Chapter 4

ECONOMIC GROWTH, INEQUALITY AND FISCAL POLICIES: A SURVEY OF THE MACROECONOMICS LITERATURE

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Abstract

The relationship between economic growth and income inequality has attracted a great deal of attention in recent years. The growth experience of several countries during the last decades with different behaviors in terms of economic inequalities has generated a growing strand of theoretical and empirical literature trying to explain these events.

Although one could argue that economic growth and inequality influence each other, it is also possible that different public policies could influence the relationship between both macro aggregates. Fiscal policy has traditionally been considered an effective instrument trough which to influence aggregate demand, the distribution of income and wealth, and the economy's capacity to produce goods and services. Therefore, a correct selection of the composition and combination of these policies has become of crucial importance for the purpose of achieving a broad-based stable path of economic growth across countries.

Within this framework, this chapter reviews the evolution of economic literature that analyzes the relationship between growth and inequality. We perform a comparative analysis of different theoretical and empirical developments, with particular focus on the importance, in terms of size and composition, of different fiscal policies, explaining that relationship.

1. Introduction

The relationship between economic growth and income inequality has attracted a great deal of attention in recent years. The growth experience of different economies with different behaviors in terms of economic inequalities has generated a growing strand of theoretical and empirical literature trying to explain these events.

An economy's growth rate and its income distribution are both endogenous outcomes of the economic system. They are therefore subject to common influences, both with respect to

structural changes as well as macroeconomic policies. Due to the importance of fiscal policy as a redistributive tool and as an instrument to promote economic growth (*Musgrave, 1959*), it is considered one of the key mechanisms to achieve goals in terms of efficiency and equity.

In general, it is possible to distinguish three major periods in the study of the relationship between economic growth and inequality and the influence of fiscal policies. During the first period, initiated by the seminal work of *Kuznets (1955)*, it was considered that economic development affects factorial and sectorial income distribution, with no important scope for fiscal policy to affect both macro-aggregates in the long-run. In turn, income inequality became a topic of lower interest in the later macroeconomic analysis. Thus, in the neoclassical growth models, inequality of income and wealth among consumers was considered the passive result of the aggregate dynamics and market interactions. The endogenous growth models putting forward new ideas about the effects of economic development on income inequality initiated the second period.[1] The contributions following this approach incorporated three new phenomena into the analysis: the increased diffusion of new technologies in different productive activities; the rapid growth of international trade, and the emergence of new organizational forms. All this new growth models have revived the interest of fiscal policy as an effective instrument to correct undesirable outcomes of the process of economic growth in terms of inequality.

In contrast, in the extensive literature on development that has appeared during the 1990s, the causation between inequality and growth runs in the opposite direction and the central concern mainly focuses on the role of income and wealth inequality in the process of economic growth. Two main groups of studies can be identified in this theoretical approach: one group suggests various transmission channels through which greater initial inequality fosters economic growth, while the other suggests several economic and political channels through which initial inequality might be harmful for growth.

On the empirical side, the relationship between income inequality and economic growth has received considerable attention. This literature is largely based on cross-country regressions trying to explain economic growth and, to a lesser extent, on panel data econometrics. Whereas cross-country regressions are used to examine the relationship in the long-run,[2] panel data estimates aim at measuring the relationship in the short and medium-term.[3]

In a parallel strand of empirical literature, the macroeconomic effects of fiscal policies on economic activity have been widely examined with contrasted views. Numerous works have used time series models, especially vector autoregressive models, to estimate the effects of different fiscal policy shocks on economic activity, but the issue of the sign and magnitude of these effects across different countries is very much an open question. Other studies used a cross country approach to examine the impact of aggregate measures of fiscal policies on economic growth for an extensive sample of countries. However, the results are not particularly robust, showing that the impact and significance of the fiscal variables depend on the set of control variables included and also on the initial conditions of the economy.

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[1] Previous theoretical contributions using endogenous growth models were made on the basis of a simple representative agent, without giving importance to distributional issues (see, for example, *Romer, 1986*; and *Lucas, 1988*).

[2] See for example, *Persson and Tabellini (1994)* and *Perotti (1994 and 1996)*.

[3] See *Li and Zou (1998), Forbes (2000), Barro (2000), Lundberg and Squire (2003), Voitchovsky (2005)*; and, for more recent empirical contributions, see *Lin et al. (2009), Huang et al. (2009), and Castelló-Climent (2010)*.

Overall, no matter the approach, there is little consensus among economists as to the magnitude or even the sign of the effects of fiscal policies on economic growth. The majority of these empirical studies use aggregate measures of fiscal policy to evaluate their impacts on economic activity and rarely take into account distributive issues. The joint response of economic growth and income inequality to fiscal policies has been largely overlooked, with significant exception of a few recent theoretical and empirical papers that find a significant *trade-off* between some fiscal policies in terms of efficiency and equity. However, some of these studies also underline that in certain circumstances, and through certain combination of fiscal policies, this *trade-off* can be avoided.

In this chapter, we review different contributions trying to explain theoretically and also empirically the relationship between growth and inequality. We focus on those approaches that can help to understand the role of fiscal policies in the relationship between these two macro-aggregates. In this sense, our revision emphasizes the importance of how causation between both variables is considered: it could run from growth to inequality (section 2), from inequality to growth (section 3), or there may be other factors that simultaneously determine both (section 4). Finally, section 5 contains some concluding remarks.

2. Effects of Economic Growth on Inequality

2.1. The Traditional Approach

Seminal studies by *Lewis (1954)*, *Kuznets (1955)* and *Kaldor (1956)* suggested that income inequality is mostly determined by the level of economic development. More precisely, they analyzed how economic development affects distribution in the long-run suggesting a potential increasing effect of growth on factorial and sectorial inequality in the first stages of economic development, and a decreasing effect in the later stages ("inverted-U hypothesis").[4]

The neoclassical growth model (*Solow, 1956*), with linear savings functions and perfect credit markets, provides a theoretical underpinning for the relationship between inequality and capital accumulation as emphasized by *Kuznets* and his followers. At the initial stages in the process of capital accumulation, the distribution of income and wealth becomes more unequal, but after sufficient wealth has become accumulated (so that wages have sufficiently grown and investment returns have sufficiently fallen), the wealth and income distribution equalizes. More precisely, according the standard neoclassical assumptions (all individuals have the same amount of labor remunerated according to its marginal productivity, the relation consumption/saving is exogenous and linear with respect to income, and capital productivity decreases as more capital is accumulated), income distribution does not affect economic growth. In turn, when the marginal consumption propensity is constant and identical across households, wealthy people consume so much that, in steady state, all wealth differences (beyond those implied by non-accumulated factors) will eventually vanish. So, the accumulation implies a tendency toward equality in the distribution of income and wealth

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[4] For theoretical studies of this "inverted-U hypothesis", see *Robinson (1976), Greenwood and Jovanovic (1990), and Helpam (1998).* For more recent empirical studies, see *Mushinski (2001), Huang (2004),* and *Huang and Lin (2007).*

when the (exogenously given) distribution of non-accumulated factor is relatively equal. When all families are equally endowed with the non accumulated factor there will be absolute convergence (see *Stiglitz, 1969; Tamura, 1991;* and *Bértola et al., 2006 chapter 2*).[5]

Some studies used the neoclassical framework to study the effects of fiscal policy on economic activity. For example, *Sato (1967), Krzyzaniak (1967)* and *Feldstein (1974)* analyze the effects of different taxes on growth; *Summers (1981)* and *Auerbach and Kotlikoff (1987)* adapt the model of overlapping generations of *Diamond (1965)* to analyze the dynamic effects of fiscal policy; *Judd (1985)* and *Chamely (1986)* used the model developed by *Cass and Koopmans (1965)* to study the effects of fiscal policy considering endogenous saving rates. In general, all these models emphasize the transitory effects of different instruments of fiscal policy. In this context, the differences in tax and expenditure policies can be important determinants of the level of output, but are unlikely to have significant permanent effects on economic growth.

The public-policy neoclassical growth models contrast with the predictions of the endogenous growth models, where investment in human and physical capital does affect the steady-state growth rate and, consequently, there is much more scope for tax and government expenditure to play a role in the growth process. The common property of the endogenous growth models is that choices made by economic agents collectively determine the growth rate (this is not conducted by exogenous factors), and, in turn, these choices can be influenced by economic policies that change the relevant *trade-offs*. So, the endogenous approach tends to transform the temporary growth effects of fiscal policy that the neoclassical model involves, into permanent effects. It follows that fiscal policy can affect the level of output as well as its long-term growth rate. In this context, one case of particular interest rises from *Barro (1990)* and *Barro and Sala-i-Martín (1992)*, where a public good financed by taxation is considered as an additional input in the production function. These models distinguish public expenses as productive or non productive, introducing them as arguments in the private production function (when classified as productive, public expenses might have a positive direct effect on the growth rate), and taxes as distorting or not distorting, depending on whether they do or do not affect private investment decisions with respect to physical and human capital and, consequently, the economic growth rate. In other endogenous growth models, like *Mendoza et al. (1997)*, consumption taxation becomes distortionary, with a negative effect on growth if leisure is included in the utility function, affecting education/labor-leisure choices and thus capital/labor ratios in production.[6]

This endogenous growth literature opened new avenues through fiscal policy can have permanent effects on economic growth. In turn, as we will see below, has brought to light new paths trough which growth and inequality may affect each other. In this context, fiscal

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[5] However, when households' savings choices are based on intertemporal utility maximization over an infinite horizon, the distribution of lifetime wealth may well become increasingly unequal in a neoclassical growing economy. This is the case when consumption-smoothing motives lead poorer consumers to choose a flatter consumption path in order to ensure the satisfaction of a minimum consumption standard: if subsistence consumption is important, poor households cannot afford to save, while wealthier ones choose steeper consumption paths and accumulate relatively more wealth (see *Bértola et al., 2006, chapter 3*).

[6] Other studies of public policy endogenous growth models are *Jones, Manuelli and Rossi (1993); Glomm and Ravikumar (1992 and 1997), Stokey and Rebelo (1995), Turnosvsky and Fischer (1995), Baier and Glomm (2001), Li and Sarte (2004), Park and Philippopoulos (2003 and 2004),* and *Cassou and Lansing (2006).*

policy has acquired a significant importance as an effective instrument to affect aggregate demand as well as an important tool for the purpose of redistribution.

2.2. The New Growth Theories Approach

The increasing inequality experienced by the OCDE countries during the eighties and nineties,[7] hardly consistent with the traditional view of Kuznets, entails the development of new endogenous growth contributions. New growth theories have focused on three related phenomena trying to explain these events: the increased diffusion of new technologies in different productive activities, the rapid growth of international trade, and the emergence of new organizational forms.

Thus, some authors argued that skill-biased technological progress (arguably the major source of economic growth) may lead to higher inequality whenever it affects the productivity of different types of labor in various ways. In general, this argument is based on the capital-skill complementarity conjecture of *Krussel et al. (2000).* This conjecture comes from the fact that the decrease in equipment prices induced by a higher productivity has brought in an increase of the use of capital in the production process; and taking into account that qualified labor is relatively more complementary to this equipment than non qualified labor, this bigger capital stock increases the skill premium of qualified workers, enlarging wage inequality across different educational cohorts,[8] and within cohorts with the same educational level.[9] In turn, several authors argued that during the 90's the skill-biased technological change has induced a reduction on workers unions jointly with decentralization in the wage bargaining process. The higher complementarities between capital and qualified workers have modified worker's incentives to unionize increasing wage inequality across workers and also between workers and employers. This policy response represents an additional channel through which technological diffusion may affect income distribution, in addition to their direct impact via wage structure (*Acemoglu et al., 2001*; *Ortigueira, 2002*; and, *Checchi and García-Peñalosa, 2010*).

The second explanation, based on the Heckscher-Ohlin model, focuses on the effects of rapid growth in international trade. According to some authors, the gains from international trade affect mainly the most abundant production factor in the country (*Wood 1994*, and *Wood and Ridao-Cano 1999*). Thus, in developing countries abundant in unskilled labor, the major exports of labor-intensive goods increases the demand and wages of unskilled workers, while demand and wages of skilled workers falls. This process reduces income inequality within these countries, sinking the wage differential between the two types of workers. On the other hand, in developed countries abundant in skilled labor, higher international trade will result in more imports of goods intensive in unskilled labor and more exports of goods intensive in skilled labor, increasing the demand for qualified workers and thus extending their wage differential relative to unskilled workers. However, some empirical studies indicated that very little of the increases in wage differentials between skilled and unskilled workers in developed countries are due to increases in imports from developing countries.[10]

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[7] See *Berman et al (1994), Atkinson (1996), Gottschalk and Smeeding (1997)*, or *Autor et al (1998)*.

[8] See *Eicher (1996), Jovanovic (1998), Aghion and Howitt (1998, chapter 8), Aghion et al. (1999, subsection 3.3.1)*, and *Violante (2002)*.

[9] See *Violante (1996), Aghion et al. (1999 subsection 3.3.2)*, and *Hassler and Rodríguez-Mora (2000)*.

[10] See *Borjas et al. (1992); Berman et al. (1994)* and *Krugman (1995)*.

Finally, a third explanation refers to the influence of new organizational forms. Technological change has modified the internal organization of firms, increasing the importance of direct or horizontal forms of communication between workers, and diversifying the tasks that they can perform. In this context, skilled workers are more able to perform various tasks and learn from the activities of other agents. In addition, if they are able to exploit the comparative advantage of their education, they will receive important wage premiums, and consequently income inequality among workers will rise.[11]

In the context of these new growth theories where the technological change and the human capital appear as the most relevant factors throughout economic growth influences income distribution, fiscal policy has acquired a significant importance as an effective instrument to influence economic growth as well as an important tool for the purpose of redistribution. In this framework, it is important to consider that growth-enhancing fiscal policy (such as expenses on R+D and/or human capital investment) could have important effects on income inequality, although their direction is not clear. On the one hand, these policies will reduce income inequality by allowing more individuals access to new general knowledge, but at the same time, as these policies encourage skill-biased technological progress they may also increase wage premiums and consequently income inequality in the long run.

In addition, it's important to note that this skill biased technological progress calls for permanent redistributive policies, such taxes and transfers, who can partially offset the undesirable effects of economic growth on the distribution of income (see *Aghion et al., 1999*). However, these permanent redistributive policies could become unsustainable in the long run when technology becomes too skill-biased (see *Hassler et al., 2003*, and *Bénabou, 2005*).

3. Effects of Inequality on Growth

In contrast, in the extensive literature on development appeared during the 1990s, the central concern focuses on the role of income and wealth inequality in the process of economic growth, and consequently the causation between inequality and growth runs in the opposite direction. Two main groups of studies can be identified following this approach: one group suggests various transmission channels through which greater initial inequality fosters economic growth; the other suggests several economic and political-economy channels through which initial inequality might be harmful for growth. In this context, redistributive policies would have opposite effects on growth according to these two different approaches.

3.1. The Pro-growth Effects of Inequality

The strand of literature pointing to the pro-growth effects of inequality basically focuses on the following factors: different saving propensity of economic agents, investment indivisibilities and incentive considerations.

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[11] See *Lindbeck and Snower (1997); Caroli (2001); Möbius and Schoenle (2006), Garicano and Rossi-Hansberg (2006);* and *Grossman and Rossi-Hansberg (2008).*

According to the growth models of *Lewis (1954)*, *Kaldor (1957)* and *Pasinetti (1962)*, the marginal propensity to save of the rich is bigger than the poor. If the growth rate relates directly to the proportion of the national revenue saved, most unequal economies will grow faster than economies characterized by a more egalitarian distribution. In this line, *Bourguignon (1981)* shows that, with a convex saving function, aggregate output depends on the initial income distribution and is higher the more unequal the economy is. More recently, *Galor and Moav (2004)* have considered a nonlinear relationship between inequality and growth that varies with economic development and obtained different conclusions depending on the economy maturity. Thus, in early stages of development, when physical capital is scarce and its returns are high, inequality stimulates growth by allowing the channeling of resources towards individuals whose propensity to save is higher. However, at higher levels of development, when human capital emerges as a key factor for economic growth, equality alleviates the adverse effects of credit constraints and stimulates growth by allowing greater investment in human capital.

The second argument focuses on investment indivisibilities, especially, when the implementation of new industries and innovations involve big sunk costs. In the absence of a perfect credit market, the wealth needs to be sufficiently concentrated to be able to cover such costs and, therefore, to initiate a new industry. Consequently, a more unequal economy will carry more investment projects and as a result it is going to grow faster than a more egalitarian one. This issue has been emphasized by policy advisors to transition economies in Central and Eastern Europe and the former Soviet Union.[12]

Finally, the third argument comes from *Mirrlees (1971)* and is based on the idea that there is a *trade-off* between productive efficiency and equity due to incentive considerations. Namely, in a moral hazard context where output depends on the unobservable effort bear by agents or "employees", rewarding the employees with a constant wage independent from output performance will discourage them from any investment effort. On the other hand, making the reward too sensitive to output performance may also be inefficient from an insurance point of view when output realizations are highly uncertain and the employees are risk averse.[13]

Focusing on the importance of incentives at microeconomic level, recently *García-Peñalosa and Wen (2008)*, incorporated new arguments related to entrepreneurship. Thus, in a Schumpeterian context, innovation is performed by entrepreneurs and hence the determinants of entrepreneurship - characterized by large risks - will affect growth. Then, in order to induce individuals to become entrepreneurs and innovators rather than employees, large returns are required to compensate for these risks. The immediate implication is that the higher the income of a successful entrepreneur, the larger the fraction of the population that chooses entrepreneurship, and hence the faster the rate of innovation is. That is, greater income inequality will result in more innovation and entrepreneurship and, as a result, faster technological change and growth.[14]

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[12] For more details, see *Aghion and Howitt (1998), chap. 9.*

[13] See *Prendergast (1999)*, for a discussion about the *trade-off* between risk and incentives.

[14] Surprisingly, in this context the fact that greater inequality induces more entrepreneurship does not imply that redistribution hampers growth. On the contrary, a certain degree of income redistribution can increase entrepreneurship and the growth rate because it provides insurance to all agents undertaking risky activities as it guarantees a minimum income in the case of failure reducing income uncertainty and hence induces more entrepreneurship.

In fact, the traditional *incentives view* in macroeconomic theory (*Okun, 1975*) is that there is a fundamental *trade-off* between growth and equality, i.e. redistribution trough income taxes has negatives effects on growth. It reduces differences on income and wealth and consequently reduces growth; and also, it has a negative effect on growth as income redistribution financed through income taxes diminishes incentives to accumulate wealth. In the same direction, *Rebelo (1991)* has shown that in a *Ramsey-Cass-Koopmans* growth model with perfect capital markets, greater taxation reduces the return to saving, thus lowering the incentives to accumulate capital and hence the rate of growth.

3.2. Inequality Being Harmful for Growth

A second group of studies explains how initial inequality in income and wealth reduces the long-term potential growth of the economy. This theoretical literature suggests several economic and also political-economy channels through which inequality might be harmful for growth. So, redistributive fiscal policies that reduce inequality can therefore be growth-enhancing in the medium and long term.

3.2.1 Economic Arguments

The main economic arguments are related to capital market imperfections, the domestic market size and endogenous fertility rate.

Stiglitz (1969) in a neoclassical economy, where aggregate output is produced by the aggregate stock of capital, points out that when there are decreasing returns to capital and capital markets are imperfect, individual wealth will not converge to a common level and the aggregate level of output may be affected by its redistribution. More recent endogenous growth theories argue that when aggregate output is the sum of the output generated by each economic agent (agent's output is a function of her own physical or human capital), the rate of growth depends on the distribution of individual capital investments as a result of *learning-by-doing* process. In this context, since the liquidity constraints due to credit market imperfections, prevent the poor agents from carrying out indivisible productive investments, the negative impact of inequality on growth will be higher as the initial wealth distribution is more unequal. So, in these endogenous growth models with concave individual production function, redistributing wealth from the rich (whose marginal productivity of investment is relatively low, due to decreasing returns to individual investments) to the poor (whose marginal productivity of investment is relatively high, but who cannot invest more than their limited endowments), would enhance aggregate productivity and growth. Therefore redistribution creates *investment opportunities*, which in turn increases aggregate productivity and growth.[15] However, economic efficiency of these progressive redistribution measures requires that the economy reach a minimum level of development. Otherwise, if the economy is characterized by a very low level of national income, these policies may cause long-term stagnation (persistence of the economy in an "underdevelopment trap"), by reducing the

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[15] See *Galor and Zeira (1993)*, *Bénabou (1996)* and *Aghion et al. (1999, section 2.2)*, for a reduced form representation of credit market imperfections. However, see *Banerjee and Newman (1993)*, *Aghion and Bolton (1997)*, *Piketty (1997)*, and *Aghion et al. (1999, section 2.3)*, for ex-ante moral hazard considerations.

number of individuals who are rich enough to cover the fixed costs of large investment projects needed for the *"take-off"* (see *Barro, 2000;* and *Bértola et al., 2006, chapter 7*).[16]

A second argument is related to the domestic market size and the influence of income distribution on the variety of goods that consumers demand. In this sense, the initial distribution of income can affect the long-run growth rate by modifying the size and the composition of the domestic demand. These developments are based on the assumption that consumption patterns vary with consumer's income level due to indivisibilities in consumption. In a sense, considering consumption invisibilities make it possible to establish a parallelism with the former models based on capital market imperfections: while low income families were not able to finance certain investments projects in the former models, in these models low income families are excluded from some consumption activities because of the existence of imperfect markets allowing the producers to fix high prices. In this context, a more equal distribution of purchasing power make it possible to shift the domestic demand towards manufactures which can be effectively produced internally only on a very large scale. Therefore, redistributive fiscal policies could increase domestic demand, fostering the development of local industry. [17]

According to the endogenous fertility argument, initial income inequality reduces future growth rate due to its positive effect on average fertility rate. Poor parents with relatively low levels of education may not finance the education of their children. In contrast, wealthy parents prefer to invest in quality (education) rather than quantity (number of sons). In this context, a more equal distribution usually reduces the average fertility rate through a progressive transfer of incomes or human capital assets. If this drop in the overall rate of fertility is simultaneously associated with a rising investment rate in human capital, then the economic growth rate will increase in the long run.[18]

The main conclusion we can obtain from the above mentioned economic arguments is that when agents are heterogeneous and capital markets are imperfect, greater inequality may have a negative impact on growth. In this context, redistributive policies that alleviate income inequality could enhance economic growth. And taking into account that most industrial economies suffer from insufficiently developed capital markets,[19] these redistributive policies could enhance growth not only in less-developed countries, but also in many developed economies.

3.2.2. Political Economy Arguments

Additionally to the above discussed economic arguments, other political-economy explanations suggest the existence of a negative relationship between initial inequality and subsequent growth.

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[16] Inside this strand of literature, the models of *Aghion and Bolton (1997)* and *Aghion et al. (1999, section 2.4)*, postulate that inequality can take the form of unequal access to investment opportunities across individuals, which, jointly with a high degree of capital market imperfection, can generate persist investment volatility. Such volatility in turn implies that there are unexploited production possibilities (idle funds) and hence the long run growth rate is lower that it could be.

[17] See *Murphy, Shleifer and Vishny (1989)*, *Jamarillo (1995)*, *Falkinger and Zweimüller (1996 and 1997)*, *Foellmi and Zweimüller (2004)*, and *Zweimüller and Brunner (2005)*, among others.

[18] See, *Becker and Barro (1988)*, *Perotti (1996)*, *Galor and Zang (1997)*, *Dahan and Tsiddon (1998)*, *Morand (1998)*, *Koo and Dennis (1999)*, and *Kremer and Chen (2000)*.

[19] See *Laporta et al. (1997, 1998)*, and the *Development Financial Report 2010 - World Economic Forum*.

Firstly, a more unequal income distribution increases redistributive tax pressures, which deters private investment and decreases future economic growth. Thus, early models of "endogenous fiscal policy", under the assumption of perfect capital markets, highlight a long-term negative relationship between inequality and growth.[20] These models are based on the "median voter" hypothesis, initially developed by *Meltzer and Richard (1981)*, where the level of government taxes and transfers is the result of a democratic voting process (*"majority rule"*). In this case, the gross personal income (pre-government intervention) is the primary determinant of voter preferences. The main idea is that a more unequal democratic societies, demand redistribution financed by distortionary taxes, and a rise in these taxes decreases private investment and consequently reduces economic growth.

An alternative approach of these pioneering models of political economy puts greater emphasis on the analysis of socio-political instability and its consequences.[21] The main argument is that the social and political instability provoked by high levels of inequality can lead to irresistible pressures for redistribution and expropriation, producing disincentive effects on capital accumulation and as a result on economic growth. In this context, greater fiscal redistribution through distortionary taxes, while it may reduce investment incentives, also decreases social conflict and contributes to greater stability that encourages productive activities and capital accumulation. Therefore, the net effect of these fiscal policies will be the result of two opposite effects: the distortion effects due to higher taxes and the pro-growth effects associated with the reduction of social conflict.[22]

More recent models of political economy tried to relax the main assumptions of the two aforementioned political economy approaches, i.e. perfect capital markets and distortionary taxes. Thus, this new approach introduces the consideration of externalities associated with human capital investment. The idea is that the *trade-off* between efficiency and equity highlighted by the aforementioned models could be avoided if human capital investment is financed by non-distortionary taxes (*Saint-Paul and Verdier, 1993*). In this case, we observe positive effects of redistribution policies on economic growth by allowing greater investment in human capital. However, if redistribution is financed through distortionary taxation, two opposite effects appear: the standard effect whereby taxation reduces net capital returns, and the growth enhancing effect provoked by the increase in human capital investment. In fact, in *Bénabou (2000 and 2005)* this *trade-off* allows for two scenarios. One, termed *"growth-enhancing redistributions"*, is consistent with pro-growth effects of transfers meanwhile tax distortions remain relatively small; the faster growth under the more redistributive fiscal policies is provoked by more efficient allocation of investment expenditures.[23] The other relevant scenario, termed *"eurosclerosis"*, explain how European voters choose more redistribution than Americans, not because they are intrinsically more risk averse, but because they vote for more cohesion societies which, ex ante, would be valued enough to compensate for lesser growth prospects.

Finally, other lines of more recent models of political economy literature endogenize the behaviour of political institutions and focuses on three aspects: the role of property rights, the vulnerability of governments to different pressure groups, and the predatory nature of

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[20] See *Bértola (1993), Alesina and Rodrik (1994)* and *Persson and Tabellini (1994).*

[21] See *Gupta (1990), Alesina and Perotti (1996),* and *Bourguignon (1998).*

[22] See *Bourguignon (1999)* for a discussion of this *trade-off.*

[23] This scenario is particularly relevant for human capital investment and public health expenditures, where the contrasted path of East Asia and Latin America were observed.

authoritarian leaders. According to this approach, an inegalitarian distribution of economic resources results in a greater political power of the wealthiest members of the society, and consequently inequality will not be associated with more redistribution; there is no scope for the implementation of policies aimed at the reduction of inequalities. [24]

4. The Macroeconomic Effects of Fiscal Policy

The empirical effects of fiscal policies have been widely examined with contrasted views. Numerous works have used time series models, especially vector autoregressive models, to estimate the effects of different fiscal policy shocks on economic activity, but the issue of the sign and magnitude of these effects across different countries is very much an open question.[25] Other studies have used a cross country approach to examine the impact of aggregate measures of fiscal policies on economic growth for an extensive sample of countries. However, in this approach, inspired by *Easterly and Rebelo (1993)*, who add fiscal variables in an ad-hoc manner to an empirical growth equation, the results are not particularly robust, showing that the impact and significance of the fiscal variables depend on the set of control variables included and also on the initial conditions of the economy.[26]

On the other hand, there are some empirical studies that have included fiscal policy variables in an inequality equation in order to explain their redistributive impact.[27] In this sense, we can distinguish between two main groups of contributions. A first group of papers discuss the impact of public spending on income distribution for OECD countries and they find a significant negative effect of total government spending on inequality (see *Gustafsson and Johannson, 1999*; and *Galli and van der Hoeven, 2001*). In turn, *Alfonso et al., (2010)* highlight important differences between European countries: the Southern countries exhibit a low efficiency pattern of government spending, while Nordic countries report a relatively high efficiency. Finally, *Wolff and Zacharias (2007)* analyses the case of United States using a panel of states and show that the reduction in inequality is due to government spending, rather than taxes.

A second group of studies evaluates the distributive effect of different fiscal policies implemented in developing countries showing, in general, very weak redistributive impacts of these policies. Thus, in the case of Andean countries, *Barreix et al. (2007)* indicate that the full effect of taxes is slightly regressive, due to a weak capacity for income tax collection. In turn, *Goñi et al. (2008)* attributes the poor performance of redistributive policies in six Latin American countries to the low volume of resources collected and transferred, the existence of regressive taxation and misguided transfers.[28]

Also, *Lopéz et al. (2010)* focusing on a larger sample of 40 developing countries, show that reallocating government spending from private goods and non-social subsidies to public and semi-public goods is associated with reductions in poverty, even though their redistributive effect is neutral implying poor targeting. In the case of the Central American

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[24] See *Bénabou (1996), Ades y Verdier (1996), Bourguignon and Verdier (2000 a, b ,c, d), Acemoglu and Robinson (2000),* and *Glaeser et al. (2004).*

[25] *Perotti (2005)* provide surveys of this literature.

[26] For a survey of this empirical literature see *Myles (2009).*

[27] For a survey of this empirical studies see *Atkinson and Brandolini, (2006, Table 14.1).*

[28] The countries analyzed are Argentina, Brazil, Chile, Colombia, México and Peru.

countries, *Cubero and Hollar (2010)* find that the impact of social spending on poverty and income distribution is undermined by its relatively low absolute level. Similarly, *Chu et al. (2000)* using a sample of developing economies finds significant impact of direct taxes reducing inequality but these effects are also extremely small in magnitude. Finally, *Li et al. (2000)* use a panel of 84 countries that includes developed and developing countries and obtain no statistically significant effects of total government expenditure on income distribution.

In summary, the results of these empirical studies show that the redistributive impact of fiscal policies seem to be strongly related to the country's development and government capacity.

Taking a theoretical approximation, *García-Peñalosa and Turnovsky (2007)* and *Chaterjee and Turnovsky (2010)* seek to model the effects of different instruments of fiscal policy on economic growth and also on inequality. A central concern of both papers is the role of government spending programs, especially public investment, in stimulating economic growth and reducing inequality.

Thus, *García-Peñalosa and Turnovsky (2007)* examined the distributional impact of different ways of financing an investment subsidy in an endogenous growth model with elastic labor supply. Their results indicate that policies aimed at increasing the growth rate result in a more unequal pre-tax income. This is because growth is fostered by policies that increase the return of capital, and since capital is more unequally distributed than labor, higher returns to capital translate into greater income inequality. However, the analysis also indicates that such policies tend to reduce post-tax inequality suggesting that gross income inequality is a poor proxy for the assessment of the effects of policy on the distribution of welfare. Because of some policies tend to have opposite effects on the pre-tax (gross) and post-tax gross (net) distributions of income, it is possible to induce faster growth in conjunction with a more equal distribution of post-tax income. Overall, the analysis provides support for the use of either a tax on capital income or a tax on consumption to finance a subsidy on investment, in that both policies increase the growth rate and reduce inequality in post-tax income and welfare. An even more attractive policy consists of adopting a consumption tax together with an equal-in-magnitude wage subsidy to finance the investment subsidy, since this does not distort the labor-leisure choice.

In a more recent paper, *Chaterjee and Turnovsky (2010)* analyzed the effects of pro-growth policies, such as government investment in infrastructure, on wealth and income inequality and how the relationships are affected by the method of financing. They use a general equilibrium endogenous growth model with heterogeneous agents, where the heterogeneity is due to the initial endowments of private wealth. Their results suggest that government spending in public capital will increase wealth inequality gradually, regardless of how it is financed. Government investment tends to enhance the productivity of private capital, thereby stimulating its accumulation, and with private capital being more unequally distributed among agents than is labor; this tends to increase wealth inequality. In contrast, the consequences for income inequality are sensitive to how public investment is financed and may be characterized by sharp intertemporal *trade-offs*. While government investment financed by a lump-sum or consumption tax leads to a short-run decline in income inequality, this is completely reversed over time, leading to an increase in the long-run dispersion of income. Public expenditure financed by capital or labor income taxes yields sharp differences

between pre-tax and post-tax income inequality, both in the short run and over time. But regardless of the financing method, both measures of income inequality increase over time.

From an empirical perspective the joint response of economic growth and income inequality to fiscal policies has been largely overlooked, with significant exceptions in recent papers. Thus, *López (2003)* uses a panel of 91 countries over the period 1960-2000 and finds that improvements in infrastructure and education reduce inequality while promoting economic growth. *Calderón and Servén (2004)* evaluate the impact of infrastructure investment on economic growth and income distribution using an unbalanced panel of 121 countries during the period 1960-2000 and highlight the positive effects on growth and negative impacts on inequality. Finally, *Muinelo and Roca-Sagales (2010)* analyze the short run impact of different instruments of fiscal policy on economic growth as well as on income inequality, using an unbalanced panel of 43 upper-middle and high income countries for the period 1972-2006. Their empirical results suggest that an increase in the size of government measured through current expenditures and direct taxes diminishes economic growth while reducing inequality. Public investment seems to be the only fiscal policy that may break *this trade-off* between efficiency and equity, since increases in this item reduces inequality without harming output, confirming the predictions of *García-Peñalosa and Turnovsky (2007)*, and *Chaterjee and Turnovsky (2010)*.

The importance of these more recent theoretical and empirical works is that they indicate that under certain circumstances the classic *trade-off* between efficiency and equity to implement specific tools fiscal policy could be avoided. In particular, in the short run, increased public investment could stimulate growth and, in turn, reduce income inequality.

5. Conclusion

This chapter surveys the contributions that analyze the relationship between inequality and economic growth and presents a comparative analysis of different theoretical and empirical developments, with particular focus on the importance, in terms of size and composition, of different fiscal policies, explaining that relationship.

Recent times have seen government spending, taxation, and deficit financing move to the forefront of policy analysis. Due to the importance of fiscal policy as a redistributive tool and as an instrument to promote economic growth, it is commonly considered one of the key mechanisms to achieve goals in terms of efficiency and/or equity.

In section 2 of the survey we examine the effects of economic growth on inequality. We show that, according the traditional wisdom, there is no important scope for fiscal policy as an effective tool to affect both macro-aggregate in the long-run. However, in the context of the new endogenous growth theories approach, where technological change and human capital appear as the most relevant factors through which economic growth influences income distribution, growth-enhancing fiscal policies (i.e. R+D and human capital investment) could have important effects on income inequality, although it is not clear their direction. On the one hand, they will reduce income inequality by allowing more individual's access to new general knowledge, but at the same time, by encouraging skill-biased technological progress they may also increase wage premiums and income inequality. In addition, this skill biased technological progress calls for permanent redistributive policies, such taxes and transfers, which can partially offset the undesirable effects of economic growth; however, these

permanent redistributive policies could become unsustainable when technology becomes too skill-biased.

More recent growth models have revived the interest of fiscal policy as an effective instrument to promote economic growth and to correct undesirable outcomes of the process of skill-biased economic growth in terms of inequality

In section 3, we analyze recent theories where the central concern mainly focuses on the role of income and wealth inequality in the process of economic growth. Two main groups of studies are identified in this theoretical literature: one group suggesting various transmission channels through which greater initial inequality fosters economic growth; the other suggesting several economic and political channels through which initial inequality might be harmful for growth. Redistributive policies would have opposite effects on growth according these two different approaches. Only when inequality is harmful for growth, due to several economic and also political-economy channels, redistribution to the less well endowed, by reducing inequality, can therefore be growth-enhancing. However, economic efficiency of these progressive redistribution measures requires that the economy has reached a minimum level of development. Otherwise, if the economy is characterized by a very low level of national income, these policies may cause long-term stagnation (persistence of the economy on an "underdevelopment trap"), by reducing the number of individuals who are rich enough to cover the fixed costs of large investment projects needed for the "take-off".

In this context, the theoretical analysis calls for further empirical evidence. However, the majority of existing empirical studies have focused on the effects of fiscal policy on economic activity without considering the redistributive effects and, not offering, in turn, an analysis of the impact of different fiscal policy instruments. Only recently some theoretical and empirical papers in this line have appeared. The importance of these more recent works is twofold. On the one hand, these empirical studies showed that the redistributive impact of fiscal policies seem to be strongly related to the country development and government capacity. On the other hand, in certain circumstances the classic *trade-off* between efficiency and equity when implementing specific tools of fiscal policy could be avoided; in particular, in the short run, increased public investment could stimulate growth and, in turn, reduce income inequality.

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