ESRC Research Group on
Wellbeing in Developing Countries

WeD Working Paper 03

THEORISING THE LINKS BETWEEN SOCIAL AND ECONOMIC DEVELOPMENT: THE *SIGMA* ECONOMY MODEL OF ADOLFO FIGUEROA

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SUMMARY

The *sigma* economy model of Adolfo Figueroa explains how labour market segmentation and inequality is perpetuated through exclusion in the provision of formal education, financial services and social protection. This article highlights the originality of the *sigma* model by contrasting it with dual economy models in the tradition of Arthur Lewis, which assume eventual labour market integration. The *sigma* model is consistent with methodological individualism, but also provides a strong framework for integrated analysis of social and economic dimensions of development.

RELATED READINGS

Figueroa, A. (2001a), 'Social Exclusion as Distribution Theory', in Gacitua, E., Sojo, C. and Davis, S. H., *Social Exclusion and Poverty Reduction in Latin America and the Caribbean*, Lima: World Bank / Facultad Latinamericana de Ciencias Sociales.

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1. INTRODUCTION

The overarching purpose of this paper is to contribute to analysis of obstacles to economic growth and inequality reduction. It starts by arguing that economic development theories from Arthur Lewis to more recent work have tended to assume labour market integration is inevitable. For example, this applies to recent work reasserting the importance of positive external effects of demand (Chandra, 2003, Easterly, 2002, Yang, 2003). Such theory pays insufficient attention to the adversarial relationships between key actors (Howard and King, 2001), and hence neglects political constraints to economic growth. Institutional economics has the potential to overcome these limitations (e.g., North, 1990, Powelson, 1997, Bardhan, 2001). But in so doing, it risks obscuring common structural constraints to economic development under a morass of detailed, diverse, and 'path dependent' explanation. Latin America is a useful context for seeking theory that combines structural and new institutional perspectives. Its history also leaves no excuse for naïve mental models that assume poverty is residual rather than relational, and casts doubt on the extent to which inequality can safely be ignored in a dash for growth.

The more specific aim of this paper is to discuss the contribution of the Peruvian economist Adolfo Figueroa to explaining economic performance in the region as a struggle to break with historically moulded institutions of cultural, political and economic exclusion and exploitation. His theory of economic development is analytically rigorous (in the sense of being compatible with the assumption of methodological individualism) and comprehensive, but also empirically grounded and validated. It addresses core economic variables, but also provides a single framework for the analysis of economic and social dimensions of development and policy. The next section sets the context by revisiting Arthur Lewis' original formulation of dualism. Section two provides a non-technical outline of Figueroa's work. Section three compares the two approaches and discusses implications for contemporary policy debates.

2. THE LEWIS MODEL REVISITED

From the point of view of the history of economic ideas, it is interesting to note how Figueroa's theory departs from Lewis' classic discussion of economic dualism, and more specifically from the simplest of his models (Lewis, 1954). In brief, this explains how a modern capitalist sector expands by attracting migrants from a traditional subsistence sector. Profits earned within the capitalist sector are reinvested in new capital stock and this further raises demand for labour. Wages do not rise because the extra demand is met from the subsistence sector. The only role of the subsistence sector in the model is to ensure constant real wages as the capitalist sector expands. The process continues "until capital accumulation has caught up with population, so that there is no longer surplus labour" (Lewis, 1954, p.172).

Three assumptions underpin this model. The first is unlimited supply of labour, attributable mainly to institutionally determined underemployment in subsistence production plus population growth. The second is an abundance of 'animal spirits' in the capitalist class, causing it to reinvest all profits. The third is that resource allocation in the capitalist sector is sufficiently efficient to avoid anything other than temporary bottlenecks in supply of particular goods or services that might otherwise impede growth. The model directs attention to the rate of savings as the key constraint on growth and explains how the savings ratio can increase rapidly (Kanbur and McIntosh, 1987, p.116). Lewis himself did not assume that inequality would inevitably increase as a result, because he argued that capitalist expansion eclipses rentierism. But his model encouraged others to explore how far rapid capital accumulation and absorption of labour into more productive activities might justify an increase in income inequality, particularly if this is offset by real wage increases once surplus labour is absorbed (e.g., Fields, 1980).

Lewis' second dual economy model replaces the distinction between capitalism and subsistence sectors with a high productivity industrial sector and a low productivity agricultural sector. This version highlights the importance of inter-sectoral terms of trade to economic growth - a line of argument further extended by Kaldor, as discussed by Bhaduri and Skarstein (2003). But it also

conveniently dispenses with the institutional dualism of the simpler model. This makes it easier to view low productivity in agriculture as simply a temporary and technical problem of mismatch in the allocation of labour and capital between sectors. Differential profit rates should induce investment in agriculture. Differential wages induce movement of labour from agriculture to industry. Markets may be a bit sticky, but factor price equalisation and integration of the economy will eventually result (Ranis, 1989, p.191).

The Fei-Ranis version of this story emphasised the final outcome of this dynamic process. As labour moves out of agriculture and into industry its marginal productivity rises above zero, and eventually marginal products of labour in the two sectors become equal. The labour market is then integrated. The policy implications are then as follows. The main role for government that Lewis discusses is the use of monetary policy to stimulate demand and thereby accelerate capital accumulation. More specifically, he envisages little problem ensuring that labour acquires any skills required for absorption into the capitalist sector.

> "There may at any time be a shortage of skilled workers in any grade.. Skilled labour, however, is only a very temporary bottleneck in the sense that if capital is available for development, the capitalists or their government will soon provide the facilities for training more skilled people." (Lewis, 1954, p.145).[1]

3. FIGUEROA'S *SIGMA* ECONOMY MODEL

Figueroa's main research goals are to explain the persistence of high rates of inequality in many low and middle-income countries, and their failure to converge towards the per capita income of high-income countries. In so doing he develops three distinct models of capitalism at the country level.[2] The *epsilon* economy has homogeneous skilled labour, though unemployment persists as a device for disciplining workers (Shapiro and Stiglitz, 1984). The *omega* economy is characterised by excess labour supply, divided between direct employment by capitalists, unemployed and self-employment in an informal sector with limited access to financial services. The *sigma* economy has two types of labour: y-workers are skilled, and divided between the same three activities as workers in the *omega* economy. Z-workers, in contrast, lack the skills to secure high-productivity employment and can secure income only through self-employment, and in generally lower productivity activities than y-workers due to their lack of skills. The Diagram summarises. The left-hand marginal product of labour curve corresponds to that in the simple Lewis model. Those y-workers unable to find employment in the high-productivity sector choose either to remain unemployed or opt for self-employment. Subsistence employment of z-workers is completely separate.

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[1] In a later article he is slightly more cautious (Lewis, 1985). But he still does not offer the explanation, critical to Figueroa, that the dominant group includes many who will lose from having to compete with more educated labour.

[2] The models are summarised in Figueroa, Altamirano and Sulmont (1996), and Figueroa (2001A). A more rigorous presentation, that formally derives reduced-form hypotheses ('Beta' propositions) from the structural equations for each model ('Alpha' propositions) is presented in Figueroa (2002). Figueroa (2001B) examines the empirical validity of the sigma model for the case of Peru.

Diagram: The Figueroa *sigma* model
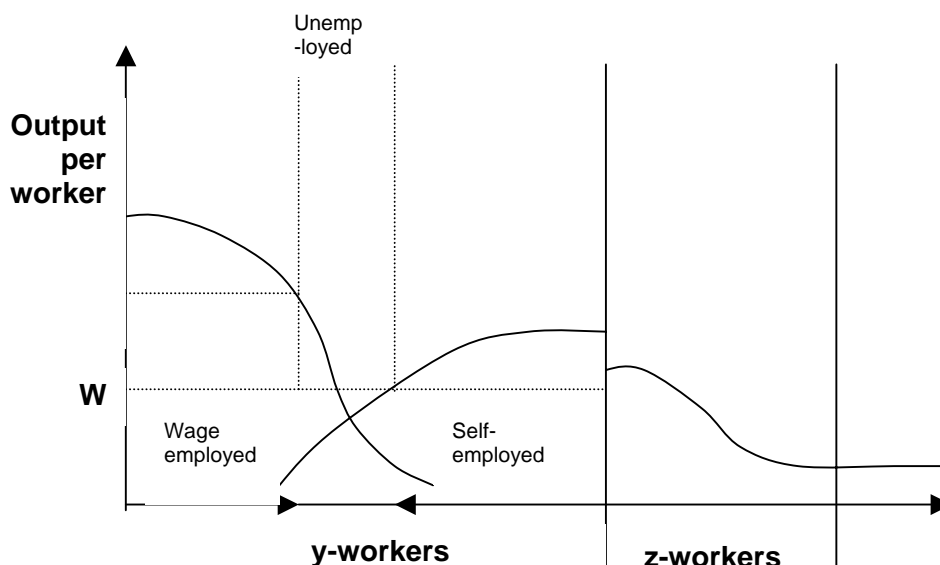
The main emphasis here is on the *sigma* model because it is the most elaborate of the three, and the most interesting point of comparison with the simple Lewis model. Two questions immediately arise. First, what prevents z-workers from acquiring skills and thus becoming y-workers? In other words, what stops the *sigma* economy transforming into an *omega* economy? Second, what prevents capital accumulation proceeding to the point at which all y-workers are either unemployed or employed in high-productivity activities? In other words, what prevents the *omega* economy from transforming into an *epsilon* economy?

To answer these questions it is first necessary to provide a fuller description of the *sigma* economy. This model is designed to explore static equilibrium and then the dynamics of an economy comprising four stakeholder groups: capitalists, government, y-workers (skilled) and z-workers (unskilled). Capitalists seek profits. To do so they are willing to take risks, so long as these do not expose them to such large losses that they would cease to belong to the capitalist class. Government seeks to maximise political power, and workers seek to maximise income and minimise effort. Capitalists, self-employed y-workers and self-employed z-workers all produce a standard good B. In other words, the *sigma* model follows the simplest of Lewis' dual economy models in ignoring specialisation in production.

There are three types of economic asset: physical capital, skilled human capital and unskilled human capital. There are also two kinds of social asset: political capital and cultural capital. The former consists of influence on government powers to tax, to spend and to regulate. The latter consist mainly of hierarchically ordered social networks through which political capital is mobilised, protected and used. Cultural capital is strongly linked to personal attributes, particularly ethnicity, and hence cannot be transferred between individuals.

The initial endowment of assets was the outcome of cultural, political and economic polarisation under colonial rule. Capitalists own most physical capital, and derive most of their income from profits. They are also rich in political and cultural capital. Y-workers own little physical capital, but are skilled. Their endowment of political and cultural capital is less than that of capitalists, but greater than that of z-workers, who have least human, physical, political and cultural capital.

Static equilibrium positions of each group of stakeholders are explored in two stages. First, Figueroa reviews what he calls *basic* markets for labour, capital and insurance. Second, he considers the role of government, acting as a power broker between other stakeholders. In the labour market, the private marginal cost of training z-workers exceeds the private marginal benefits to capitalists. As a result they are excluded from wage employment, and restricted only to self-employment at relatively low levels of productivity. Y-workers face three possibilities, as already briefly

discussed and as illustrated by the diagram. Their first preference is to work for capitalists at an efficiency wage, W, that is set at a premium over and above that which would clear the market for z-workers. Second they can be self-employed and earn income equal to their marginal product, subject to their limited access to capital and to diminishing returns. Third they can be unemployed but available for work by capitalists. Equilibrium in the market for y-workers is set by the condition that W multiplied by the probability of getting a job must be equal to the marginal product of y-labour in self-employment. Z-workers are self-employed and produce B, but less efficiently and also subject to diminishing marginal returns.

Capital markets are segmented because risk-adjusted benefits are less than the costs of providing financial services to both y-workers and z-workers. Segmentation of the insurance market is also critically important. Capitalists have sufficient wealth and income to be able to at least partially insure against the failure of risky investments. As a result they not only invest more, but can also commit to high-risk, high-return investments. Self-employed workers, in contrast, are limited in their ability to make risky investments by fear of losing the little physical capital they have. Their lack of access to financial services helps to explain why output from self-employment is less productive than in capitalist wage employment. Lower productivity of z-workers can also be explained partially by lack of physical capital as well as by lower skills.

Given this exclusion from capitalist controlled credit and insurance markets, workers seek their own personalised and inter-linked forms of security. These institutions are an effective form of collective social protection, but rules of "reciprocity and redistribution" limit the scope for individual accumulation (Figueroa, 2002, p.119). The nature of this financial market dualism is complex, but is reinforced by the distribution of cultural assets. These embed z-workers more firmly in a micro-economy dominated by non-market exchange rules. The cultural capital of y-workers enables them to access a mixture of mutual forms of social protection and patronage from capitalists and government. Wood (2003) refers to this as the Faustian bargain of the poor: security at the expense of autonomy.

Why does the government fail to raise taxes from the rich in order to address the market failures identified above? There are three policy propositions to consider. First, government could provide free education so as to turn unskilled workers into skilled workers. Second, they could subsidise financial services. Third, they could provide a social protection system. Table 1 takes a first look at each of these policy propositions from the perspective of each stakeholder.

Table 1. Stakeholder analysis of government initiatives to reduce economic exclusion.

	Provide free education	Provide subsidised financial services	Provide social protection
Z-workers	Z-workers would be the main beneficiary in each case. But Figueroa emphasises their inability to turn strength of numbers into political capital for three reasons. First, poverty limits their time and energy for doing anything other than meeting immediate material needs (Maslow, 1970). Second, they face the standard collective action problem (Olson, 1965, Lichbach, 1998). Third, they are handicapped by their lack of cultural capital (a polite way of saying they suffer ethnic/racial discrimination).		
Y-workers	Opposition due to fiscal cost, plus fear of seeing their own employment opportunities weakened (a labour aristocracy argument).	Support, to the extent that this could strengthen their prospects for self-employment and low level capital accumulation. But opposition from those for whom benefits are likely to be more than offset by the fiscal cost.	
Capitalists	Support to the extent that there are skill shortages, and W can be lowered by increasing the supply of skilled labour.	Opposition to the extent that increased self-employment raises the opportunity cost of labour, hence W, and reduces profits.[3] For some it may also undermine their own powers of patronage.	

Z-workers should benefit from political intervention in each market. However, Figueroa suggests that their ability to bring mass support to bear on the government is weakened by lack of cultural and hence political capital. In the case of education they also face opposition led by those y-workers most likely to face competition from an erosion of education as a barrier to entry into skilled jobs. In the case of financial services and social protection, opposition is led by capitalists fearful of a resulting rise in the wages of skilled workers. Both groups are better endowed than z-workers with the political and cultural resources to ensure government responds to their wishes. Capitalists can also threaten the government with disinvestment if it demands too much on behalf of the workers. These arguments suggest that government will not do much to offset social and economic exclusion, at least in the short-term.

Figueroa (2002) formally sets out the assumptions of the model and derives from them a set of testable reduced-form equations. Exogenous variables include the money supply, the international terms of trade, technological knowledge, and (critically) the distribution of economic and social assets. Figueroa draws on Latin American evidence to explore how far changes in each over time are associated with the predicted direction of endogenous variables.

Moving from comparative statics to dynamics, Figueroa follows Lewis by assuming that the profits of capitalists are all reinvested in the following period, and that they are more than sufficient to offset capital depreciation. The increase in the capital stock invested in high-productivity activities is likely to be further augmented by technological progress. The resulting economic growth has no effect on z-workers, but y-workers benefit from increased wage employment. Their wages also rise as excess skilled labour supply is absorbed, and technical progress may also raise the efficiency wage premium. On the other hand, this effect may be delayed by displacement of self-employed y-workers (a Ricardian machinery effect) - a point made by Lewis (1954, p.145), but rejected on empirical grounds. The overall effect on income inequality is indeterminate, depending on whether the "enrichment and enlargement effects" on the income share of y-workers outweighs the falling

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[3] Lewis (1954, p.149) is particularly forceful on this point. "The fact that the wage level in the capitalist sector depends upon earnings in the subsistence sector is sometimes of immense political importance, since its effect is that capitalists have a direct interest in holding down the productivity of the subsistence workers."

income share of z-workers (cf., Fields, 1980, p.30).

Political reactions to these changes in income distribution are also indeterminate. But relative income changes of any kind may upset the social order, even to the point of triggering political violence. This represents a potentially powerful negative feedback loop: capitalist growth disturbs income distribution, this upsets the political order and undermines the confidence of capitalist investors, hence capital accumulation dries up. The key issue, then, is whether government can sustain economic growth by mitigating the destabilising effects of induced changes in income distribution.

This argument runs counter to the usual assumption that capitalist growth is stabilising precisely because it creates new jobs. The reason for this is that many workers perceive themselves to be excluded from securing those new jobs. Hirschman's (1973) "tunnel effect" argument (that people will tolerate temporary inequality so long as they believe that their turn is about to follow) cuts no ice. On the other hand, government may have some discretion to alter fiscal and spending policies in response. Capitalists will accept higher taxes to pay for actions to reduce cultural, political and hence economic exclusion of z-workers if this reduces political instability, as well as reducing skilled labour shortages. On the other hand, y-workers' support for continued capital accumulation and job creation will eventually disappear if the price of this are policies that undermine their cultural, political and labour market privileges.

This is a delicate balance, and Figueroa adds a final twist by suggesting that style of political management may also be endogenous. The reaction to social and economic exclusion in richer societies, he notes (following Okun, 1975) is a political process of establishment of universal rights. But this is not necessarily an effective way for government of a *sigma* economy to maximise power. First, no credit is given to those who deliver them, since a right is by definition an entitlement, not a gift. Second, universal provision limits powers of patronage. Third, rights are not easily reversed. Other strategies include restricting access to information about the process of government (hiding costs) and repression. Hence we have an endogenous theory of authoritarianism.

In sum, Figueroa offers a profoundly pessimistic model of failed development as the outcome of the self-interested actions of the main domestic actors. Both z-workers and capitalists would benefit from labour market integration. But in isolation from each other - and perhaps even if they could form an improbable alliance - they lack the political resources to force the pace of integration in the face of resistance from y-workers and government.

Finally, Figueroa asks whether development agencies might help to overcome these collective action problems. If the main issue was one of income or asset redistribution then this might, he suggests, be the case. But reflecting on the historical failure of land reform to transform *sigma* economies in Latin America, he observes that the key battles have to be fought in sensitive cultural and political arenas where external support can be counterproductive. There is also, of course, the issue of how to model the incentives of the intervening agencies themselves. Indigenous non-government organisations, for example, are fairly brusquely dismissed as a form of self-employment and patronage for z-workers.

4. FIGUEROA AND LEWIS COMPARED, AND SOME CONCLUSIONS

This section further explores four differences between the simple Lewis model and Figueroa's *sigma* model as presented in the previous two sections. First, Lewis was vague on the nature of labour market segmentation at the national level. This made it easy for others to assume that segmentation would inevitably be broken down by the onslaught of capitalism. If labour market dualism is primarily geographical, for example, then it can be eroded by investment in improved transport and communication. Others, notably Boeke (1942), constructed more detailed explanations of "an immutable economic dualism", comprising a social theory for each sector plus explanations for their sustained coexistence. But as Higgins (1956) observed, such explanations ultimately rested on

questionable empirical evidence of the resilience of non-capitalist values in the traditional sector.[4] Figueroa's model of persistent dualism, in contrast, rests on a universal application of the orthodox assumption of rationality and methodological individualism. Social differences between the subsistence sector of z-workers, y-workers and capitalists persist, and may indeed become more marked. Exogenous differences in some period in history are again a necessary condition for this. But the *persistence* of dualism becomes endogenous or a *consequence* of exclusion rather than its prime determinant. Hence Figueroa helps to fill a gap noted by Kanbur and McIntosh (1989, p.119), who observed that

> "… there are non-dual economy models of growth but there no models which treat factor immobility and asymmetry as endogenous, and, hence, there are no models which analyse the path of dualism itself. This is clearly a major area for further research."

A second important difference between the two models is that Figueroa gives as much emphasis to financial market dualism as to labour market dualism.[5] It is necessary not only to explain why z-workers cannot acquire skills, but also why they (and self-employed y-workers) cannot acquire sufficient capital, either of their own or from other sources to rival established capitalists. Exclusion takes place partially because the transaction costs associated with such services are too high to be profitable to capitalists, though it should be added that these costs reflect and are compounded by social factors (Johnson, 2003). Figueroa also suggests that solidarity among capitalists may inhibit them from renting capital too generously to those outside their own social class. But perhaps there is some hope for more progressive change here, if some capitalists (including foreign investors) can be persuaded by new opportunities arising from financial innovation to break ranks and open up new avenues of finance to small-business hopefuls. Copestake (2002) observes that, whether or not it reduces poverty and inequality microfinance can also reinvigorate the myth of social mobility as a basis for political tolerance of inequality.

A third point of difference between the two models is that Figueroa traces unequal access to both financial services and to education back to inequalities of political power between members of different social networks. Status and other cultural barriers are actively reproduced to defend these unequal power relations. Thus social development (such as promoting good governance, or mobilising movements in support of an extension of social and economic rights) becomes a precondition for economic development rather than part of some quite distinct development policy agenda. In contrast, the dominant argument of Lewis' 1982 lectures on racial conflict and economic development runs the other way: economic growth and job creation are a precondition for civic and political reform, rather than *vice versa* (Lewis, 1985, p.121):

> ".. a theme that runs through this book is the dependence of desegregation on fast growth of the economy.. The disadvantaged and the subordinate have a vested interest in fast economic growth. Every reduction in the target rate for economic growth is also a reduction in the strength of equalizing forces"

A fourth and even more profound difference between the two models concerns their implications for progress. Lewis and his successors leave open the possibility, indeed likelihood, of an essentially apolitical path of economic development through smooth labour market integration. Figueroa, in contrast, sets up a low level equilibrium trap for the economy that can only be broken by political struggle. He then constructs a political theory to explain why this is unlikely. This is more consistent with Powelson's (1997, p.7) theory of development as the evolution of institutions conducive to resource bargaining, compromise and "power diffusion". In an institutional vacuum, conflict is resolved by a relative show of power among competing parties. If the event is repeated many times, the manner of resolution becomes an institution and power diffuses among parties to

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[4] The index of the third edition of Meier (1976) gives references to dualism covering 60 pages. In contrast, there is no reference to dualism in the index to the seventh edition (Meier and Rauch, 2000).
[5] Both models can be criticised for their neglect of exclusion processes in product as well as factor markets, and hence inter-sectoral terms of trade effects. A fully articulated model would allow for exclusion in these markets too, and not only on the basis of ethnicity (cf., Harris-White, 1998).

that institution. As capitalists and z-workers become less and less dependent on local producers and consumers for their own living standards, the latter are left with ever less political leverage or spoiling power. Cultural and political exclusion is likely to become sharper rather than weaker.[6]

The overall argument can now be briefly restated. Fifty years ago, Arthur Lewis and most economists went along with a view that development could be addressed through aid transfers, with national labour market integration acting as a key transmission mechanism. Fifty years later, Figueroa locates lack of development in self-reinforcing social and economic exclusion, which block the labour market transmission mechanism because of lack of incentives to bring about more equal access to education as well as financial services.

In so doing, Figueroa provides a consistent framework that can accommodate both social and economic development policy agendas. What combination of policies, for example, can external agencies best use to break open or at least weaken the domestic trap of low growth, exclusion and poverty? Risky reversals of control over aid to national elites in the name of policy ownership look at best naïve, and aid bribes to cajole governments into poverty reduction processes in collaboration with minority groups seem inadequate and lacking in credibility. Timely and discrete support for social movements campaigning for political as well as economic rights looks more promising, but beg further questions about external motives and capacity.

International capitalists also perhaps have a vested interest in labour market integration and what Prelahad and Hammond (2002, p.1) describe as "building a global economy of six billion consumers rather than two billion". However, unless effectively managed by government the danger is that direct foreign investment accentuates increasing income inequality, which in turn fosters political uncertainty and neutralises the original incentive to invest. If so, then global capitalists and poor people have a common interest in political changes that ensure benefits of growth are more equitably distributed. The use of development resources to support a popular struggle for social and economic rights may not only be an end in itself, but also a means of unlocking domestic and external resources for faster economic growth. Ultimately, global capitalists and their political allies will help to remove the barriers to labour integration and poverty reduction only if they can be persuaded that it is profitable to do so.

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[6] Powelson (1997, pp.262-66) offers perhaps a crumb of comfort to all but Peruvians by observing in the course of a grand global historical survey that Peru - the cradle of Figueroa's theory - is a particularly hopeless case. Appraising current prospects for sustained economic growth in Peru he observed: "In a dual society, with narrow participation in the formation of economic and political institutions, the equilibrium tensions among plural groups which elsewhere sustain free markets and economic development do not arise… Those who think President Fujimori can bring lasting change might also contemplate the immensity of history."

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