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Pro-Growth Equity

A Policy Framework for the Twin Goals

Luis F. López-Calva
Carlos Rodríguez-Castelán

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Abstract

Growth is an important channel for poverty reduction. Policies to make growth more "inclusive" have permeated the development debate and "pro-poor growth" has been the subject of a wide range of papers in the literature, including issues related to measurement, modeling, and policy. However, the analytical and particularly empirical literature to support the idea that equity-enhancing policies have a positive effect on growth is more scarce and limited, especially on the potential policy links. This paper proposes a simple conceptual framework to identify the main elements that contribute to the income generation of households, building on the notion that growth can be seen partly as the aggregate outcome of the income generation capacity of households. The framework relies on an asset-based approach, and offers insights on how a more equitable distribution of assets and opportunities for their productive use can feed back into higher growth in the long term. Using this framework, the paper links the World Bank's twin goals to specific policy channels that have direct impacts on the income generation capacity of households, with a particular focus on households at the bottom of the income distribution. The four key policy channels include (i) implementing equitable, efficient and sustainable fiscal policy and macroeconomic management, (ii) strengthening fair and transparent institutions capable of delivering quality basic services, (iii) enabling well-functioning markets, and (iv) establishing adequate risk management instruments at the macro and household levels.

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Pro-Growth Equity:

A Policy Framework for the Twin Goals[1]

Luis F. López-Calva[†] Carlos Rodríguez-Castelán[‡]

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[†] World Bank. E-mail: lflopezcalva@worldbank.org

[‡] World Bank. E-mail: crodriguezc@worldbank.org

1. Introduction

In 2013 the World Bank adopted two overarching strategic goals, namely: (1) to end extreme poverty at the global level by 2030, and, (2) to promote shared prosperity in every country. The latter refers to a sustainable increase in the well-being of the poorer segments of society, roughly defined as the lowest 40 percent of the income distribution.[2] A central question to be answered in this context is: What are the constraints to progress? This question has typically been answered from a top-down perspective, by looking at how growth can be an important channel for poverty reduction ("pro-poor growth"). However, this paper takes a bottom-up perspective, building on the idea that policies that focus on the income generation capacity of households at the bottom of the income distribution can feed back into higher growth potential in the long run ("pro-growth equity").

The purpose of this paper is to propose a simple conceptual framework that identifies the main elements that contribute to the income generation of households which can be intuitively related to poverty reduction and shared prosperity. This framework utilizes an asset-based approach and presents the realization of household market income as a function of four main components[3]: (i) the capacity of households to generate income based on the assets they own; (ii) the private transfers they receive that are independent of household income-earning assets; (iii) the set of prices of the basket of goods and services that the household consumes; and, (iv) the realization of exogenous shocks that generates variability of incomes.

This approach is particularly useful for linking equity-enhancing policies to growth. By looking at the impact of different policies on the income generation capacity of households, this paper links changes

[2] Although the shared prosperity indicator focuses attention on the poorest segments of a country's population, it does not completely ignore the rest of the segments. Those above the bottom 40 percent will fall back into the bottom of the distribution if growth occurs only there (Basu, 2013).

[3] This approach is an extension of a framework that has been previously discussed in the literature (see Attanasio and Székely, 1999; Carter and Barrett, 2006, Bussolo and Lopez-Calva, 2014; Carter and Janzen, 2015).

in the welfare of households (particularly of those at the bottom) with their ability to contribute to aggregate growth (following Basu 2006). This paper focuses specifically on four key policy areas in this regard, also defined in previous studies (Bussolo and Lopez-Calva, 2014; Cord, Genoni and Rodriguez-Castelan, 2015): (i) Equitable, efficient and sustainable fiscal policy and macroeconomic stability (direct and indirect taxes and transfers, inflation targets); (ii) Fair and transparent institutions capable of delivering quality basic services (more and better supply of public goods, protection of property rights); (iii) Well-functioning markets (improved connectivity to markets, competition policy), and; (iv) Adequate risk management at the macro and household levels (safety nets, macro prudency).

The next section of the paper provides a brief discussion on the relationship between equity and growth. Section 3 presents a description of the asset-based conceptual framework. Section 4 explains its connection to poverty reduction and shared prosperity. Section 5 offers a simple model to connect the four policy areas to the twin goals through the asset-based approach. Section 6 presents conclusions.

2. From equity to growth: What does the literature tell us?

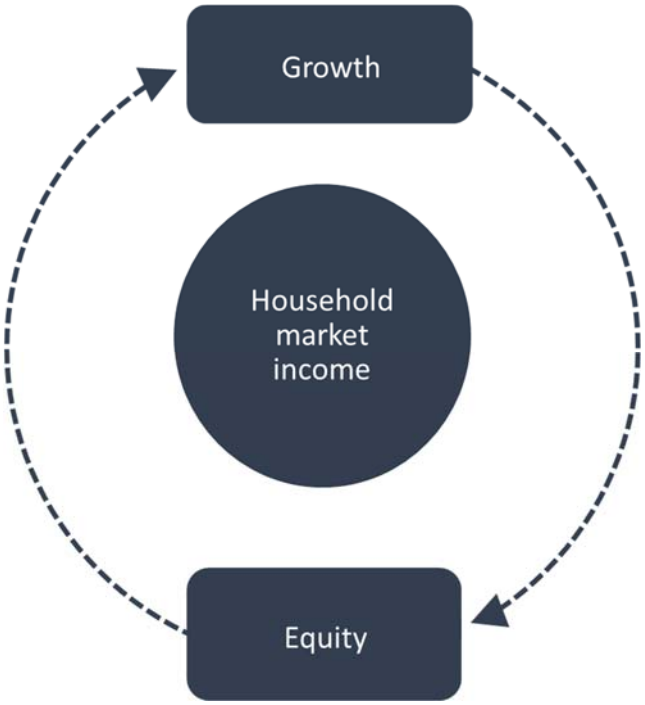
What does the literature say about the relationship between equity and growth? Economic growth plays a key role in contributing to poverty reduction. Policy discussions to make growth more "inclusive" have permeated the development debate. The so-called "pro-poor growth" has been the subject of a wide range of papers in the economic development literature, including measurement, modeling and policy implications (see Foster, 2014, for a recent review of the concept). There are, for example, widely accepted empirical regularities about the growth elasticity of poverty in cross-country analysis (Dollar and Kraay, 2002; Dollar, Kleineberg and Kraay, 2013) and debates about how it varies as economies grow richer (Allwine, et al., 2013). However, the analytical and empirical literature to

support the idea that policies oriented to reduce inequality have a positive effect on growth ("pro-growth equity") is more scarce and limited.

Pro-growth equity

Conceptually, income inequality should have a strong contemporaneous correlation with growth, as growth and inequality are jointly determined (Chenery, et al, 1974; Ferreira, 2010). As Chenery, et al. (1974) show 40 years ago, overall growth can be decomposed as the weighted sum of the income growth of different groups in society, where the weights are determined by those groups' initial share in total income.

Figure 1. Growth and equity are jointly determined



Studies looking into the inequality-growth relationship have found ambiguous results (Marrero and Rodriguez, 2013). In a recent study, Ferreira et al. (2014) use two new data sets, consisting of 118 household surveys and 134 Demographic and Health Surveys, to show that inequality is negative for

economic growth, though the specific component of inequality of opportunity –that inequality that correlates with circumstances at birth—does not show a robust effect by itself. One of the main contributions of that paper is the attempt to distinguish between income inequality and indicators of equity –in this case, inequality of opportunity. Along the same lines, Marrero and Rodriguez (2013), using the PSID database for the U.S. in 1970, 1980 and 1990, find a robust support for a negative relationship between inequality of opportunity and growth, and a positive relationship between inequality of effort and growth. Thus, the indicator of inequality used in the empirical work –based on different notions of what is the inequality that "matters"—may lead to different results. On the other hand, equity indicators –such as access to basic services and access to markets—may have a more delayed effect on growth, as they affect the long-term productivity of the poor or previously excluded groups.

Revisiting equity-efficiency trade-offs

As discussed in Kanbur (2013), there is no shortage of theoretical models showing why equity is associated with growth.[4] If the economy is "distorted enough" –producing within its full productive capacity, lifting constraints to productivity might actually improve both efficiency and equity. Political economy considerations might also lead to a situation where redistribution enhances efficiency (Levy and Walton, 2005).

[4] There are diverging views on the link between economic growth and equity. Aghion et al. (1999) present three arguments that support the view that wealth inequality should be growth-enhancing. The first argument is Kaldor's hypothesis that the marginal propensity to save of the rich is higher than that of the poor. Stiglitz (1969) and later Bourguignon (1981) formalized this argument and demonstrated that more unequal economies will grow faster. The second argument has to do with investment indivisibilities. In the absence of a well-functioning market for shares, wealth needs to be sufficiently concentrated in order for economic agents to be able to cover large sunk costs and thereby engage in entrepreneurial activities. The third argument is based on incentive considerations. In an economy where all agents have the same preferences, greater taxation reduces the return to savings and thus lowers the incentives to accumulate capital and hence the rate of growth (see for instance, Basu 2006).

Most of these theoretical models rely on some form of market failure, which interacts with an unequal distribution of income to produce a negative effect on growth. Kanbur (2010) discusses, for example, how a threshold level of investment may be required for human capital investment. He argues that in the presence of imperfections in the credit market, the amount that can be invested is determined by one's own wealth. Those with low wealth will not invest in their own human capital, and "…thus, if human capital investment by the wealthy is diminishing at the margin, a redistribution of wealth will increase overall investment in human capital and, where this mechanism is tacked on to an endogenous growth model, the steady-state growth rate as well". These dynamics are consistent with traditional models on inequality and growth, like those discussed in Banerjee and Newman (1994) and Galor and Zeira (1993), which suggest that in the presence of failures in credit markets there are interventions that may enable people who are currently marginalized to improve their access to credit. These interventions could unlock the inherent economic potential by means of higher productivity, thus spurring growth.

Fiscal redistribution is another channel through which promoting equity could lead to higher growth in the presence of market failures. Following a simple model in Aguion et al. (1999), which assumes imperfect capital markets, it can be shown that redistribution to the poorly endowed, that is, to those individuals who exhibit the highest marginal returns to investment, will be growth-enhancing. The model can be extended to other kinds of market failures, and interacted with an unequal distribution of income, to reach a similar conclusion: more equitable fiscal policy could increase aggregate output and enhance growth. The well-functioning of markets thus becomes crucial for unleashing the productive potential of the less well-off. As a recent review by Duflo (2011) discusses:

> "In a world of perfect markets, the distribution of resources in an economy would not affect investment and growth, and the ability to benefit from growth would only depend on one's

> intrinsic talents. However, if financial, land, and human capital markets do not function very well, the identity of who holds resources in an economy matters for how they are used. The poor can stay poor even if the economy as a whole grows. And growth can be slowed down because resources are not used in the most efficient way possible. Our understanding of why growth suddenly catches on in a poor country, and even more of what type of growth is inherently "pro-poor" or not is very limited. A long term strategy to balance growth with equity is thus to put in place policies that maximizes the chance that the poor are able to fully participate in markets, so that when growth starts, they can benefit from it."

There could be also a political economy channel through which inequality induces inefficiency. Alessina and Rodrik (1994), as well as Persson and Tabellini (1994) were among the first to establish that inequality affects taxation through the political process where voters decide the tax rate of the economy. In particular, Alessina and Rodrik (1994) present a voting model in which more inequality induces more inefficient policies (e.g. a higher level of distortionary tax).

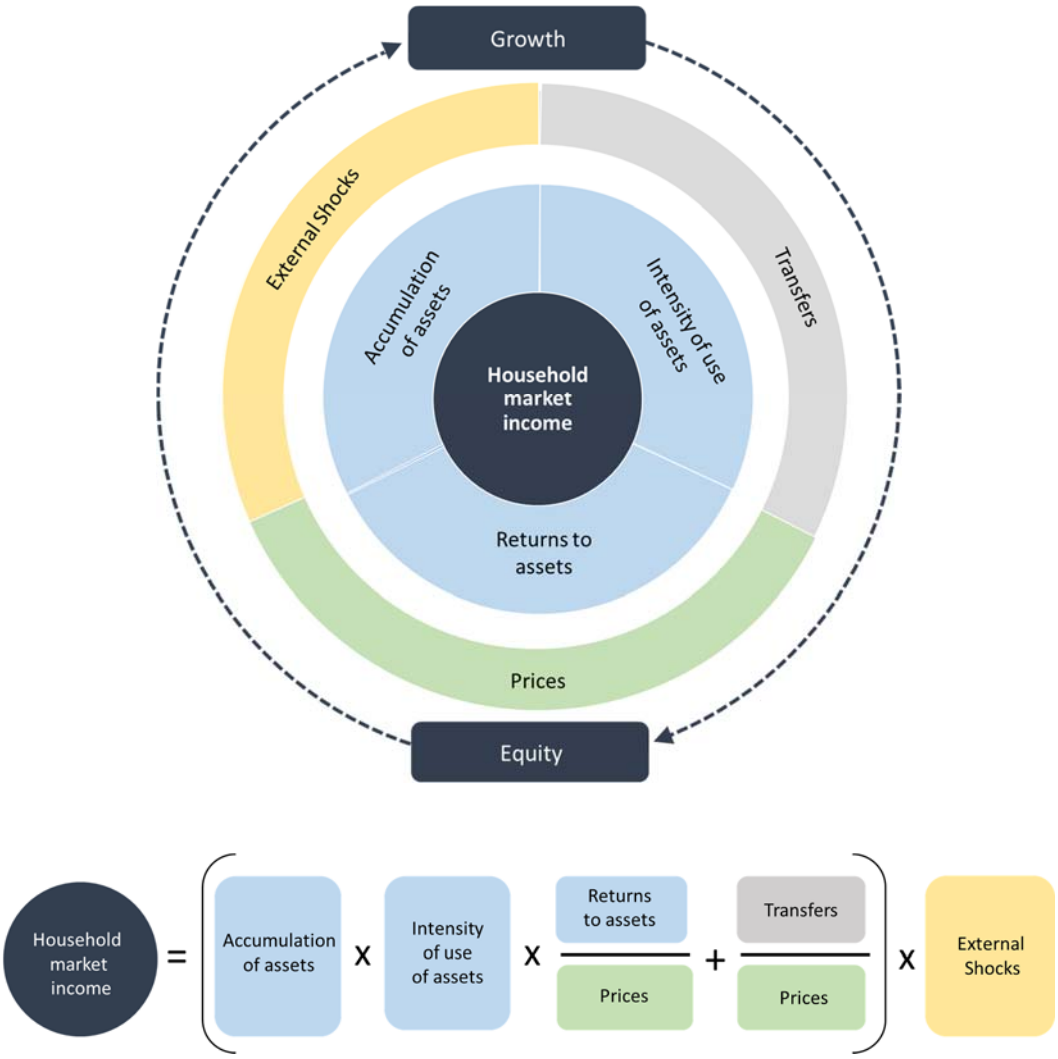
3. An asset-based approach to market income

Indeed, strategies that break traditional equity-efficiency trade-offs are needed. The framework presented here suggests that such trade-offs can be overcome by enhancing the productive capacity of the poor via policies that promote a diversification of their asset-base and a more intensive use of those assets, in a market environment in which returns are not systematically distorted.

The proposed framework is based on Attanasio and Székely (1999) and Bussolo and Lopez-Calva (2014). It defines a household's market income potential as a function of four main components: (i) the capacity of households to generate income based on the *assets* they own; (ii) the *transfers* they receive that are independent of household income-earning assets; (iii) the set of *prices* of the basket of goods

and services that the household consumes; and, (iv) the realization of *external shocks* that generates variability of incomes. Figure 2 illustrates the interaction between these components.

Figure 2. Assets approach to market income



The *capacity of households to generate income based on the assets they own* is the foundational component of the framework. This component can be further disaggregated into three sub-components: the stock of income-earning assets owned by each household member, the intensity rate at which these assets are

utilized by each individual to produce income, and the returns to these assets. *Income-earning assets* may include human capital, such as education and years of experience in the labor market; financial and physical assets like ownership of machinery, or bonds and stocks; social capital such as the set of norms and social networks that facilitate collective action; and natural capital, which can refer to land, soil, forest and water. Examples of the *intensity of use* of assets include labor market participation, utilization of machinery and exploitation of land through agricultural production. The *returns to household assets* consist of the nominal price of factors of production such as wages, interest rates, rents from property rentals, prices of land and time devoted to collective action.

The household market income, generated from the use of productive assets and its corresponding reward in the market, is complemented by *transfers* received by households, which may include domestic and international remittances, and in-kind transfers from other households, or public transfers. The market income of households is also directly affected by a set of *prices* of the goods and services they consume. Finally, the stock, utilization and returns to households' productive assets, as well as consumer prices and private transfers can be directly affected by the realization of *external shocks*, such as health shocks, natural disasters, loss of employment, financial crisis, civil conflict, such that the realization of market income may be different from the potential market income.

The following sections present a way to model the constraints that prevent the poor and those at the bottom of the income distribution from contributing more actively to economic growth through these different channels.

Asset-based income generation

We start by using the asset-based approach to illustrate the individual decisions of households which, every day, engage in managing their resources. The basic model does not include transfers, which will be introduced in the policy section.[5] We follow Carter and Janzen (2015) to set up the basic problem. Each household is initially endowed with a productive asset A_0. In our very general framework, this initial asset level can represent a wide set of possibilities such as education or land. Households generate income by using their productive asset as an input to produce a single consumption good. Each period the household allocates income between consumption and investment in the productive asset, thus:

$$c_t + i_t \leq f(A_t) \quad (1)$$

For simplicity, we assume that the productive asset does not depreciate, thus assets relate to investment through:

$$A_{t+1} = A_t + i_t \ (2)$$

The household's basic problem is then:

$$\max_{\{c_t\}_{t=0}^{\infty}} \sum_{t=0}^{\infty} \beta^t U(c_t) \quad (3)$$

Subject to the constraints:

$$A_{t+1} = f(A_t) - c_t + A_t \ (4)$$

$$c_t \leq A_t + f(A_t) \ (5)$$

[5] Adding private transfers does not alter the main elements of the analysis.

$$A_t \geq 0 \ (6)$$

The first constraint shows that the level of productive asset in the next period depends on the consumption decisions a household makes today. In this sense, by renouncing present consumption the household is able to save and invest those savings in more productive asset for the next period. For example, by improving his education level or improving the infrastructure of the land owned. The recursive formulation of the problem is as follows:

$$V(A) = \max_{0 \leq A' \leq f(A)+A} \{U[f(A) + A - A'] + \beta V(A')\} \ (7)$$

With the Euler equation given by:

$$U'(c) = \beta U'(c')[f'(A')+1] \ (8)$$

This reflects the fact that the household will consume until it is indifferent between allocating a unit of the good to current consumption or investing it in productive asset and thus enjoy higher consumption in the future.

Now that we have set up the basic dynamic model of optimal household growth based on accumulation of productive assets, next we briefly show the dynamics of accumulation with different technologies, with competitive equilibrium and with uncertainty.

Intensity of use of assets

What leads to the possibility of poverty traps is the –realistic— assumption of two different technologies through which the productive asset may be used. These technologies, which can be thought of as traditional versus modern, or low quality versus high quality, have low and high productivity, and are respectively denoted by $f^l(A)$ and $f^h(A)$. Moreover, in order to be able to use

the high productivity technology, individuals require a minimum level of asset $\tilde{A}$, which is associated with a fixed cost F. On the other hand, the low productivity technology has zero cost. The analysis assumes throughout that if a household is able to access the high productivity technology, its capacity to generate income is enough to reach above-poverty-threshold consumption levels. The opposite occurs if the household is using the low productivity technology. Given that this is a general framework, the specific threshold $\tilde{A}$ is contingent to the type of activity and asset each household is using. For example, it is equivalent to have access to low quality education, with returns that prevent the household from earning wages above poverty standards. It could also mean lacking the land titles that would allow the household to engage in long term farming projects.

The introduction of two technologies effectively creates a non-convexity that allows for two equilibria; either below or above the poverty line. More importantly, and as will be discussed later, the access to the high productivity technology is not guaranteed since there can be other constraints (such as market failures or institutional constraints) that limit the possibility of accessing the more productive technology and therefore generating sufficient income to move above the poverty line.

Finally, consider the existence of credit constraints. In the extreme –for households with no access to credit whatsoever-- this implies that the consumption level and the saving capacity are restricted to be no greater than the current income generation capacity, given the current level of assets.

The introduction of these two technologies modifies the basic problem in (3)-(6) by adding the following constraint:

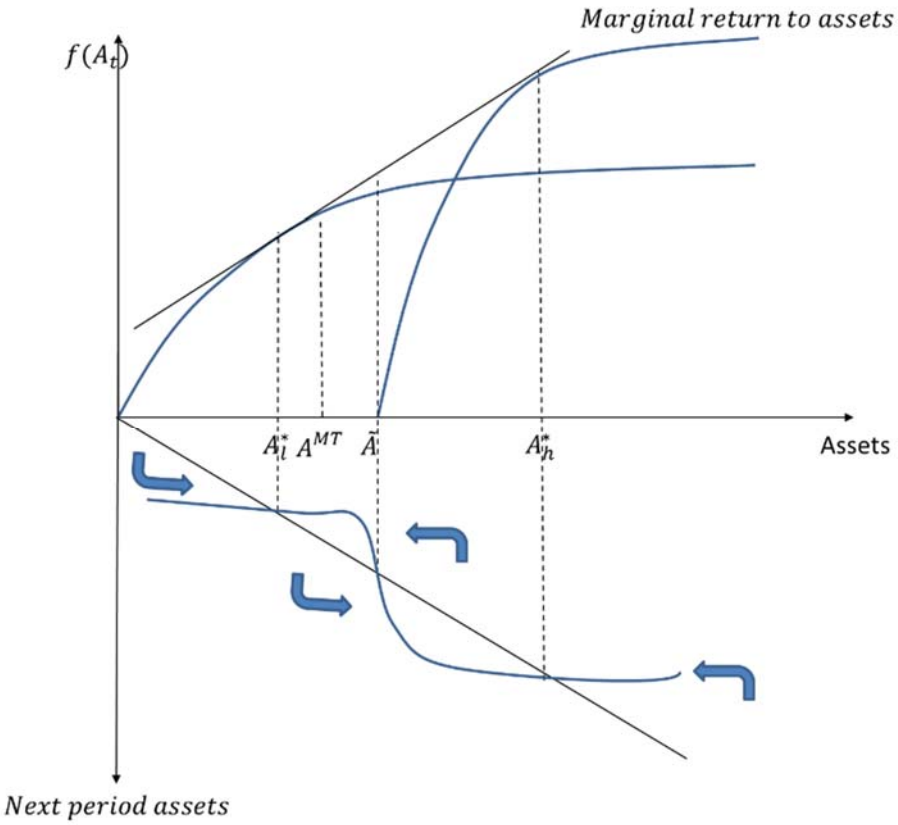
$$f(A_t) = \max[f^h(A_t) - F, f^l(A_t)] \quad (9)$$

Thus, the Bellman and Euler equations remain similar, but will now depend upon the type of technology used.

As shown by Carter and Janzen (2015), there is a critical value of assets, called A^{MT}, such that if a household's initial level of assets is below $\tilde{A}$ but above A^{MT}, the accumulation dynamics determine that the household will accumulate assets over time to reach $\tilde{A}$ and therefore be able to access the more productive technology.

Figure 3 illustrates how this process of accumulation takes place. In particular, a household has two technologies available and an optimal level of asset accumulation of A_l^* and A_h^* for the low and high productive technology respectively. As mentioned before, being above the threshold A^{MT} determines if the household is willing to accumulate assets up to $\tilde{A}$ where it will be able to use the high productive technology and accumulate capital up to A_h^*.

Figure 3. Dynamics of capital accumulation



Source: Adapted from Carter and Barret (2006)

Returns to assets

In order to introduce prices, we now follow a competitive equilibrium approach. We assume that households own the factor of production and the firms in the economy. Each period they trade their productive asset to firms, and buy the good produced by firms. This amount of good is then allocated between consumption and investment in the productive asset.

Let w_t denote the price of a unit of productive asset in period t, expressed in units of goods, so that it represents the real wage. Given the prices $\{w_t\}_{t=0}^{\infty}$, the problem faced by the representative firm every period is:

$$\max_{\hat{A}_t} \Pi_t = y_t - w_t \hat{A}_t \quad (10)$$

Subject to

$$y_t \leq f(\hat{A}_t) \quad (11)$$

And the representative household solves:

$$\max_{\{c_t\}_{t=0}^{T}} \sum_{t=0}^{\infty} \beta^t U(c_t) \quad (12)$$

Subject to:

$$c_t + A_{t+1} - A_t \leq w_t \hat{A}_t + \Pi_t \, , t = 0,1, \ldots \quad (13)$$

Where $\hat{A}_t$ is the asset supplied to firms. In equilibrium $\Pi_t = 0$, also every period households will supply all productive assets to firms, since this causes no additional disutility for them, hence $\hat{A}_t = A_t$. The household's problem can be rewritten as:

$$\max_{\{c_t\}_{t=0}^{T}} \sum_{t=0}^{T} \beta^t U(c_t) \quad (14)$$

Subject to:

$$c_t + A_{t+1} \leq (1 + w_t) A_t, t = 0,1, \ldots \quad (15)$$

$$c_t, A_{t+1} \geq 0 \quad (16)$$

The first order conditions are given by:

$$\beta^t U'(c_t) - \lambda_t = 0 \quad (17)$$

$$\lambda_t = \lambda_{t+1}(1 + w_{t+1}) \quad (18)$$

Where λ_t is the multiplier of the budget constraint.

Thus the competitive equilibrium consists of quantities and prices $\{(c_t, A_{t+1}, w_t)\}_{t=0}^{\infty}$. In general, it is possible to show that the competitive equilibrium allocations are Pareto optimal, since the household's problem is the same as the planner's problem. Later we will see that in the presence of distorting taxes this may not be the case.

External shocks

There are multiple external risks, including macroeconomic crisis, natural disasters, weather-related events, health-related shocks, crime and violence, that individuals and societies as a whole face over time which can have pernicious consequences for the income generation capacity of households (World Bank, 2013b). Risks turned into shocks could potentially lead to asset loss, disinvestment, unemployment, malnutrition, and child labor, when people lack means to effectively manage and cope with risks. The realization of a household's market income may then vary due to such external shocks.

Uncertainty can be added to the basic model in several ways. For instance, by directly affecting the stock of productive asset a_t, or the technology $f(a_t)$. We follow the second specification. Building upon the definition of market income given in (1), the first constraint can be modified to include the presence of a random i.i.d. shock θ_t. As mentioned above, shocks could be aggregate such as weather shocks, financial crisis, or idiosyncratic; through machinery destruction, health shocks, etc.

In fact, previous studies (see for example, Barro, 2009; Becker, 1968; Carter et al., 2007; Dercon and Christiaensen, 2011) have found that uninsured risks are often found to have permanent effects on the welfare of households, further aggravating poverty traps as low-income people (those poor and/or in the bottom 40 percent of the income distribution) are often more vulnerable to the negative consequences of shocks. This is also true since wealthier households are expected to have better access to risk-coping strategies than poorer households.

When risk is introduced, the problem can be rewritten as:

$$\max_{\{c_t\}_{t=0}^{\infty}} E\left[\sum_{t=0}^{\infty} \beta^t U(c_t)\right] \quad (19)$$

Subject to:

$$A_{t+1} = (1-\theta_t)f(A_t) - c_t + A_t \ (20)$$

$$c_t \leq A_t + f(A_t) \ (21)$$

$$c_t, A_t \geq 0 \ (22)$$

The recursive form of the problem is:

$$V(A,\theta) = \max_{0 \leq A' \leq (1-\theta)f(A)+A} \{U[(1-\theta)f(A) + A - A'] + \beta EV(A',\theta')\} \ (23)$$

The first order condition is given by:

$$U'[(1-\theta)f(A) + A - g(A,\theta)] = \beta EV_1[g(A,\theta),\theta'] \ (24)$$

Thus, the optimal asset accumulation is given by the stochastic difference equation $A' = g(A,\theta)$. In particular, when $\theta = 0$ we get the same result as in the basic problem in (3)-(6). As can be seen, now

consumption is contingent on the expected value of assets, and therefore depends on the probability of a shock realization. Specifically, the incentives for renouncing consumption today are reduced because households are uncertain about the possibility of profiting in the future from their sacrifices today.

4. Implications for the twin goals: Linking the framework to poverty reduction and shared prosperity

There are several advantages to selecting a simple framework. In addition to its relevance for unpacking the components which influence the income generation capacity of households, the framework allows us to analyze how this capacity differs across socioeconomic and demographic groups (e.g. bottom 40 percent and top 60 percent, or poor and non-poor, indigenous and non-indigenous, urban and rural).

As mentioned earlier, a shared characteristic of the World Bank's twin goals is that they both focus on the welfare of those at the bottom of the income distribution. The first goal *to end extreme poverty at the global level by 2030* is about moving the vast majority of those individuals currently living below the $1.25/day line, out of extreme poverty. The second goal *to promote shared prosperity in every country* is related to a sustainable increase in the well-being of the poorer segments of society, defined as the lowest 40 percent in the income distribution.

The poverty headcount ratio

To identify those who are poor, the World Bank uses the family of poverty measures defined by Foster et al. (1984), which satisfy both the monotonicity and transfer axioms proposed by Sen (1976), and the decomposability property. In general, the Foster-Greer-Thorbecke (FGT) Index (also known as the P_α measure) has the property of subgroup decomposability and can represent several commonly

used poverty metrics that take into account the intensity and severity of poverty. The FGT estimates the weighted sum of the poverty gap ratios of a group of observations under an arbitrary poverty line, and includes a parameter α that measures the sensitivity of the income distribution within those observations. Based on the final market income aggregate defined in (1) and (4), the poverty rate can be defined as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{N} B_i \cdot \left(\frac{z - \tilde{y}_i}{z}\right)^\alpha \quad (25)$$

where N is equal to the total number of individuals in the economy. z is an scalar-valued poverty line. $\tilde{y}_i$ is the final market income of individual i. B_i is an indicator value taking the value of one if $\tilde{y}_i < z$ and zero otherwise. α is a parameter reflecting the weight placed in the severity of poverty.

In particular, when $\alpha = 0$, this index becomes the poverty headcount ratio. This metric represents the number of households under the poverty line but fails to capture the extent to which each household income falls below the poverty line. When, $\alpha = 1$ this index becomes the income-gap ratio for the mean poor income. This ratio measures the total shortfall of the poor households with respect to the poverty line. However, the income-gap ratio is not sensitive to the distribution of income among the poor. When $\alpha = 2$, the FGT Index becomes the squared income-gap ratio. This index computes the severity of poverty more accurately, since it represents the squared income-gap ratio for the mean poor income. In this form, the index incorporates information on both poverty and income inequality among the poor households. Higher order classes of poverty indices can be derived as α becomes larger. Finally, as $\alpha \to \infty$ the FGT family of poverty measures tends to a Rawlsian social welfare function, i.e. the index depends only on the welfare of the poorest household in the population.

Shared Prosperity

The goal of promoting shared prosperity derives from the concept of "quintile income" (Basu, 2010), which is defined as the income per capita of the bottom quintile (20 percent) of the population. It draws from the Rawlsian principles of focusing on the welfare of the less well-off. As mentioned above, beyond the single-period calculation of poverty headcount rates, in cases when there is access to information for two different time periods, we can calculate the shared prosperity indicator. From Basu (2000), the share of income of the bottom 40 percent can be simply written as:

$$s(y_{B40}) = \frac{[y_1+y_2+\cdots+y_r]}{[y_1+y_2+\cdots+y_M]} \quad (26)$$

Where y_i is the income generated by a household given the productive technology it has at hand, and $s(y_{B40})$ denotes the share of total income corresponding to the bottom 40 percent of the final market income distribution for the income profile y; with *M* equal to the total population and *r* is the largest integer such that $\frac{r}{M} \leq 0.4$.

Let $\bar{y}$ be the mean per-capita market income, so the mean income of the bottom 40 percent is

$$y_{B40} = \left(\frac{s(y_{B40})}{0.4}\right) \cdot \bar{y} \quad (27)$$

Thus, the shared prosperity indicator can be expressed by the percentage change in y_{B40} between time *t* and time *t+1*

$$ShP = \frac{y_{B40,t+1}}{y_{B40,t}} - 1 \quad (28)$$

Non-decreasing functions of household market income

Individuals --no matter how poor they might be—may have options that would allow them to improve their economic situation, but sometimes they find limitations on the best use of whatever assets they have. These external constraints make it harder for them to reach their full economic potential and therefore overcome poverty. The role of policy is to help alleviate these constraints.

It is important to identify policy variables that directly affect the income generating function of households defined in (1) and (4). The poverty headcount ratio defined in (25) is a non-increasing function of market income and shared prosperity defined in (28) is a non-decreasing function of market income. Then, policy variables that (i) increase the accumulation of assets, (ii) increase the use of assets, (iii) increase the returns to assets, (iv) decrease the consumer prices paid by households, (v) increase the monetary value of private transfers, and, (vi) decrease the probability of risks faced by households, are expected to have a direct impact on poverty reduction and shared prosperity. The next section defines and discusses the policy areas that directly impact the World Bank's goals.

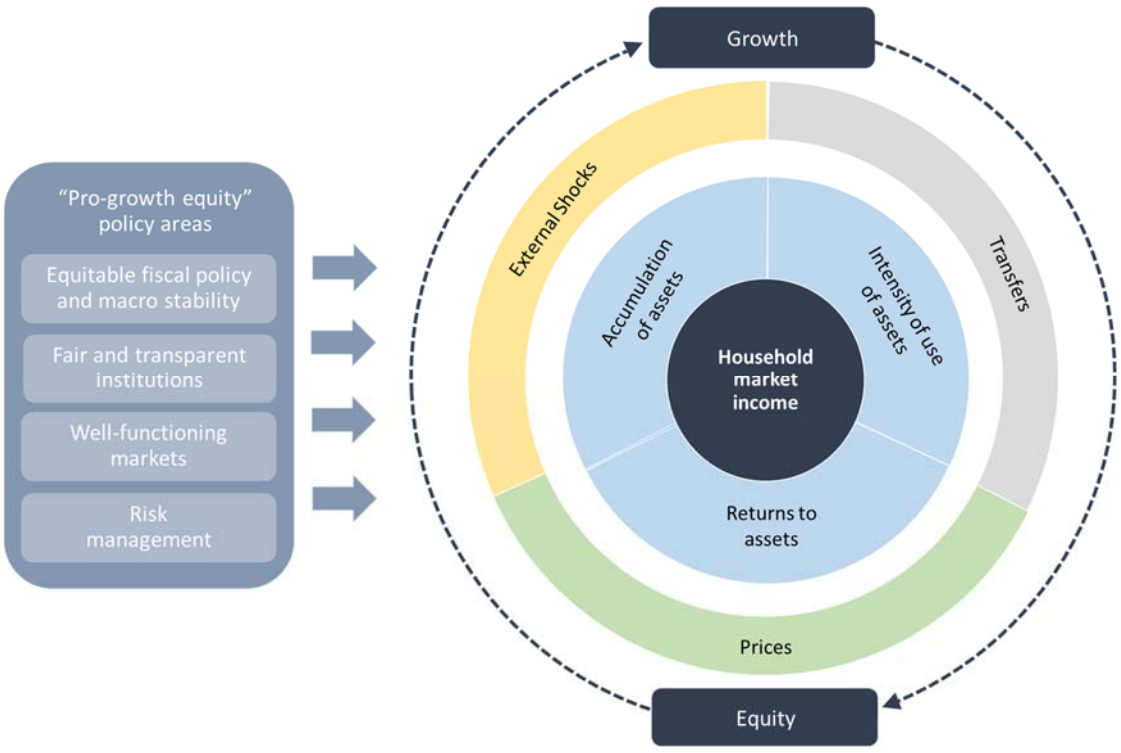
5. Policies for poverty reduction and shared prosperity

The asset–based model presented above assumes that all agents are rational; however, there is no equality of opportunities given the heterogeneous initial level of assets A_0 and, at the same time, they face some market failures, limiting their ability to take full advantage of their assets. In the absence of these factors that affect the income generation capacity of households, including lack of access to specific markets or assets --inequality of opportunities, when initial asset holdings is a circumstance individuals cannot control-- exposure to uninsurable risks and market failures, we would expect that all individuals will be able to accumulate the most productive assets.

Based on the discussion of interventions that correct inequality of opportunity, risks and market imperfections—widely used in microeconomic theory—the asset-based approach adopted here is

linked to four fundamental policy areas that have a direct impact on the income generation capacity of all households in an economy (with particular focus on those households that are poor and/or in the bottom 40 percent in the income distribution). These policies, which have also been defined in previous studies (World Bank, 2013a and 2014), can be organized in four broad groups: (1) Equitable, efficient and sustainable fiscal policy and macroeconomic stability; (2) Fair and transparent institutions capable of delivering quality basic services; (3) Well-functioning markets, and; (4) Adequate risk management at the macro and household levels (Figure 4).

Figure 4. Policy Areas that affect households' income generation capacity



These policies can influence the realization of the total income of households by means of directly affecting their private income generation capacity through asset accumulation, asset use, or returns to assets; by increasing the size of transfers, public or private, while mitigating the negative effects of external shocks. In particular, the policies presented in Figure 4 directly affect the decisions of

economic agents with respect to asset accumulation and more (or less) intensive use of assets. Also, these policies directly and indirectly affect returns to factors of production, the consumer price index and non-labor incomes comprised by private and public transfers. Finally, these interventions can mitigate the effects of external shocks.

It is clear that there is no single policy that solves all the restrictions on the use of resources. On the contrary, there are a multiplicity of policies that depend on the specific constraint, the type of assets involved and the initial condition of the households. The policies that we present are only examples that are used to illustrate the policy channels that are playing a role in the reduction of poverty by allowing households to make a better use of their resources. Next, we present a simple model to link these four policy areas to the income-generation function of households, and to poverty eradication and the promotion of shared prosperity.

Equitable and sustainable fiscal policy

Equitable and sustainable fiscal policy affects the full income generation capacity through direct taxation. It also affects the decisions of individuals with respect to the intensity of use of their assets by affecting returns—also through direct taxes and public transfers. Indirect taxes such as the value-added tax (VAT) can have a direct effect on consumer prices and thus affect the relative returns of households. Similarly, parameters of monetary policy related to macroeconomic stability, such as inflation targets linked to interest rates, directly affect the relative prices of the economy and thus the income generation capacity of all households. Prudent fiscal and monetary policies that are conductive to sustainable and acceptable trends of fiscal deficits and inflation are also very important to mitigate potential external shocks such as fiscal and financial crisis.

Following the model presented above, and abstracting from the presence of risk, Carter and Barret (2006) proved by numerical methods that the initial level of capital an individual has and its relation with the critical thresholds $\tilde{A}$ and A^{MT} determines if a household is able to access the low or high productive technology.

In this particular case, we want to focus on the role of fiscal policy in improving the welfare of households. We consider a simple modification of the basic problem, by adding a flat-rate tax and associated government spending programs. Let $\tau \in (0,1)$ be the flat-rate tax on income derived from the use of the productive asset. The tax revenues are then returned as a lump-sum transfer to some households. In this case, the household's budget constraint is:

$$c_t + A_{t+1} = (1-\tau)f(A_t) + A_t + T_t \qquad (29)$$

Where:

$$T_t = \begin{cases} 0, & A_t \geq \tilde{A} \\ > \tau f(A_t), & A_t < \tilde{A} \end{cases}$$

Such that households with $A_t < \tilde{A}$ will accumulate assets and access the high technology productivity. Additionally we require that for all t:

$$\sum_i \tau\, f(A_{ti}) = \sum_i T_{ti} \qquad (30)$$

Where the sum is across households, i. The problem in recursive form is:

$$V(A) = \max_{0 \leq A' \leq f(A)} \{U[(1-\tau)f(A) + A + T - A'] + \beta V(A')\} \qquad (31)$$

With the Euler Equation given by:

$$U'(c) = \beta U'(c)[(1-\tau)f'(A') + 1] \quad (32)$$

In this case, the government's sole activity is to transfer income from the rich (skilled/using high productive technology) to the poor (unskilled/using low productive technology). Additionally, we assume that in this particular case, the tax τ is not large enough as to make the high productive technology unappealing. As can be seen clearly now, the presence of the tax affects the perceived future benefit from accumulation of capital. In this manner, the presence of τ will affect the relative position of the critical thresholds $\tilde{A}$ and A^{MT} shifting them to the right.

It can be proven that if the number of people using the high productive technology reaches a certain threshold, there is redistribution such that it is possible to subsidize the accumulation of assets of individuals below A^{MT} favoring that they are able to access the more productive technology. Thus, equitable fiscal policy that redistributes income to households trapped in a long-term low-productivity path of production can have long-term positive effects on welfare.

Fair and transparent institutions

Fair and transparent institutions capable of delivering quality basic services could directly affect the decision of individuals to accumulate assets. Strong institutional capacity linked to the delivery of good quality services, such as education and health, can enhance the ability of poorer households to improve the accumulation of net assets. In addition, more and better health services as well as employment systems are fundamental for mitigating risks for households, such as health related shocks and loss of employment. Moreover, institutions that promote the protection of property rights can improve the investment climate in the economy, increasing the availability of well-paid employment opportunities and thus affecting the returns to the factors of production. Strong regulatory entities are also important

to oversee private behaviors in markets and thus minimize the risks of potential financial and sectoral macroeconomic crisis.

To illustrate the role of the government in improving access to quality services, we can consider an example following the previous model. Recall the fixed cost to access the high productive technology given by F. This may represent the access to quality education. In this sense, households will want to accumulate human capital, but only if the cost of it is not too high. Similarly as in the fiscal policy model, the government would collect taxes but direct them towards lowering the cost of the productive technology, F, instead of giving direct transfers, thus making quality education more accessible for low-income households.

Given that the objective of the government is poverty eradication, and assuming that the government decision is to provide an in-kind transfer in the form of better quality of education instead of a direct cash transfer, an optimal taxation can be found such that the cost of education can be subsidized for people with an initial endowment below A^{MT}, effectively allowing them to become more productive.

Well-functioning markets

Well-functioning markets directly related to improved connectivity and competition are central for reducing barriers to a more efficient utilization of households' productive assets, and can be conductive to improving the relative returns to assets. Enhanced transport infrastructure that allows disadvantaged groups to connect to markets, for instance, is an example of an opportunity to directly increase the utilization of assets, which can create additional income. Furthermore, a robust competition policy that reduces entry barriers for new firms to certain markets directly affects the relative prices of all households by reducing consumer prices.

One example of how well-functioning markets work is access to credit in a competitive credit market. The presence of the credit market will reduce the threshold A^{MT}, which determines that a household finds it optimal to accumulate capital. However, credit requirements such as collaterals or high interest rates can leave a large part of the population with low initial levels of assets unable to access the high productivity technology.

Since the objective of the government is to eradicate extreme poverty, its role is to promote the existence of a competitive credit market with information systems that foster good credit behavior by reducing moral hazard. In this sense, competition in the credit market increases access to credit by lowering interest rates and fostering the development of bank branches that are closer to consumers that traditionally have not had easy access to the formal banking system. Moreover, when the credit history is centralized, the reduction of moral hazard can further expand access.

It is important to highlight that this policy does not suit the circumstances of the population whose level of assets is too low. But it can allow for an important part of the population to access higher levels of assets without direct government assistance.

Risk management

Finally, risk management can reduce the exposure to and impact of shocks for all the households in an economy but particularly for those poor and vulnerable, who usually have a higher probability of risk 'realization', forcing them to engage in negative coping mechanisms. In this way, public safety nets, such as public cash transfer schemes that are flexible so that they can be scaled up during crisis and scaled down during recovery, are important instruments that can support households affected by external shocks by providing temporary income support. Another relevant policy that can both mitigate risk and increase the intensity of use of assets is the insurance of crops that offers a payout

to the affected household in case a predicted drought (or flood) is realized but also increases the utilization of land for agricultural activities.

The introduction of risk makes it such that even households whose initial asset level would allow them to access the high productivity technology are no longer guaranteed to end up in that circumstance. In this case, risk creates an additional category of households, in addition to those that are persistently poor because they are not able to overcome poverty over time. This new category of households, households that are poor but able to accumulate and leave poverty over time, are however, vulnerable to shocks that might destroy enough capital to change their accumulation dynamics, leaving them poor indefinitely.

Based on the model on insurance by Janzen and Carter (2015), we modify the household's problem under uncertainty in what follows. We first assume that the shock can be decomposed into two separate parts; a covariant shock and an idiosyncratic one such that: $\theta_t = (\varepsilon_t^c, \varepsilon_t^i)$. We assume that the covariant shock ε_t^c is observable. Thus, the insurance payout δ introduced in this part will only cover the covariant part of the shock such that:

$$\delta(\varepsilon_t^c) = \max\{\varepsilon_t^c - d, 0\} \quad (33)$$

Where $d \geq 0$ represents the level of the deductible. Thus, the household will now choose the level of insurance, I_t, given its premium, p. The household's problem becomes:

$$\max_{c_t, I_t} E\left[\sum_{t=0}^{\infty} \beta^t U(c_t)\right] \quad (34)$$

Subject to:

$$c_t + A_{t+1} + pI_t = (1 - \theta_t) f(A_t) + A_t + \delta(\varepsilon_t^c) I \quad (35)$$

More interestingly, even when insurance is available for these vulnerable households, if they are to the right of the threshold A^{MT} but not very far away from it, the household's optimal decision is not to insure against potential losses. This happens as a consequence of the fact that they face a very difficult decision. If they decide to buy insurance, the premium could be large enough that it puts them to the left of A^{MT}, making certain that they will remain below the poverty line. On the other hand, if they decide not to buy insurance, there is a positive probability that an actual shock happens and drives them to the left of A^{MT} and into poverty. At the same time, as has been discussed in the literature, it is often the case that by endogenous reasons, individuals that start with low levels of capital are actually the ones that face higher probabilities of facing risks.

In order to achieve the goal of eliminating poverty, the government should implement a system that is able to cover risks, especially for those households that are vulnerable. As was discussed by Janzen et al (2013), a safety net scheme that provides transfers to the poor and also insures the risks of the vulnerable has lower fiscal costs in the long term as it is more efficient in reducing the long-term poverty rates.

6. Conclusions

Policies to make growth more "inclusive" have permeated the development debate and "pro-poor growth" has been the subject of a wide range of papers in the literature, including issues related to measurement, modeling, and policy. However, the analytical and –particularly— empirical literature to support the idea that equity-enhancing policies have a positive effect on growth is more scarce and limited, particularly in terms of potential policy links. This paper proposes a simple conceptual framework using an asset-based approach that helps to explain the capital accumulation dynamics of households and how it is affected by the role of government and markets. This framework is useful

for unpacking the components of household market income generation capacity and is also useful to analyze how that capacity differs across socioeconomic and demographic groups. It provides an intuitive framework to argue that equity-enhancing policies have a positive effect on the capacity of those at the bottom to contribute to growth.

More importantly, this asset-based approach represents a bridge between the World Bank's goals and specific policies that could have direct impacts on the income generation capacity of households. Using this framework and presenting a simple model (building on Janzen et al. (2013), this note links the World Bank's goals of poverty reduction and fostering the income growth of the bottom 40% of the income distribution to four fundamental policy areas that directly affect the generation of income.

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