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Structural Reforms, Growth and Inequality: An Overview of Theory, Measurement and Evidence

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ABSTRACT

Structural Reforms, Growth and Inequality: An Overview of Theory, Measurement and Evidence*

This chapter provides a critical overview of the state of the art in the economics literature on structural reforms. It takes stock of theoretical developments, measurement efforts and of the econometric evidence. We start with a simple theoretical framework for the relationship between structural reforms, economic growth and income inequality. We argue that whether structural reforms have a positive or negative impact depends on various factors. The type of reform, timing, sequence and political constraints play crucial roles in determining the effectiveness of reforms on economic growth and income inequality. We conclude by proposing a 7-point agenda for future research.

JEL Classification: E65, 011, 043

Keywords: structural reforms, income inequality, economic growth

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1. Introduction

Since the financial crisis of 2007-08, most European Union member states have been unable to return to their pre-crisis growth path. From Brussels, Frankfurt and Berlin, we have been incessantly hearing that structural reforms are the key to higher growth rates and to economic recovery. This view has been very influential and led many countries in Europe to carry out extensive structural reform programs.

Structural reforms refer to policies that fundamentally alter the way the economy is organized. Such reforms usually include the opening up of the economy to international trade, to international competition and to foreign direct investment, the transfer of state assets to the private sector, product market deregulation and measures aimed at making labour markets more flexible. In short, these are policies aiming at increasing the role of markets in the organization of the economy.

The policy response to the crisis was mostly driven by a supply side story of the origins of the low growth in the European countries. According to this view, low growth results from structural rigidities (i.e. a lack of flexibility in the way the supply side of the economy works). For example, labour markets are rigid preventing demand and supply of labour from reaching equilibrium. As a result of these rigidities, production remains below its potential. Similarly, goods markets are said to be subject to regulatory and price rigidities that reduce potential output. Policies that address these imperfections will suffice to increase potential output. This story has become the mainstream view among policymakers in Europe.

This view, however, was based on a misdiagnosis of the sources of the decline in economic activity following the financial crisis of 2007-08. It is now increasingly recognized that the debt financed consumption and real estate boom of the pre-2007 period led to a crash that in turn necessitated a deleveraging of debt. This produced a long and protracted period of declining aggregate demand needed to reduce debt levels (see Krugman, 2013; Koo, 2009;

Wolf, 2014; Reinhart and Rogoff, 2009). No amount of supply side reforms could alleviate this debt-deleveraging problem that essentially originated from the demand side of the economy. In fact, as it has been shown by a number of authors, the implementation of some supply side reforms during a period of declining economic activity aggravated this decline (see Eggertsson and Krugman, 2012; Eggertsson et al.,2014).

A key difficulty with structural reforms is their multi-dimensional character. Every reform package involves questions about bundling, dosage and timing: which policy areas will be subject to reform (take the regulatory framework and privatization for example)?; how much change is planned (what is the extent of regulatory reform planned; what is share of the public sector to be privatized), and how the reform will take place over time (whether regulatory reform will precede privatization, for example)? Reforms have different degrees of complementarities and can be combined into different bundles. They are not binary (dosage-free) nor is their implementation over time pre-determined. Further, different combinations of dosage and timing lead to different speeds of reforms. A reform strategy will be given by a specific bundle and speed. One should expect that different strategies would produce different outcomes in terms of economic growth, distribution and welfare.

Focusing on the rich comparative experience of emerging economies and developed countries, the objective of this chapter is to take stock of key theoretical developments, measurement efforts and econometric findings so as to put forward an agenda for future research.

This chapter is organized as follows. In section 2, we first develop a theoretical framework that allows us to analyze three possible versions of the relationship between structural reforms and economic growth. In section 3, we briefly discuss four sources of uncertainty that arise when we move from theory to empirics, that is when one tries to evaluate the relationship between structural reforms and growth in practice. Section 4

presents the main issues in terms of measurement linked to a critical survey of the econometric literature. Section 5 analyses structural reforms and macroeconomic stabilization. Section 6 discusses the links among structural reforms, political institutions and inequality. Finally, Section 7 concludes with some suggestions for future research.

2. A theoretical framework

In order to bring more structure in the theoretical discussion on how structural reforms affect the economy, we propose to use three charts that summarize different views about the relationship between structural reforms and economic growth. These different views have been influential at different moments of the recent history in shaping economic policies. We will distinguish between the linear view, and two versions of the non-linear view of the relationship between economic growth and structural reforms.

2.1 The linear view

We present the linear view in Figure 1. On the horizontal axis, we set out the nature of the economic system from the extreme (on the left) of a centrally planned economy where markets play no role, to the other extreme of completely free markets where government regulations of markets are reduced to zero. Clearly, these are extremes that are not observed in reality, but there is some intellectual merit in identifying the limits between which economic systems can evolve.

When an economy is moving from left to right, it is increasingly introducing institutional changes (call them structural reforms) giving more scope to market processes in the organization of the economy. On the vertical axis, we set out the long-term growth potential of the economy.

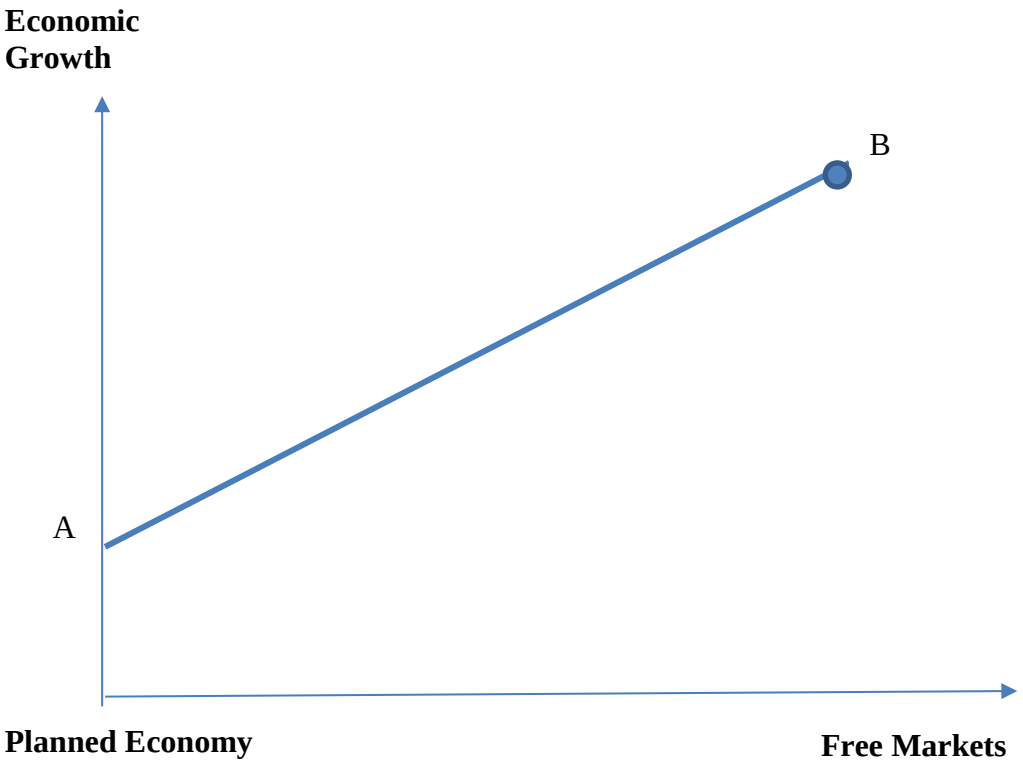
We show a linear relationship – AB. It says that as countries move from a planned economy to more free markets, this will tend to increase the long-term economic growth

potential. We stress that it is the *long-term* growth potential. It is possible, as we move from left to right, that this leads to short-term disturbances that can push countries into recessions, and therefore temporary declines in economic growth. This has been observed when Eastern European countries moved away from planned economies (Campos and Coricelli, 2002).

The linear AB line is very much influenced by the Washington consensus (Williamson, 1990). This says that as countries dismantle regulations and allow market processes to take over, economic growth will be boosted. It is a theory that was very influential in the first generation literature on structural reforms and economic growth (Drazen 2000). This literature emerged in the early 1990s when China, Eastern European and Latin American countries moved away from planned economies and introduced market mechanisms to steer their economies. In other words, the AB-line predicts that the transition to market economies would ultimately lead to more economic growth (Roland, 2000). This was very much the consensus among economists studying the transition economies.

This theory was generally thought to be a linear one, i.e. whatever the initial level of market processes used in an economy, further structural reforms aimed at strengthening market forces ("increase flexibility") would continue to lead to more economic growth. Thus, countries that where far away from being planned economies, but had all kind of regulations in their economies would profit from structural reforms. It is unclear, however, whether the relationship between economic growth and flexibility should be seen as a linear one. We therefore consider two non-linear versions of this relationship.

Figure 1: Economic growth and flexibility: a linear relationship



2.2 Non-linear view 1: decreasing returns

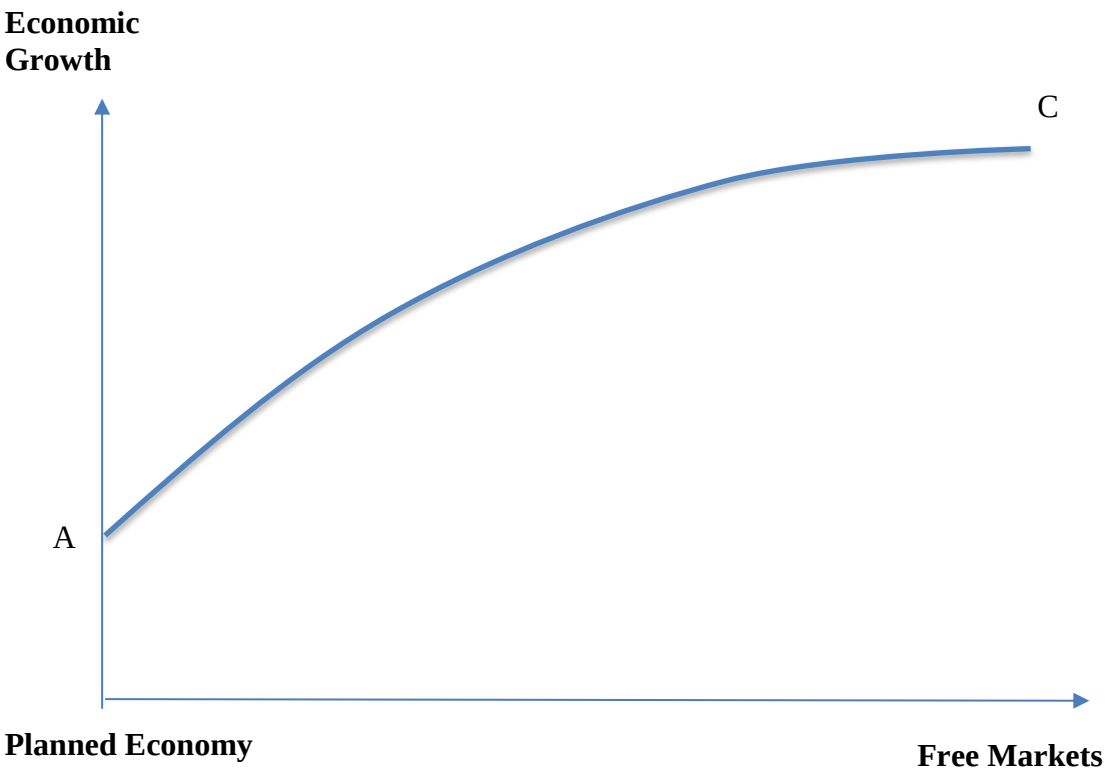
Most economic activities at some point hit the law of decreasing returns. The same holds for structural reforms (Belot et al., 2007). When moving from a fully planned economy towards a market economy, the initial benefits in terms of economic growth are likely to be higher than when countries implement structural reforms starting from an already strong market economy. In the former case, the elimination of planning and allowing individuals to take initiatives in relatively free markets is likely to unleash a dynamic leading to a strong increase of the long term economic growth of the country. This has been the experience of many Central European and Asian countries moving away from planning. At the same time, and as mentioned earlier, countries that had already a market economy and decided to increase the intensity of market forces did not experience the same growth-boosting effect. Put

differently, when a country moves from a planned economy to a market economy, there is a lot of low hanging fruit. As it moves on in this direction, the fruit is more difficult to harvest.

This implies that at some level of flexibility it may not be worthwhile to go on with structural reforms aiming at increasing market forces even more. The return in terms of additional economic growth may be close to zero. This is a question with which many developed countries are confronted with nowadays.

The previous discussion leads to the question of whether at some point the return may not actually become negative. We discuss this possibility in the next section.

Figure 2: Economic growth and flexibility: decreasing returns



2.3 Non-linear view 2: too much flexibility may harm growth

In Figure 3 we have drawn an alternative non-linear relationship AC. This non-linear relationship says that when countries continue to move towards more intense market

mechanisms, there will be a point where further structural reforms will lead to less economic growth.

What are the mechanisms that can lead to a non-linear relationship between structural reforms and economic growth? We will analyze two of such mechanisms here. One is economic in nature and invokes the Coase theorem; the second one relies on the political and social implications of structural reforms.

2.3.1 Structural reforms and the Coase theorem

Market mechanisms create wonderful effects by allowing free enterprise to flourish. But, they also lead to transactions costs. Contracts have to be drawn up. They have to be monitored and implemented. They can lead to disputes and costly enforcement. That is why, according to Coase (1937), many transactions are not organized by markets and instead are organized within organizations, like firms. Typically, within these firms the organizational principles are similar to those employed in planned economies. That is, they are hierarchical in nature and use a command and control approach. The reason why so many transactions are nowadays organized within organizations is that these transactions when organized in markets lead to high transactions costs. These are reduced or eliminated when organized within the firm.

This theory then leads to the view that when countries go on trying to enforce market mechanisms, transactions costs actually start to increase and thereby reduce the country's growth potential.

An example from the labour markets will clarify this point. Let us consider employment protection. Most countries have some form of employment protection legislation. Let us envisage a country with 100% employment protection. This is a country where workers cannot be sacked. Such extreme form of employment protection is likely to lead to very poor incentives for workers to perform. As a result, labour productivity will be

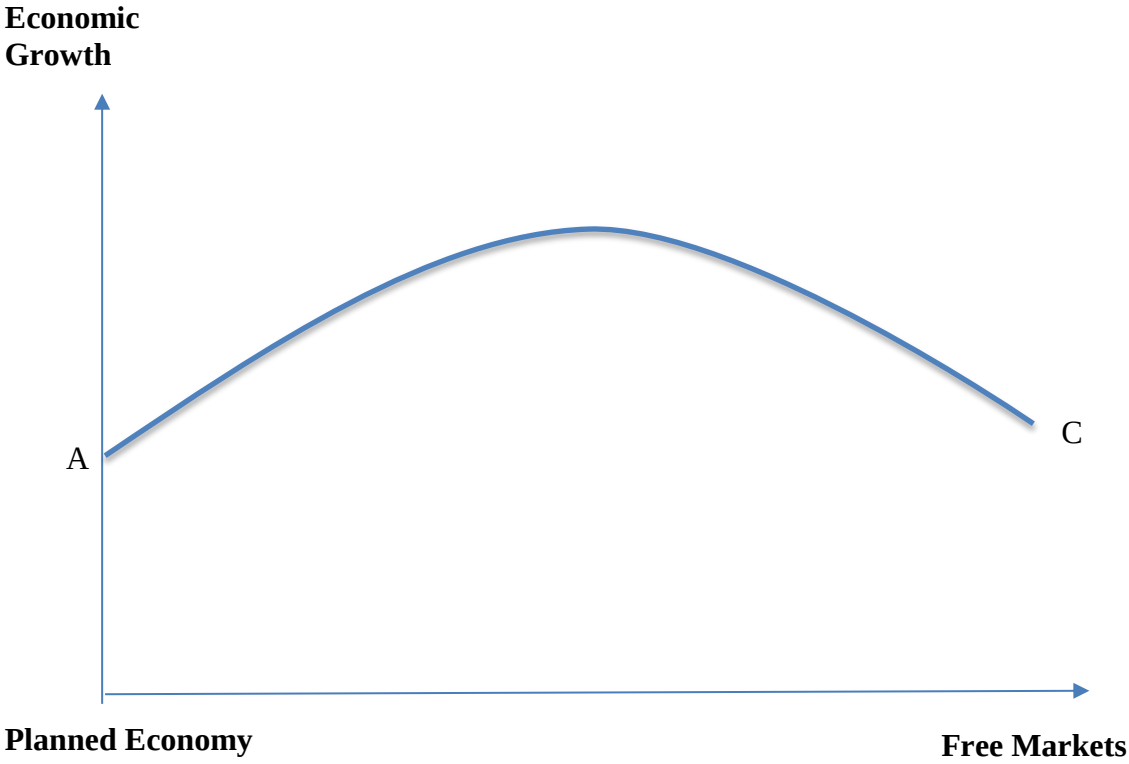
low. Any move that reduces employment protection is likely to improve incentives and performance, and thereby raise productivity.

How far can we go in this direction without encountering the non-linearity embedded in Figure 3? Let us assume that we move to the other extreme, i.e. zero employment protection: workers can be dismissed without notice and they can leave the job without notice[1]. In such a world firms and workers will be faced with large transaction costs. Firms face frequent situations where workers leave without notice. This leads to search and other transaction costs. Similarly, workers that are dismissed face the need to look for a new job, creating large transaction costs. This will also lead to a situation in which firms and workers have little incentives to invest in skill-accumulation and in human capital. It is a world of low labour productivity. There exists, therefore, a level of employment protection that is optimal and lies between the two extremes of 100% and 0% employment protection. This is a level of employment protection that minimizes transaction costs and gives enough incentives for workers to perform. If we go beyond this optimal level, the relationship between growth and employment protection becomes negative.

From the preceding it follows that some form of employment protection is good for efficiency. It is a way to bind workers and firms together so that they avoid prohibitive transactions costs that exist when these relations are dictated only by market forces. Too much flexibility in the form of very low employment protection will tend to reduce productivity and economic growth. We have a different non-linear relation between employment protection and economic growth.

[1] In the UK zero-hour labour contracts have become popular. This is an extreme form of market mechanisms employed in the labour markets. Workers can be called upon for a particular job on short notice. They can be dispensed with equally quickly. The workers in such contracts have no incentives to invest in human capital needed for these jobs. As a result, the quality of the work delivered suffers compared with a situation in which the worker has a long-term contract with the firm. Such a contract gives incentives to invest in human capital, and it also allows for better monitoring of the efforts produced by the workers. Extreme labour market flexibility may then ultimately reduce labour productivity in the economy and thus also reduce economic growth.

Figure 3: Economic growth and flexibility:



2.3.2. The political economy of structural reforms

A second mechanism that underlies the non-linearity of the relation between growth and structural reforms as shown in Figure 3 has to do with the political economy of structural reforms (see Fernandez and Rodrik, 1991; Dewatripont and Roland, 1992 and 1995).

The movement towards more flexibility affects peoples' income position. When an economy becomes more flexible there are likely to be winners and losers from such a move. More intense market forces tend to create opportunities for some who will improve their income positions dramatically, while others will experience declines in their incomes. Such effects on income distributions, if substantial, are likely to create social and political spillovers: Social and political unrest over perceived unfairness of the outcome of the reforms; changes in political regimes that lead to reversals in the structural reforms; political

instability that reduces investment. All these spillovers are likely to lead to less economic growth.

Thus, political economy effects of structural reforms are likely to produce a non-linear relationship between economic growth and structural reforms. Therefore, a key dimension of any research of how structural reforms affect economic growth concerns the effects of these reforms on income distribution. Growth and incomes distribution cannot be dissociated (see Blanchard and Giavazzi, 2003; Spector, 2004; Messina, 2003; Fiori et al., 2007; Bassanini and Duval, 2006; Stand et. al., 2011).

3. From theory to empirics: the main issues

The previous theoretical analysis has provided different views about the relationship between structural reforms and economic growth. These should be considered as different mechanisms that underlie this relationship. All this implies that when we want to analyze this relationship empirically it will be difficult to identify these different mechanisms leading to great uncertainty about the nature of this relationship. This uncertainty is compounded by a number of other factors that we want to analyse now.

First, the linear and non-linear relationships in Figures 1-3 are aggregate relationships. Structural reforms can take many forms. They involve product markets and labour markets. They may focus on domestic reforms or rather on opening markets to foreign competition. In the labour markets, they may involve reducing minimum wages, extending the working age or limiting employment protection (Botero et al 2004). They may be based on reducing labour taxes, etc. All these different reforms may have different effects on economic growth and income distribution. One of the objectives of our future research is to go deeper into the detail of these reforms to gain insight on the nature of the relationships identified in Figure 1 - 3. An example may clarify this point. We have seen that employment protection legislation

has non-linear effects on productivity growth. Extending the working age, however, may have different effects, corresponding more to those described in Figure 2. When aggregating these reforms into an index of labour market reforms, the observed aggregate effect may become very weak and uncertain.

Second, there is the nature of the political system and institutions in which the reforms are implemented. Some political systems and institutions are based on consensus building leading to greater acceptance of reforms once these reforms are agreed upon. Others are more adversarial leading to conflicts during the post-reform process. Other differences in political systems and institutions may matter. We will want to investigate these when we take up the analysis of the political economy of structural reforms.

A third source of uncertainty arises from the timing of the reforms. Reforms implemented during economic recessions have different short-term effects on economic growth compared to those implemented during economic booming conditions. As the short-term can sometimes be surprisingly long, it will be very difficult to identify the nature of the relationship between economic growth and structural reforms (see Eggertsson and Krugman, 2012; Eggertsson, et al., 2014; Blanchard, 2015; De Grauwe, 2015; Fatás, 2015; Cacciatore et al., 2016).

A final factor introducing uncertainty has to do with the sequencing of the reforms. There is a large literature on the optimal sequencing of the reform process suggesting that the sequencing matters, i.e. the exact sequencing of the reforms (e.g. first reforms domestically and later externally) may have quite different short-term and long-term effects on economic growth. This introduces another layer of uncertainty in the long-run relation between growth and structural reforms.

From the preceding it will be clear that the uncertainty about the long-run relationship between economic growth and structural reforms is a serious one. This uncertainty can only be resolved by empirical analysis.

4. The measurement of structural reforms

Structural reforms are notoriously difficult to measure across countries and over time in a consistent and objective manner. We believe there are four main inter-related difficulties. Some reforms (e.g., privatization) have at the same time elements of "stroke of the pen national policies" (Easterly, 2005) and harder-to-change "institutions" (Acemoglu, Johnson and Robinson, 2005, Besley and Persson 2013).

A second important difficulty relates to the fact that there are a number of studies that focus on one reform and/or on one country but very few which study multiple reforms in more than one country over time.

A third difficulty is that results using the existing measures of reform tend to be inconclusive. For example, Babecky and Campos (2011) collect data from 43 econometric studies and show that the t-values of the more than 300 coefficients (on the impact of reforms on growth) follow a normal distribution with mean zero: about a third of them is positive and significant, another third is negative and significant and the remaining third is not statistically significant. They try to explain this variation in terms of differences in method, specification and measurement and argue that measurement plays a key role.

Geographical differentiation gives rise to the fourth difficulty. This aspect has not been fully acknowledged. The literature on structural reforms developed in three different geographic regions (namely Latin America, transition countries and OECD economies) in a somewhat disconnected or uncoordinated manner. The Latin American literature stresses the relationship between structural reforms and macroeconomic stabilization. It is heavily

influence by the Washington Consensus. Recall the very origin of this Consensus lies in the Latin American experience (Williamson, 1990). Structural reforms occupied a defining role in the literature focusing on the transition from centrally-planned to market-based economies in Central Europe, markedly with the debate between Big Bang versus gradualist strategies. The literature on OECD countries focuses mainly on two pillars, product and labor markets deregulation. Importantly, each of these three regional groupings gives rise to different measures of structural reforms. In what follows, we examine each of these three literatures by discussing how indicators were originally built and what type of evidence they initially produced. Table 1 presents a list of more recent studies that measure different dimensions of reforms, combining many of the lessons from these three literatures, and covering areas such as trade and financial liberalization, privatization, product market, labour market and competition policy.

4.1 Structural Reforms in Latin America

The measurement of first generation reforms in Latin America was pioneered by the structural reform indexes by Lora (1997, 2001, 2007). These studies consider five structural reforms from the Washington Consensus (namely trade, tax, financial, privatization and labor market regulation) that are aggregated further in an overall structural reform policy index.

In the case of *trade reform*, two indicators were used, namely average tariffs and the tariff dispersion. The following four variables are used to construct the *tax policy reform* indicator: (i) maximum marginal income tax rate on corporations, (ii) maximum marginal income tax rate on individuals, (iii) basic value-added tax rate, and (iv) productivity of value-added tax (the ratio between the basic rate and actual collection expressed as a percentage of GDP). With respect to *financial reform*, four indicators were used: (i) freedom of interest rates on deposits (a subjective 0-2 categorical variable), (ii) freedom of interest rates on loans

(subjective 0-2 categorical variable), (iii) real level of reserves of bank deposits, and (iv) quality of banking and finance oversight (subjective 0 to 2 categorical variable). In terms of privatization, the one indicator used is cumulative privatization revenues, including sales and other property transfers, as a proportion of average public investment. Finally, *labor market reform* intends to capture the flexibility of legislation and is based on the following five aspects: (i) hiring, (ii) costs of dismissal after one year of work, (iii) costs of dismissal after ten years of work, (iv) overtime pay, and (v) social security contributions.

This structural policy index is constructed for 20 Latin America countries for all years from 1985 to 1995. As there is more than one variable in each reform, the overall reform index is the simple average of the indices in the five units, which in turn are the simple average of the indices for the policy variables considered. Note that Morley, Machado and Pettinato (1999) extend Lora's indicators to cover the whole period from 1970 and 1995 for 17 countries (and the following structural reforms: trade, tax, financial, capital account liberalization and privatization reform.)

There are various estimates of the effects of reforms on economic growth in Latin America. One of the first and most influential studies is that of Easterly, Loayza and Montiel (1997), which looks at the relative growth performance of 16 Latin American economies over the 1980s and early 1990s. The reforms these authors examine are not only macroeconomic stabilization but also financial, trade and structural reforms. They argue that contrary to the common perception, performance in Latin America and the Caribbean (LAC) was not disappointing, and estimate that the effect of reforms was to return the LAC per capita growth rate to the 2% historic norm. Fernández-Arias and Montiel (1997), based on the experience of 18 LAC economies between 1985 and 1995 and using macroeconomic stabilization and the structural reform indexes constructed by Lora (1997), estimate that reforms raise the average growth rate by 1.7%. Loayza, Fajnzylber and Calderón (2003)

report a similar estimate of 1.9%, also from combining macroeconomic stabilization and the structural reform but over the period 1986 to 1999. Lora and Panizza (2002) separate out the effects of macroeconomic stabilization from structural reforms and estimate that the growth payoff of reforms in LAC was 0.7% when comparing the period of 1997-99 with 1985-87.

4.2 Structural Reforms in the Transition Economies

For the transition economies, international organizations are the main source of indicators of reforms. The World Bank started this work in the early 1990s by putting forward three reform indicators, covering privatization and internal and external liberalization efforts. Later on, the European Bank for Reconstruction and Development (EBRD) took over this task and improved upon it by offering more (nine) detailed indicators of reform.

The two sets are constructed in a similar manner, namely in three steps: (1) a comprehensive set of underlying objective variables is collected, (2) a common scale and weighting scheme is agreed upon, and (3) country and sector specialists study these data, judge them and agree on individual scores on each reform item for each country in each year (the top score is set to reflect the standards and performance typical of those in advanced industrial countries.) One main advantage is that these indexes are available in a balanced panel format for all years since 1990.

The data effort carried out at the World Bank is presented in the World Development Report 1996 (also in de Melo et al., 1996). The overall liberalization index is a weighted average of three areas: (1) internal markets (liberalization of domestic prices and the abolition of state trading monopolies), (2) external markets (liberalization of the foreign trade regime, including elimination of export controls and taxes, and substitution of low-to-moderate import duties for import quotas and current account convertibility), and (3) private sector entry (privatization of small-scale and large-scale enterprises and banking reform.) The

weights for this overall liberalization index are determined a priori and set as follows: 0.3 for internal, 0.3 for external liberalization and 0.4 for privatization.

The EBRD took over after the mid-1990s, extending the methodology and publishing yearly its set of "transition indicators." Originally, there was a set of structural reform measures broadly known as the EBRD Transition Indicators covering the following areas: large-scale privatization, small-scale privatization, governance and enterprise restructuring, price liberalization, trade and foreign exchange system, competition policy, banking reform and interest rate liberalization, securities markets and non-bank financial institutions, and infrastructure reform.

The EBRD indexes on price, external liberalization and privatization are of particular interest as they overlap more closely with measures traditionally available for other geographical areas. The price liberalization is based on a survey of national authorities and IMF country reports to determine the share of administered (regulated) prices in the Consumer Price Index as well as the share of goods with administered prices in a basket of "15 basic goods." It also takes into account whether wages are regulated. Concerning external liberalization, the EBRD reports on the share of trade in GDP, share of trade with non-transition economies and tariff revenues. With respect to privatization, the EBRD surveys national authorities for data on, inter alia, the share of privatized enterprises and the estimated share of private sector output and employment to GDP and total employment, respectively.

The final, aggregate indexes take values from "1" to "4+". For instance, regarding price liberalization, higher values of the index are associated with a smaller extent of regulated prices. Thus, a score of 1 is obtained when most prices are controlled by the government. A score of 2 stands for some lifting of price administration, yet the state still sets the majority of prices. A score of 3 is reserved for significant progress in price liberalization, but still some involvement of the state in price regulation. A score of 4 stands for

comprehensive price liberalization when only a small number of administered prices remain. A score of 4+ means that standards and performance are typical to those of advanced industrial countries with no price control outside housing, transport and natural monopolies.

With the 2010 Transition Report (EBRD, 2010), a new set of structural reform indicators was introduced. The revision reflects the main recommendations from the Besley, Dewatripont and Guriev report (2010). The main change was a shift from emphasizing country- to stressing sectoral-level indicators. More specifically, the previously existing sectoral indicators were substantially extended in 2010: from five infrastructure and two financial sector indicators to 16 indicators within four sector groups (corporate, energy, infrastructure and financial.) All these revised sectoral indicators were also constructed using a different, new methodology which "aim[s] to measure not only the structure and extent of markets but also the quality of market-supporting institutions, and to relate the findings either to published data or observable criteria" (EBRD 2010, p 3). The EBRD still publishes the traditional country-level indicators but have since 2010 been subordinated to the sectoral-level measures in that much less space is devoted to them and much less details are provided.

The econometric literature using the EBRD structural reform indicators is large. The early empirical literature based on Eastern Europe stressed reform choices (e.g., Aslund et al. 1996, de Melo et al., 1996; Fischer et al., 1996; Selowsky and Martin, 1997). These choices were viewed as exogenous with respect to economic performance and initial conditions (including pre-existing institutions, see Prati et al., 2013), as the government is assumed to choose optimally from an array of reform measures. Accordingly, bad performance is caused by bad reform choices and good performance by good choices. Hence, the majority of this literature focuses on assessing the vices and virtues of a big-bang versus gradual reform strategies. Most of the quantitative literature argues that faster progress in liberalisation leads to better performance. The research is not unanimous, however, with some showing adverse

effects from too rapid liberalisation (Popov, 2000) or privatization (Hamm et al. 2012; Godoy and Stiglitz, 2006).

While this strategy may be useful to evaluate the impact, it cannot explain the choices of reforms themselves – a concern that has been forcefully raised in the theoretical literature (Roland, 2000). Political constraints, for example, may have prevented some countries from implementing comprehensive reform policies (Hellman, 1998). It is thus necessary to understand the more general conditions that underpin such choices. The subsequent literature tried to identify the relative impacts of policies and initial conditions (such as the level of economic development and the legacy of communism) on economic performance (e.g. Sahay et al., 1999; Popov, 2000). Krueger and Ciolko (1998), Heybey and Murrell (1999) and Falcetti et al. (2002) relate policy choices to initial conditions. In their view, initial conditions required the adoption of certain reforms but also defined underlying political constraints, for example by determining the expected distribution of potential gains and losses.

Another important stream in this literature links policy choices and economic performance to political institutions (e.g., democracy as in Giuliano et al., 2013). Dethier et al. (1999) find that democracy facilitates economic liberalisation. Fidrmuc (2000) finds that democracy, in the absence of liberalisation, has a negative effect on growth early in transition, but, when accounting for its indirect effect on liberalisation, its overall effect is positive. Finally, Brunetti et al. (1998), Campos (1999) and Hellman et al. (2003) measure the quality of selected institutions and discuss their impact on performance. What seems to be still missing, however, is an emphasis on factors that lead to the adoption of development-enhancing inclusive institutions (Frye, 2012).

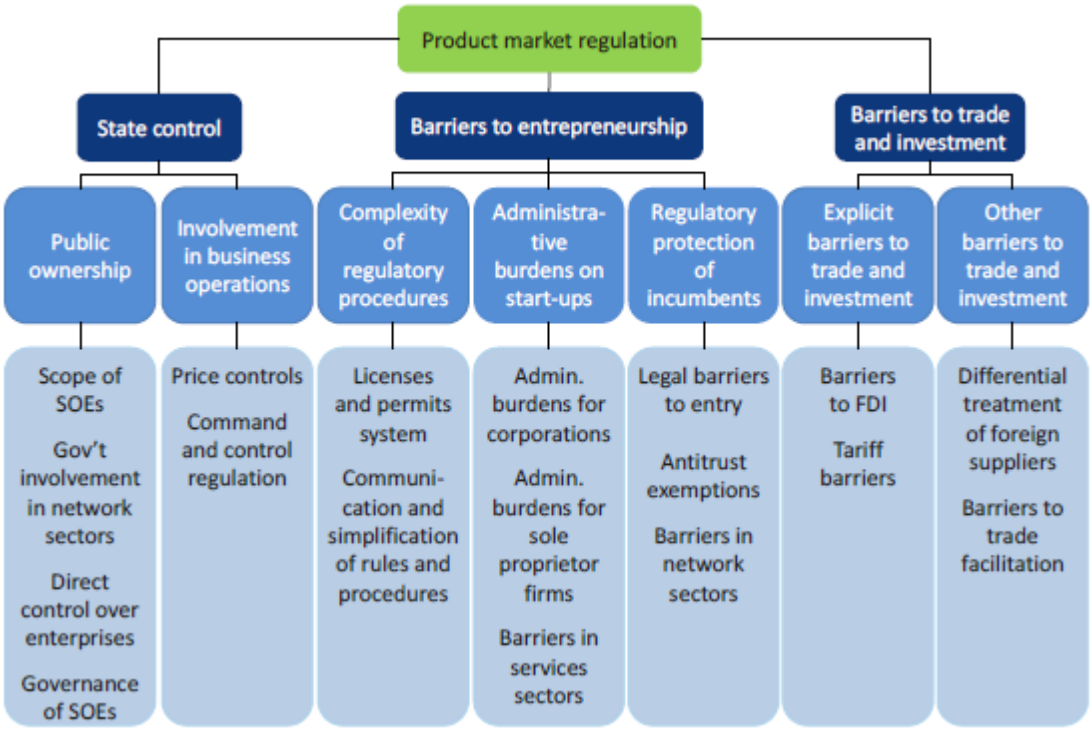
4.3 Structural Reforms in the OECD countries

The OECD has produced a widely used set of structural reforms indicators. The literature on

OECD countries focuses mainly on two pillars, product and labor markets deregulation.

The product market regulation index (PMR) is quite broad. It contains information on regulatory structures and policies that is collected through a questionnaire sent to governments in all OECD and in 21 non-OECD countries. This is updated every five years since 1998. For the subset of regulatory questions in seven network sectors, the "data from the questionnaires are complemented by data from publicly available sources to create time series data of annual frequency starting in the mid-1970s" (Kokse et al., 2015, p. 7). The figure below shows the various components list the components of the PMR index.

Figure 4. Tree structure of the economy-wide PMR indicator



Source: Kokse et al. 2015, p. 10.

The numerical values from each question are aggregated into these 18 lower-level indicators, which are then aggregated into seven mid-level indicators, which are in turn aggregated into three high-level indicators. At each step, the composite indicators are

calculated as weighted averages of their components, while for the aggregate PMR indicator it is the simple average across the three high-level indicators: state control, barriers to entrepreneurship and barriers to trade and investment.

The OECD employment protection legislation measure (EPL) covers 21 items which are classified in three main broad areas: (1) protection of regular (permanent) workers dismissed on personal grounds or economic redundancy, (2) regulation of temporary forms of employment (mainly fixed-term contracts and temporary work agency); and (3) specific requirements for collective dismissals. The overall EPL index is available for all OECD countries yearly since 1985, for various Latin American countries after 2008 (this work is a joint OECD effort with the Inter-American Development Bank) as well as for selected developing countries (like India and China, Latvia, Lithuania and Croatia.) A pre-defined matrix method is used to convert raw information on each item into a score on a 0 to 6 scale and then aggregate using a pre-determined set of weights. The higher values of the EPL index indicate stricter regulation.

Regarding the empirical evidence using the OECD measures, most econometric studies examine the impact of labour and product market rigidities on economic and productivity growth. In general, these studies find weak and often insignificant effects of measures of rigidity on economic growth. This is especially the case with measures of labour market regulation for which limited evidence exists of its impact on economic growth in the OECD countries. This is confirmed by a recent study by Guo (2015) that fails to find a significant effect of employment protection on productivity growth in a sample of industrialized countries (see also De Grauwe and Ji, 2016). Older studies report more mixed evidence. Nickell and Layard (1999) find a positive association between employment protection and productivity per capita, using cross-country variation only. Belot et al. (2007) uses a richer data-set, including time-varying indicators of employment protection and

legislation, and find that there is an inverse U-shaped relationship between employment protection and growth. Bassanini et al. (2009) use industry level data to analyze the relation between employment protection and productivity growth. These authors find that employment protection legislations have a negative impact on productivity growth in industries where layoff restrictions are more likely to be binding. It is unclear, however, how large these sectoral effects are when aggregated to the economy as a whole.

The empirical evidence of the effect of product market regulation on economic growth is equally inconclusive (see Aghion et al., 2009). Some econometric evidence shows that less rigid product market regulations increase economic growth (see Nicoletti and Scarpetta, 2003; OECD 2015). It is striking in these studies that these estimates are not robust. Typically, a large number of specifications is reported with only a few significant results. For example, in the influential paper by Nicoletti and Scarpetta (2003) out of 17 estimated coefficients of product market regulation variables only 3 are significant (see also Guo, 2015).

The OECD has performed other (non-econometric) empirical studies simulating the effects of labour and product market deregulations on economic growth. Two approaches have been used. The first one consists in using some of the estimated coefficients of market regulation found in the literature (see e.g. De Mello and Padoan, 2010; Barnes et al., 2011; Bouis and Duval, 2011). Sometimes not even estimated coefficients are used but "calibrations by assumption" (Barnes et al., 2011). It should be borne in mind that these simulations use only a small number of estimated coefficients that come from regression exercises where most estimated coefficients of market regulation variables are insignificant.

The second popular approach is to use a macroeconomic model of the DSGE type and to simulate the effect of deregulation on output (e.g., ECB, 2015; Cacciatore et al., 2012). Invariably these simulations find that deregulation of labour and product markets lead to an

increase in output. A problem with this approach is that the simulations just confirm a-priori beliefs: in most DSGE models, unemployment is voluntary. Structural reforms are interpreted as an intervention that changes the relative price of leisure versus labour (e.g. by reducing unemployment benefits). In addition, most DSGE models are based on calibrations as acknowledged by all authors. They are not empirical evidence. Unfortunately, often these simulations are interpreted as providing empirical evidence of how structural reforms boost economic growth in the policy debate.

Some econometric studies encompassing both developed and developing countries find significant effects of labour and output market regulations on economic growth. A typical example is a study of the World Bank (Loayza et al., 2004) which finds that deregulation of product markets in developing countries to the mean level achieved in the OECD countries would increase economic growth by up to 1.4% per year.

There are also two important studies in this regard by Nicolletti and Scarpetta (2003) and the IMF's World Economic Outlook (WEO, April 2004). The latter presents a set of indicators for 20 industrial countries from 1975 to 2000 on a yearly basis. The WEO (2004) shows that not only there are noticeable regional differences but there have been enormous contrast among the different reform units: "overall reforms have, on average, not been substantial in the labor market or in the tax system domains and, compared with 1975, the overall degree of restrictiveness deteriorated" (2004, p. 4). Further, the report finds that the differences in regulatory regimes in financial and trade reforms have narrowed and converged and there was a tendency for the timing of reform efforts to cluster across countries. More importantly for present purposes, it finds that "reforms were typically sequenced and gradual. For example, in selected product markets, entry deregulation was gradual and sequenced across industries (…) Across sectors, finally, there is evidence of joint reform dynamics in the sense of reforms being implemented simultaneously if analyzed on a

year-by-year basis. However, over longer periods of time, there is some evidence of joint efforts. Specifically, considering five-year intervals suggests that labor reforms tended to coincide with both product market and tax reforms" (2004, p.6)

In summary, despite the enormous volume of theoretical work on structural reforms, the econometric evidence remains inconclusive and limited. Most of the earlier empirical studies originate – from the experience of the "new EU members" (economies that transited from communism to a market-based system). This experience shows that there is a comprehensive range of structural reforms (beyond labour and product markets) and that their ultimate impact on economic outcomes is complex. More specifically, structural reforms are more reversible than commonly thought (Campos and Horvath, 2012, 2013), they follow intricate patterns of complementarity and substitutability as well as non-linearities (Campos and Coricelli, 2012), and they may be driven more by political crises than by economic ones (Campos et al., 2010).

5. Structural reforms and macroeconomic stabilization

As mentioned in the previous section, the reform process, that started in Latin-America and that was very much influenced by the Washington consensus, focused on macroeconomic stabilization. It was generally felt that the large macroeconomic instability experienced in Latin America during the 1960s and 1970s could only be reduced by introducing structural reforms, in particular financial market reforms, that would give the right incentives to policymakers to pursue stable policies (Easterly, Loayza and Montiel, 1997; Fernández-Arias and Montiel, 1997).

The second-generation reform process that was pursued in many OECD countries from the 1990s on was much less focused on Latin-American type stabilization issues. Rather

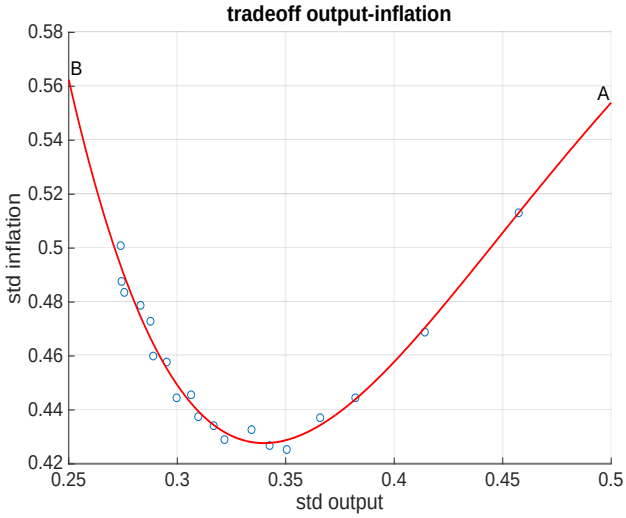
it was mostly concerned about timing issues: when during the business cycle it was most appropriate to introduce structural reforms in the labour markets was a key question.

The consensus today seems to be that labour market reforms should ideally not be introduced during recessions as they risk intensifying these recessions. The main reason is that these reforms, while they may increase the competitiveness of countries, also tend to reduce disposable income and have a negative effect on aggregate demand. When this happens during a recession, the latter will tend to be more intense (Eggertsson and Krugman, 2012; Eggertsson, et al., 2014).

Recently, De Grauwe and Ji (2017) analyzed how structural reforms affect the capacity of central banks to stabilize output and inflation. Using a behavioral macroeconomic model with New-Keynesian features, they found that there is an optimal level of flexibility (produced by structural reforms). They derive a non-linear tradeoff between output and inflation variability (see Figure 5 which shows the standard deviation of the output gap and of inflation).

As a country starts increasing the degree of flexibility, it moves down (from point A in Figure 5) along a positively sloped segment of the trade-off between output and inflation variability. This downward movement implies that increasing flexibility creates a win-win situation in that both the volatility of output and inflation decline with increasing flexibility. However, when the country goes too far with structural reforms, it reaches a minimum point on the trade-off. From that point on one obtains a traditional negatively sloped trade-off, i.e. further increases in flexibility lead to less volatility of output at the expense of increasing inflation volatility. The optimal level of flexibility will then depend on society's preferences between inflation versus output volatility.

Figure 5: Flexibility, output and inflation



6. Structural reforms, political institutions and inequality

The success of structural reforms very much depends on the political system and institutions in which these reforms are embedded. Institutions matter a great deal. For example, the Danish Flexicurity system is generally credited of having been very successful in maintaining low rates of unemployment and strong social security protection despite the disruptions produced by technological changes and globalization (Andersen and Svarer, 2007). This system, however, works well because labour unions and employers' organization have a strong cooperative attitude. The Danish system cannot easily be transplanted in countries like France or Italy, where labour unions and employers often consider themselves to be enemies.

However, the political support for structural reforms is not exogenously determined and is affected by macroeconomic conditions. There seems to be a dilemma here: on the one hand reforms tend to be introduced more frequently during economic recessions and increasing unemployment (see Duval and Elmeskov, 2006; Cacciatore et al., 2016; Dias Da Silva, Givone and Sondermann, 2017). On the other hand, it is also true that reforms that could lead to inequality and many losers are not likely to be sustainable and could be reversed. A good example is what has happened in Portugal that implemented structural

reforms such as reduction of minimum wages and pension cuts during the Euro sovereign debt crisis under the pressure of the Troika. When the new socialist government came to power in 2015, some of these reforms were partially reversed.

A key issue is how structural reforms affect income distribution. As was stressed in section 2, the success of structural reforms in boosting economic growth very much depends on how they affect income distribution. Theoretical findings on how structural reforms affect income inequality are quite mixed. On the one hand, greater competition in the product market reduces market rents, expands economic activities and increases demand for labour, while a less protected labour market facilitates employers to hire more skilled worker. In this scenario, these structural reforms will likely reduce unemployment and therefore reduce income inequality (Blanchard and Giavazzi, 2003; Spector, 2004; Messina, 2003; Fiori et al., 2007; Bassanini and Duval, 2006). On the other hand, structural reforms can also increase income inequality. Blanchard and Giavazzi (2003) have pointed out that deregulation in the product market decreases the rents to the firms and thus the rents to the workers. In less protected labour markets, where the bargaining power of workers is weakened, wage inequality can increase. A number of previous studies associated less strict employment protection and declines in union density with higher wage dispersion among wage earners (e.g. Visser and Cecchi, 2009; Wallerstein, 1999).

An alarming issue that has been analyzed intensively by Atkinson (2003) and Piketty (2014) is the increase in top income inequality. They have argued that the increased share of top incomes has come about mainly via executive remuneration and via the rents earned by “superstars”. Additionally, the shift from labour to capital income has reinforced the income inequality. Finally, these authors have provided evidence that changes in tax and social transfer policies have played a major role in increasing inequality in a number of countries.

Morley (2000) provides a comprehensive study of the effects of reforms on income inequality in Latin America. He uses the structural reform indicators developed in Morley et al. (1999) to examine the impact of various reforms on income inequality. Morley finds that the overall effect is negative, small and not statistically robust. However, disaggregation throws lights on the reasons behind this result: he finds that different reforms have different effects on income inequality. For example, while "tax reform is unambiguously regressive, opening up the capital account is unambiguously progressive" (Morley, 2000, p. 38). Morley also reports that the effects of trade reform on income inequality are very mixed and that for privatization and financial reform "our data was not good enough to give us a clear answer" (Morley, 2000, p.38).

Concerning transition countries in the Central and Eastern European countries, a widespread view is that the transition to market-oriented reforms which include liberalization of capital, goods and services, and labor markets and their integration into regional and world markets, privatization of state owned enterprises, and the formation of new institutions to serve the market economy, have invariably led to a significant shift in the distribution of income. Some earlier studies focusing on the initial period of the transition can be found in Mitra and Yemtsov (2006), Ferreira (1999), Milanovic (1999), Ivaschenko (2002) and Giammatteo (2006). Milanovic and Ersado (2012) analyse the household data from 26 post-Communist countries and find unprecedented increases in inequality in most of these countries during the transition period of 1990‑2005. The analysis shows that economic reforms are strongly negatively associated with the income share of the bottom decile, and positively with the income shares of the top two deciles.

Using OECD countries data, increasing income inequality is found to be associated with liberalized reforms in product and labour markets (Stand et. al., 2011; Checchi and García-Peñalosa, 2008).

If market-oriented reforms lead to increasing inequality and to situations in which significant numbers of people lose income and economic status, these reforms may actually reduce economic growth. The reason is that such effects on income distribution, if substantial, are likely to create social and political spillovers (Stiglitz, 2012): Social and political unrest over perceived unfairness of the outcome of the reforms; changes in political regimes that lead to reversals in the structural reforms; political instability that reduces private and public investment. Furthermore, income inequality without proper redistributive policies can undermine progress in health and education (Cingano 2014). All these spillovers are likely to lead to less economic growth. Growth and income distribution, therefore, cannot be dissociated. Empirical evidence shows that inequality is associated with slower and less durable growth in the medium and long run (see Persson and Tabellini, 1994; Perotti, 1996; Alesina and Rodrik, 1994; Easterly, 2007; Berg and Ostry ,2011; Berg, Ostry and Zettelmeyer, 2012; Ostry, Berg and Tsangarides, 2014).

Finally, there is a growing interest in the literature on the impact of financial liberalization on income inequality (e.g. De Haan and Sturm, 2017). Some of these studies are based on worldwide country level analysis. Though the causal mechanism of financial liberalization on income inequality is not very well understood, the empirical findings seem to confirm that internal and external financial liberalization is associated with increasing income inequality (see Table 1).

7. Conclusions and future research agenda

The objective of this chapter was to provide a comprehensive and critical overview of the state of the art of the structural reforms literature. We started out developing a simple pedagogic theoretical framework that highlights the different dimensions in the transmission of structural reforms into the economy. One crucial element in this framework is the initial conditions in which structural reforms take place. Sometimes the initial conditions are such

that a specific structural reform program boosts economic growth; sometimes they are such that they reduce economic growth. These initial conditions can be related to business cycle conditions; they can relate to the underlying political institutions; they can also arise from different levels of development. Thus, a structural reform program that worked in the new member states of the EU may not work in boosting economic growth in more advanced EU-countries. All this leads to the view that the relation between structural reforms and economic growth is non-linear. It is important to keep this into account when engaging with measurement and empirical analysis.

Structural reforms have a strong multi-dimensional character and are notoriously difficult to measure across countries and over time in a consistent and objective manner. We survey the nature of these difficulties by analyzing the attempts at measuring different reforms programs in Latin America, in transition economies and in Western European countries. We provide an overview of the major empirical work in the literature concerning the relationship between structural reforms and economic growth.

We also surveyed the literature on the political economy of structural reforms. This literature asks the question of how these structural reforms come about and why they are often discontinued or terminated. A key dimension here is how structural reforms interact with income inequality. If these reforms tend to increase income inequality, they will be resisted. We also discussed the paradox that has been revealed from empirical analysis. This is that quite often structural reforms tend to be introduced during recessions when their positive effects on economic growth will be small or even negative. At the same time, this is when these reforms will be resisted most by the voting population creating a risk that these reforms trigger political upheaval and ultimately turn out to be unsustainable.

The success of future research depends on how far we advance in understanding the theoretical and empirical relationships between structural reforms and the economy. The

research agenda that one can distill from the discussions in this chapter contains the following priority issues.

First, there is a need to study the nature of non-linearity between structural reforms and economic growth. This will allow us to better understand why reforms seem to work in some countries and not in others; why the effectiveness of reforms in lifting economic growth is affected by different degrees of development of countries.

Second, the interaction of different types of reforms is a subject that is worth studying in more detail. Sure, a lot has been done in the literature but much remains to be done. For example, there is a need to better understand the relation between reforms in the labour markets and in the product markets. Do these reforms reinforce each other, or could it be that they weaken the effectiveness of the reform dynamics? Similarly, there is an issue of how labour market reforms interact with tax reforms (e.g. a shift from wage taxes towards consumption taxes). We observe that labour market and tax reforms are instituted simultaneously. This leads to the need to find out whether it is the labour market or rather the tax part that leads to success.

Third, a key factor of the success of structural reforms is the nature and the quality of political and social institutions in which these reforms are embedded. This leads to the need to analyze how reforms affect income inequality and how in turn the latter affect and possibly changes these institutions.

Fourth, there is still a lot of work needed to improve the measurement of structural reforms across countries and in particular over time. This measurement effort should be guided by justified theories which will help us to avoid having too many indexes of factors that are easy to measure or having too few indexes that are of underlying reasons and/or are hard to measure.

Fifth, structural reforms, if significant, tend to be disruptive. They change the economic and social positions of many people, leading to reactions and attempt to change their course. This issue is very much related to the previous one as the nature of this disruption is also influenced by institutions. This research is of great importance as it will help us to understand the factors that determine the sustainability of reforms. It will also allow us to better understand why structural reforms are regularly turned back.

Sixth, the nature and effectiveness of structural reforms appears to be highly context dependent. Different regions have given rise to different measures, different priorities, and unsurprisingly different results. Future research focusing on the European Union should be attentive to these matters when drawing lessons from other countries (such as the U.S.). To what extent and why Europe differs is a key concern for future research. Moreover, thanks to the enlargement after 1980, the European experience has offered economists and other social scientists something close to a natural experiment that should be exploited by adopting robust methodologies in future research.

Finally, there is the timing of the reforms. We have mentioned many times that the timing of the implementation of reforms is of great importance for their success. One common finding from the existing literature is that it is not a good idea to introduce some structural reforms during recession (e.g. employment protection). It is less clear whether this holds for all types of structural reforms. In addition, we want to know more about the paradox which is that while structural reforms do not seem to work well when applied during recessions, it is also true that a majority of reforms are implemented during recessions. Why do governments do this while they (should) know that it is during recessions that the chances of success are the weakest? This research will help us to better understand the political economy of structural reforms.

Table 1. Selected studies on structural reforms and their impact on economy

Study	***External Financial Liberalization Reform Measure Details***	***Sample***	***Methods***	***Findings***
Quinn (1997)	De Jure Indicators Based on Text of AREAER. Inward and outward capital account transactions are quantified on a 0-4 scale. Inward and outward current account transactions are quantified on a 0-8 scale.	64 countries 1958-1989	Cross-country OLS regression, extreme bounds analysis, include measures of corporate taxation, government expenditures and inequality as dependent variables.	Capital account liberalization is positively associated with economic growth, corporate tax revenues and income inequality. Government spending seems to be also increasing with capital liberalization but the results are less robust.
Bekaert et al. (2005)	Binary tracking liberalization episodes according to Bekaert and Harvey's, Chronology of Important Financial, Economic and Political Events	50 to 95 countries 1980-1997	Cross-country OLS regressions, SUR, Dynamic-fixed effects panel model using GMM.	Equity liberalization raises growth on average across specifications by 0.74% to 1.82%
Chinn and Ito (2006, 2008)	Measures degree of openness in capital account transactions. Authors take first principal component of AREAER summary binary coding of controls of current and capital account transactions, multiple exchange rates, and requirements of surrendering export proceeds.	181 countries 1970-2005	This paper only constructs a measure of reform. It does not econometrically analyse it.	This paper only constructs a measure of reform. It does not econometrically analyse it.
Kappel (2010)	Private credit from commercial banks over GDP, stock market capitalization over GDP, stock market total value over GDP, stock market turnover ratio, percentage of adult population with access to an account with financial intermediaries.	78 countries 1960-2006	Cross-country OLS regressions, 2SLS using legal origin and latitude as instrument for financial development.	Financial development reduces inequality but the relationship is weaker for developing countries
Quinn and Toyoda (2011)	Authors use a combination of different de jure and de facto measures of financial openness.	28-187 countries depending on measure 1949-2011	OLS in a seemingly unrelated regression and dynamic fixed-effects panel model using GMM.	Most de jure indicators show a positive relationship between financial openness and growth. De facto measures lead to more ambiguous effects.
Fernández et al. (2015)	Inflows and outflows of equity, bonds, money market, collective investment, financial credit, and foreign direct investment based on the text in AREAER.	100 countries 1995-2013	This paper constructs a new index. It does not analyse it.	Construct a more refined measure of financial openness based on AREAER text measures.

Furceri and Loungani (2015)	Chen-Ito index as a measure for financial liberalization	149 countries 1970-2010	Panel fixed effects regression.	Financial liberalization increases income inequality.
Bumann and Lensink (2016)	Chinn and Ito (2008) index, foreign direct investments over GDP as a measure of capital account liberalization. Private credit by financial institutions over GDP as a proxy for financial depth.	106 countries 1973-2008	Dynamic fixed-effects panel regression with GMM.	If private credit over GDP exceeds 25%, capital account liberalization lowers income inequality. If the level of financial depth is below the above threshold, which is the case for most developing countries, then financial openness raises income inequality.

Study	***Domestic Financial Liberalization Reform Measure Details***	***Sample***	***Methods***	***Findings***
Beck and Levine (2004)	Value of shares on domestic exchange over value of all shares or over GDP as proxy for stock market development. Bank claims on the private sector by deposit money banks divided by GDP for bank development. Ratio of M3 to GDP proxy financial development.	40 countries 1976-1998	Dynamic Fixed-Effects Panel Model using GMM.	Banks and stock market development are positively associated with economic growth.
Braun and Raddatz (2007)	Trade liberalization measure from an older version of Wacziarg and Welch (2008). Capital account index from Ito and Chinn (2006). Financial indexes based on Abiad and Mody (2005).	108 countries 1970-2003	Cross-country OLS regression, 2SLS using legal origin as IV for financial development, fixed effects panel GMM.	Financial development is positively associated with economic growth.
Abiad et al. (2008)	Seven dimensions of financial policy changes: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, securities markets, banking regulations, and restrictions on capital account. These are aggregated on a continuous 0-1 index.	91 countries 1975-2000	This paper only constructs a measure of reform. It does not econometrically analyse it.	This paper only constructs a measure of reform. It does not econometrically analyse it.
Gimet and Segot (2011)	Domestic credit as a percentage of GDP, difference between lending and deposit rate in banking sector, capitalization of listed companies over GDP, turnover ratio.	49 countries 1994-2002	Panel Bayesian structural vector autoregressive (SVAR) model.	Increased banking credit raises inequality. Increased market size and liquidity decrease inequality.
Agnello et al. (2012)	Financial reform measures from Abiad et al. (2010).	62 countries 1973-2005	Fixed-Effects panel data regression.	Removal of subsidized directed credit, high reserve requirements and security market liberalization lower income inequality.

Christiansen et al. (2013)	Financial and capital account indexes from Abiad et al. (2008). Tariff index from Spilimbergo et al. (2009) and economic liberalization index from Wacziarg and Welch (2008).	90 countries 1974-2004	Fixed-Effects panel data regression and dynamic fixed-effects panel model with GMM.	Domestic financial reform and trade reform raise growth. Capital account reforms are not associated with growth.
Delis et al. (2013)	Banking reform measures from Abiad et al. (2010). Ratio of bank deposits to bank credit. Index of supervisory power on banking sector from Barth et al. (2006) used as instrument for Abiad indexes.	87 countries 1997-2005	OLS, 2SLS and dynamic fixed-effects panel regression with GMM.	Abolishing credit controls reduces income inequality, interest rate controls and tighter banking supervision reduces income inequality, liberalizing the stock market increases inequality.
Prati et al. (2013)	Index that measures financial reform by combining and extending Quinn (1997) and Abiad et al. (2010) measures.	163 countries 1960-2005	Cross-country OLS regressions and dynamic fixed-effects panel model with GMM.	Financial reform leads to higher economic growth. Effects seems larger when markets and institutions are relatively developed.
Arcand et al. (2015)	Log of credit to the private sector.	66 countries 1960-2010	OLS growth regression, Dynamic fixed –effect panel model using GMM.	Finance depth is positively associated with economic growth as long as private credit over GDP is below 80-120%.
Estrada et al. (2015)	3 measures: total capital flows as a share of GDP, aggregate assets plus liabilities as a share of its GDP, Chinn and Ito (2008) index.	108 countries 1977-2011	Cross-country OLS regressions and dynamic fixed-effects panel regression with GMM.	Financial development significant for growth relative to the composition of financial system, banking and stock market activities relative to GDP increase growth. Financial openness bigger effect developing countries.
Samargandi et al. (2015)	Aggregate indicator derived using PCA from ratio of M3 to GDP, share commercial bank assets, and bank credit to private sector over GDP.	52 middle-income countries 1980-2008	Panel ARDL model based on mean group estimator, pooled mean group estimator and dynamic fixed-effects estimator.	In short-run insignificant relationship between economic growth and financial reforms. In long-run inverted U-shaped relationship between finance and growth.
Naceur and Zhang (2016)	Financial depth: bank's private credit to GDP and stock market total value to GDP. Net interest margin and stock market turnover ratio as measures of financial efficiency. The ratio of regulatory capital to risk-weighted assets and the volatility of the stock price index are used as a measure for financial stability. Financial liberalisation: Abiad et al. (2008).	143 countries 1961-2011	OLS regression and 2SLS using lagged values of the dependent variables and external instruments such as ethnic fractionalization, linguistics, religious composition, and legal systems.	Financial development reduces inequality and the poverty gap while the opposite is true for financial liberalization.

De Haan and Sturm (2017)	Private credit over GDP as a proxy for financial development. Abiad et. al (2010) indexes and Fraser Economic freedom sub-indices as a measure for economic liberalization. Data from Laeven and Valencia (2013) that identify banking crisis.	121 countries 1975-2005	Dynamic panel model, Random Effects model, Cross-country OLS regressions.	Financial development, financial liberalization and banking crises increase income inequality. The impact of financial liberalisation on inequality depends on the level of financial development and quality of political institutions.

Study	***Privatization Reform Measure Details***	***Sample***	***Methods***	***Findings***
Brown et al. (2006)	Data on privatization available from state sources.	Four countries, 1992-2002 for Romania, 1986-2002 for Hungary, 1992-2002 for Ukraine, 1985-2002 for Russia	Fixed-Effects Panel Model	MFP raises by 15% in Romania 8% in Hungary and 2% in Ukraine and -3% in Russia.
Benett et al. (2007)	Data from government sources, external documentary sources and EBRD indicators.	23 transition countries 1990-2003	First difference OLS regression, static fixed effects regression and dynamic Fixed Effects panel GMM.	Privatization by sale and MEBO have no statistical significant relationship with growth. Voucher privatization has a positive impact on growth.

Study	***Product Market Reform Measure Details***	***Sample***	***Methods***	***Findings***
Bassanini and Ernst (2002)	Employment protection legislation index, administrative regulation, inward-oriented economic regulation, indicators for tariffs and non-tariffs trade barriers from Nicoletti et al. (1999); intellectual property rights from Ginarte and Park (1997).	18 OECD countries 1993-1997	cross-country OLS regressions	Regulations that increase competition and that simultaneously guarantee intellectual property rights stimulate innovation.
Loayza et al. (2004)	Business entry regulation from WB Doing Business and Heritage Foundation; trade liberalisation from Heritage Foundation,	76 countries 1990-2000	cross-country OLS regressions; 2SLS	negative influence of regulatory burden on economic growth; positive influence of regulatory burden on macroeconomic

	Fraser Institute and World Economic Forum; financial market regulation from Heritage Foundation and Fraser Institute; contract enforcement from WB Doing Business and PRS Group; fiscal regulation from Heritage Foundation, KPMG and Fraser Institute; labour market regulation from Rama and Artecona (2002) and WB Doing Business; bankruptcy regulation indicators from WB Doing Business.			volatility; influence of regulatory burden depends on the quality of political institutions.
Duval and Elmeskov (2006)	Binary reform indicator over 5 domains: unemployment benefits, labour taxes, employment protection legislation, product market regulation and retirement schemes.	21 OECD countries 1985-2003	Cross-country/time series Probit regressions	EMU countries made comprehensive reform progress; however, it is not clear if this is related to EMU membership.
Griffith et al. (2006)	Reform indicators of the EU Single Market Programme (SMP) from the 1988 Cecchini Report.	9 OECD countries 1987-2000	Two-stage instrumental variable estimations	PMR under the EU Single Market Programme increased product market competition, innovation intensity and productivity growth for manufacturing sectors.
Amable et al. (2007)	Employment protection legislation index from authors' calculations; product market regulation index from OECD; net replacement rates from Scruggs (2004); tax wedges from OECD.	18 OECD countries 1980-2004	OLS; Panel-Corrected Standard Error estimation (PCSE); GLS estimator	Positive influence of employment protection legislation index on employment performance; substitutability relationship between product and labour market regulation policies.
Spilimbergo et al. (2009)	Product market reform index OECD; capital account reform index from an older version of Abiad et al. (2010), Quinn (1997), Schindler (2009); domestic financial sector reforms from Abiad and Mody (2005), Detragiache and Tressel (2008), Bekaert et al. (2005) and EBRD's Transition reports; trade reform index from OECD and IMF; trade restriction indicators from Quinn (1997) and Sachs et al. (1995); indicators on liberalisation to trade and foreign exchange from EBRD.	91 countries 1960-2005	panel OLS; panel 2SLS	Reforms boost economic growth; trade, financial sector and farm sector liberalisation play a major role; sequencing of reforms matters.

Bouis and Duval (2011)	Product market reform index, labour market legislation index, unemployment benefit spending, active labour market policy spending, labour tax wedge, implicit tax rate on continued work and standard retirement age from OECD databases .	24 OECD countries 1995-2007	Error-Correction Model	Product market regulation reforms towards best practice countries can boost labour productivity; impact of LMR is smaller; adopting both product market regulation and labour market legislation reform can boost economic growth substantially.
Fatas (2015)	Product market regulation indices from OECD and WB Doing Business; labour market regulation indicators from OECD.	40 OECD countries 1950-2013	OLS	Strong association between reforms and economic growth; reforms happen faster in countries that need them the most.
Amable et al. (2016)	Product market regulation Indicators from OECD.	17 OECD countries 1977-2005	IV; GMM	PMR increases productivity; negative impact of PMR on innovation, productivity and growth cannot be confirmed.
Egert and Gal (2016)	ETCR indicator from OECD; employment protection legislation indicators from OECD; legal age of pensions from OECD.	25 OECD countries 1985-2011	cross-country OLS regressions	Product market regulation reforms largest impact on per capita income 5 years after the reforms. Yet combined influence of all labour market reforms is larger than the combined influence of all product market reforms.
Dias Da Silva et al. (2017)	Employment protection legislation index from OECD; ETCR indicators from OECD; business environment index from WB Doing Business; FDI barrier measures from OECD.	40 OECD countries 1975-2013	Pooled OLS; Fixed-Effects; 2SLS; GMM	Reform pressure is high when (1) recession takes place, (2) unemployment is high and/or (3) when economy is farer away from best practice; PMR increase likelihood of LMR.

Study	***Labor Market Reform Measure Details***	***Sample***	***Methods***	***Findings***
Merlevede (2003)	Aggregate reform index from EBRD.	25 transition economies 1989-2000	3SLS	The reversal of reforms immediately negatively influences economic growth.
Bassanini and Duval (2006)	Replacement rates, tax wedges, collective bargaining coverage, employment protection legislation indicators and	21 OECD countries 1982-2003	OLS; IV; 2SLS; GMM; GLS regressions	In the average OECD country, unemployment benefits, tax wedges and anti-competitive PMR stimulate unemployment; Coordinated

	product market reform indicators from OECD.			wage bargaining systems decrease unemployment.
Falcetti et al. (2006)	Reform indicators from EBRD.	25 transition economies 1989-2003	OLS; 2SLS; 3SLS; GMM	Reforms can significantly increase growth; this improvement in economic conditions can then stimulate further reform progress.
Fiori et al. (2012)	Domestic regulation indicators from Conway and Nicoletti (2006); FDI restrictions indicators from Golub (2003) and Gloub and Koyama (2006); employment protection legislation from OECD; tax wedges from OECD; union's power and bargaining regimes from OECD.	20 OECD countries 1980-2002	Feasible GLS regressions	PMR liberalisation is more effective when LMR is high; PMR liberalisation can stimulate employment-improving LMR reforms
Cette et al. (2016)	Employment protection legislation index from OECD.	14 OECD countries 1998-2007	Difference-in-difference estimator	EPL are especially unfavourable for low-skilled employment because LMR increases the capital-to-labour ratio

Study	***Trade Liberalization Reform Measure Details***	***Sample***	***Methods***	***Findings***
Dollar (1992)	Outward-orientation index measured by index of real exchange rate distortion from Summers and Heston (1998)	95 LDC countries 1976-1985	Pooled OLS; non-linear regressions	The 25% most open countries have growth rate of 2.9% while the 25% most closed countries have shown -1.3% growth rates.
Sachs et al. (1995)	Binary trade liberalisation variable is based on: black market exchange rate premium, export market index, dummy for being socialist (Kornai, 1992), coverage of quotas on imports, average tariffs on imports	135 countries 1970-1989	Cross-country OLS regressions	Trade liberalisation boost economic growth of poor countries
Lora (2000)	trade reforms (based on average tariffs and tariff spreads), domestic financial reforms; tax reforms; privatisations; labour market reforms.	20 Latin American countries 1985-1995	OLS; GLS regressions	Crises and a change of the governing party are the major drivers for structural reforms.

Dollar and Kraay (2003)	Trade-to-GDP ratio	All 1980-1998	OLS; IV	Trade openness and institutional quality support growth in the long run.
Kraay (2004)	Trade-to-GDP ratio	80 developing countries 1980-1999	OLS	Trade openness has a negative impact on the Gini coefficient. Thus, trade liberalization comes along with distributional changes that tend to increase poverty.
Giavazzi and Tabellini (2005)	Binary trade liberalisation indicator from Sachs et al. (1995) and an older version of Wascziarg and Welch (2008).	140 countries 1960-2000	Difference-in-difference estimator	Countries that open up economy and then become democracies perform better wrt growth, investment and trade volume.
Noguer and Siscart (2005)	Trade-to-GDP ratio; bilateral trade volumes	98 countries 1985	OLS; IV; 2SLS	Countries with larger trade volumes have higher levels of income; trade policy determines the composition of trade.
Kim and Pirttilä (2006)	Internal liberalization index, external liberalization index and private sector reform index from World Bank	14 transition economies 1990-1997	2SLS; GMM	Public support for structural reforms significantly determines the reform progress.
Salinas and Aksoy (2006)	Terms of trade; manufactures exports; imports of goods and services; frequency of non-tariff barriers (% of Tariff Lines); unweighted average tariff; exports of goods and services.	39 countries 1970-2004	Multivariate fixed-effects estimations	Post- trade liberalisation reforms, the economic growth was 1.2% higher than before. Trade liberalisation influences investment, exports of goods and services, manufacturing exports and export diversification.
Demekas et al. (2007)	Tariff-import ratio; statutory corporate tax rate; foreign exchange and trade liberalisation index from EBDR; index of infrastructure reforms from EBDR	16 European transition economies 2000-2002	GMM	High corporate tax burden and high level of import tariffs decrease non-privatisation FDI.
Campos and Kinoshita (2010)	Construction of reform indices on trade liberalisation, privatisation and financial sector reforms (data from earlier version of Abiad et al. (2010), Beck et al. (2000), WB UNCTAD WITS system and Kikeri and Kolo (2005))	19 Latin American and 25 transition economies 1989-2004	Panel OLS; GMM; difference-in-difference estimator	Positive and significant influence of structural reforms on FDI; financial sector reforms have a larger impact than privatisation and trade liberalisation

Kneller et al. (2008)	Binary trade reform variable based on reform dates based on Sachs et al. (1995) and older version of Wacziarg and Welch (2008).	37 liberalising countries 1970-1998	Difference-in-difference estimator	Small but significant impact of trade liberalisation on economic growth
Wacziarg and Welch (2008)	Binary trade liberalisation variable based on Sachs et al. (1995) criteria; dummy reform based on reform dates	118 countries 1950-1998	Difference-in-difference estimator	Countries that opened up borders have 1.5% higher GDP growth rates after the liberalisation compared to before.
Nannicini and Billmeier (2013)	Binary trade reform variable based on reform dates based on Sachs et al. (1995) index	180 countries 1963-2000	Synthetic control method with case study methodology	Trade liberalisation has significant positive impact on real income per capita; gains are higher in countries that liberalised before the latest wave of globalization.
Looi Kee et al. (2009)	Tariff rates from UNCTAD's TRAINS database and MAcMap database; non-tariff barriers indicators from UNCTAD's TRAINS, WTO's trade policy review, EU Standard's Database and WTO's member notifications.	78 countries 1992-2004		Poor countries are more likely to have more trade restrictive policies in place. At the same time, they also experience higher trade restrictions on their exports.
Campos et al. (2010)	Trade liberalisation indicators from Sachs et al. (1995), Rodriguez and Rodrik (2001), Rodriguez (2006) and Wacziarg and Welch (2008); labour market liberalisation indicators from Blanchard and Wolfers (2000), Heckman and Pages (2004) and Botero et al. (2004) extended with data from World Bank (2004).	100 countries 1960-2000	Panel fixed-effects regressions	Political crises determine structural reforms more than economic crises do.
Kim et al. (2011)	Trade-to-GDP ratio; average tariffs	61 countries 1960-2000	GMM	Trade openness benefits the real income of high-income countries. For low-income countries, trade openness influences the real income significantly negatively.
Campos and Horvath (2012)	Construction of indices for internal liberalisation, external liberalisation and privatisation based on data by EBRD, IMF and national authorities.	25 Central and Eastern European countries 1989-2005	Random-effect logit model	Factors for reversals differ across reforms: (1) FDI inflows decrease the probability of privatisation reversals, (2) worsened terms of trade increase the likelihood of external liberalisation reversals, (3) labour strikes increase reversals of price liberalization.

Gries and Redlin (2012)	Trade-to-GDP ratio	158 countries 1970-2009	Error-Correction model in combination with GMM	In industrialized countries, trade liberalisation and economic growth are positively related. In developing countries, openness furthers growth but growth decreases the likelihood for trade liberalization.
Sakyi et al. (2012)	Trade-to-GDP ratio	85 middle-income countries 1970-2009	Common Correlated Effects Mean Group estimations (based on Pesaran, 2006); Fully Modified OLS; Dynamic OLS (based on Pedroni, 2000)	In the long run, trade openness and GDP growth positively influence each other; this relationship cannot be confirmed for the short-run.
De Macedo et al. (2014)	Trade Freedom Score, Business Freedom, Free Flow of Capital, Financial Freedom and Property Rights index from Heritage Foundation; Network Infrastructure Index based on authors' calculations.	100 countries 1994-2006	Cross-section, panel data with fixed- and random effects; IV regressions	Effect of structural reforms on economic growth depends on the complementarities of reforms (especially for developing countries).

Study	***Competition Policy Reform Measure Details***	***Sample***	***Methods***	***Findings***
Aghion et al. (2005)	Major UK competition policy reforms	UK 1970-1989	Flexible non-linear estimations	Inverted-U relation: very high and very low competition levels decrease innovation. In contrast, innovation reaches its peak when competition is at a medium level.
Bourlès et al. (2015)	non-manufacturing regulation indicators from OECD	15 countries 1984-2007	Error-Correction model	Competition policies that follow the best practice regulations boost economic growth.

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