previously 30). Notice periods and severance payments are costs for entrepreneurs and therefore any increase makes it more expensive for him/her to run the business. Venezuela and Bolivia are the only two countries in the world where dismissal due to redundancy is no longer allowed by law, making it prohibitively expensive for anyone to start a small business and employ workers.

b. Fiscal and Economic Variables

We study the reform impact of fiscal imbalances, as measured by the ratio of budgetary deficit to GDP, initial economic conditions like GDP per capita and economic growth in the previous year, while controlling for the dependence on natural resources (Oil&Gas), the influence of IMF programs, year and regional dummies.

Figure 2: **Budget Deficit to GDP Ratio, 2004-2015**



Source: IMF statistics.

The regional dummies follow the World Bank classification and include East Asia, Eastern Europe and the former Soviet Union (post-communist countries), high-income OECD countries, Latin America, the Middle East and North Africa, South Asia and sub-Saharan Africa. The OECD high-income countries comprise a third of the sample, with African countries constituting another 23% of the sample. The smallest region is South Asia, comprising less than 4% of the sample (Table 2).

[Table 2 here]

The measure of fiscal imbalances is proxied by the share of the budget deficit or surplus as a percent of GDP. The distribution of this explanatory variable is not normal, ranging from a deficit of 18% of GDP in Greece in 2009 and 32% of GDP in Ireland in 2010, to a surplus of 128% of GDP in São Tomé and Príncipe in 2007 (Figure 2). The world is running a deficit throughout most of the sample period, reaching 3.6% of GDP in 2009, the trough year of the latest global financial crisis. Thereafter there is some reduction in the deficit by 2012, only to start increasing again toward the end of the sample period and reach 3.9% in 2015. The largest deficit is run by Middle Eastern countries, reaching nearly 10% of GDP in 2014. OECD high-income countries and East Asian countries record the smallest deficits throughout the period, though the former group is more affected by the 2009 financial crisis.

The IMF data on budgetary deficits has some gaps. We expand the sample by adding data from the European Statistical Office, the Hong Kong Monetary Authority, and several central banks. Even with

these additions, the variable restricts the overall sample to 2,201 observations, or about 90% of the sample.

Fiscal imbalances can also be proxied by the increase in the share of public debt to GDP. This is, however, a less precise measure as many countries maintain a reserve fund that can be used for budgetary contingencies. This is particularly the case in resource-rich countries, which frequently implement laws on what share of fiscal surpluses arising from oil and gas revenues go into the reserve fund. To accommodate this legislation, in some regressions we use as control variable the percentage of public debt to GDP in combination with a proxy for resource-dependence.

We construct 4 proxies for fiscal imbalances based on the budget deficit data. FisImb1 equals 1 if the budget is in deficit, 0 otherwise. FisImb2 is a dummy variable equal to 2 if country's deficit is more than 0; 1 if cash surplus is between 0 and 3; and 0 if more than or equal to 3. FisImb3 is a dummy variable equal to 2 if a country's deficit is more than 3; 1 if between 0 and 3; and 0 if cash surplus is more than or equal to 0. FisImb4 is dummy variable equal to 3 if deficit is more than 3; 2 if between 0 and 3; 0 if cash surplus is between 0 and 3; and 0 if is more than or equal to 3.

We also construct a fiscal crisis variable, FisCri, equal to 1 if a country's deficit is more than 1% of GDP and jumps by 3 percentage points of GDP from the previous year, while the previous year deficit does not exceed 5 percent of GDP. It comes as no surprise that 2009 is the year with largest share (1/3) of fiscal crises. OECD high income countries is the group with highest total number (23), followed by Sub-Saharan Africa (11) and Europe and Central Asia (8). While East Asia and Pacific is the region with lowest share of economies under fiscal pressure throughout the sample period, several countries faced difficulties for several years. For example, Mongolia - 2008, 2011, 2012 and Papua New Guinea - 2009, 2011, 2012. Europe and Central Asia, on the other hand, is the region with largest share of countries (71%) facing fiscal challenges in different years. Some countries repeat the crisis, for example Azerbaijan in 2006 and subsequently in 2015; Bulgaria in 2009 and 2014. Forty percent of the countries face a fiscal crisis only once, while 36 % - twice in the period. Bhutan and Libya experience fiscal crisis in 1/3 of the period. We use this alternative variable in the robustness section. The list of countries with fiscal crises is given in Table A1.

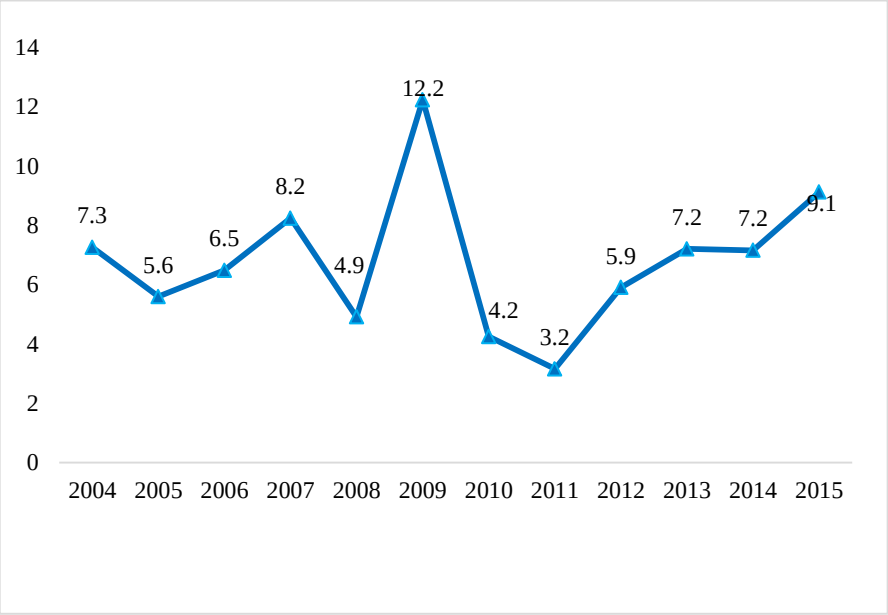
We do not consider a continuous variable of fiscal imbalances as most countries have legal provisions for determining fiscal imbalances that are discrete in nature. For example, European Union countries consider a 3% budget deficit to constitute a breach of the fiscal rules. Other countries have automatic rules for when to use the reserve fund, for example in Russia when the budget deficit reaches 1% of GDP or more. The maximum size of the reserve fund in Russia is limited to 10% of the state GDP forecasted for the corresponding fiscal year.

To study the possible weakening of the fiscal effect by resorting to monetary policy, we construct the log of the prevailing real annual lending rate to business. We use GDP-deflated inflation to construct the real interest rate (figure 3). The resulting figure shows that the lending rate shoots up in 2009, the peak year of the global financial crisis, and falls quickly to pre-crisis levels only to start a gradual climb again. Specifically, in 2008 the average real interest rate globally is 0.9%, while in 2009 it skyrockets to an average of 12.2%. The regions, most severely impacted in 2009 are Sub-Saharan Africa, Middle East and North Africa, and Latin America and Caribbean with an average real interest rate of 21%, 12%, and 11% respectively. For example, Gabon, Madagascar and Brazil are among the economies with more than 30 % real interest rate. Gambia, Nigeria, Iraq, Yemen and Paraguay show real interest

rate above 20%. The region that managed to weather the crisis relatively well is South Asia. India, for example experienced 6% real interest rate in 2009, close to its average of 5% in the sample period.

A handful of OECD high income economies, such as Australia, Austria, Japan, Singapore and Switzerland have a real interest rate on businesses between 1% and 2% in the crisis years. Since 2011, real interest rates around the world have seen a steady increase. In 2015, the region with highest rates was Sub-Saharan Africa with an average of 13%, followed this time by Latin America with an average of 11%.

Figure 3: Average Real Interest Rate, 2004-2015



Source: IMF, World Bank national accounts data, and OECD National Accounts data files.

About a quarter of the sample countries were in IMF programs during the 2004-2016 period. IMF-supported adjustment programs come in several guises. The IMF's main tool is the Stand-By Arrangement (SBA), the IMF's workhorse lending instrument for emerging and advanced market countries. The SBA was upgraded in 2009 as more funds were made available up front, and borrowing limits were doubled in response to the global financial crisis. The enhanced structural adjustment facility (ESAF) was established in 1987 to provide low-interest loans to poor countries experiencing fiscal problems. When a country faces serious medium-term balance of payments problems because of structural weaknesses that require time to address, the IMF can assist with the adjustment process under an Extended Fund Facility (EFF). Compared to assistance provided under the Stand-By Arrangement, assistance under an extended arrangement features longer program engagement and a longer repayment period. The Extended Credit Facility (ECF) provides financial assistance to low-income countries with protracted balance of payments problems. For the purposes of the analysis here, we group all these instruments together and code 1 if a country has any such IMF program in a given year, 0 otherwise.

The data show that East Asian and OECD high-income countries rarely use IMF assistance. Iceland had a stand-by agreement between 2008 and 2010, Ireland had an extended fund facility between 2010 and

2013, Greece had a stand-by agreement between 2010 and 2012, followed by an extended fund facility until January 2016 when it was cancelled at the request of the Greek government, and Portugal had an extended fund facility from 2011 to 2014. In contrast, two-thirds of Sub-Saharan Africa and over half of the post-communist countries and South Asia resorted to such assistance during the period, with a peak in 2009-2010.

Only 8.5% of countries received more than half of their budget revenues from oil and gas proceeds and thus depended less on taxable revenues from other sources. These are the OPEC countries plus several former Soviet Union countries. Only 12 countries enter this group throughout the whole sample period: Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Norway, Qatar, Russia, Saudi Arabia, United Arab Emirates and Venezuela.

c. Political Change

We next construct a proxy for the change in political power (PolChange), to test the link between the two theories on determinants of structural reform.

Fifty-four percent of countries had parliamentary elections in any one year, consistent with a 4-year election cycle in the democratic world. OECD high-income countries had an average of 0.250 elections a year, highest in the world. However, Brunei, China, Eritrea, Fiji, Guinea, Qatar, West Bank and Gaza and Yemen did not have a single parliamentary election during 2003-2016. Most of these countries have presidential or hereditary royal systems. In contrast, Kuwait had the largest number of elections: 7, in 2003, 2006, 2008 and 2009, in February and again November 2012, and in July 2013.

In testing the political change theory, we use as our main explanatory variable not just the occurrence of elections, but when these elections lead to a change of control over parliament from one party or coalition of parties to another. 223 changes of power took place in the sample period. The data suggest that such change of power varies widely across countries by income group. More than sixty percent of political changes during the sample period took place in upper and upper-middle income countries, while only twelve percent of changes occur in lower income countries. Serbia had the highest number of political changes in the sample period (5), Bulgaria, Latvia and Slovenia had four changes of power; Belgium, Indonesia, Iraq, Greece, Guatemala, Lithuania, Jamaica, Mexico, Peru and Poland had three changes, while Albania, Argentina, Grenada, Suriname had two each.

Regionally, Latin America and Caribbean has the highest average number of political changes (14% of the time) throughout the sample period, followed by OECD high-income countries (11%). Conversely, the region with the least number of political changes is the Middle East and North Africa with an average probability of 5% a year. The political transitions in Egypt, Iraq, and Morocco accounted for all changes. Countries in South Asia and Europe, including former Soviet Union countries, share the same average of 11%.

The highest number of changes in power took place in postcommunist countries. Serbia had 5 changes in the sample period. The State Union of Serbia and Montenegro was formally established in February 2007 and indirect elections were held in the two assemblies of the two member states. In Serbia, the largest party in the National Assembly became the Serbian Radical Party (SRS). That government, however, lasts only 16 months and new elections were held in May 2008 when the newly formed “For a European Serbia alliance” won 39 % of the distribution of votes. When the 2012 elections came, no

party won an outright majority, however the Serbian Progressive Party leader, Tomislav Nikolic, managed to form the coalition “Let’s Get Serbia Moving” comprising of 4 parties. In 2014, a new coalition was formed. The “Future We Believe In” was the first electoral coalition in Serbia to secure an absolute majority in parliament. In April 2016 elections, the “Serbia Wins” coalition led by Prime Minister Aleksandar Vucic took the majority back.

Political power in Slovenia, another former Yugoslav republic, shifted in four elections years: 2004, 2008, 2011, and 2014. In October 2004 in the first elections of the National Assembly since the country joined the European Union, the Liberal Democracy of Slovenia (LDS) lost the elections to the conservative Slovenian Democratic Party (SDS). During 2008 in a very close election campaign the Social Democrats surpassed the Slovenian Democratic Party by 1.19 % of the votes and created a coalition with 2 parties from the opposition ("For Real-New Politics" Party (ZARES) and Liberal Democracy of Slovenia (LDS)). The December 2011 were the first early elections to be held since the country gained independence in 1991. Among the major political contenders were two new parties formed a month prior to the election - Positive Slovenija, established by the mayor of the capital city Ljubljana; and the Citizen's Alliance, led by former Public Administration Minister Gregor Virant. Positive Slovenija surpised the establishment parties by coming on top. However, the leader of the party soon faced impeachment on corruption charges and the government lost a no-confidence vote. In July 2014, power changed hands again. This time, the Miro Cerar Party (SMC), established by law professor Miro Cerar just a month earlier, came in first, taking 36 seats in the 90-member National Assembly.

The frequent changes of power in Eastern Europe during the sample period may have to do with the fallout from the Eurozone crisis, for example in the two Baltic countries Latvia and Lithuania, as well as the fact that these are fledgling democracies where it is not uncommon for entirely new parties to emerge and take power within a few months.

d. Correlations Table

The correlation table of the main variables of interest highlights several features of the data. First, some types of reforms are not correlated, for example reforms in labor regulation and minority shareholder protections (Table 3). The overall reform variable is positively correlated with GDP growth and the presence of an IMF program, suggestion that impetus for change is present after major imbalances.

[Table 3 here]

All four fiscal Imbalances proxies are weakly correlated with regulatory reform, the only statistically significant result coming in reform of insolvency legislation. They are also uncorrelated with reversals in reform, something we will explore in the Robustness section.

Income per capita (logged) is negatively correlated with IMF assistance and with the incidence of fiscal imbalances, and especially with the log lending rate. GDP growth is also negatively correlated with the proxies for fiscal imbalances. Resource-dependent economies are less subjected to fiscal imbalances. Finally, there is a high positive correlation between the lending rate and the presence of an IMF program.

These correlation results give indication of preliminary support for both the fiscal imbalances and political change hypotheses. The multivariate regression analysis that follows will tell how robust these findings are once various controls are used.

3. Does Political Change Happen More Often in Periods of Fiscal Imbalances?

The two theories of reform implicitly take the view that fiscal imbalances and political change are independent factors in determining regulatory reform. In this section we revisit this hypothesis, in particular using t-test comparison of means to test the endogeneity between the two theories.

A recent strand of the political science literature posits that political change follows periods of fiscal imbalances. To test this claim, we define an event as any year in which a country experienced deficit of more than 3 percent of GDP. This arbitrary cut-off is consistent with the variable FisImb3, and also with the Stability and Growth Pact budget rule in the European Union, which defines a deficit as excessive if it surpasses 3 percent of GDP. We further define the event window as the three-year period before an event of excess deficit took place and the three-year period after the event.

For example, Guatemala had an excess deficit event at the peak of the global financial crisis in 2009. Parliamentary elections were held two years prior, in September 2007. The outcome of these elections was the social-democratic National Unity of Hope, led by Alvaro Colom, winning over the conservative Patriotic Party. For 2009, we look at the 3-year period before – that is 2006, 2007, 2008 and we identify that 1 power change occurring. Therefore, we record a mean of 0.33 for the period before the 2009 event took place. Then we look at the three-year period after – 2010, 2011, 2012 and we show that in 2012 Guatemala had new elections. This time, the winning party is that of the Army General Otto Pérez Molina, leader of the conservative Patriotic Party. We record these elections as power change, given the change in the distribution of seats and hence assign 0.33 for the period after the 2009 took place.

As another example, Latvia had 2 excess deficit events in the apex of the crisis: in 2009 and 2010. Immediately following these two events, the country faced two elections – first in October 2010 when the center-right Unity coalition took the majority of seats and again less than a year later, in September 2011, following a decision to dissolve parliament, the left-wing Centre for Harmony won the majority of seats. In 2009, we again look at the 3-year period before (2006, 2007 and 2008) and the 3-year period after (2010, 2011 and 2012). Given that there were 2 political changes in 2010 and 2011, we record a mean of 0.66 for the period after the 2009 event. There was no political change in the "before" period.

We do the same coding for all 497 event windows (Table 4). The probability of political change in the "before" window is 0.798%, while in the "after" window the probability is 0.981%. Events often occur one after the other, so we have 107 single-year excess deficit events and 390 overlapping event windows. Taking again the example of the Czech Republic, in 2009 there was an event, but we also know than in the 3-year period before that (2006, 2007, 2008) there was also 1 political change (the same in 2007), hence the mean for the "before" window is now 0.33.

The test excludes three groups of countries. First, it excludes a group of 30 countries which maintain a deficit below 3 percent of GDP in the sample period. These are Benin, China, Comoros, Congo, Dem.

Rep., Estonia, Gabon, Hong Kong SAR, China, Indonesia, Iran, Islamic Rep., Korea Rep., Kuwait, Luxembourg, Macao SAR, China, Mauritius, Nepal, Nicaragua, Norway, Paraguay, Peru, Philippines, Qatar, Singapore, Solomon Islands, Sweden, Switzerland, Timor-Leste, Turkmenistan, Uzbekistan, Vanuatu, West Bank and Gaza. Second, it also excludes 11 countries with perennial excess deficits – that is, countries which experience more than 3% deficit in all years: Albania, Egypt, Arab Rep., Eritrea, France, Greece, India, Lebanon, Portugal, Sri Lanka, United Kingdom, and the United States. Finally, we exclude 25 countries which experience excess deficits in ¾ of the sample period: Barbados, Burundi, Cabo Verde, Croatia, Cuba, Cyprus, El Salvador, Gambia, Ghana, Grenada, Guyana, Hungary, Israel, Italy, Jordan, Kenya, Kiribati, Maldives, Pakistan, Poland, Sao Tome and Principe, Senegal, Slovak Republic, Spain and Tanzania. The latter cut-off is admittedly arbitrary, and aims to capture chronic excess deficits. Altogether, 61 countries are excluded from the test, or about a third of the sample.

[Table 4 here]

The t-test rejects the null hypothesis that the "before" and "after" means are equal at the 1% level of significance (t-statistic of -2.32). Political change tends to happen after periods of fiscal imbalances.

We also test the alternative hypothesis: that political change instigates fiscal imbalances. There are 146 political change events in our sample. We devise the same 3-year windows before and after such events and use t-statistics to compare the man probability of fiscal imbalances. We cannot reject the null hypothesis that the before (0.343) and after (0.289) means are equal (t-statistic of 0.2263).

These findings have an implication for the theoretical set-up imposed on the analysis. In particular, they suggest that political change may be directly associated with regulatory reform, but is also a link in the chain of association between fiscal imbalances and regulatory reform.

4. Regression Strategy

We employ a logistic regression to study the determinants of regulatory reforms (*Reforms*). The logistic regression model is given by the following equation:

$$logit\left(P_{Reform}\right) = \ln\left(\frac{P_{(Reform)}}{1-P_{(Reform)}}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 \ldots + \beta_n x_n + \varepsilon \quad ,$$

where P is the probability of a reform ($Y = 0 \mid Y = 1$), $x_1, x_2 \ldots x_n$ are the explanatory variables, and $\beta_1, \beta_2 \ldots \beta_n$ are the coefficients. When the independent variable x_1 increases by one unit, with all other factors remaining constant, the odds increase by a factor $\exp(\beta_n)$. This $\exp(\beta_n)$ indicates the relative amount by which the probability of the outcome increase ($Y > 1$) or decrease ($Y<1$), when the value of the independent variable increases by one unit. For example, when the value of the *FisImb1* variable changes from 0 to 1, moving toward a budgetary deficit, the probability of reform is expected to increase.

To ameliorate endogeneity, we take several steps. First, all explanatory variables are lagged one year. As a robustness check, we do a two-year lag as well. Second, we include a dummy for the presence of

IMF assistance programs. Such programs are requested in times of fiscal imbalances and it is expected that the inclusion of this control variable will reduce the endogeneity between the dependent variable and the main explanatory variables of interest. Third, we include income per capita growth as another control variable.

We begin by controlling for differences in income levels across countries using GDP per capita (natural log), a proxy for political change, a proxy for dependence on natural resources, and year and regional fixed-effects. We find that poor countries are more likely to reform, as are post-communist countries (the regional dummy for Eastern Europe and the former Soviet Union being positive and significant). The latter result support earlier findings by Gassebner et al. (2011) who show that regulatory reforms in a specific country are a function of reforms in neighboring countries. The years immediately following the global financial crisis of 2008-2009 show an increased number of reforms. IMF programs are associated with reforms.

The effects of economic growth on regulatory reform is positive and statistically significant. However, the effect of natural resources is insignificant (Table 5).

[Table 5 here]

We next turn to an expanded specification, testing the link between fiscal imbalances and regulatory reform (Table 6). The results are positive and significant in all specifications: fiscal imbalances are associated with overall regulatory reform. In particular, in the presence of a budget deficit reform is between 14% (column 3) and 23% more likely to take place (column 1).

[Table 6 here]

The presence of IMF programs is robustly associated with higher incidence of reform. As IMF programs typically result from fiscal imbalances, we can posit that the IMF dummy proxies for such imbalances in developing countries. Resource wealth is weakly associated with reform. Income per capita weakens significantly as an explanatory variable, though it remains marginally significant.

Political change is also significantly correlated with reform in all specifications. The economic magnitude is large: reform is almost 40% more likely in the presence of political change.

5. Sensitivity Analysis by Type of Reform and Country

First, we use the real interest rate, which we define as the nominal lending interest rate to businesses minus GDP-deflated inflation, as a proxy for loose monetary policy. In particular, we construct a dummy variable, which equals 1 if a country has a negative real interest rate and 0 otherwise. Once the dummy real interest rate and the interaction term are included in the regressions we observe that in the first column (FisImb1), the significance of the coefficient on fiscal imbalances disappears, while in the next 3 columns (FisImb2, FisImb3, and FisImb4) the significance of the coefficient weakens (Table 7).

The cost of borrowing remains insignificant in all specifications and no interaction term is significant, confirming the earlier result that looser monetary policy discourages reform. The coefficients on the presence of IMF programs turn insignificant as well, explained by the high correlation between the real interest rate and IMF assistance.

[Table 7 here]

Next, we rerun the logit specification using the three alternative measures of reform: changes in insolvency law, labor regulation and minority shareholder protections (Table 8). The choice of reform areas is dictated by the literature on structural change, which suggests that reforms that change the underlying incentives for market participants – firms, workers, financiers – are most difficult to achieve as they require legal and sometimes constitutional redrafting and face stiff opposition from lobby groups.

When insolvency reforms are used as the dependent variable, the association with fiscal imbalances is always positive and statistically significant. The IMF program variable remains significant across two of the four specifications, while the coefficients on other control variables are statistically insignificant.

Labor regulation as well as minority shareholder rights are also reformed in times of fiscal imbalances, and the association is statistically significant in three of the four specifications for minority rights and all four specifications for labor regulation, in two instances only at the 10% level. Political change, too, is correlated with reform of labor regulation, though the statistical significance weakens to the 10% level.

[Table 8 here]

Once the interaction between fiscal imbalances and the prevailing real lending rate to businesses is included, the significance of fiscal imbalances on reforms strengthens for labor regulation, remains broadly robust for insolvency laws and disappears altogether for minority shareholder rights (results shown in an online appendix).

We next divide the sample between advanced and developing countries to see whether the results are driven by rich countries (Table 9). Indeed, the association between fiscal imbalances and reform is robust only in the OECD high-income sample. For developing countries, in contrast, the presence on an IMF program is the variable most closely associated with reform. The latter result signals a high degree of endogeneity: the IMF is called upon in times of crisis to provide liquidity assistance and design structural reforms. What is noteworthy is that the link between fiscal imbalances and reform survives even when including the IMF program dummy, albeit only in the advanced country sample. Political change is also correlated with reform in advanced economies, while its significance disappears in developing countries.

[Table 9 here]

We use the FisCri variable to look more specifically at the association of spikes in fiscal imbalances and regulatory reform (Table 10). The idea is that a rapid deterioration in the fiscal position of a country may catalyze reform. We do not find evidence for this effect: the coefficients on the fiscal crisis variable are small and statistically insignificant.

Finally, we regress reform reversals, defined as changes that make it more burdensome for businesses to operate, on the same explanatory variables to see whether any time of regulatory change is associated

with fiscal imbalances. The results, not reported here, suggest this is not the case. The association between reform reversals and our explanatory variables is insignificant.

6. Conclusions

We seek empirical support for two existing theories on regulatory reform. The first theory – the fiscal crises theory - finds some empirical backing. The fiscal imbalances theory is robust to different proxies for regulatory reform, but is not robust in developing countries and in the presence of loose monetary policy. There is also support for the second theory, as political change seems itself driven by fiscal imbalances but also displays an independent association with regulatory reform. This evidence reconciles our findings with the previous literature on political change, but clarifies the channel through which the determination of reform takes place, from fiscal imbalances to political change to regulatory reform.

We also show that the presence of IMF assistance is predicated on fiscal imbalances and hence such imbalances are a significant determinant of regulatory reform in developing economies as well.

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Table 1
Variable Definitions

Variable	Description
Reforms	Dummy equal to 1 if a country implemented two or more positive reforms during the year and 0 otherwise. *Source:* Doing Business, www.doingbusiness.org
Reversals	Dummy equal to 1 if a country implemented one or more negative reforms during the year and 0 otherwise. *Source:* Doing Business, www.doingbusiness.org
Insolvency reform	Dummy equal to 1 if a country implemented 1 positive reform in the area of *Doing Business* resolving insolvency indicator during the year and 0 otherwise. *Source:* Doing Business, www.doingbusiness.org
Labor regulation reform	Dummy equal to 1 if a country implemented 1 reform in the area of *Doing Business* labor market regulation indicator during the year and 0 otherwise. *Source:* Doing Business, www.doingbusiness.org
Protecting minority investors reform	Dummy equal to 1 if a country implemented 1 positive reform in the area of *Doing Business* protecting minority investors indicator during the year and 0 otherwise. *Source:* Doing Business, www.doingbusiness.org
GDP per capita	One year lag of natural log of GDP per capita (current USD). *Source:* WDI, World Bank
GDP per capita growth	One year lag of GDP per capita growth (annual %). *Source:* WDI, World Bank
Election	Dummy variable equal to 1 if an election took place 12 months prior to the start of the Doing Business reform period for the Lower House of the country and 0 otherwise. Source: Inter-Parliamentary Union (IPU) and website searches
PolChange	Dummy equal to 1 if an alternation of political parties or coalitions took place 12 months prior to the start of the *Doing Business* reforms period for the Lower house of the country and 0 otherwise. *Source:* Inter-Parliamentary Union (IPU) and website searches
Oil&Gas	One year lag of dummy variable equal to 1 if over half of a country's fiscal revenue comes from oil and gas
IMFProg	One year lag of dummy equal to 1 if a country is under an IMF-supported arrangement during the year. *Source: MONA database, IMF*
Debt	One year lag of change in share of public debt (% of GDP). *Source:* WDI, EIU, various central banks.
FisImb 1	One year lag of dummy variable equal to 1 if a country's deficit is less than 0 and 0 otherwise. *Source:* IMF, Eurostat, various central banks.
FisImb 2	One year lag of dummy variable equal to 2 if country's deficit is more than 0; 1 if cash surplus is between 0 and 3; and 0 if more than or equal to 3. *Source:* IMF, Eurostat, various central banks.
FisImb 3	One year lag of dummy variable equal to 2 if a country's deficit is more than 3; 1 if deficit is between 0 and 3; and 0 if cash surplus is more than or equal to 0. *Source:* IMF, Eurostat, various central banks.
FisImb 4	One year lag of dummy variable equal to 3 if deficit is more than 3; 2 if deficit is between 0 and 3; 0 if cash surplus is between 0 and 3; and 0 if is more than or equal to 3. *Source:* IMF, Eurostat, various central banks.
FisCri	One year lag of dummy variable equal to 1 if a country's deficit jumps by 3 percentage points from the previous year and maintains a level of more than 1 percent deficit as a share of GDP. The deficit in the previous year shall not exceed 5 percent of DGP. *Source:* IMF, Eurostat, various central banks.

Real interest rate	One year lag of dummy variable equal to 1 if real interest rate (%), is less than 0, 0 otherwise. The variable is derived by subtracting lending interest rate (%) from inflation, GDP deflator (annual %). *Source:* WDI, World Bank.
Regions	
East Asia and Pacific (EAP)	Dummy indicating a country in East Asia or Pacific region. *Source:* WDI, World Bank
Europe and Central Asia (ECA)	Dummy indicating a country in Europe or Central Asia region. *Source:* WDI, World Bank
OECD high income	Dummy indicating a country in OECD high income group. *Source:* WDI, World Bank
Latin America and Caribbean (LAC)	Dummy indicating a country in Latin America or Caribbean region. *Source:* WDI, World Bank
Middle East and North Africa (MENA)	Dummy indicating a country in Middle East or North Africa region. *Source:* WDI, World Bank
South Asia (SA)	Dummy indicating a country in South Asia region. *Source:* WDI, World Bank
Sub-Saharan Africa (SSA)	Dummy indicating a country in Sub-Saharan Africa region. *Source:* WDI, World Bank

Table 2
Summary Statistics

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Reforms	2,457	0.331298	0.4707759	0	1
Reversals	2,457	0.175824	0.380748	0	1
Labor market regulation reform	2,457	0.054945	0.2279194	0	1
Resolving insolvency reform	2,457	0.076516	0.2658762	0	1
Protecting minority investors reform	2,268	0.065697	0.2478057	0	1
GDP per capita (log)	2,331	8.501321	1.57577	4.782983	12.1738
GDP per capita growth	2,308	2.462202	5.349173	-62.2144	104.6576
Election	2,172	0.223757	0.416857	0	1
PolChange	2,172	0.09116	0.2879031	0	1
Oil&Gas	2,448	0.085784	0.2801025	0	1
IMFProg	2,448	0.264297	0.4410485	0	1
Debt	1,825	-1.48447	13.62999	-173.89	46.6
FisImb1	2,201	0.709223	0.454224	0	1
FisImb 2	2,201	1.578828	0.7104971	0	2
FisImb 3	2,201	1.094502	0.8169632	0	2
FisImb 4	2,201	1.964107	1.032685	0	3
FisCri	2,183	0.085662	0.279928	0	1
Real interest rate	2,189	.1571494	.3640247	0	1
East Asia and Pacific (EAP)	2,652	0.107843	0.3102407	0	1
Europe and Central Asia (ECA)	2,652	0.102941	0.3039393	0	1
OECD high income	2,652	0.333333	0.4714934	0	1
Latin America and Caribbean (LAC)	2,652	0.127451	0.3335404	0	1
Middle East and North Africa (MENA)	2,652	0.063726	0.2443094	0	1
South Asia (SA)	2,652	0.039216	0.1941444	0	1
Sub-Saharan Africa (SSA)	2,652	0.22549	0.4179835	0	1

Table 3
Correlations among the Main Variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)	*Reform*	9.															
(2)	*Reversals*	0.0134	1														
(3)	*Resolving insolvency reform*	0.3049*	-0.0002	1													
(4)	*Labor market regulation reform*	0.2477*	0.1092*	0.0583	1												
(5)	*Protecting minority investors reform*	0.2180*	0.0199	0.0894*	0.0168	1											
(6)	GDP per cap (log)	-0.0269	-0.0013	0.0626	0.1006*	-0.0176	1										
(7)	GDP per cap growth	0.0858*	-0.0342	-0.0166	0.0136	0.0322	-0.1165*	1									
(8)	*PolChange*	0.0581	0.0475	0.0179	0.0528	0.0229	0.0429	-0.002	1								
(9)	*Oil&Gas*	0.0141	0.0107	-0.0441	-0.0044	0.005	0.1224*	0.021	-0.024	1							
(10)	*IMFProg*	0.1110*	0.0299	0.054	-0.0097	0.0374	-0.4197*	0.0054	0.0167	-0.0811*	1						
(11)	*FisImb 1*	0.0261	0.0503	0.049	0.0357	0.0293	-0.1023*	-0.1366*	0.0438	-0.2651*	0.0815*	1					
(12)	*FisImb 2*	0.0398	0.0561	0.0463	0.0386	0.032	-0.1314*	-0.1311*	0.0587	-0.3554*	0.0897*	0.9260*	1				
(13)	*FisImb 3*	0.0259	0.0586	0.0763*	0.0357	0.0279	-0.0532	-0.1865*	0.049	-0.2162*	0.0924*	0.8580*	0.7945*	1			
(14)	*FisImb 4*	0.0364	0.0628	0.0708	0.0391	0.0312	-0.0875*	-0.1776*	0.0598	-0.2989*	0.0990*	0.8760*	0.9093*	0.9603*	1		
(15)	*FisCri*	-0.0225	0.0225	0.0038	0.0106	0.0125	-0.0167	-0.1753*	-0.0464	0.0597	-0.0043	0.1963*	0.1818*	0.2858*	0.2647*	1	
(16)	*Real interest rate*	-0.0296	0.0066	-0.0475	-0.0361	-0.009	0.0568	0.0700	-0.0116	0.2631*	-0.0958*	-0.2209*	-0.2692*	-0.2081*	-0.2528*	-0.0704	1

* p<0.05, Bonferroni adjusted

Table 4
Event Study

a. Before/After comparison of excessive deficit

Paired Samples Statistics

Variable	Mean	N	Std. Dev.	Std.Err.
before	.0798	467	.1463	.0067
after	.0989	467	.1574	.0072

Paired Samples Test

	Mean	Std. Dev.	Std. Error Mean	95 % Conference Interval of the Difference				
				Lower	Upper	t	df	Sig. (2-tailed)
before - after	-.0190	.1779	.0082	-.0352	-.0029	-2.32	466	0.0209

b. Before/After Comparison of political change

Paired Samples Statistics

Variable	Mean	N	Std. Dev.	Std.Err.
before	.3437	135	.3597	.0309
after	.2896	135	.3661	.0315

Paired Samples Test

	Mean	Std. Dev.	Std. Error	95 % Conference Interval of the Difference				
				Lower	Upper	t	df	Sig. (2-tailed)
before - after	. 0540	.5168	.0444	-.0339	.1420	0.23	134	0.2263

Table 5
Basic results: Logit coefficient estimates.
Dependent variable: *Reforms*

	(1)	(2)	(3)	(4)
GDP per capita (log)		-0.173***	-0.170***	-0.128**
		(0.0598)	(0.0600)	(0.0645)
GDP per capita growth			0.0389***	0.0397***
			(0.0110)	(0.0112)
Oil&Gas				0.134
				(0.171)
IMFProg				0.351***
				(0.118)
East Asia and Pacific	-0.445***	-0.351*	-0.391**	-0.229
	(0.169)	(0.184)	(0.185)	(0.194)
Europe and Central Asia	1.238***	1.336***	1.257***	1.227***
	(0.156)	(0.181)	(0.182)	(0.184)
OECD High income	0.0616	0.535**	0.564**	0.588**
	(0.119)	(0.237)	(0.238)	(0.244)
Latin America and Caribbean	-0.261*	-0.0353	-0.0454	-0.0312
	(0.154)	(0.183)	(0.183)	(0.185)
Middle East and North Africa	-0.283	-0.0325	-0.0432	-0.00170
	(0.197)	(0.218)	(0.221)	(0.223)
South Asia	-0.0935	-0.161	-0.242	-0.182
	(0.233)	(0.242)	(0.243)	(0.245)
Sub-Saharan Africa	-	-	-	-
2005.year	0.312			
	(0.251)			
2006.year	0.786***	0.498**	0.535**	0.519**
	(0.241)	(0.232)	(0.234)	(0.234)
2007.year	0.479*	0.209	0.221	0.189
	(0.247)	(0.238)	(0.239)	(0.240)
2008.year	0.737***	0.494**	0.504**	0.483**
	(0.242)	(0.234)	(0.235)	(0.235)
2009.year	1.044***	0.804***	0.907***	0.871***
	(0.238)	(0.231)	(0.235)	(0.235)
2010.year	0.687***	0.411*	0.644***	0.582**
	(0.243)	(0.236)	(0.246)	(0.247)
2011.year	0.952***	0.721***	0.798***	0.722***
	(0.239)	(0.232)	(0.235)	(0.236)

2012.year	0.637***	0.419*	0.504**	0.431*
	(0.244)	(0.238)	(0.240)	(0.242)
2013.year	0.858***	0.673***	0.772***	0.702***
	(0.240)	(0.234)	(0.238)	(0.239)
2014.year	0.712***	0.507**	0.617**	0.564**
	(0.242)	(0.237)	(0.240)	(0.241)
2015.year	0.611**	0.463*	0.574**	0.535**
	(0.244)	(0.239)	(0.242)	(0.243)
2016.year	0.834***	0.621***	0.746***	0.712***
	(0.241)	(0.239)	(0.243)	(0.244)
Constant	-1.443***	0.0588	-0.138	-0.599
	(0.200)	(0.424)	(0.431)	(0.476)
Observations	2,457	2,203	2,203	2,203

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6

Fiscal Crises and Regulatory Reform: Logit coefficient estimates.

Dependent variable: *Reforms*

	(1)	(2)	(3)	(4)
GDP per capita (log)	-0.117*	-0.113*	-0.122*	-0.119*
	(0.0667)	(0.0669)	(0.0666)	(0.0668)
GDP growth	0.0522***	0.0527***	0.0536***	0.0542***
	(0.0124)	(0.0125)	(0.0125)	(0.0126)
PolChange	0.396**	0.384**	0.392**	0.382**
	(0.162)	(0.162)	(0.162)	(0.162)
Oil&Gas	0.207	0.307	0.203	0.277
	(0.185)	(0.192)	(0.183)	(0.188)
IMFProg	0.238*	0.241*	0.227*	0.229*
	(0.123)	(0.123)	(0.123)	(0.123)
FisImb 1	0.226*			
	(0.117)			
FisImb 2		0.217***		
		(0.0797)		
FisImb 3			0.141**	
			(0.0650)	
FisImb 4				0.147***
				(0.0536)
Constant	-0.865*	-1.088**	-0.813	-0.977*
	(0.507)	(0.521)	(0.501)	(0.510)
Observations	2,025	2,025	2,025	2,025

Standard errors in parentheses; years and regional dummies included but not reported.

*** p<0.01, ** p<0.05, * p<0.1

Table 7
Controlling for Monetary Policy: Logit coefficient estimates.
Dependent variable: *Reforms*

	(1)	(2)	(3)	(4)
GDP per capita (log)	-0.133**	-0.129*	-0.139**	-0.136**
	(0.0676)	(0.0677)	(0.0676)	(0.0677)
GDP per capita growth	0.0480***	0.0485***	0.0496***	0.0501***
	(0.0126)	(0.0126)	(0.0127)	(0.0127)
PolChange	0.398**	0.387**	0.393**	0.384**
	(0.162)	(0.162)	(0.162)	(0.163)
Oil&Gas	0.295	0.367*	0.288	0.346*
	(0.192)	(0.199)	(0.191)	(0.196)
IMFProg	0.168	0.172	0.157	0.159
	(0.125)	(0.125)	(0.125)	(0.125)
FisImb 1	0.207			
	(0.129)			
FisImb 2		0.211**		
		(0.0906)		
FisImb 3			0.149**	
			(0.0709)	
FisImb 4				0.153**
				(0.0598)
Dummy Real interest rate (drir)	-0.330	-0.238	-0.283	-0.228
	(0.219)	(0.272)	(0.205)	(0.250)
FisImb 1_drir (interaction)	0.0459			
	(0.288)			
FisImb 2_drir (interaction)		-0.0308		
		(0.171)		
FisImb 3_drir (interaction)			-0.0201	
			(0.175)	
FisImb 4_drir (interaction)				-0.0326
				(0.127)
Constant	-0.584	-0.810	-0.552	-0.719
	(0.521)	(0.538)	(0.513)	(0.524)
Observations	1,972	1,972	1,972	1,972

Standard errors in parentheses; years and regional dummies included but not reported.
*** p<0.01, ** p<0.05, * p<0.1

Table 8
Reforms in Insolvency, Labor Regulation and Minority Rights: Logit coefficient estimate.

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Insolvency reform				Labor regulation reform				Protecting minority investors reform			
GDP per capita (log)	-0.0621	-0.0654	-0.0681	-0.0690	-0.0281	-0.0265	-0.0351	-0.0328	-0.0471	-0.0455	-0.0531	-0.0509
	(0.125)	(0.126)	(0.126)	(0.126)	(0.153)	(0.153)	(0.153)	(0.153)	(0.122)	(0.123)	(0.122)	(0.123)
GDP per capita growth	-0.00446	-0.00586	0.00244	0.000443	0.0434	0.0429	0.0465*	0.0463*	0.0151	0.0146	0.0169	0.0165
	(0.0232)	(0.0232)	(0.0235)	(0.0234)	(0.0271)	(0.0271)	(0.0272)	(0.0271)	(0.0207)	(0.0207)	(0.0207)	(0.0206)
PolChange	0.106	0.0985	0.0855	0.0781	0.496*	0.479*	0.490*	0.476*	0.336	0.328	0.328	0.321
	(0.273)	(0.273)	(0.274)	(0.274)	(0.288)	(0.288)	(0.288)	(0.288)	(0.278)	(0.278)	(0.279)	(0.279)
Oil&Gas	-0.500	-0.387	-0.446	-0.326	-0.113	0.0640	-0.154	-0.0228	0.278	0.361	0.261	0.334
	(0.431)	(0.446)	(0.426)	(0.435)	(0.442)	(0.463)	(0.433)	(0.446)	(0.342)	(0.355)	(0.337)	(0.346)
IMFProg	0.395*	0.394*	0.370	0.372	0.0903	0.0942	0.0703	0.0724	0.211	0.214	0.199	0.202
	(0.229)	(0.230)	(0.229)	(0.229)	(0.279)	(0.280)	(0.279)	(0.279)	(0.222)	(0.223)	(0.222)	(0.222)
FisImb 1	0.547**				0.438*				0.352			
	(0.227)				(0.264)				(0.225)			
FisImb 2		0.372**				0.371**				0.267*		
		(0.156)				(0.187)				(0.155)		
FisImb 3			0.420***				0.247*				0.208*	
			(0.121)				(0.138)				(0.122)	
FisImb 4				0.343***				0.240**				0.189*
				(0.102)				(0.117)				(0.102)
Constant	-3.801***	-3.992***	-3.841***	-4.062***	-4.000***	-4.309***	-3.905***	-4.137***	-2.657***	-2.847***	-2.585***	-2.750***
	(0.982)	(1.003)	(0.978)	(0.992)	(1.180)	(1.214)	(1.166)	(1.187)	(0.911)	(0.938)	(0.899)	(0.917)
Observations	2,025	2,025	2,025	2,025	2,025	2,025	2,025	2,025	2,025	2,025	2,025	2,025

Standard errors in parentheses; years and regional dummies included but not reported.
*** p<0.01, ** p<0.05, * p<0.1

Table 9

Dividing the Sample between Advanced and Developing Countries: Logit coefficient estimates.

Dependent variable: *Reforms*

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Advanced				Developing			
GDP per capita growth	-0.0130	-0.0141	-0.00698	-0.00887	0.0821***	0.0834***	0.0810***	0.0825***
	(0.0283)	(0.0283)	(0.0286)	(0.0286)	(0.0144)	(0.0145)	(0.0145)	(0.0145)
PolChange	0.811***	0.789***	0.780***	0.761***	0.179	0.173	0.182	0.177
	(0.270)	(0.270)	(0.272)	(0.271)	(0.202)	(0.202)	(0.202)	(0.202)
Oil&Gas	0.417	0.606*	0.520	0.701**	0.242	0.305	0.206	0.243
	(0.330)	(0.368)	(0.323)	(0.350)	(0.210)	(0.214)	(0.208)	(0.211)
IMFProg	0.483	0.490	0.420	0.436	0.438***	0.438***	0.440***	0.436***
	(0.308)	(0.308)	(0.311)	(0.311)	(0.116)	(0.116)	(0.116)	(0.116)
FisImb 1	0.455**				0.136			
	(0.217)				(0.136)			
FisImb 2		0.335**				0.172*		
		(0.147)				(0.0944)		
FisImb 3			0.394***				0.0134	
			(0.119)				(0.0762)	
FisImb 4				0.321***				0.0588
				(0.0981)				(0.0633)
Constant	-0.693**	-0.915**	-0.798**	-1.012***	-2.011***	-2.205***	-1.919***	-2.027***
	(0.351)	(0.395)	(0.344)	(0.374)	(0.269)	(0.298)	(0.261)	(0.280)
Observations	578	578	578	578	1,447	1,447	1,447	1,447

Standard errors in parentheses; year dummies included but not reported.

*** p<0.01, ** p<0.05, * p<0.1

Table 10

Fiscal Crises and Regulatory Reform: Logit coefficient estimates.

Dependent variable: *Reforms* and Indicator specific reforms

VARIABLES	(1) Reform	(2) Resolving Insolvency	(3) Labor Market Regulation	(4) Protecting Minority Investors
GDP per capita (log)	-0.132**	-0.0728	-0.0497	-0.0554
	(0.0667)	(0.124)	(0.152)	(0.122)
GDP growth	0.0545***	-0.00935	0.0440	0.0174
	(0.0128)	(0.0233)	(0.0280)	(0.0218)
PolChange	0.406**	0.147	0.552*	0.366
	(0.161)	(0.272)	(0.288)	(0.278)
Oil&Gas	0.138	-0.795*	-0.346	0.0958
	(0.178)	(0.415)	(0.421)	(0.326)
IMFProg	0.218*	0.418*	0.0686	0.225
	(0.123)	(0.228)	(0.281)	(0.222)
FisCri	-0.160	0.113	0.413	0.407
	(0.188)	(0.330)	(0.375)	(0.313)
Constant	-0.533	-3.313***	-3.514***	-2.342***
	(0.498)	(0.960)	(1.157)	(0.895)
Observations	2,013	2,013	2,013	2,013

Table A1

List of Countries in fiscal crisis

2004	Congo, Rep., Kosovo, Marshall Islands, Micronesia, Fed. Sts., Ukraine
2005	Barbados, Bhutan, Guyana, Jordan, Maldives, Marshall Islands, Solomon Islands, Togo
2006	Azerbaijan, Grenada, Guyana, Sao Tome and Principe, Senegal, Venezuela, RB
2007	Afghanistan, Burkina Faso, Malawi, Mali, Mauritania, Nigeria, San Marino, Seychelles, Tajikistan, Yemen, Rep., Zambia
2008	Angola, Belarus, Bhutan, Bosnia and Herzegovina, Botswana, Dominican Republic, Iceland, India, Ireland, Latvia, Liberia, Maldives, Mongolia, Montenegro, Sierra Leone, Spain
2009	Algeria, Armenia, Australia, Austria, Bahrain, Belgium, Bulgaria, Cabo Verde, Cambodia, Canada, Chad, Chile, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Ecuador, Equatorial Guinea, Fiji, Finland, France, Georgia, Guinea, Honduras, Iraq, Japan, Jordan, Latvia, Lesotho, Libya, Luxembourg, Malaysia, Mexico, Moldova, Montenegro, Netherlands, Niger, Nigeria, Papua New Guinea, Peru, Russian Federation, Sao Tome and Principe, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Spain, Sudan, Suriname, Swaziland, Taiwan, China, Thailand, Trinidad and Tobago, Turkey, Ukraine, United Arab Emirates, Venezuela, RB, Vietnam, Yemen, Rep.
2010	Dominica, Kyrgyz Republic, Namibia, St. Kitts and Nevis, Swaziland, Tonga, Uganda
2011	Antigua and Barbuda, Bhutan, Lesotho, Libya, Malawi, Mongolia, New Zealand, St. Lucia
2012	Algeria, Barbados, Dominican Republic, Equatorial Guinea, Mongolia, Papua New Guinea, Paraguay, South Sudan, Spain, Sudan, Suriname, Togo, Vietnam
2013	Antigua and Barbuda, Bhutan, Central African Republic, Djibouti, Ecuador, Gambia, The, Iraq, Kosovo, Lao PDR, Lesotho, Liberia, Libya, Malawi, Papua New Guinea, Slovenia, St. Vincent and the Grenadines, Suriname, Zambia
2014	Algeria, Angola, Bolivia, Brazil, Bulgaria, Fiji, Libya, Mozambique, Niger, Oman, Sao Tome and Principe, Saudi Arabia
2015	Azerbaijan, Belize, Bolivia, Botswana, Brunei Darussalam, Denmark, Greece, Guinea, Kazakhstan, Kyrgyz Republic, Liberia, Montenegro, Myanmar, Oman, Saudi Arabia, Swaziland