

The Dynamics of the Regulation of Labor in Developing and Developed Countries since 1960*

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Abstract: Recent research emphasizes the origin of the legal system as a main explanation for the cross-country variation in employment protection legislation. Yet the supporting evidence is largely confined to *levels* of regulation and is almost exclusively based on international cross-section data for the post-1995 period. This paper introduces new data measuring the rigidity of employment protection legislation (LAMRIG) for an unbalanced panel of more than 140 countries since 1960 in 5-year intervals. Although the importance of legal origins in explaining the variation of the level of labor regulation across countries is replicated using LAMRIG, its explanatory power is much weaker in explaining changes in LAMRIG (i.e., labor market reform) over the 1960-2004 period. In its stead, the roles of the level of development and of other reforms become stronger. Our results show that per capita GDP levels and unemployment rates foster labor market reform while trade liberalization tends to hinder it.

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I. Introduction

Employment protection legislation is one of the most important components of labor market institutions. One way changes in these laws work is by reforming labor market institutions. Active labor market policies, unemployment benefits and the regulations concerning labor unions are among many other components of labor market institutions. Yet, even these or changes therein are determined to a large extent by labor laws. Given that few other structural reforms affect so many economic agents – workers, firms, unions, government and even consumers - at the same time and in a powerful manner, it is hardly surprising that these reforms are implemented more slowly and less frequently than other structural reforms.

It may also be unsurprising that there is heated controversy over the effects of labor markets reforms. The conventional view is that such reforms (for example, by lowering dismissal costs or allowing for more flexible work contracts) increase social welfare and improve economic performance (MacLeod, forthcoming). Yet Freeman (2010), among others, highlights the difficulties in identifying the economic growth implications of changes in labor market institutions and points out that such reforms may increase income inequality. Since investments in worker training and employee loyalty may be greater in situations where labor is protected, Acharya et al. (2010) argue that innovation and growth are fostered by stringent labor laws, especially in innovation-intensive sectors. Hence, it is also quite plausible that higher levels of worker protection can be beneficial in terms of economic growth.

Since labor market reforms are not necessarily exogenous to the examination of their effects, it should be clear that evaluations of the effects of labor market reforms can benefit from a deeper understanding of the factors determining changes in employment protection legislation. If employment laws were in fact invariant over time, it would be easy to see how legal origins (which themselves are also quite naturally invariant with respect to time) and labor regulations as

captured in the employment laws could be closely related. However if employment laws can be shown to change over time and other factors can be identified as contributing to changes in employment laws, then endogenizing employment protection can become an important prerequisite to the analysis of its effects.

The seminal contribution in the empirical literature on the rigidity of employment protection legislation is the paper by Botero, Djankov, La Porta, Lopez de Silanes and Shleifer (2004), hereafter BDLLS. That paper constructed an index of labor market rigidity based on the detailed provisions of the labor laws for approximately the year 1997 for some 85 countries and then examined the relevance of various proxies for efficiency, political and legal origin theories in explaining the variations in the index across countries. It concluded that the legal origins explanation dominates the other two. On average, countries that have labor regulation embedded in the English common law system have less restrictive labor laws and regulations than those based on French or other civil law systems. The intuition is that the main difference between the English common law and French or other civil law systems is that the latter are associated with more rigid, more detailed, complicated, all-encompassing labor laws which are more difficult to change (i.e., less flexible). As a result, the English common law origin countries have simpler and more flexible labor laws which are believed to better allow their labor markets to adjust to various shocks like severe economic recessions.

In recent years, an enormous literature has arisen concerning the construction of various alternative indicators of labor market characteristics, most often concerning rigidity or flexibility. These indexes have been based on various different kinds of measures: (1) measures based on market outcomes, such as the extent of labor turnover, the number of strikes, labor force participation rates, unemployment rates, (2) measures of job satisfaction, the rigidity of labor markets, the competitiveness of, or the extent of discrimination in, labor markets based on

subjective opinion surveys of employers, workers or other parties, (3) tax wedges (distortions measured in terms of the gap between what workers receive and employers pay) and (4) as in BDLLS codified characterizations of various features of the labor laws and other labor market regulations. Within the latter class some apply to individual worker rights, others to collective rights (such as the right to form and join a union), in both cases distinguishing between the laws themselves and the practice or enforcement of these laws. Each approach has advantages and disadvantages.

This paper attempts to extend the individual rights and law-based component of the latter approach in several respects, namely, by adding countries and more importantly extending it both backwards from the late 1990s (wherever possible to the early 1950s) as well as forward to 2005. This extension allows us to study the *dynamics* of labor market reform across a fairly large number of both developing and developed countries. Specifically, it does so for a single relatively comprehensive measure of labor market rigidity based on comparisons of labor laws across countries and over time. Ours is an employment laws rigidity index intentionally designed to be consistent with a similarly constructed one in the seminal study of BDLLS (2004). Several studies have attempted to up-date BDLLS for large samples of countries (e.g., World Bank's *Doing Business* project, the EU's LABREF). For going backwards in time, however, studies have been limited to two regions (OECD as in Blanchard and Wolfers, 2000, and Allard, 2005) and Latin America (Heckman and Pages, 2004).¹ Our index, called LAMRIG, is a measure of the rigidity of employment laws and as such it is a purely *de jure* index. Our extension increases the number of countries to 145 for at least one time period and to approximately 130 countries for the panel dimension (5-year averages from 1960-64 to 2000-04.)

¹ In the case of collective relations laws, Greenhill, Mosley and Prakash (2009) have extrapolated the series put together by Kucera (2002) back to 1986 for a sample of 90 developing countries.

Section II describes how this index is constructed, which varies somewhat by region but always in a way consistent with the BDLLS measure. This data construction exercise was made possible in large part by the on-line availability of comprehensive databases of labor laws, such as NATLEX.² In Section III we make use of LAMRIG to describe the changes over time in the employment protection legislation for specific countries. We use the examples of various individual countries to illustrate both how the changes in these indexes have been calculated and to help identify possible political economy determinants of these changes.

Section IV is devoted to several exercises aimed at assessing the applicability of the index. First, we restrict our analysis to the cross-section for 1995-1999 (the period coinciding with that in BDLLS and repeat their analysis of the determinants of the rigidity of labor market regulations. For the cross-section, we fully replicate their results, demonstrating the greater importance of legal origins than that of per capita GDP and/or political factors. Second, however, when we extend the analysis to the panel and to changes over time (treating labor market reforms as changes in our employment protection index), our results diverge from those of BDLLS. For example, when we use a system GMM model with lagged changes in LAMRIG included among the explanatory variables, the influence of legal origins disappears altogether. Third, to the aforementioned models of labor market reform that reflect the legal, efficiency and political theories, we investigate various other factors suggested by our country case studies and by the extant political economy of reform literature. These include measures of economic crises, structural factors and other structural reforms. Along with the reduced role of legal origins, we find evidence suggesting that per capita GDP tends to reduce LAMRIG while lagged changes in LAMRIG tend to raise it. We also find that economic crisis in the form of higher unemployment

² NATLEX, available at http://www.ilo.org/dyn/natlex/natlex_browse.home. It is maintained by the International Labour Organization (ILO)'s International Labour Standards Department and contains labor law records for more than 150 countries since the late 1940s.

rates tends to reduce LAMRIG (meaning lowering the rigidity of such regulations) while trade liberalization in the preceding period tends to deter labor market reform.

We believe these findings to be of considerable potential importance to policy-makers and to provide useful new evidence for the nascent academic literature on the determinants of labor market reforms. With respect to policy, the emphasis on legal origins leaves little room for maneuver. Irrespective of the method of transplantation of the legal system from the countries originating the systems, the current legal system of a country would inevitably depend largely on colonial experience or geographic factors which are non-changing over the period of study (La Porta et al. 2008). If labor laws do in fact change over time, as our LAMRIG indices show for most but not all countries and quite substantially for some, then it is rather obvious that non-changing factors like legal origins cannot be as important as demonstrated by BDLLS. By showing that changes in labor market laws are positively related to past changes, negatively to income, and unemployment rates and positively to prior trade reforms it is clear that policy makers may have more room for maneuver, and once reforms get started, they may be expected to continue for some time. In particular, we find that trade liberalization in the previous 5-year interval is systematically and negatively related to the changes in employment protection legislation in the current period (conditional on per capita GDP and legal origins). This finding is consistent with the view that workers react to the process of opening up of the economy by voting or lobbying for job protection. This would suggest that policy-makers will do well in fully considering these findings in designing, implementing and sequencing of comprehensive packages of structural reforms.

Our findings on the inverse relationship between trade liberalization and labor market reform also provide new evidence and support for a burgeoning yet recent academic literature. There is little disagreement among economists that trade liberalization generates large efficiency

gains by relocating domestic resources along comparative advantage lines. There is also little disagreement that trade liberalization generates winners as well as losers, and this is reflected in a large body of evidence on its relationship with poverty (Winters et al 2004) and inequality (Goldberg and Pavcnik 2007).

Yet, recently attention has been directed to another possible and previously overlooked mechanism relevant to this, the ability (from flexibility) of domestic markets to adjust to particular changes in the economic environment, such as within-country labor and capital mobility. Artuc et al. (2010), Cosar (2010), Helpman and Itskhoki (2010) and Kambourov (2009) are all examples of this line of inquiry. These papers provide different ways of thinking about the relationship between trade liberalization and labor market reform and they all have in common the notion that this is better characterized as an inverse relationship. These authors highlight that those workers employed in import-competing sectors will try to resist trade liberalization as it is they who would have “the most to lose.” One aspect that has not figured prominently in these analyses, however, is that jobs in the import-competing sectors are generally in the formal sector (or to put it differently, across the world, informal sector jobs are mostly in non-tradables.) Because employment protection legislation by definition only applies to formal sector workers who are in largely in import competing sectors, our results provide support for this explanation. In particular, we suggest that this may explain why trade liberalization tends to set back labor market liberalization.

The paper is concluded with Section V which contains our suggestions for future research. A detailed appendix of data sources and further details on the construction of the ELR indexes contained in LAMRIG is available upon request as well as on-line.

II. Constructing LAMRIG

The purpose of this section is to describe the methods used in constructing our Labor Market Rigidities (LAMRIG) index. To that end it identifies the data sources for constructing an index that is consistent across countries and over time. LAMRIG is based on two principal pillars (BDLLS and NATLEX) and its construction follows five main steps.

The first pillar of LAMRIG is the BDLLS (2004) index of employment protection legislation which is available for 85 developing and developed countries for year 1997. The second pillar is the availability for well over 140 countries of labor laws and other labor regulations. The primary sources of these laws are the International Labor Organization's NATLEX data set and, to a lesser extent, the Netherlands-based World Law Guide (LEXADIN), both free-access internet-based depositories of current and past laws and regulations.

The five steps we followed in constructing LAMRIG were: (1) Once the the labor laws were obtained for a particular country, the various provisions of these laws and regulations were used to construct measures of each of the 36 individual components and subindexes for that country in the late 1990s according to coding scheme identified in the BDLLS Appendix. Most of the individual components were scored on a 0-1 basis based on “Yes”-“No” answers to questions about the presence of certain restrictive provisions. These were then averaged into four subindexes - alternative employment contracts (part-time, fixed term etc.), costs of increasing hours worked, costs of firing workers, and dismissal procedures. The subindexes were then aggregated into a single index akin to the Employment Laws Index in their original paper.³ In this way, for the most part we were able to corroborate the values of the Employment Laws Index for

³ The original version of the Employment Laws Index published in BDLLS Employment Laws Index was presented in Djankov et al (2003). It has been presented on different scales in different versions of their work (0-1 when the individual 0-1 subindexes were averaged, 0-3 when the same indexes were summed, and 0-100, when transformed in a way that facilitates rankings as in the Doing Business Surveys and comparisons across other indicators of factors deemed to make it more difficult to do business in a particular country and across countries).

the 85 countries in the BDLLS sample for approximately the year 1997. (2) Next, we extend this index by going through the same procedure as in Step (1) for an additional 60 countries not included in the BDLLS sample with information from the employment laws in effect in approximately 1997. (3) We apply the same procedure for the 85 original countries plus the 60 additional ones for employment laws of additional periods between 1950 and 2005 wherever possible. This allows us to extend the corresponding Employment Laws Index backwards to the 1950s in some cases and forward to 2005 in five year periods. . Steps (4) and (5) are essentially checks of and adjustments to this first version using other somewhat comparable sources. For example in Step 4 we compare LAMRIG to other different but related measures of labor market rigidity (identified below) before 1995 for the OECD and Latin America, and after 2000 for the remaining countries (using wherever possible the relevant Doing Business Employment Laws Index that updates the BDLLS index (though on a different scale). Since in some cases one cannot be certain from the Labor Laws stored in NATLEX and LEXADIN for earlier years whether these were in fact the original laws or those incorporating subsequent amendments, in Step 5 we make use of individual country studies that provide quantitative or even qualitative assessments of employment protection legislation and changes therein over time. Quite naturally, by its very nature step 5 is considerably less systematic and comparable across countries, but perhaps better in some cases as far as changes over time are concerned. Let us turn to details on each of these steps.

To study labor market reforms, either determinants or effects, one needs time series data on some kind of a labor market index that one thinks is relevant to the issues in which one is interested, such as unemployment (duration or level), labor turnover, dualism, growth, or structural change. Yet, because there is no single data set of any kind that covers the more than

100 countries studied here on a consistent basis for anything more than a few years⁴, as indicated above the present study makes use of data from several different major sources and many other country-specific special sources for countries and years not covered by the major sources.

To our knowledge, there are only a very few labor laws rigidity indexes relevant to unemployment, the size of the informal sector and related phenomena that have reasonable cross-country and over time coverage going back from the present to the late 1980s or beyond. Aside from the Forteza and Rama index of ILO Conventions (identified in footnote 4 above), almost all of these, e.g., Blanchard and Wolfers (2001), OECD (2004), Allard (2005a) do so only for developed countries. These studies built upon a whole series of earlier attempts (e.g., Lazear 1990, Grubb and Wells 1993, Addison and Gosso 1996, Nickell 1997, Layard and Nickell 1998 and OECD 1999) to construct such an index for developed countries. For example, the Blanchard and Wolfers (2001) study constructs a series “NEWEP” for 26 OECD countries going back from

⁴ One labor index that may be considered close to what one might want in this respect is the one by Forteza and Rama (2006) and Rama and Artecona (2002) based on ILO conventions signed by each country. This has good coverage (more than one hundred countries and over time.) But, since this index bases much on country’s having approved of various ILO conventions on such social issues as non-discrimination in employment that are often not adhered to in practice, few seem to have been persuaded that this is a useful index for examining unemployment and other issues. It also has the disadvantage of having almost no variation over time once these conventions had been signed by the individual country (which in many cases was quite early). With respect to the rules governing unions and collective bargaining, Kucera (2002) takes advantage of data from a number of other sources such as the International Confederation of Free Trade Unions, the US State Department’s Country Reports on Human Rights Practices, and ILO Reports of the Committee on Freedom of Association to construct a Freedom of Association index based on 37 different indicators. The individual indicators are then weighted by their assumed relative importance and then aggregated into an index representing the average of such scores for the period 1993-7. Greenhill et al (2009) distinguish between the indicators which pertain to the laws and those which pertain to practice (captured by the reported numbers of law violations) and then extend the two sets of indexes backward to 1986 and forward to 2002 for developing countries. Neither of these indexes is utilized here since the rights with respect to creation and participation in unions need not necessarily relate to flexibility/rigidity in the use of labor. Interestingly, however, these authors use bilateral trade patterns to show that the level of their freedom to organize indexes (especially the laws-oriented one) can be linked to the extent to which the individual developing country exports to developed countries with higher labor standards. Another source for measuring the degree of regulation of labor markets is now Canada’s Fraser Institute. Since 1975, this institute had been scoring countries on a number of sub-indicators of economic freedom, such as strength of property rights, freedom from price and wage controls, restrictions on trade, financial transactions and product markets. These were then aggregated into an overall index of Economic Freedom. In 2001 the Institute began to include scores on six additional subcomponents, all relevant to measuring the freedom of labor markets. While at first this was limited to 58 countries, the country coverage has grown somewhat over time.

the 1995-99 period (more exactly about 1996) to the 1960s in five year intervals.⁵ We have used that one in the past. But, for its greater consistency over time, availability on an annual basis and longer time coverage, for the 21 countries covered by Allard (2005a) in this paper we make use of her estimates of Employment Protection Legislation (EPL). They are in principle comparable to those of OECD (2004) and to a large extent BDLLS but exclude two minor subcomponents (delay in the notification and compensation for unfair dismissal), for which information could rarely be found in the legislation. For the remaining five OECD countries not covered by Allard but covered by Blanchard and Wolfers, namely, Iceland, Korea, Luxemburg, Mexico and Turkey, we have based on our indexes on Blanchard and Wolfers (2001), though especially in the case of Korea also on various other sources as discussed below.⁶

The other multi-country sources with some time coverage as well are Heckman and Pages (2000 and 2004) which cover most countries of the Latin America and Caribbean (LAC) region, going back from the late 1990s only to the late 1980s. For the most part, the LAC indexes are available primarily only at intervals a decade apart, not annually. For this reason, we extend these indexes backwards and forwards with use of information on the labor laws and other studies where available.

As has been noted in many surveys, e.g., Bertola (2008), Freeman (2010), Djankov and Ramalho (2008), the data on countries outside of these two regions is much more limited in time coverage. Indeed, for them we had to base our data construction work on the application of steps

⁵ Nickell et al (2003) have annualized the Blanchard and Wolfers series. More recently, the European Union (EU) has constructed a somewhat similar set of indexes called the Labor Market Reform Database (LABREF) with somewhat more detail on certain policy-related aspects of labor legislation, but only for each year between 2000 and 2006 for each EU member. These labor market reform indexes include pension, labor taxation and other aspects. Both Arpaia et al (2007) and Bassanini and Venn (2007) describe the indexes and relate them to different effects on labor. Arpaia (2007) focuses on the effects of the indexes on labor market participation (of all workers but especially of older ones) while Bassanini and Venn (2007) examine the effects of the indexes on labor productivity.

⁶ Acharya et al. (2010) use the Deakin et al. (2007) index, which although more comprehensive (it covers forty dimensions of employment protection legislation) is only available for the U.S., U.K., France, Germany and India.

(1)–(5) above to the employment laws from NATLEX, LEXADIN and other sources as well as the Doing Business Surveys and other country-specific information as indicated in Steps (4) and (5). In every case, we construct the overall index in LAMRIG to be as consistent as possible with the coding system identified in the appendix to BDLLS (2004). We will come to these regions after describing how the OECD and LAC regions are dealt with in greater detail.

Even for the OECD and LAC data sets, their comparability is made more difficult by the fact that, although similar in spirit, the Heckman and Pages (2000 and 2004) Job Security Index and Allard (EPL) are built up from sources, methods and index aggregation procedures that are by no means identical.

The Heckman and Pages Job Security Index (JS) is defined as the discounted value of dismissing a worker at an expected date in the future based on the likelihood and costs of dismissal implied by the labor laws and regulations (but excluding the costs of court actions). It makes use of a common discount rate of 8 percent, an assumed turnover rate of 12 percent and the country and period-specific cost (inclusive of those related to seniority) of dismissing a worker for either justified or unjustified reasons. This corresponds (though only imperfectly) to the Firing Cost Subindex included along with two other subindexes in the BDLLS Employment Laws Index

As indicated above, Allard (2005a) made use of 16 of the original 18 aspects of EPL used in OECD (2004) but obtained the data, not from questionnaires cross-checked with the individual countries as in the OECD study, but rather from direct examination of the laws themselves based on ILO's NATLEX supplemented with OECD sources. The 16 indicators were aggregated first into three separate indicators (laws protecting workers with regular contracts, those affecting workers with fixed term (temporary) and regulations applying to dismissals), and then into a single EPL index. In all these studies, both the scoring of the individual components and their

weighting into the various subindexes and further into the overall indexes has been controversial since virtually any method is subjective.⁷ While the scales of the indexes (the EPL of Allard and NEWEP of Blanchard) are almost identical ranging from 0-4, that of EP of Heckman and Pages) is quite different, the latter ranging from 0-18. Unfortunately, none of these indexes reflects by any means all of the labor market institutions (such as wage flexibility, team production, job rotation, social dialogue, pension plans of different types, and workers use of the courts) that one might think could exercise influence on economic outcomes of various sorts (Freeman 2008).⁸ Yet, as indicated both above and further below, each of them captures a number of important (largely common) dimensions of labor regulations and thus may be regarded as a measure of the restrictiveness of labor laws and regulations for firms in their use of labor. Since both also allow internally consistent comparisons over time, we deem it valuable to make use of them together.

To mitigate the problem of the differences between the Allard-Blanchard and Wolfers and Heckman-Pages indexes, as noted in Steps (1) –(3) above we make use of the way in which the various provisions of the labor laws from NATLEX and LEXADIN were coded into the 36 individual indicators and aggregated into three or four subindexes and then into the overall index in the Appendix to Djankov et al (2003) revised as BDLLS (2004). In this respect the ELRs of BDLLS are somewhat broader in scope than the other studies. Because it has scored each of 85 countries, including almost all of the 21 countries for which we have used Allard's ELR,⁹ 3 of the 5 other countries for which we have used NEWEP from Blanchard and Wolfers and the 21 LAC

⁷ Indeed, as shown by Addison and Teixeira (2003), the various variants of the aggregate indices that have arisen are not always highly correlated and their application to issues like unemployment rates has sometimes resulted in opposite findings. These and other authors also point out that what is relevant in constructing these indices may also vary from industry to industry.

⁸ Allard (2005b) creates for the same 21 OECD countries in her 2005a EPL indexes of unemployment benefits based in part on tax treatment and subsidies with duration and the conditions for qualification.

⁹ These countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

countries¹⁰ covered by Heckman and Pages (2000, 2004) for the year 1997, we use the ELR of BDLLS (2004) in order to provide consistency between the indexes coming from each of the other sources in LAMRIG.¹¹ For countries not included in the 85 country sample of Djankov et al (2003) and BDLSS (2004) the subsequent Rigidity of Employment (ROE) Indexes (based on mostly the same individual indicators) developed in the World Bank's *Doing Business Surveys* so that, for subsequent years 2003 and 2007 at least, so as to add as many as 60 more countries to the sample. The ROE indexes are, like the BDLLS (2004) ELR indexes, based on averages of the subindexes which are again averaged but in the later versions scaled on a 0-100 scale and since the aggregate ROE index is an average of these, it, too, is on a 0-100 scale. As described in greater detail below, the differences in scale used in these various BDLLS-related studies and Heckman-Pages (2004), Allard (2005a), Blanchard and Wolfers and OECD indexes were overcome by establishing average conversion factors between each of these scales in all cases normalized so as to be consistent with the BDLLS figures for 1995-9.

Both the country-specific Heckman and Pages Job Security Indexes and the Blanchard-Wolfers NEWEP indexes are then converted into indexes with bases 1995-9 = 1.0. Using the NATLEX data, the over-time variations in these indexes are then applied to the country-specific 1995-9 values in the BDLLS (2004) to construct over time variations in the country-specific ELR indexes for the countries included in the OECD and LAC samples. Since they were roughly on the same scale, the Allard indices were left as they were but aggregated from annual scores to

¹⁰ The LAC countries covered by Heckman and Pages include: Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guyana, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. They also included Mexico but for this country we have used Blanchard and Wolfers because of its more complete time coverage.

¹¹ Another reason for choosing the broader ELR index of BDLLS (2004) as the lynch-pin for our construction of LAMRIG is that these authors have shown it to have important consequences for labor market outcomes, perhaps stronger ones than have been obtained by other authors. For example, in their recent recapitulation of their results and attempt to rebut the criticisms raised of their study, La Porta et al (2008) have shown that a two standard deviation increase in ELR implies a 1.99 percentage point reduction in the male labor force participation rate, a 2.32 percentage point increase in the unemployment rate, and a 5.67 percentage point increase in the unemployment rate of young males.

their five-year averages. A similar procedure is applied to the more fragmentary evidence of over-time changes in the relevant components of labor laws for the remaining countries in the samples afforded by the BDLLS (2004) and subsequent *Doing Business* Surveys. Below we describe how these indices were also updated to 2000-4.

While others may wish to keep the various sub-indexes separate for use in different kinds of application, for the present purposes we keep the focus on a single broad indicator of the restrictiveness of employment laws. To avoid getting bogged down in the various possible weighting systems, moreover, we simply accept the equal weighting of the three sub-components as suggested by BDLLS (2004).

The end result is an unbalanced panel of Employment Laws Restrictiveness (ELR) indicators for well over 100 countries measured as 5-year averages ranging from 1950-54 through 2000-04, a dataset we call LAMRIG for Labor Market Rigidities. For some years there are as many as 145 countries with ELR scores. As has been pointed out by quite a few analysts (e.g., Eichhorst et al 2007, Freeman 2005, 2008), whether higher scores are looked as desirable or undesirable is subjective. For example, employers associations and individual employers typically view them as harmful to investment, employment, productivity and the long run interests of workers. But, those supporting labor interests and those interested in “public welfare” and human rights often see them as good, helping to increase the legitimacy of working outside the home for individual workers and thereby creating larger and better organized labor markets. Others (Boeri et al, 2000, Nicoletti et al, 2000, and Amable et al., 2007) view the “goodness” or “badness” of such indexes to be more complex, depending on the identity and magnitude of other market imperfections, regulations and so on. We are agnostic on this, but given considerable evidence suggesting that higher scores are associated with higher informality or unemployment rates and lower labor force participation rates, we use the term “reform” to refer to a reduction in

these indexes and “reform reversal” to refer to an increase in these indexes.

For the 21 OECD countries covered by Allard (2005a), her series were used to construct an index from 1950-4 through 2000-4 and then converted to a 0-3 scale so as to coincide with those of BDLLS (2004) for the period 1995-9. For three of the OECD countries covered by Blanchard and Wolfers but not by Allard (Korea, Mexico and Turkey), the BDLLS numbers were extrapolated backwards to 1960-4 based on an index with 1995-9 = 1 constructed from Blanchard and Wolfers NEWEP, although as described below additional information from other studies has been used, especially in the case of Korea.

Two countries covered by Blanchard and Wolfers but not by Allard, Luxemburg and Iceland, were not covered in BDLLS (2004). They were, however, covered in the World Bank’s *Doing Business* 2008 (pertaining to 2007) as “Rigidity of Employment Index”¹² and rescaled from 0-100 to 0-3. This index was scaled differently but based on similar methodology to the Employment Laws Index of BDLLS (2004) as explained in *Doing Business*. The values from the *Doing Business* scale for these two countries were then extrapolated backwards to 1995-9 on the basis of information in NATLEX or LEXADIN website and other sources and converted to those of BDLLS (2004) scale as indicated in Step (3)-(5) above and on the basis of the Blanchard and Wolfers (2000) data base for NEWEP.

As indicated above, for Latin American and Caribbean (LAC) countries for which 1995-1999 values of ELR were available from BDLLS (2004) (other than Mexico which was covered in Blanchard and Wolfers (2000)), the interpolation backwards was based on the Job Security Index of Heckman and Pages (2000), certain refinements thereof for the dates of reforms contained in Heckman and Pages (2004) and information from the NATLEX and LEXADIN

¹² This index combines sub-indexes for (1) alternative employment contracts, (2) conditions of employment, and (3) job security. See also World Bank (2004).

electronic data depositories, and other sources identified in the Appendix.¹³ Specifically, the Heckman and Pages numbers were calculated as the total costs of firing a worker relative to wages in 1987 and in 1999. We calculated the ratio between the 1987 number and the 1999 number for each nation in the Heckman and Pages study, and used this as an index to extrapolate the index number in the BDLLS study backwards to the 1985-1989 period for each nation. But since Job Security (or costs of firing workers is only one component of the Employment Laws Index of BDLLS, we also depend on our own evaluations of the Labor Laws for the other more straight-forward components of the index For the 1990-4 value we made use of NATLEX and other studies to identify changes and if these occurred to approximate the magnitude based on the relative importance of the items changed based on NATLEX or LEXIDIN. Similarly, NATLEX was also used to extrapolate the ELR indexes backward in time in a way consistent with the BDLLS (2004) matrix of the scores assigned to each of the 31 components of ELR.

For those LAC countries (Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Paraguay) for which there was no observation for the Employment Laws Index in BDLLS (2004), but there did exist a score on the closely related Rigidity of Employment Index for either 2003 or 2007 from the World Bank *Doing Business* volumes for 2004 and 2008, a similar procedure was used as that described above for Iceland and Luxemburg in the OECD sample to interpolate backwards to 1995-99. For Chile, even though over time values were included in the Heckman and Pages (2000) study, because of its greater detail and longer time coverage, the index was interpolated back to 1960 based on the Job Security Index data presented by Montenegro and Pages 2004 (Figure 7.1). Wherever possible, these indexes for Latin America

¹³ This index was computed as the expected discounted cost at the time a worker is hired of dismissing the worker at some time in the future based on existing labor law (but excluding the costs of court actions). It makes use of a common discount rate of 8 percent and assumed turnover rate of 12 percent¹³ and the costs (inclusive of those related to seniority) of dismissing a worker (for justified and unjustified reasons).

and the Caribbean were interpolated backwards from there to the late 1980s based on Heckman and Pages (2004) and to earlier years based on the various provisions in the earlier employment laws from NATLEX and LEXIDIN. In cases where there was no new Employment Law between dates covered, such as in Haiti between 1984 and 1995-99, the resulting index values were assumed to remain constant between those dates. For LAC countries not included in Heckman and Pages for which Djankov et al (2003) or BDLLS (2004) was available or could be constructed based on conversions from the subsequent Doing Business surveys, namely, Guatemala and Haiti, the values were interpolated backwards solely based on our scoring of the changes in the individual provisions of the employment laws as reported in NATLEX and LEXIDIN. Two other LAC countries, Belize and Suriname had to be dropped from the present study for lack of data.

To repeat, the 1995-9 values for all these countries have been constructed in such a way as to be consistent with what the BDLLS (2004) did or would have done with their methodology.

As indicated above, for countries outside of the OECD and LAC regions, data on employment rigidities are much less complete and rarely if ever already developed into an index over time. Some early studies identifying the effects of employment laws were Fallon and Lucas (1991, 1993). They identified law changes in both India and Zimbabwe that had the effect of tightening labor regulations and claimed that in both cases the result was lower formal sector employment of industrial labor.

Once again, our first step is to make use of the BDLLS (2004) and subsequent Doing Business surveys for 2004 and 2008, for arriving at values of the index for 1995-99 that would be comparable to those for the BDLLS (2004) indicators. In these cases, we went country by country, making use of NATLEX, LEXADIN and published papers covering that country in order to interpolate the indexes backward in time to the extent possible.

For example, Gerardo Sicat’s article “Reforming the Philippine Labor Market” provided us with ample data of Philippine labor regulations. This source discusses changes in labor law/regulation and the actual impact they have on labor regulation (and the ease of employing workers) – whether they make regulation stricter or looser. Starting with our 1999 BDLLS number, we assessed the impact of previous changes in labor regulation and worked our way backward.

For India we made use of Dutt (2002), Dutta Roy (2004), Besley and Burgess (2004) and Pages and Ahsan (2008) and other materials identified in Section IIIB below. The latter two of the studies identified above make use of state-specific changes to the federal-level Industrial Disputes Act of 1947. This is relevant because in India’s federal system states are also granted the power to regulate industry, labor, health and other matters. A problem with the state level data is that some states were liberalizing while others were tightening regulations, making it difficult to aggregate them into all-India changes. As noted below, we did so very crudely based on the number of states moving in either direction, the magnitudes of these changes and the sizes of the respective states. Note also that Bhattachajea (2006) has criticized Besley and Burgess (2004) and Pages and Ahsan (2008) though more for their analysis of the effects than for the scoring of the amendments. It should also be admitted that most of these indexes for India pertain exclusively to manufacturing (and even within manufacturing there may be differences).

For the remainder of our countries (primarily Africa, Asia and the Middle East), the International Labor Office’s *NATLEX* database provided us with the majority of our data. Similar to our process for the Philippines, we gauged the effect of previous changes in labor regulation and adjusted BDLLS ELRs across different time periods accordingly. In each such case, we gain made considerable use of the appendix materials for BDLLS (2004) containing the scores assigned to the countries included in that study for all 31 sub-indicators. For the nations

for which a 1995-1999 BDLLS ELR did not exist, we used the subsequent rankings and indexes on ease of hiring and firing workers in the *Doing Business* Surveys of 2004, 2007 and 2009 as described above for OECD and Latin American countries.

There were, however, some instances where we found inconsistencies between BDLLS (2004) and *Doing Business* evaluations that could not be attributed to labor law changes and therefore did not use this method of conversion. For Iran, for example, which was not included in BDLLS (2004) but was included in subsequent editions of *Doing Business*, we have made use of the relevant components of the index of Labor Market Flexibility by Gholam Reza (2009) which covers the entire period 1960-2006 even though it also includes minimum wages and other unemployment insurance requirements. For a few countries that have received considerable attention by individual scholars or international organizations, we have made considerable use of these studies. Illustrative examples of this are given in the following section.

III. LAMRIG: Country examples

As has been widely observed, labor market regulations tend to be much more static over time than other types of regulations. This may well be attributable to the numbers of parties that are generally involved in making changes to labor regulations (firms of different ownership types, sizes, sectors, workers of different types, managers of different backgrounds, government bureaucrats from different ministries, labor unions of different types and sizes, employer organizations, intermediaries between business and labor, and the judiciary).

Despite the fact that there are quite a few countries that have experienced little or no change in their ELR scores over the entire period, in each region, there are also countries whose scores have changed from one 5 year period to another, resulting in some interesting differences over time as well as across countries and regional or other groupings. This section examines some of

these patterns of change in individual countries so as to provide a flavor of LAMRIG.

In their exposition of their indicators of the restrictiveness of labor laws, BDLLS (2004) illustrated the indexes and the relevance of differences in legal tradition by comparing New Zealand and Portugal, two countries at fairly similar income levels(at least in the late 1990s) but different legal traditions and ELR scores in 1997. In particular, Portugal was an example of a country with French Civil Law background and a high ELR Index of 2.36 (3.7 on Allard's EPL index) while New Zealand was an English Common Law country with a low ELR index of 1.06 (0.7 on Allard's EPL index). They illustrated the sizeable differences between these countries with reference to the various subcomponents of their index, making the sizable difference between their respective overall index scores understandable. As shown in Figure 1a, for LAMRIG New Zealand has had a low score of 0.48 for the entire time between 1975-9 and 1995-9 before rising slightly to 0.50 in 2000-4. In the 1960's, however, its ELR score was lower still at 0.14. Portugal, by contrast, had its high LAMRIG score of about 2.4 ever since 1985-89. Notably, however, in the early 1950s and even in the 1960-4 period, Portugal's score of 0.066 was slightly lower than that of New Zealand's at that time. Clearly, if the 1950s or 1960-4 scores had been used, this comparison would not have served the purpose of showing that the French civil law tradition gives rise to greater restrictiveness in labor legislation than does the common law tradition. Moreover, with such sizeable changes in relative rankings over time, it is unclear why the legal tradition should matter much since the legal tradition almost never changes over time. As indicated above, the changes over time in OECD and Latin American countries have already been rather extensively documented by the several already cited studies done on these regions.

Therefore, to illustrate some other interesting differences in the index over time, also in Figure 1 we show the LAMRIG values for other countries from outside the OECD. Firstly we look at India, China, and Brazil in Figure 1b. It is important to note that these countries represent

three different legal traditions: English, Socialist and French, respectively. China's LAMRIG started high with a score of 2.5 but it declined in the late 1970s, again in the late 1980s and still again in each of the next three periods, reaching a relatively moderate LAMRIG score of 1.42 by 2000-4. It is also very interesting to notice that the India trajectory is radically different supporting the view that labor market regulations have become increasingly more rigid over time, including the period following the great liberalization reforms in India in 1991. Finally, according to our LAMRIG figures, Brazilian labor regulations have been similarly rigid from 1960 to the late 1980s. The immediate effect of the promulgation of the new constitution in 1988 was to make these laws even less flexible, but with economic stabilization and further reforms in the mid 1990s, our LAMRIG scores rebound to the original levels. Nevertheless, labor regulations in Brazil seem to be the most inflexible in this group of large emerging markets.

Finally, Figure 1c shows the behavior over time of the LAMRIG scores for a few selected developing countries from various regions of the world: Botswana, Ethiopia and Zambia from Sub-Saharan Africa, Jordan from the Middle East and the Philippines from Asia. There are quite substantial changes in the rigidity of employment protection legislation over time in this group of countries. Ethiopia and Philippines have seen their LAMRIG averages rise over time. Jordan's LAMRIG was steady at a relatively high value of 2.7, before falling substantially in 1995-9 and then rising again slightly in 2000-4. Botswana's LAMRIG index started very low at 0.9 in 1970-4, rose gradually to 1.3 in the 1990s before falling to 1.05. Zambia's LAMRIG fluctuated a bit more but remained fairly low over the whole period.

In summary, the behavior of our LAMRIG score over time and across countries does seem to confirm the commonly held view that these regulations change do indeed very slowly over time. However, our LAMRIG scores show that the intensity and to a lesser extent the direction of these changes in regulations vary quite dramatically over time but also across countries. Finally,

and arguably more importantly, the descriptive analysis above raises important questions about the strength and nature of the relationship between origins of the national legal systems and employment protection legislation. In the next section we evaluate this relationship in a systematic manner.

IV. Assessing LAMRIG: Data and Methodology

In this section we discuss the methodology we choose to assess the applicability of the empirical specification used in BDLLS (2004) to explaining variability across the larger number of countries in our considerably extended ELR/LAMRIG index. We then go on to investigate its applicability to explaining variations over time as well. In this latter and more important application we draw from a broader list of explanatory variables, including some based on political economy considerations such as crises, and reforms of various sorts.

Before engaging in any of these extensions, we wish to determine whether or not we can replicate their BDLLS (2004) results in a cross-sectional setting. ly, Based on the specification in their Table IV, the first model we estimate takes the form:

$$LAMRIG_i = \alpha_i + \beta_1 GDP_i + \beta_2 LO_i + \varepsilon_i \quad (1)$$

where $LAMRIG_i$ is our index of Labor Market Rigidity for country i , GDP_i is the log of per capita GDP, and LO_i is a set of dummy variables for each of the following legal origins (, French, German, and Scandinavian civil law, Socialist and English common law) in each case for country i . BDLLS estimate this model by OLS with robust standard errors and data for the 85 countries in their sample for the year 1997. They find that legal origins are a much more important determinant of labor market reform than per capita GDP. They argue that this result favors the legal theories of institutional changes (and, by the same token, belittles the two other theories

they identify, the efficiency and political theories.)

We then subject this baseline model to various robustness checks. These extend it to applying the model to explain changes in the LAMRIG indexes over time, to dividing the sample into OECD and non-OECD countries¹⁴, and into the pre- and post-1980 time periods.¹⁵

Our second step is to utilize estimation strategies that would more fully exploit the panel structure of our data and therefore departing from OLS as the estimation procedure. While the use of a fixed-effects estimator would be a natural starting point, since the most important variables in the BDLLS (2004) exercise, legal origins, are time-invariant, our starting point is the following random-effects model:

$$LAMRIG_{it} = \alpha + \beta_1 GDP_{it} + \beta_2 LO_i + \varepsilon_{it} \quad (2)$$

where again $LAMRIG_{it}$ is our index of Labor Market Rigidity for country i at period t . The subscript t refers to a 5-year period, where the measure is the average over the whole period. Nine periods are included: 1960-1964, 1965-1969, 1970-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-2000 and for LAMRIG, 2000-4. In order to minimize country-specific errors, we clustered the standard errors at the country level. Using the random-effects estimator, we also carry out the same split-samples checks as for the baseline model, namely for OECD versus non-OECD and pre- and post-1980.

While the above specifications are clearly for the levels of LAMRIG, we define reform as changes in these levels, leading us to the third step in our estimation strategy, namely, to estimate changes in levels of LAMRIG. Since it is quite likely that either the level of the index or (perhaps because of reform momentum) the change in that index may affect the likelihood and magnitude

¹⁴ The rationale for this is that richer countries may face quite different political and institutional constraints in modifying their labor laws than poorer countries.

¹⁵ This split is motivated by the fact that 1980 marked the beginning of a period of considerably greater economic reform in countries around the world than in preceding years.

of reform in the next one, we add a one-period lag (i.e. 5 year) lag of the dependent variable to the baseline BDLLS model.

$$\Delta LAMRIG_{it} = \alpha + \beta_1 \Delta LAMRIG_{i,t-1} + \beta_2 GDP_{it} + \beta_3 LO_i + \beta_4 X_{i,t-1} + \varepsilon_{it} \quad (3)$$

where $\Delta LAMRIG_{it}$ is the change in our index of Labor Market Rigidity for country i between period t and period $t-1$, with periods defined as before. This model will be estimated at first using the random-effects with standard errors clustered at the country level and later using the Blundell-Bond System GMM estimator appropriate for models like this where elements of lagged dependent variable appears on the right hand side of the equation. To avoid the inconsistency that would arise in this case, we make use of the System GMM estimator is specifically designed to address. Finally, we re-estimate this model by adding variables for four different groups of factors (in $X_{i,t-1}$) namely, political crises, economic shocks, structural factors and other reforms. As the notation indicates, we always enter these factors lagged one-period. This is not only to minimize endogeneity concerns but also avoid the problem that could arise because of the somewhat lengthy time period covered by a single observation, wherein a change in LAMRIG occurring early in the period could be affected by a change in any of the explanatory variables occurring later in the same period

Aside from the LAMRIG index constructed as described above, the data for the other two variables in the baseline model GDP per capita and legal origins are taken from the Penn World Tables and the legal origins classification provided in BDLLS (2004). For the structural variables included in the model, namely, the Gini coefficient, the Government share of GDP, the ratio of foreign aid to GDP, the share of natural resources exports in total exports and share of agriculture in GDP, we make use of data from World Development Indicators.

For economic crises we include several different measures,¹⁶ namely, the largest single year GDP fall in percentage points that occurred in each five-year period (Max fall GDP), the number of years of negative GDP growth (between zero and five for each of the 5-year average period), the current account balance (CAB)¹⁷, the number of years in a debt crisis within each five year period (Debt Crisis), and a dummy variable for periods in which annual inflation was above 50%.

Regarding political crises, we limit our attention to the following indicators. The first group comprises count variables for both the assassination of important political leaders and general strikes during each five year period. Both of these variables originate from Banks (2005). The second group comprises the democracy measure (from the POLITY IV data set) and also the Political Constraints Index (POLCON) provided by Henisz (2000). The Polity IV democracy variable is used to control for relative levels of democratic freedoms (coded on a 1 to 10 scale, with 10 indicating the highest level of democracy). The stronger is democracy, the more the median voter might be expected to exercise influence. Yet, because the median voter is more likely to be a worker or even a union member than an employer, the influence of democracy on labor market liberalization could be ambiguous or perhaps even negative. POLCON measures the number of veto points in a political system, the expectation being that the more potential vetoes which need to be circumvented, the less likely it is that labor market reforms will be adopted. The third and last group contains a measure of the intensity of civil war and of the intensity of international armed conflicts. Data for constructing these measures is from the *Correlates of War* project at the University of Michigan.

Finally, we investigate the role of other structural reforms – in particular, financial and

¹⁶ For a review, see Furman and Stiglitz (1998) and Ishihara (2005).

¹⁷ CAB is an inverse measure of crisis.

trade liberalizations, in affecting the probability and magnitude of labor market reform.¹⁸ We proxy financial reform by two measures: the share of credit to the private sector in GDP, and an index of financial development that reflects not the overall size of the financial system but its efficiency levels. In the case of trade liberalization, we use four different measures. One is the length in years of uninterrupted trade liberalization derived from the Appendix 2-B of Warziarg and Welch (2003). Another measure is a measure of trade openness from PWT (*openk*, exports plus imports as a share of GDP). A third is the trade liberalization index developed by Campos, Nugent and Hsiao (2010), which represents an extension of the Sachs and Warner (1995) measure of trade openness that was already corrected and extended from 1970-1989 to 1990-99 by Wacziarg and Welch (2003).¹⁹ Since Rodriguez and Rodrik (2000) and Rodriguez (2006) had provided a powerful critique of the efforts of Sachs and Warner (1995) to apply their “open” measure to cross-country growth rates, we have incorporated these views in this modified measure of trade reform, especially with respect to the way the export marketing boards (XMB) component of “open” was calculated and the threshold of tariff rates distinguishing an “open” from a “closed” economy.²⁰ Fourth, since these authors showed that reducing the black market premium (BMP) was the most important reform in terms of stimulating growth, we have also

¹⁸ On the relationship between trade liberalization and labor market reform see Fajnzylber and Maloney (2005), and references therein. Idem for financial reform and labor market reform, see Pagano and Volpin (2008).

¹⁹ More specifically, these authors defined a country as closed (i.e., $open = 0$) if it had any one of the following: (1) an average tariff rate of 40 per cent or more, (2) non-tariff barriers covering 40 per cent or more of trade, (3) a black market exchange rate that is depreciated by 20 percent or more relative to the official exchange rate, (4) a state marketing agency or board for major exports, and (5) a socialist economic system (as defined by Kornai 1992).

²⁰ Rodriguez (2006) pointed out that not all export marketing boards are distortive in the sense of discriminating against producers for export markets. For this reason, in our construction of the XMB component of “open” we take advantage of more recent information on XMBs (from World Bank and other sources) that distinguish between those marketing boards that in practice discriminate against producers for export and those which do not, as well as some of their other suggestions. With respect to the tariff rate threshold we follow Warziarg and Welch (2003) in using a lower tariff rate threshold (20% instead of the 40% in the original S-W) to distinguish “open” from “closed”.²⁰ Since most countries in the world had fallen below the 40% threshold by the mid- 1990s, this change has the effect of giving more weight to tariff barriers in the classification, something which had led Rodrigues and Rodrik (2000) and Rodriguez (.2006) to argue that the tariff component was actually playing virtually no role in the Sachs-Warner open measure.

made use of BMP by itself, again as an inverse measure of trade reform. .

V. What are the determinants of LAMRIG?

Next we turn to an assessment of the ability of the aforementioned alternative models to explain variations in LAMRIG both across countries and over time. Given that the lynch-pin for our construction of LAMRIG was the BDLLS (2004) data set for 85 countries circa 1997, we begin our assessment in Table 1 by trying to replicate the findings in Table IV of that study. That table related their ELR index to the log of per capita GNP, and dummy variables for Socialist, French, German and Scandinavian legal origins (English Common Law being the omitted legal origin type). The results they reported for their sample of 85 countries in 1997 are reported in column (1) of Table 1. As can be seen, the explanatory power of the model was high and although the income per capita measure was insignificant, the four legal origin dummy variables had highly significant positive effects on ELR. This supported their main claim that legal theories provide a much better explanation for the observed variation in employment protection legislation across countries than what they call efficiency theories.

In column (2) of this table we repeat their analysis to explain variations in our similarly based LAMRIG for the same year (actually for a cross-section of countries in our period 1995-1999) but using a larger sample of 142 developed and developing countries. Notice that the effect of income per capita is now negative and significant (providing more support for the efficiency theory) but the effects of all four legal origin dummy variables have even stronger positive and highly significant effects on LAMRIG (again supporting the legal origins theory).²¹

²¹ This result may not seem entirely surprising when one considers that our LAMRIG index is available for 142 countries (compared to BDLLS's original 85 countries) with most of the difference naturally accounted for by lower income countries. Yet we should not underestimate the implications because including these poorer countries challenge the conclusion about the explanatory supremacy of legal origins (a finding that has not been restricted to employment protection legislation but also to other areas such as financial development).

Yet our more fundamental extension of the BDLLS dataset is its extension over time going back to the early 1950s in quite a few cases with a pooled panel data now consisting of more than 850 observations. Given our earlier observation that in the 1950, 1960s and even 1970s, the ELRs were rising before stabilizing and declining in some cases in recent years, in columns (3) and (4) we break the sample into pre and post-1980 observations. While these are very similar for the French and German legal origin dummies, there are some notable differences in other respects. When split this way and using the between-effects panel estimator, the negative coefficient of the Log Per Capita GDP is again statistically significant in both periods but quite a bit larger in the Pre-1980 sample (these results are obtained). On the other hand, the impact of the Scandinavian dummy is larger (and statistically significant) in the post 1980 sample.

Columns (5) and (6) provide the results obtained by splitting the sample not by time period but by income level, i.e., into OECD and non-OECD subsamples. Notice that in our case and in contrast to BDLLS, the non-OECD sample is considerably larger than the OECD sample. While once again the various Civil Law dummies are shown to have significant positive influences in both samples (when there is sufficient variation of these variables in the sample to allow coefficients to be estimated), the French Legal Origin dummy has a much weaker effect in the non-OECD countries than in the OECD sample emphasized by BDLLS. The most striking difference between the samples, however, is the difference in the effect of per capita GDP, large and positive in the case of the OECD sample, but negative and significant in the non-OECD sample. These results suggest that employment protection legislation tends to be more rigid among the richer countries within the OECD but less rigid among the richer countries outside of the OECD.

Given the aforementioned absence of change over time in the legal tradition upon which each country's legal system is based, as noted above, if fixed effects were used to account for

unmeasured, non-changing influences, the parameters for legal origin dummies could not be estimated. We proceed in the rest of our empirical analysis to estimate not the levels of LAMRIG but rather the changes in LAMRIG. As explained in Section IV, this makes it appropriate to start estimating the relationships in the LAMRIG panel with random effects and standard errors clustered at the country level with equation (3) above.

Table 2 reports the results obtained for changes in LAMRIG first for the full sample (an unbalanced panel of 855 observations) and then for the same subsamples as in Table 1 but now using random-effects estimator.²² Once again, we find considerable variation across samples in the effects of Log Per Capita GDP, positive and significant in the pre 1980 sample and negative and significant once again in the non-OECD and now also in the OECD samples. For the full and post-1980 samples, the coefficient of Log Per Capita GDP is not statistically significant. With the minor exception of the Scandinavian Legal Origin dummy (for which there is little variation in our samples), the coefficients of the various Civil Law Origin variables are no longer positive and statistically significant on a consistent basis, and in fact are small but negative and significant in the non-OECD sample (a finding that is opposite to that of BDLLS). In general, therefore, when it comes to changes over time in employment laws, these results challenge the notion that legal origins provide a more powerful explanation than efficiency or development level (per capita GDP). Next we turn to an evaluation of the third type of theory regarding the determination of labor market regulations that BDLLS had considered, namely, political theories. The intuition behind these theories is that if workers have more political power, they would be able to succeed in getting less flexible, more protective employment laws passed. Workers can further their

²² We report estimates from the Blundell-Bond System GMM estimator with Windmeijer-corrected standard errors. The results from Arellano-Bond test for serial correlation in the first-differenced errors and from the Sargan test of overidentifying conditions are reported at the bottom of each table. As it can be seen, by and large, they strongly support the validity of the underlying moment conditions.

political power not only through traditional organizations (like trade unions and their legal use of strikes), but also through other political institutions, such as democratization, constraints on the executive power, and extreme manifestations in terms of political instability (e.g., civil and international wars.) We investigate the explanatory power of these political theories using the same random-effects estimator we used in Table 2. Since the results failed to provide support for any of these six different political measures but left all other results largely unaffected, we do not report these results here. However, since the random effects panel estimator fails to deal with the bias and possible inconsistency arising from the inevitable correlation between the error term and the lagged dependent variable, we repeat estimation of the model with the different political measures but using the more appropriate Blundell-Bond System GMM estimator.²³ Table 3 reports the results from the latter.

Table 3, therefore, permits a comparative evaluation of all three theories. For changes in employment laws at least, in contrast to BDLLS, it suggests little support for either the political or legal origins explanations. The results for each the six different political measures are presented in the six columns of the table, those for Democracy in column (1), the political constraints index (POLCON) in column (2), assassinations in column (3), strikes in column (4), and international and civil wars in columns (5) and (6), respectively. Democracy has a negative but insignificant effect on the change in LAMRIG as does POLCON which is often considered another measure of democracy reflecting the extent of checks and balances. So too neither strikes, nor assassinations, civil and international wars have significant effects on labor market reforms. Note that now none of the legal origin dummies have significant effects on the change in LAMRIG in any of the columns. The negative and significant effects of per capita GDP (in logs),

²³ We investigated whether there are important non-linearities in the effects of per capita GDP but did not find any supporting evidence.

however, are retained in all but one set of estimates. In these estimates, moreover, there is also a positive effect of lagged LAMRIG (indicating that once labor market reforms starts, it tends to feed on itself) in all specifications. This finding is quite consistent with the quite different trends between countries with initially low LAMRIG indexes and those with initially high ones in Figure 1 and the upward trends for Portugal and New Zealand whose initial LAMRIG scores were very low, and the downward trends from initially high scores for China and Jordan.

Given that neither political factors nor legal origins account for the cross-country over time variation in LAMRIG, what does? The political economy literature suggests various interesting candidates (Drazen 2000, Persson and Tabellini 2000). Tables 4, 5 and 6 examine various other factors that have been highlighted therein, namely: structural features of the economy, economic crises and other structural reforms, respectively.

Table 4 reports the System GMM estimates when the added variable is one or another of the following structural variables: Gini coefficient for income inequality, the government share in GDP, the share of foreign aid in GDP, natural resource exports as a share of total exports and the share of agriculture in GDP. Except in column (1) with the Income Gini as the structural indicator which because of missing data for this variable greatly reduces the size of the sample, the effect of the lagged dependent variable is always positive and significant and in most cases, the effect of GDP per capita is negative and significant and as in Table 3 the legal origin dummies are never statistically significant. The primary news in Table 4, however, is that none of the individual structural indicators has a significant effect on the change in LAMRIG. One should notice, however, that due to missing observations on these additional variables, the sample sizes are considerably smaller in this table, especially in column (1) and (5).

In Table 5 we present estimates similar to those of Table 4 for changes in LAMRIG but in this case with five different measures of economic crises. Column (1) presents the results when

the crisis is a debt crisis. Columns (2) –(5) report the corresponding results when the crises pertain to inflation rates above 30% per annum, a period including a year with the largest fall in GDP during the period covered, the number of years of falling GDP within the five year period, and high unemployment , respectively. The effects of Log Per Capita GDP are negative and significant in all columns and the only economic crisis variable that is found to play a role is, maybe unsurprisingly, unemployment. When unemployment is high it tends to lower LAMRIG, i.e., implying loosening of the labor regulations. This is a very important result for at least two reasons. The first is that it provides some support for the commonly held view that crises beget reforms but also introduces some potentially interesting refinements in this view: certain types of crises or only specific features of economic crises are conducive to economic reforms (Campos, Hsiao and Nugent, 2010). Secondly, the strong association between labor market reform and lagged unemployment rates that we find raises important questions to the vast literature examining the impact of labor market institutions on labor market outcomes. The latter studies often assume not only that labor market institutions do not change over time, but also that causality flows in one way only, from institutions to outcomes (unemployment, of course, being one of the main labor market outcomes of interest). Other than unemployment, none of the other economic crisis variables turns out to have a significant effect on the change in LAMRIG.²⁴

Finally, in Table 6, to our basic specification we add alternative measures of other types of reforms, in each case lagged to avoid the simultaneity and other problems identified above. In columns (1) – (3) we present the results for three alternative measures of trade reforms. Column (4) presents estimates when the added variable is the black market premium (BMP), an inverse measure of trade reform. Columns (5) and (6) present results for two alternative measures of

²⁴ We have also run all these specifications for each legal origin sub-sample and do find that this had an impact in the main results.

financial market reform/development, namely, the share of credit to the private sector in GDP and the Financial Reform Index, respectively. Again all previous results apply: positive effects for the lagged change in LAMRIG, negative effects of per capita GDP and no significant effects from the legal origin dummies. The effects of the various lagged measures of other reforms vary considerably from case to case. Trade openness as measured by the first two measures in columns (1) and (2) reveal positive and significant effects on LAMRIG changes. In the same spirit, an increase in the BMP premium has the effect of reducing LAMRIG. Taken together, these results suggest that trade liberalization slows down labor market reform.²⁵ By contrast, neither of the two financial reform measures has a significant effect on changes in LAMRIG.

We have also studied a few important additional issues. Cultural factors provide another explanation for the cross-country variation in labor market institutions. Mobility involves substantially higher costs in societies in which family ties are stronger. This leads to individuals with stronger family ties to support more rigid labor markets or stringent labor market regulations. Alesina et al. (2010) present broadly supporting empirical evidence (controlling for legal origins) using World Value Surveys data for about 60 countries in two points in time. Using LAMRIG we replicate this result, yet only based in less than 100 observations. The second important issue is the role of foreign pressure in implementing labor market reform. Our results show that the share of foreign aid in GDP does not seem to be an important factor. However, recent research has focused on U.S. preferential trade agreements and the role official petitions play in this process (Frundt, 1998). We have collected this information and evaluated how it relates to LAMRIG. We find little evidence that neither the existence of a preferential trade agreement with the U.S. or official complaints against violations of international labor conventions is significantly related to

²⁵ On the relationship between trade liberalization and labor market reforms see Artuc et al. (2010), Cosar (2010), Helpman and Itshoki (2010), Kambourov (2009) and Goldberg and Pavcnik (2007).

LAMRIG or to changes in LAMRIG. The third and finally, we have also investigated lagged level of LAMRIG instead of lagged changes. We find that the lagged level is always negative and significant providing evidence of a dominant convergence process (countries with more rigid labor markets tend to reform more.)

VI. Conclusions and Future Research

The substantive results presented here are clearly only the beginning of a fuller analysis. We would like to further examine the robustness of the results, e.g., when several of the additional variables are retained in the estimating equation at the same time, or with more refined measures of some of the variables used. Similarly, in view of the differences in some of the effects between pre and post 1980 samples and between OECD and non-OECD samples, it would be desirable to examine the robustness of the results of the more inclusive specifications to different samples. Yet, with the data available at present, because most such investigations would greatly reduce the number of observations, these extensions may not be promising until data becomes available.

(1) The fact that the earlier cross-sectional results of BDLLS are replicated and indeed somewhat strengthened when their specifications of the contending theories are applied to our substantially expanded LAMRIG data base. In other words, the Socialist and civil law origin countries are associated with significantly more rigid labor market law indexes than are the common law countries.

(2) Nevertheless, when the dependent variable becomes the change in LAMRIG from one five year period to the next but without the lagged level or changes in LAMRIG, the effects of the legal origin measures are diminished substantially but are still positive and significant,

(3) When lagged values or changes of LAMRIG are introduced to reflect persistence or dynamics in the effects, the effects of the legal origin variables totally disappear, but the effects

of the lagged changes in LAMRIG become consistently positive and significant and those of per capita GDP consistently negative and significant.

(4) When in addition political factors (democracy, political constraints, strikes assassinations or wars) or structural measures (income inequality, the shares of government, foreign aid, agriculture in GDP or of natural resource exports in total exports) are added as in Tables 3 and 4, none of these measures turns out to exert a statistically significant influence on the change in LAMRIG. All other results, however, are left unaffected. The same finding applies to various measures of economic crises (debt, inflation, falling GDP) when such measures are introduced in Table 5. An important exception, however, is when the crisis measure is the unemployment rate. In this case, higher unemployment rates are associated with downward (i.e., liberalizing) movements in LAMRIG,

(5) Consistent with the findings of other studies, the results in Table 6 show that labor market reforms may be affected significantly by lagged trade reforms. In particular, lagged trade reforms are shown to have a significant tightening effect on labor regulations. On the other hand, we find no significant effects of our measures of financial reforms or development on changes in LAMRIG.

(6) With respect to future research, in addition to the additional robustness checks and improvements in some of the measures of variables identified above, it is our intent to:

(a) Further improve on LAMRIG by digging deeper into the ever-improving availability of information on labor laws over time and across countries,

(b) Possibly to follow the lead of some researchers on OECD countries to annualize the data on LAMRIG as well as the related variables used to explain changes therein over time,

(c) To extend the use of LAMRIG to examine its effects on labor market and other phenomena as BDLLS and many others have with somewhat smaller data sets.

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Figure 1. Rigidity of Employment Protection Legislation across Countries Since 1960

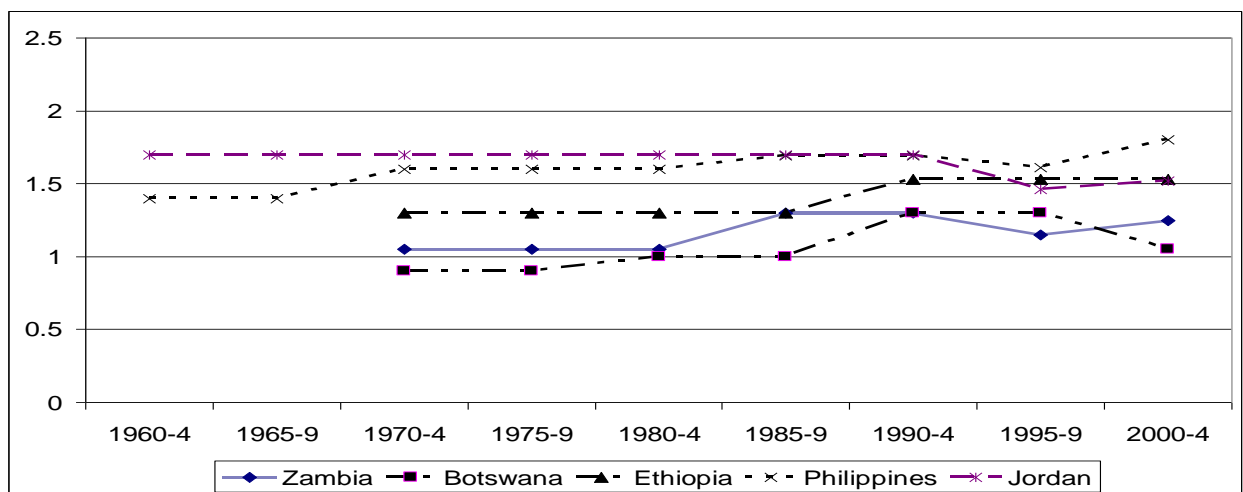
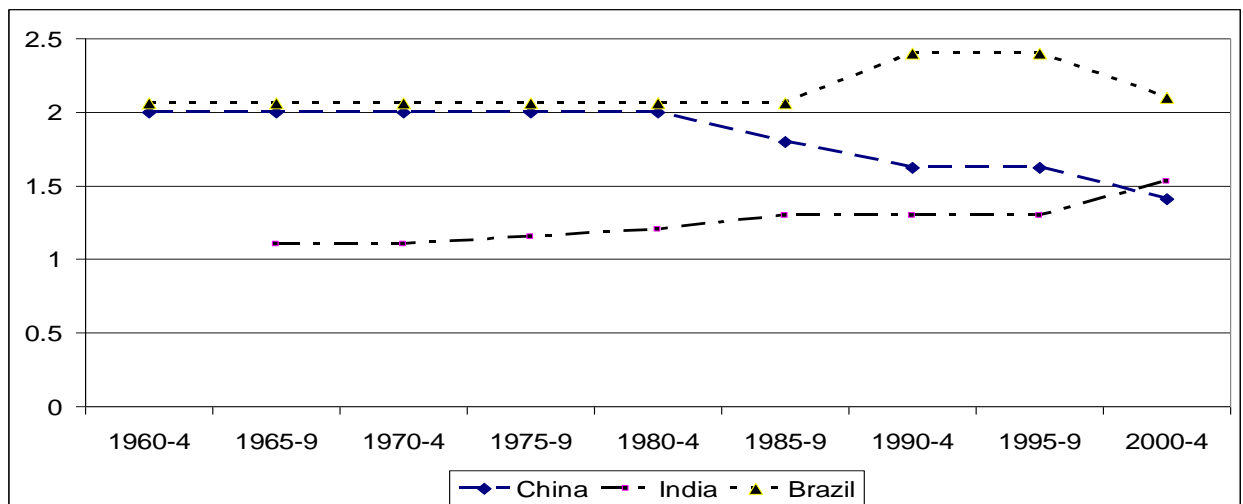
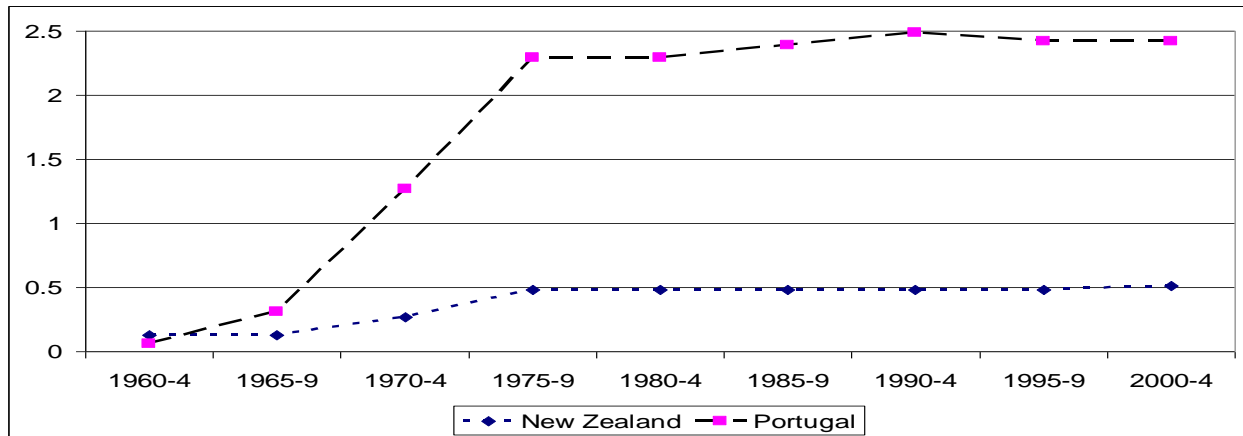


Table 1
The Extent of Labor Regulation, Legal and Efficiency Theories
(Dependent variable: Level of LAMRIG, Labor Market Rigidity)
Columns 1 and 2: OLS. Columns 3-6: Between-effects Panel Estimates

	[1]	[2]	[3]	[4]	[5]	[6]
	BDLLS (2004)	Botero & LAMRIG	Pre 1980	Post 1980	OECD	Non-OECD
<i>Log Per Capita GDP</i>	-0.001 [0.0116]	-0.0775*** [0.0295]	-0.227*** [0.0621]	-0.0890** [0.0352]	0.321 [0.382]	-0.0805* [0.0413]
<i>Socialist Legal Origin</i>	0.2943*** [0.0453]	0.721*** [0.116]		0.775*** [0.130]		0.764*** [0.131]
<i>French Legal Origin</i>	0.2474*** [0.0381]	0.462*** [0.0696]	0.610*** [0.113]	0.509*** [0.0781]	1.098*** [0.288]	0.393*** [0.0802]
<i>German Legal Origin</i>	0.1553** [0.0702]	0.516*** [0.116]	0.590*** [0.217]	0.623*** [0.122]	0.666 [0.397]	0.621*** [0.134]
<i>Scandinavian Legal Origin</i>	0.3865*** [0.0462]	0.935*** [0.110]	0.554** [0.257]	1.142*** [0.197]	1.101*** [0.325]	
<i>Constant</i>	0.3072*** [0.1038]	1.886*** [0.247]	2.525*** [0.436]	1.909*** [0.289]	-2.289 [3.300]	1.849*** [0.310]
<i>Observations</i>	85	142	371	484	222	633
<i>R-squared</i>	0.44	0.348	0.307	0.360	0.513	0.289

Notes: Robust standard errors in brackets,
*** denotes significant at 1%, ** at 5% and * at 10%.

Table 2**Labor Market Reform, Legal and Efficiency Theories****Dependent variable: Change of LAMRIG, Labor Market Rigidity****Random-Effects Panel Estimator with Standard Errors Clustered at Country Level**

	[1]	[2]	[3]	[4]	[5]
	PoolOLS	Pre1980	Post1980	OECD	Non-OECD
<i>Log Per Capita GDP</i>	-0.00223 [0.00515]	0.0383*** [0.0120]	0.00351 [0.00643]	-0.0521*** [0.0162]	-0.00873** [0.00364]
<i>Socialist Legal Origin</i>	-0.0150 [0.0359]		-0.0106 [0.0355]		0.00418 [0.0357]
<i>French Legal Origin</i>	-0.00347 [0.0106]	0.0185 [0.0196]	-0.0186* [0.0112]	0.0488 [0.0301]	-0.00982* [0.00570]
<i>German Legal Origin</i>	-0.0351 [0.0331]	0.00384 [0.0328]	-0.0771* [0.0393]	0.0392 [0.0269]	-0.0664** [0.0303]
<i>Scandinavian Legal Origin</i>	0.0986*** [0.0362]	0.179*** [0.0494]	-0.0890* [0.0478]	0.0678** [0.0343]	
<i>Constant</i>	0.0515 [0.0388]	-0.223*** [0.0833]	-0.00187 [0.0497]	0.519*** [0.139]	0.0848*** [0.0272]
<i>Observations</i>	855	371	484	222	633
<i>Number of countries</i>	142	100	142	23	119

Notes: Robust standard errors in brackets,

*** denotes significant at 1%, ** at 5% and * at 10%.

Table 3**Labor Market Reform, Legal, Efficiency and Political Theories****Dependent variable: Change of LAMRIG, Labor Market Rigidity****Blundell-Bond System GMM estimator (Windmeijer-corrected standard errors)**

	[1]	[2]	[3]	[4]	[5]	[6]
Political Factors:	Democracy	POLCON	Assassinations	Strikes	International conflict (war)	Civil war (intensity)
<i>Lagged ΔLAMRIG</i>	0.264*** [0.0636]	0.314*** [0.0582]	0.285*** [0.0632]	0.277*** [0.0648]	0.205*** [0.0794]	0.265*** [0.0542]
<i>Log Per Capita GDP</i>	-0.0347** [0.0147]	-0.0504** [0.0202]	-0.0409*** [0.0141]	-0.0324** [0.0140]	-0.0192 [0.0137]	-0.0427*** [0.0156]
<i>Socialist Legal Origin</i>	0.845 [2.860]	0.862 [2.471]	1.424 [2.820]	1.273 [3.285]	2.622 [12.43]	8.291 [17.21]
<i>French Legal Origin</i>	-0.163 [0.654]	0.106 [0.597]	-0.275 [0.658]	-0.214 [0.752]	0.135 [0.370]	-0.759 [1.162]
<i>German Legal Origin</i>	0.560 [0.556]	0.627 [0.474]	0.387 [0.484]	0.458 [0.552]	0.230 [1.268]	-0.216 [0.941]
<i>Scandinavian Legal Origin</i>	0.336 [0.401]	0.491 [0.442]	0.236 [0.484]	0.297 [0.464]		0.0565 [0.767]
<i>Political Factors</i>	-0.00108 [0.00572]	-0.0576 [0.0959]	0.0367 [0.0248]	-0.0113 [0.0118]	0.00506 [0.00995]	0.00521 [0.00494]
<i>Constant</i>	0.296 [0.278]	0.273 [0.366]	0.398 [0.401]	0.300 [0.327]	0.0388 [0.204]	0.703 [0.648]
<i>Observations</i>	711	708	721	721	421	589
<i>Number of groups (countries)</i>	134	137	137	137	85	103
<i>AR(2) (p-value)</i>	0.6012	0.7865	0.6458	0.5827	0.7421	0.6251
<i>Sargan (p-value)</i>	0.6194	0.0350	0.5889	0.1407	0.9986	0.6187

Notes: Robust standard errors in brackets, *** denotes significant at 1%, ** at 5% and * at 10%.

Table 4
Labor Market Reform, Legal and Efficiency Theories, and Structural Factors
Dependent variable: Change of LAMRIG, Labor Market Rigidity
Blundell-Bond System GMM estimator (Windmeijer-corrected standard errors)

	[1]	[2]	[3]	[4]	[5]
Structural Factors:	Income Gini	Govt Share to GDP	Foreign Aid to GDP	Natural Res Exports (%)	Agric Share in GDP
<i>Lagged ΔLAMRIG</i>	-0.00836 [0.0981]	0.284*** [0.0646]	0.304*** [0.0758]	0.285*** [0.0587]	0.315*** [0.0983]
<i>Log Per Capita GDP</i>	-0.0780 [0.0856]	-0.0333*** [0.0119]	-0.0440*** [0.0124]	-0.0358*** [0.0115]	-0.0127 [0.0326]
<i>Socialist Legal Origin</i>		0.975 [0.923]	0.137 [0.832]	0.850 [1.094]	-0.623 [17.07]
<i>French Legal Origin</i>		-0.108 [0.523]	0.495 [0.473]	-0.215 [0.387]	-0.923 [1.512]
<i>German Legal Origin</i>	-0.0199 [0.584]	0.475 [0.604]	1.366 [0.948]	0.369 [0.551]	-0.150 [1.485]
<i>Scandinavian Legal Origin</i>	0.0676 [0.462]	0.425 [0.391]	0.543* [0.303]	0.342 [0.324]	-0.378 [1.143]
<i>Structural Factors</i>	-0.00258 [0.00687]	0.000613 [0.000977]	8.11e-05 [0.00167]	0.000672 [0.000787]	0.136 [0.333]
<i>Constant</i>	0.758 [0.672]	0.241 [0.359]	-0.0184 [0.323]	0.339 [0.253]	0.603 [1.036]
<i>Observations</i>	202	726	663	723	472
<i>Number of countries</i>	107	135	136	139	105
<i>AR(2) (p-value)</i>	n.a.	0.6401	0.6285	0.6779	0.4071
<i>Sargan (p-value)</i>	n.a.	0.3969	0.4016	0.5427	0.4602

Notes: Robust standard errors in brackets, *** denotes significant at 1%, ** at 5% and * at 10%.

Table 5**Labor Market Reform, Legal and Efficiency Theories and The Role of Crises****Dependent variable: Change of LAMRIG, Labor Market Rigidity****Blundell-Bond System GMM estimator (Windmeijer-corrected standard errors)**

	[1]	[2]	[3]	[4]	[5]
	Debt Crises	High Inflation (>30% p.a.)	Max Fall of GDP	Years of Negative GDP Growth	Unemployment ILO
<i>Lagged ΔLAMRIG</i>	0.275*** [0.0709]	0.291*** [0.0629]	0.267*** [0.0595]	0.259*** [0.0604]	0.315*** [0.0717]
<i>Log Per Capita GDP</i>	-0.0461** [0.0186]	-0.0446*** [0.0165]	-0.0335*** [0.0113]	-0.0328*** [0.0114]	-0.0404** [0.0173]
<i>Socialist Legal Origin</i>	0.229 [1.288]	1.129 [2.887]	1.142 [2.694]	1.245 [2.704]	0.416 [1.086]
<i>French Legal Origin</i>	-0.0660 [0.607]	-0.164 [0.579]	-0.190 [0.636]	-0.210 [0.663]	0.605 [0.414]
<i>German Legal Origin</i>	0.607 [0.616]	0.530 [0.451]	0.570 [0.545]	0.575 [0.558]	0.953* [0.577]
<i>Scandinavian Legal Origin</i>	0.230 [0.396]	0.324 [0.407]	0.302 [0.416]	0.288 [0.434]	0.689* [0.413]
<i>Crises</i>	-0.00115 [0.00645]	-0.0247 [0.0211]	0.000498 [0.00106]	-0.00930 [0.00956]	-0.0143*** [0.00516]
<i>Constant</i>	0.362 [0.360]	0.374 [0.286]	0.293 [0.333]	0.304 [0.336]	0.0266 [0.302]
<i>Observations</i>	635	700	742	742	526
<i>Number of groups (countries)</i>	138	138	139	139	124
<i>AR(2) (p-value)</i>	0.8672	0.6169	0.6090	0.5904	0.9671
<i>Sargan (p-value)</i>	0.6531	0.2730	0.4720	0.4351	0.3678

Notes: Robust standard errors in brackets, *** denotes significant at 1%, ** at 5% and * at 10%.

Table 6**Labor Market Reform, Inertia, Legal Origins, Per Capita GDP, Trade and Financial Reforms****Dependent variable: Change of LAMRIG, Labor Market Rigidity****Blundell-Bond System GMM estimator (Windmeijer-corrected standard errors)**

	[1]	[2]	[3]	[4]	[5]	[6]
	Wacziarg Open Uninterrupted	C.N.Hsiao Trade Lib	PWT openk	BMP	Credit Private Sector/GDP	Financial Ref Index
Other Reforms						
<i>Lagged ΔLAMRIG</i>	0.268*** [0.0632]	0.254*** [0.0646]	0.259*** [0.0648]	0.337*** [0.0755]	0.164* [0.0963]	0.337*** [0.0744]
<i>Log Per Capita GDP</i>	-0.0600*** [0.0175]	-0.0545*** [0.0176]	-0.0403*** [0.0110]	-0.0620*** [0.0167]	-0.0895*** [0.0281]	-0.0595*** [0.0201]
<i>Socialist Legal Origin</i>	2.426 [3.723]	0.736 [1.365]	0.799 [1.718]	1.608 [3.370]		0.198 [2.092]
<i>French Legal Origin</i>	-0.174 [0.635]	-0.405 [0.649]	-0.376 [0.596]	-0.00358 [0.766]	-0.548 [1.570]	0.910 [1.719]
<i>German Legal Origin</i>	0.444 [0.529]	0.157 [0.714]	0.0345 [0.851]	0.594 [0.687]	0.212 [1.293]	1.625 [2.214]
<i>Scandinavian Legal Origin</i>	0.214 [0.402]	0.197 [0.420]	0.278 [0.428]	0.230 [0.654]	0.0726 [0.879]	0.682 [0.688]
<i>Lagged Other Reforms</i>	0.110** [0.0479]	0.0836** [0.0419]	-0.000125 [0.000488]	-1.42e-06*** [5.27e-07]	1.89e-08 [4.80e-08]	-0.0192 [0.0819]
<i>Constant</i>	0.434 [0.330]	0.573 [0.409]	0.522 [0.365]	0.459 [0.500]	0.997 [0.841]	-0.166 [1.127]
<i>Observations</i>	710	705	703	622	406	658
<i>Number of countries</i>	125	134	130	118	94	131
<i>AR(2) (p-value)</i>	0.7472	0.6835	0.5593	0.6728	0.5496	0.9210
<i>Sargan (p-value)</i>	0.3478	0.2174	0.5101	0.1398	0.0675	0.0345