

KALECKIAN ESSAYS ON CONTEMPORARY ISSUES
IN MIDDLE-INCOME ECONOMIES: THEORETICAL
EXTENSIONS AND APPLICATIONS

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TESE DE DOUTORADO
EM ECONOMIA

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**ENSAIOS KALECKIANOS SOBRE QUESTÕES
CONTEMPORÂNEAS EM ECONOMIAS DE RENDA MÉDIA:
EXTENSÕES TEÓRICAS E APLICAÇÕES**

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Economies: Theoretical Extensions and Applications

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Aos meus pais, Lúcia e Antonio.

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ABSTRACT

This thesis examines persistent dual economic structures in developing nations through a Kaleckian perspective. Moving beyond conventional perspectives that view informality as a temporary phenomenon destined to disappear with economic advancement, the research demonstrates how this duality transforms fundamental macroeconomic processes, including long-term adjustment mechanisms, social policy effectiveness, and growth patterns.

The work develops through interconnected yet independent essays. Initially, it analyzes the evolution of economic discourse on welfare and its relationship with structural development literature. Subsequently, it presents a Kaleckian model that explicitly incorporates the informal sector, demonstrating how its specific dynamics influence long-term equilibrium. The analysis reveals significant impacts of informality on productive capacity utilization, investments, and growth, illustrating the ineffectiveness of conventional strategies when they disregard sectoral heterogeneity.

Additionally, the thesis investigates how various taxation and transfer mechanisms affect sectoral composition and growth in dual economies, identifying possible trade-offs between redistribution, public service provision, and accumulation. The framework is subsequently expanded to incorporate financial and external sectors, showing how credit restrictions and balance of payments considerations condition growth possibilities.

Finally, the study addresses ecological dimensions of development, analyzing how redistributive policies impact resource utilization through differences in sectoral consumption patterns, identifying conditions under which redistribution and environmental sustainability can be compatible.

Through the application of the Kaleckian perspective to contemporary economic issues, the thesis presents several contributions: it adapts Kaleckian models to better reflect the realities of current developing economies; demonstrates the non-neutrality of the urban informal sector in macroeconomic processes; identifies growth limitations arising from the financial sector; highlights distinctive constraints on welfare systems in dual economies; and integrates environmental considerations into distributional analysis. The developed framework offers analytical tools for designing more effective poverty reduction strategies that recognize structural heterogeneity, while maintaining central aspects of Kaleckian analysis, with its emphasis on demand and distribution.

Keywords: Kaleckian model, post-Keynesian model, development, growth and distribution.

RESUMO

Esta tese examina as estruturas econômicas duais persistentes nas nações em desenvolvimento através de uma perspectiva kaleckiana. Contrariando visões que consideram a informalidade como fenômeno transitório, a pesquisa demonstra como esta dualidade transforma processos macroeconômicos fundamentais, incluindo mecanismos de ajuste de longo prazo, eficácia de políticas sociais e padrões de crescimento.

O trabalho desenvolve-se em ensaios interconectados, embora independentes. Inicialmente, analisa-se a evolução do discurso econômico sobre bem-estar e sua relação com a literatura de desenvolvimento estrutural. Em seguida, apresenta-se um modelo kaleckiano que incorpora explicitamente o setor informal, evidenciando como sua dinâmica específica influencia o equilíbrio de longo prazo. A análise revela impactos significativos da informalidade sobre a utilização da capacidade produtiva, os investimentos e o crescimento, demonstrando a ineficácia de estratégias convencionais quando desconsideram a heterogeneidade setorial.

Adicionalmente, a tese investiga como diversos mecanismos de tributação e transferência afetam a composição setorial e o crescimento em economias duais, identificando possíveis trade-offs entre redistribuição, provisão serviços públicos e acumulação. O arcabouço é posteriormente ampliado para incorporar os setores financeiro e externo, mostrando como restrições de crédito e considerações de balanço de pagamentos condicionam as possibilidades de crescimento.

Por fim, o estudo aborda dimensões ecológicas do desenvolvimento, analisando como políticas redistributivas impactam a utilização de recursos através de diferenças entre os padrões de consumo setoriais, identificando condições em que redistribuição e sustentabilidade ambiental podem ser compatíveis.

Através da aplicação da perspectiva kaleckiana a questões econômicas contemporâneas, a tese apresenta diversas contribuições: adapta modelos kaleckianos para melhor refletir as realidades das economias em desenvolvimento atuais; demonstra a não-neutralidade do setor informal urbano nos processos macroeconômicos; demonstra limitações ao crescimento vindas do setor financeiro; identifica restrições distintivas aos sistemas de bem-estar em economias duais; e integra considerações ambientais à análise distributiva. O arcabouço desenvolvido oferece ferramentas analíticas para a concepção de estratégias mais eficazes de redução da pobreza que reconheçam a heterogeneidade estrutural, mantendo a aspectos centrais da análise kaleckiana, com sua ênfase na demanda e na distribuição.

Palavras-chave: modelo kaleckiano, modelo pós-keynesiano, desenvolvimento, crescimento e distribuição.

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LIST OF SYMBOLS

α_0	Autonomous component of investment function
α_1	Sensitivity of investment to capacity utilization
α_2	Sensitivity of investment to profit rate
β	Ratio of new loans to previous debt stock (b_t/B_{t-1})
γ	Workers' propensity to consume informal goods
γ_f	Formal workers' propensity to consume informal goods
γ_i	Informal workers' propensity to consume informal goods
δ_1	Ratio between materialization in workers' consumption and investment goods
δ_2	Ratio between materialization in capitalists' and workers' consumption goods
δ_f	Tax rate on formal wages
δ_π	Tax rate on profits
θ	Share of formalization of total output
θ'_t	Ratio of investment to retained profits
θ_j	Degree of materialization in sector j
λ	Firms' leverage (debt-to-capital ratio)
λ_D	Ratio of deposits to capital stock
$\lambda_{\max}$	Maximum permitted leverage
μ_j	Share of revenue directed toward imported inputs
ρ	Bank reserve rate
σ	Proportion of deposits kept idle
τ	Government revenue
φ	Fixed proportion of debt stock amortized (chapter 5)
φ	Ratio of material usage to investment goods materialization (chapter 6)
ψ	Ratio of economy-wide materialization to investment goods materialization
χ	Sensitivity parameter of informal consumption
A	Matrix of income flows
B	Stock of bonds/debt
b	New loans/credit
C_c	Capitalists' consumption goods sector
C_i	Informal consumption goods sector
C_w	Workers' consumption goods sector
D	Deposits
e	Employment rate
F	Funds free to be loaned
g	Growth rate of the economy
g_I	Growth rate of capital stock
g_s	Growth rate of savings
h	Profit share
h_f	Profit share in the formal sector
I	Investment goods sector

i	Interest rate
J	Identity matrix
K	Capital stock
L	Labor utilized
L_j	Labor utilized in sector j
M	Material usage
m	Degree of materialization (material usage per unit of spending)
m_c	Ratio of capitalists' consumption to investment
m_k	Share of income spent on imports
N	Population
P	Mass of profits
r	Profit rate
s	Propensity to save out of profits
u	Capacity utilization rate
u_f	Capacity utilization rate in formal sector
v	Capital-output ratio
W	Mass of wages
W_I	Mass of wages in investment goods sector
W_c	Mass of wages in capitalists' consumption sector
W_w	Mass of wages in workers' consumption sector
W_i	Mass informal income
w_I	Labor share in investment goods sector
w_c	Labor share in capitalists' consumption sector
w_w	Labor share in workers' consumption sector
X	Export sector
Y	Total output
Y_f	Formal output
Y_i	Informal output

Note: Variables indexed with subscript t (e.g., X_t) denote the value of variable X at time period t .

GLOSSARY

CEPAL	Comisión Económica para América Latina y el Caribe
ECLAC	Economic Commission for Latin America and the Caribbean
FS	Formal Sector
GDP	Gross Domestic Product
GFC	Great Financial Crisis
GHC	Greenhouse Gases
ILO	International Labour Organization
IS	Informal Sector
ISI	Import Substitution Industrialization
p.p.	Percentage points
RCT	Randomized Controlled Trials
SSM	Sraffian Supermultiplier
UN	United Nations
UNDP	United Nations Development Programme
VAT	Value-Added Tax

CHAPTER 1

INTRODUCTION

The current study aims to examine alternatives within the Kaleckian economic perspective to improve the standard of living of citizens, particularly in the developing world, by adapting these theoretical principles to contemporary contexts. Specifically, it focuses on issues related to economic growth and income distribution while also taking into account the significant environmental constraints that affect societies today. These two issues, namely inequality and environmental concerns, are regarded as the most pressing issues in the world at this point in the twenty-first century.

Within the neoclassical school prevails the belief that the distribution of income is ultimately determined by the marginal productivity of factors¹, which is primarily driven by technological conditions and relative scarcity. Meanwhile, in the heterodox view, the role of policy in shaping the course of development becomes indispensable (MOLLO, 2016). Across non-mainstream approaches, the Kaleckian tradition, in particular, emphasizes political economy over solely focusing on technical aspects.

With these issues at heart, the author has grown increasingly absorbed by the Kaleckian school and soon grasped how much room this school of thought leaves to deal with not only contemporary macroeconomic processes, but also institutional and political questions. Consequently, the following essays represent the author's perspective on the aforementioned concerns utilizing the analytical devices developed according to such theoretical approach. No claim is made to present definitive solutions or answers. In contrast, the aim is to contribute to the ongoing discussions by presenting certain advancements in this analytical framework, theoretically grounded in this tradition.

Some of the extensions proposed here explore the issue of economic duality. Early development literature primarily viewed duality as the divide between a capitalist, urban modern sector and a subsistence-based, rural traditional one. The surplus labor that once characterized the countryside has now been transferred to cities, creating vast pockets of urban informality where workers engage in low-

¹Even though a substantial part of the orthodox literature acknowledges the effect of institutions such as unions and taxation in the final income distribution, there is a broad understanding within this perspective that such effects are mostly undesirable interferences in an otherwise natural order that yields a fair distributional outcome.

productivity activities to secure their livelihoods. This transition requires fundamental modifications in the analytical framework.

The contemporary setting requires a shift in the analytical framework, since because workers have no access to land or natural resources, they cannot produce for their own consumption, but rather produce for sale. In a setting where output is limited by demand, this characteristic significantly impacts their livelihood prospects. The cost of living in cities is usually higher, and monetary income is absolutely necessary for even basic needs (SCHOR, 2022). In this way, this thesis places particular emphasis on duality, which is understood here as the divide between the modern sector and the contemporary urban informal economy.

In this regard, it is important to point out that while this work draws upon analytical tools from the Kaleckian tradition, it is not focused on thoroughly examining Kalecki's writings on development. Rather, it applies and extends such frameworks to address contemporary social and economic challenges in developing economies.

The work is structured in a set of five independent essays that, although interconnected, individually hold their own significance as they together build a comprehensive framework. The opening essay establishes the theoretical background, examining the historical evolution of economic thought concerning welfare and development, with particular attention to structuralist frameworks that emphasize sectoral compositional dynamics within low-income countries.

This initial essay reflects on the topic of development by examining perspectives on poverty and well-being within the development literature concerned with structural change, a particularly relevant topic for addressing economic dualism in developing countries. Starting from Lewis (1954)'s famous work, a selection of canonical writings in this field is covered, up to the 1990s. In addition to such models of 'transition' or 'take-off', a few remarks on how such economic divide is treated in the Latin American structuralist school are drawn.

Overall, the paper seeks to discuss how economists' models of growth and distribution, developed until recently, have been useful yet insufficient to address questions of the well-being and standard of living of the masses. It encompasses perceptions and insights gathered by the author when studying development theory through the lens of structural change and modernization theory. This intellectual progression traces the Kaleckian approach's conceptual background and positions the subsequent analysis within broader scholarly discourse on development, inequality, and structural transformation.

The historical analysis illuminates a critical paradigm shift: from interpreting poverty as individual deficiency to recognizing it as an emergent property of systemic arrangements—a perspective fundamental to Kaleckian analytical frameworks.

The second essay examines the impact of economic duality on the medium- to long-term adjustment process—an issue that remains contested within contemporary Kaleckian economic theory. Central to this debate is whether and how capacity utilization adjusts to its normal or desired level over the long run. By engaging with this ongoing controversy—where canonical Kaleckian models have been revised through various extensions and assumptions—this essay introduces a novel variant of the traditional model that explicitly incorporates a dual-economy model.

Within this framework, the dynamics of the informal sector’s response to changes in the formal economy emerge as a decisive factor shaping macroeconomic outcomes. In particular, the response of the informal sector as procyclical or countercyclical, along with the intensity of this reaction, are critical factors. Theoretical studies offer support for different types of responses, while empirical findings remain rather inconclusive, varying across countries and time periods (RAMOS, 2007a; FIESS *et al.*, 2010).

The third essay addresses the question of income distribution, drawing on the well-known Kaleckian growth and distribution framework known as the three-department model (KALECKI, 1968). It introduces a methodological innovation by recasting this growth and distribution scheme in matrix form. This modification enables a convenient manipulation of the system of equations, facilitating the introduction of other relevant institutional sectors affecting distributional outcomes. Through this method, the public and the informal sectors are introduced, thus characterizing a dual economy with government.

Further, once the system is structured in the form of matrices, it becomes straightforward to introduce different forms of taxation and also alternative redistribution schemes, allowing the analysis of a wide variety of policy choices. The framework specifically addresses the challenges faced by middle-income economies (as is typically the case of Latin American nations), where informality simultaneously constrains government revenue capacity and complicates social benefit administration due to its detachment from formal employment structures.

Through numerical simulations, the model explores how different configurations of taxation and social transfers affect distributional outcomes while accounting for their growth implications. The

analysis reveals potentially contradictory effects: while redistributive policies can stimulate growth through enhanced aggregate demand, excessive taxation combined with substantial leakage into informal consumption may dampen investment. By systematically evaluating these competing forces, the framework illuminates both the possibilities and limitations of welfare enhancement in economically dualistic contexts, offering an analytical tool suitable for economic policy planning in middle-income countries.

The fourth essay addresses a fundamental issue in development economics: the elements that sustain effective demand when internal markets alone prove insufficient. Drawing on Kalecki's insights regarding external sources of demand, this chapter examines how both the foreign sector and the financial system operate as essential mechanisms supporting expanded reproduction.

The analysis proceeds in two stages. First, it extends the matrix framework developed in the previous essay to incorporate international trade flows, capturing both export demand and import leakages. Second, it develops a comprehensive model of financial dynamics, comparing scenarios with and without a banking system to illuminate how financial development transforms growth possibilities. Particular attention is paid to the crucial distinction between rentier-dominated systems—where leverage is tightly constrained by existing portfolios—and bank-centered arrangements that enable more extensive credit creation.

By modeling the interactions between entrepreneurial investment decisions and banking system limitations, the essay identifies critical thresholds in leverage ratios and liquidity preferences that condition growth possibilities. The framework distinguishes between supply-side credit constraints, where banks' balance sheet considerations limit lending, and demand-side restrictions. Through numerical simulations, the essay demonstrates how variations in maximum leverage ratios and liquidity preferences influence equilibrium capacity utilization and growth trajectories, offering a quantitative assessment of financial development's importance for macroeconomic stability and sustained growth.

Finally, the fifth essay turns to the environmental concerns involved in reducing poverty and improving income distribution. Starting from the premise that redistribution is desired, the analysis outlines causes for concern regarding the ecological impacts that might result from increased consumption. This growth in expenditure is to be expected as redistribution policies redirect income from social groups with a lower propensity to consume to those with a higher one. In addition, it is explored the possibility that each dollar spent on wage goods might possibly contain a higher amount of material

resources than a dollar spent on luxury goods. This is because the former is usually comprised mostly of food and durable or non-durable material items, while the latter tends to present a higher share of services and pricey goods. These expensive items are likely to have a very high price for each unit of material resource utilized, or, in other words, a very low content of material resource per dollar spent.

Under these circumstances, an ecological model of Kaleckian inspiration is put forward, in which the material impact to be expected from income distribution is analyzed under different scenarios. It is assumed that there is an exogenous limit to the amount of resources that may be utilized per period (say, a year). The framework shows that, under a certain set of reasonable circumstances, environmental restrictions may not adversely affect the pursuit of a better distribution outcome. However, under a different set of circumstances, especially when the ecological constraint is sufficiently tight, then a better income distribution might only be achieved at the cost of a lower growth rate. In this case of a classical growth versus distribution tradeoff, it might be fair to wonder whether less inequality is socially and ethically more desirable than a faster pace of increase in overall consumption under ecological distress.

The five interconnected essays collectively present a comprehensive approach that moves beyond aggregate growth models to examine how sectoral composition, financial development, and ecological constraints shape development possibilities. This multidimensional analysis acknowledges that improving living standards in developing countries requires attention not only to quantitative expansion but also to qualitative transformations in economic structures, institutions, and distributional arrangements. While recognizing the inherent tensions between growth, distribution, and environmental sustainability, this thesis seeks to identify conditions under which these objectives can be reconciled. The analysis suggests that under certain circumstances, redistributive policies need not conflict with ecological constraints or long-run growth imperatives.

Drawing from the rich theoretical foundation established by Kaleckian economics, this thesis aims to make a meaningful contribution to the development debate by adapting such theoretical frameworks to the realities of contemporary low and middle-income economies. Rather than offering conclusive judgments, the aspiration here is to demonstrate the immense potential residing within the Kaleckian tradition for tackling current economic issues and to delineate various promising directions in which his pioneering contributions can afford fruitful extensions.

CHAPTER 2

ECONOMIC STRUCTURE AND WELL-BEING IN THE DEVELOPING WORLD

2.1 INTRODUCTION

This opening chapter establishes the ethical and pragmatic imperative that underpins the entire thesis: redirecting economic and developmental discourse toward human welfare. This position stems from the fundamental belief that economic development, at its very core, is fundamentally about improving the living conditions of citizens, particularly the underprivileged.

To examine the subject at hand, the present thesis relies on Kaleckian economics, a tradition that emphasizes effective demand, income distribution, and class dynamics, offering analytical tools that are particularly valuable for understanding systemic inequalities. In this vein, this chapter is intended to contextualize said approach within the broader advancement of economic thought on poverty, with particular attention to the development literature concerned with structural patterns which emerged in the second half of the twentieth century. The intellectual production of this period represents an important chapter in the evolution of economic thought on material deprivation, a progression that spans from early classical economists' concerns with subsistence to midcentury dualist models of development, encompassing structuralist critiques of underdevelopment and contemporary approaches that integrate ecological constraints into discussions of poverty reduction and economic growth.

A pivotal shift in intellectual history occurred as poverty came to be understood not as a matter of individual moral failure or responsibility, but as a social phenomenon resulting from the operation of the economic system and its underlying social structure. This transformation in perspective provided the foundation for structural approaches to economic development, which recognize that individual outcomes are shaped by broader economic arrangements and power relations.

Structuralist paradigms have consistently highlighted that growth patterns matter as much as growth rates, that development must be evaluated not just by aggregate increases in output, but by

how those increases affect the distribution of resources and possibilities. This focus on examining distributional outcomes distinguishes structural approaches from viewpoints focused exclusively on accelerating growth, regardless of who benefits.

Broadly conceived, structuralism constitutes a methodological orientation in which socioeconomic systems are viewed as interconnected configurations of distinct but interdependent components (including economic sectors, social classes, and nation-States), with particular analytical emphasis placed on the relationship between these elements. In this sense, Kaleckian economics aligns with these general lines, having not only served as an intellectual precursor, but also significantly influenced these analytical frameworks.

In this landscape, the present chapter explores how understandings of poverty and its potential solutions evolved within development theory, with particular attention to perspectives centered on structural transformation. This analysis reveals how different interpretations of material deprivation have informed policy orientation. Two segments of the structural change literature are encompassed: one dealing with dualism, initiated by Lewis’s groundbreaking work; and another addressing the urban informal economy, analyzed here by introducing elements of Latin American structuralism. These systems of thought represent the intellectual articulation of two historical movements with their reflection on the theoretical plane: the industrialization of certain developing countries (already progressing by the first half of the twentieth century) with their respective urbanization processes, and the later explosive growth of cities in the Global South during the 1970s, creating vast metropolises with significant zones of poverty.

The factors behind extreme destitution and material hardship have been a subject of interest for thinkers since ancient times. Since its dawn, economics as a discipline has paid attention to the stark contrast between the impoverished and the affluent segments of society. References to the indigent permeate the literature of the emerging science, as evidenced by the many mentions of “poor nations” and “poor workers” (from wealthy countries) in *The Wealth of Nations* (SMITH, 1996). Indeed, it is interesting to notice that, in his work, Smith finds quite clear qualitative differences between poverty in countries that were already rich in the 18th century and that observed in those not yet developed at the time, issues essentially related to growth and distribution, which constitute an essential concern in this essay.

It is against this background that the focus on the expansion of the availability of material goods

has been central to the field of economics from the outset, often (though not always) closely linked to the matter of improving the overall well-being¹. In essence, better living conditions are thought to be based on expanding the material base. To some extent, the general improvement in living conditions, and the reduction of penury in particular, can be seen as one of the motivations or objectives of the discipline, although not the sole one (and arguably not the main one).

It is pertinent to note that the increase in material wealth undoubtedly interests sectors of society other than the masses, particularly those sectors that perceive opportunities to expand their wealth or influence, as well as nation-States in the pursuit of their political objectives. In this sense, the enrichment of the nation (termed simply economic growth in present-day debate) constitutes a goal towards which various interests converge. Perhaps for this reason, the appeal to the matter of poverty itself has been secondary until recently, with economists' interest being more emphatically directed toward issues of growth (and, after the mid-20th century, development as 'catch-up')².

Hence, the theories of growth and development, each in its own context although largely related, are primarily concerned with increasing output, in other words, expanding societies' material base. An exception might be the work of Amartya Sen (SEN, 1983; SEN, 1989), which deals directly with development. The author does not start from the macroeconomic view that follows the tradition of Lewis (1954), rather he departs from the micro-perspective of welfare economics. This perspective brings to the forefront precisely the issues related to the living conditions of the poorest. Despite this important voice in the intellectual debate, the core of what evolved into the development theory was formed around the essential question of increasing per capita income. Ravallion (2015) attributes this focus present in the early literature in the field to the underlying belief that growth would be either a sufficient condition for the reduction (or elimination) of poverty or, at the very least, a necessary one. However, he also points out that, from a logical standpoint, growth is neither sufficient nor necessary for poverty reduction.

It was only in the mid-20th century that economic thought underwent a significant shift, intensifying its focus on perceived living conditions in the Global South (then often termed "Third World"). This period saw the emergence of growth and development theories, with hardship and indigence as

¹(SMITH, 1996) already understands poverty as not just concerning basic needs, but in terms of a broader set of living conditions to be achieved: "Every man is rich or poor according to the degree in which he can enjoy the necessities, conveniences, and amusements of human life." (p. 87)

²Important distinctions between the literature of growth and development theory are highlighted by Boianovsky (2019) and by Jorgenson (1961).

key motivators, although not yet systematically addressed as a central issue. This academic debate still assumed, explicitly or implicitly, that poverty would be eradicated or significantly alleviated through economic growth, particularly as the incrementation of the modern, highly productive industrial sector gradually absorbs spare labor from the low-productivity traditional activities. Nevertheless, the analytical tools developed in this context have been valuable for debate and policy formulation, which makes this strand of economic ideas relevant to present-day thought. Even so, it can be argued that a more pronounced focus on poverty itself is still necessary, underscoring the urgency of this issue.

In the last two hundred years (most notably during the twentieth century), the modernization of lagged countries and the transition from rural to urban settings transformed the manifestations of material poverty, therefore leading to a shift in the intellectual debate. This was followed by the perception of a diverse kind of economic dualism that, since the second half of the past century, has become more relevant in the socioeconomic landscape, that of the formal-informal structural divide. Still presently a pertinent issue, such division is especially noticed in urban contexts of developing countries. The literature on development reflects the profound historical transformations that took place in the period when these analytical advancements gained momentum. Given this background, it is sought here to cover the period from the publication of Lewis's essay (1954) to the early 1990s. This period is considered of particular interest because it encompasses a time when concern for poverty in developing countries increased dramatically (RAVALLION, 2011). Limiting at the turn of the 1990s was due to scope issues, since major changes occurred in the debate on poverty after the incorporation of important elements of Sen's theory (SEN, 1983) in the publication of the United Nations Human Development Report (UNDP, 1990).

It is important to differentiate poverty from inequality, which has been extensively debated in recent years, especially following the significant discussions triggered by the work of Piketty (2014). In public discourse, such topics often become conflated. Ravallion (2015) emphasizes that the concern for inequality gained prominence from the realization that the advancement of industrialization did not inexorably lead to the elimination of poverty, not even in advanced countries, let alone in developing ones. Although there is a clear relationship between the issues, inequality is certainly a broader topic: while the debate on poverty focuses on the base of income distribution, the debate on inequality concerns the entire distribution.

For the purposes of this essay, amid a myriad of possible definitions, poverty is defined as material

scarcity, an understanding that permeates most of the historical period leading up to the rise of development literature. In this sense, a person is poor if they do not have, continuously or recurrently, the material resources necessary for participation in the society in which they live.

Looking to the future, the evolution of development economics suggests that continuing to improve human welfare will require approaches that recognize poverty as a phenomenon embedded in complex social, economic, and ecological systems. Rather than seeing poverty reduction as an automatic consequence of economic growth, contemporary perspectives emphasize the need for deliberate policies that address structural inequalities while respecting environmental constraints.

The present chapter is organized into four sections beyond this introduction. Section 2 provides a historical background on perspectives of poverty over time and their reflections in economic thought, tracing intellectual developments from pre-modern societies through the 20th century. Section 3 examines structural change and development theory, focusing on how dualistic economic frameworks pioneered by Lewis and others conceptualized the transformation of developing economies. Section 4 explores Michal Kalecki's distinctive structural approach to development, highlighting how his analysis of sectoral dynamics and income distribution offers valuable insights for understanding developmental challenges. Section 5 investigates the relationship between structural change, urban informality, and poverty, with particular attention to the formal-informal divide in urban settings and the contributions of Latin American structuralism to this analysis. The chapter concludes with a few remarks synthesizing these perspectives and their implications for contemporary development thinking.

2.2 HISTORICAL BACKGROUND: THE EVOLUTION OF ECONOMIC DISCOURSE ON WELFARE

An assessment of how societies have understood and addressed material well-being throughout history is provided by Beaudoin (2006), who distinguishes different stages in global history in terms of both economic organization and the institutional responses to distributional challenges. It is in the light of this historical context that the development of economic theory on the subject can be examined. While the theoretical corpus of economic literature is situated within each era's intellectual context, it stands apart from broader intellectual history by employing the analytical tools of economists. While there is no prevailing narrative that is broadly acknowledged as a benchmark for the history of economic

thought regarding poverty and deprivation specifically, there are tentative systematizations in various aspects to be found, for instance, in (LUNDAHL *et al.*, 2021a; LUNDAHL *et al.*, 2021b) and also by (RAVALLION, 2015).

The difficulty of obtaining means of survival³ is considered a constant in human history, especially before the advent of agriculture. It is widely accepted that the emergence of excess production in farming is the fundamental transformation that allowed not only the generation of food in quantities sufficient for social reproduction but also the development of human endeavor in other fields. This is the case because such surpluses are a necessary condition to enable certain individuals in a community to devote themselves to a more diverse set of activities, eventually leading to the establishment of civilizations in various parts of the world. At this stage of humanity, social classes emerge and intricate distributive issues arise with them.

In most of the pre-modern world, the particular manifestations of material scarcity were influenced, on one side, by the available resources inherent to each region, and on the other side, by the distinctive forms of economic organization prevalent in those areas. Each social configuration could produce a greater or lesser surplus, with high variability depending on the conditions of commerce and nature (such as climate), eventually leading to episodes of severe deprivation. Since in these traditional societies the product was primarily composed of food and a limited set of items essential for physical existence in general, scarcity, even if temporary, posed a threat to survival. As the yield from crops, hunting, fishing, and gathering could vary significantly, scarcity meant hunger — and almost no one was safe from it (BEAUDOIN, 2006; RAVALLION, 2015).

Conversely, the advent of industrialization is decisive in transforming the ways material hardship appears, affecting both developed and developing countries. Beaudoin (2006) pinpoints a critical transition starting from the 18th century. After around 1750, a new global order was sufficiently established, bringing with it major changes concerning the determinants of the material conditions of the masses. A key transformation was that many traditional subsistence activities had given way to wage or slave labor, with the establishment of agriculture for commercial purposes in rural areas around the world and, most importantly, wage labor in the cities of those countries that had advanced in industrialization and urbanization.

This shift significantly alters the way labor is integrated into productive activity and, more fun-

³Particularly food, but also other means, such as ways to protect oneself from the cold, for example.

damentally, the allocation of the product. For the general public, the acquisition of survival resources was increasingly contingent upon the individual circumstances of each family, no longer depending on the collective's ability to procure sufficient supplies. From each family's point of view, securing means of livelihood hinged on whether the workers in that particular household were employed or not. Simultaneously, local economies start to depend ever more on occurrences in the global economy, and the demand for labor becomes increasingly subject to events in other parts of the world (BEAUDOIN, 2006). This condition exacerbates the challenges faced by workers in the so-called 'global periphery,' which, according to Furtado and other structuralist authors, is a portion of the world that has as a nearly defining characteristic the fact that it is profoundly influenced by the occurrences in the central countries (FURTADO, 1990; FURTADO, 2000).

Throughout much of history, charity institutions have been the main devices of relief for the destitute. Later on, States gradually incorporated some of the forms to support those in need that became predominant, especially in urban settings. The initial policies aimed at addressing material deprivation were centered on social protection, primarily against adverse circumstances, which could be unpredicted (like illness) or previously foreseen (like old age), though with particular concentration on those that characterize transient situations. Only in the twentieth century do policies promoting welfare come into existence⁴, aimed at improving the opportunities and quality of life for those living in conditions of structural disadvantage.

This change in policy praxis already denotes a shift in the understanding of the nature and causes of socioeconomic disparities, locating it no longer in a transient, temporary situation due to particular unfortunate circumstances (like joblessness, for instance) but in immutable characteristics of a particular set of families or in the structural configurations of society at large. For such policies to be formulated, it was required not only a transformation in the understanding of the issue at stake, but also an increase in the spending capacity of the States, along with a transformation in political positions.

Against this historical background, Ravallion (2011) identifies two transformative periods in economic thought which he terms 'enlightenments' - pivotal moments when intellectual engagement with material welfare sparked fundamental shifts in how societies understood economic hardship and human prosperity. The first such transformation takes place in the context of the French Revolution, around

⁴The distinction between social protection and social promotion policies is outlined by Dreze & Sen (1990).

the 1790s. The second emerged only in the 1960s, within the climate of political and social movements occurring globally. These upheavals involved claims for civil rights and the student movements. Moreover, it was marked by the *War on Poverty* campaign launched by Lyndon Johnson in the United States.

Before the initial “enlightenment,” the discourse on indigence and pauperism, as Ravallion (2015) suggests, was primarily engaged in justifying its existence and pertinence, thus defending the social structures and class hierarchies of the time. Widely employed arguments ranged from the upheld view of a “natural order,” in which individuals were ascribed to their rightful social positions, to the utility of the threat of deprivation as an inducement to encourage work and compliance with social norms. Discourses rooted in such views of a natural order were present even in the works of Aristotle and Confucius, as they discuss the plight of the indigent within their societies (RAVALLION, 2015). This emphasis on justification dispensed with the requirement for measures to improve living conditions, then considered pertinent to the world’s established order.

It was also commonplace the so-called instrumental argument, which perceives material deprivation as an incentive for labor and thus necessary for the maintenance of social order and even as a catalyst for ethical and socially desirable behaviors. Indeed, within mercantilist thought, for instance, low wages were furthermore considered beneficial for sustaining a positive balance of payments by contributing to maintaining lower prices for national products in relation to foreign competitors. In this context, the actual concern was not with well-being, but that indigence and starvation could incite insurgencies and endanger the equilibrium of the social hierarchy (BEAUDOIN, 2006).

Both Beaudoin (2006) and Ravallion (2015) highlight the period from 1650 to 1800 as one of a significant rise in poverty worldwide. As colonialism spread, many indigenous productive systems were disrupted, resulting in land and other natural resources being appropriated by colonial powers. Moreover, the progression of slavery in the Americas, in an epoch of expansion of European economies, drove a considerable segment of the population in colonized nations into severe privation. At the same time, the standard of living for the masses in the colonizing nations was not yet increasing rapidly in this period.

The principal transformation of Ravaillon’s “first enlightenment” was the overcoming of the notion that indigence was inescapable. In philosophy, the role of institutions in forming societies was accentuated, which enabled the abandonment of the concept of a “natural state”. It is in this context

that thinkers such as Rousseau, Kant, and Hume instituted the notion of deliberateness in social configurations, a turning point in intellectual history. This opened the door to the concept of a public effort towards improving living conditions. Nevertheless, such a shift in ideas would not materialize into social transformation anytime soon. As Ravallion (2015) notes, from a practical standpoint, there were no significant changes for the deprived during this period, who continued to be blamed for their circumstances, although specific interventions now seemed appropriate.

The transition from attributing ultimate causes of economic misfortune to individual responsibility, on one side, to recognizing them as social phenomena resulting from the operation of the economic system and its underlying social structure, on the other, was yet to come. At that time, industrialization and the expansion of European societies simultaneously increased global material wealth and integrated diverse societies through the enlargement of trade. Throughout this process, traditional production structures were dismantled. This twofold dynamic enabled the growing inequalities to draw attention.

2.2.1 Urbanization and Structural Change in the 19th Century

In the 19th century, as industrialization transformed economic structures, the living conditions of urban workers emerged as a central concern in Great Britain. It was at this time that political economy firmly established itself as a pertinent discipline in the public policy debate, engendering the development of new analytical tools. Despite such social issues ranking higher on the agenda, the perspectives of classical economists brought about a reversal in optimism regarding the possibilities of improving material conditions (LUNDAHL *et al.*, 2021b). In his famous work, Malthus expected cycles of pervasive hunger alternating with growth spurts, while Ricardo anticipated the eventual halt of economic progress owing to diminishing returns amid scarce natural resources (MALTHUS, 1806; RICARDO, 1927).

During the 1830s, the debate over the reformulation of the Poor Laws was prominent. Such laws, which had been introduced as an initial social protection policy in England in the 16th century (under Henry VIII and later regulated by Elizabeth I), had seen a substantial increase in the volume of resources spent. Public discussion revealed emerging tensions between market-based and institutional approaches to welfare provision - a discourse that anticipated later development policy discussions about the appropriate role of the State in economic matters.

During the first half of the nineteenth century there was a resurgence of moral arguments, highlighting the behavioral issues of the poor and establishing, in public debate, correlations between certain behaviors and income levels (HIMMELFARB, 1985). Political economists generally opposed the maintenance or expansion of welfare policies, raising arguments regarding adverse targeting and incentives as they distinguished the “deserving” from the “underserving” and also the able-bodied from the disabled. However, Ravallion (2015) also contends that economic arguments were neither sufficiently explored nor decisive for the reform of the Poor Laws that occurred in 1834, with political and moral arguments being significantly more influential.

In the 19th century, the doctrine of utilitarianism gained momentum, becoming widely used to evaluate public policy proposals aimed at improving social welfare. This theoretical construct is still present in neoclassical microeconomics and welfare economics. Concurrently, in the political and economic debate, socialist ideas began to gather support. Intellectual and political conflicts (both within and outside of economics) were greatly intensified and polarized following the publication of “Das Kapital” (MARX, 1867). There, capitalists were blamed for inequality and deteriorated living conditions of the working classes due to the extraction of surplus from the value created by laborers alone.

The intense political debate that emerged aroused general interest in understanding economic disparities, which occurred then in both affluent and impoverished societies. At the beginning of the 19th century, the first qualitative and observational social studies on the lives of the marginalized populations appeared, generally conducted by researchers outside of academia. Toward the end of that century, the studies claiming scientific rigor were put forth, bringing the beginning of the efforts to collect data and information on low-income families (RAVALLION, 2011). In this regard, O’Connor (2016) differentiates “poverty knowledge,” which is generated primarily by that amateur movement, from “poverty research,” which is of a proper scientific nature. The author claims that there was convergence and eventual fusion between them occurring around the end of the 19th century. The abundance and quality of information yielded by certain studies motivated academic debates in the field of social research and also influenced public policies, solidifying the perception of the need to create sample household surveys, which are today deemed fundamental for policy design and evaluation.

2.2.2 New Political Battlegrounds in the 20th Century

On the political front, it was not until the 1910s that the first social-democratic governments came into power in Northern Europe (HOBSBAWM, 1995). This movement marked a significant evolution in development models, as states began systematically integrating social welfare objectives with economic growth strategies. About four decades later, the ramifications of the two world wars and the Great Depression contributed to a broader acceptance of social protection policies. Within this setting, Lundahl *et al.* (2021a) note that while Keynes's contributions were motivated, to a large extent, by the affliction of urban joblessness in wealthy nations, they thereby laid the theoretical foundation for a great part of the social (and economic) policies in the post-war period.

At this point in time, a rapid increase in social promotion policies (as opposed to social protection (DREZE; SEN, 1990)) was observed in the mid-twentieth century, in view of the context of the Cold War. In industrialized countries, relative rather than absolute poverty was increasingly becoming the predominant form. This indicated that families classified as disadvantaged were no longer defined by a lack of sufficient resources but rather by having consumption levels that were beneath the societal norm (BEAUDOIN, 2006). Certainly, an important advancement from the point of view of well-being.

Post-Second World War Europe saw the blossoming of social protection schemes, progressively covering more aspects of private life and significantly reducing absolute economic deprivation. In the United States, in turn, President Lyndon Johnson launched the “War on Poverty” initiative in 1964, stimulating discourse in both the public and academic spheres (RAVALLION, 2011). In spite of these efforts, economic inequalities were becoming ever more apparent in the rich countries, which was mainly due to a change in public perception. It is in this context that the “second enlightenment” of poverty identified by Ravallion (2011) takes place. The author notes that in this epoch, the ultimate responsibility for socioeconomic disparities shifts in the public eye from the poor individuals themselves to deep-seated structural issues in society. This time, it is the visibility of harsh living conditions that drives the debate (rather than class relations, as in the 18th century), including that of the developing world, which could be seen through the mass communication media.

By the 1970s, opposition to the War on Poverty initiative intensified, leading to a decline in social welfare policies. This affected not just the United States but also other countries, particularly from the 1980s onwards, with the predominance of liberal and anti-welfare views. Nevertheless, academic

research on living conditions and welfare had already become established within the field of economics, and new approaches that emerged after that would gain greater prominence when a more favorable environment formed, which would occur only at the onset of the 21st century.

2.2.3 A Brief Comment on the Prevailing Perspectives since the 1990s

In 1990, the inaugural edition of the Human Development Report (UNDP, 1990) published by the United Nations Development Programme (UNDP) essentially incorporated a significant part of Amartya Sen's capabilities approach, which reconceptualized the very meaning of development beyond economic growth to encompass human freedom and potential. Based on the concepts of *functionings* and *capabilities*, this perspective seeks to grasp well being and development itself not in terms of consumption or access to goods and services, but rather in terms of the possibilities of life of each person. Although the span of individual prospectects is indeed supported to a large extent by access to certain goods and services, there is no direct one-to-one equivalence between personal oppportunities and production or consumption (SEN, 1989).

Through this lens, the discourse is transformed: production is no longer the appropriate measure of progress, but rather the life possibilities of individuals and the degree of control they have over their own lives (SEN, 1983). While the importance of developing productive capacities to enhance the overall quality of life is acknowledged, it is not taken as the primary purpose of economic activity. On the contrary, the traditional economic approach is criticized for treating people as mere instruments to generate output (or "factors of production"), while production is erroneously considered the ultimate goal of all society. The impact on academic debate and development policies has been substantial, which is why their further implications will not be explored in the current study.

Another strand in the economic literature that focused on the living conditions of those with the lowest income emerged in the 1990s. Turning to the empirical field, particularly randomized controlled trials (RCTs), this line of research (whose leading figures Abhijit Banerjee, Esther Duflo, and Michael Kremer were jointly awarded the Nobel Prize in Economics in 2019) is primarily concerned with identifying factors that limit income growth and the improvement of the living standards of the economically marginalized ⁵. With a theoretical foundation in microeconomics, such experiments seek

⁵For a broader understanding of the types of experiments conducted, as well as their interpretation in terms of theory and policy recommendations, see Duflo & Banerjee (2011).

to assess the impact of specific targeted public policy interventions at the personal or family level under the assumption that once certain constraints are relaxed, individuals could improve their livelihoods on their own. This perspective sides with neoclassical economics, implicitly assuming methodological individualism, thus neglecting structural processes in the macro environment (economic, political, or sociological) in which individuals are immersed.

2.3 STRUCTURAL CHANGE AND DEVELOPMENT

The concept of structural change refers to the change in the relative participation of productive sectors in the economy, with impacts on production, trade, employment patterns, and income distribution. From this perspective, it is understood that there are important differences among sectors, whether from the point of view of productivity, the capacity to absorb labor, the links with foreign trade, the potential to trigger technological progress or even the institutional environment – all factors that ultimately affect citizens' living standards. The origins of the systematic analysis of the structural issue in economic theory can be traced back to the physiocrats of the eighteenth century, who gave prominence to the agricultural sector in national economies. Ranis (2006) further points out the “classical dualism,” analyzed in greater depth by Phillips (1965), which was identified in authors like Ricardo and Malthus, as they would understand the agricultural and industrial sectors as two separate, though interconnected, economic subsystems, each operating under a distinct logic.

Since the early stages of growth theories, there have been works that attribute distinct importance to different sectors. For instance, Feldman (1928) and also in Mahalanobis (1953) (both models for planned socialist economies), the growth of the investment goods industry influences the economy differently compared to the expansion of the consumer goods sector. For capitalist economies, Kalecki (1956) further differentiates the sectors of capitalists' consumer goods from those of workers' consumer goods in a framework where the expenditure decisions of capitalists determine the sectoral composition (as well as the actual growth rate), in an analysis with profound concern with income distribution. Yet, these models do not correspond to the framework of duality in the context of the development literature, which constitutes the primary focus of this essay.

The topic of structural change became increasingly significant in the final decades of the twentieth century. On the post-Keynesian front, the debate was mainly influenced by Luigi Pasinetti's

contributions (PASINETTI, 1993; PASINETTI, 1983) regarding multi-sector models employing the methodological device of vertical integration. Examining the relation between wages and the prices of final consumption goods as productivity and demand patterns evolve, Pasinetti's work sheds light on how sectoral evolution impacts living standards across social groups.

Later, the emergence of complexity economics, a perspective not connected to the Keynesian tradition, even though not entirely committed to neoclassical postulates, highlighted the importance of sectoral composition for economic success. Both viewpoints make use of multisectoral systems, moving away from the aggregate output approach and sharing the belief that the evolution in the economic structure toward sectors that are more advanced in terms of technology or productivity is an integral part of the development process. This marks a clear departure from the theoretical construct of a 'homogeneous product,' still nowadays present in growth models (which are single-sector models) that often obscure distributional questions. Moreover, according to Gabardo *et al.* (2017), there are models with distinct sectors that cannot be considered structural change, as they ultimately yield a single final good (which is necessarily for consumption), like those of Feldman (1928) and Mahalanobis (1953), for instance. The three-department model by Kalecki (1956), on the other hand, highlights the class struggle and dynamic implications arising from the existence of different consumption goods sectors that directly address how economic structures affect the material welfare of diverse social groups.

2.3.1 Development and Dualism

As mentioned earlier, thanks to mass communication media, greater attention was given during the 1950s to the very low standards of living in developing nations, which could, by then, be contrasted with the increasing material well-being of populations of rich countries. On the political front, the Cold War imposed the need to curb the progression of communism and to present the market economy as a feasible option for impoverished nations (including the newly independent ones emerging from the post-war decolonization movements).

It is within this context characteristic of the mid-20th century that interest in the topic of development brought structural change in poor countries to the forefront. In particular, attention was given to the possibility of overcoming traditional productive forms in favor of capitalist ones. Stemming from the foundational work by Lewis (1954), the focal sectors were identified then as the traditional

(or pre-capitalist) and the modern (or capitalist) ones, each with distinct implications for workers' welfare. The former is often associated with agricultural production in rural areas and the latter with urban industrial production. However, this identification is not always immediately applicable: agricultural production can be capitalist⁶ (also said commercial) and urban production can be traditional or subsistence-based (as in the case of informal labor, addressed in more detail later). Indeed, Jorgenson (1961) even asserts in a footnote (p.311) that in countries like those in Southeast Asia, plantation agriculture could be considered a modern activity in this sense.

Although Jorgenson was likely thinking in terms of the adoption of wage labor and more advanced production techniques⁷, this statement would certainly conflict with the views on development of Latin American structuralists, such as Furtado (2000), for whom the primary sector was most likely not enhancing but hindering development. Even though this simplification of equating 'rural' with 'traditional' and 'urban' with 'industrial' may overly generalize complex situations, it is widely adopted in the dualism literature, as justified by Ranis and Fei:

"We wish to underscore the absence of any necessary one-to-one relationship between the subsistence sector and agriculture, or between the capitalistic sector and industry in most less-developed economies. The existence of substantial islands of commercialized production in the primary sector and of sizable subsistence enclaves in the small-scale and service industries does not, however, bar Lewis, or us, from using this short-hand terminology."

(RANIS; FEI, 1961, p. 534)

Yet, regarding welfare and material deprivation, the rural versus urban dichotomy holds substantial relevance, as such settings significantly impact the nature of subsistence activities, the risks faced, and the survival strategies devised by the most impoverished population. In particular, informal means of obtaining livelihoods in urban contexts, a topic explored in more detail in an upcoming section, become a prominent issue. However, it is crucial to bear in mind that the process relevant to this initial phase of dual economy models is the transition from traditional to capitalist (or modern) forms of production, which in this context is closely associated with urbanization. Ranis & Fei (1961, p.534) even go so

⁶Lewis (1954, p. 20) refers to the case of capitalist agriculture: "If the capitalists are investing in plantation agriculture side by side with their investment in industry, we can think of the capitalist sector as self-contained."

⁷Indeed he notes at the essay's conclusion (p.334) that agriculture experienced rapid productivity growth in countries like Japan, the United States, Canada, Argentina, Australia, and New Zealand due to the application of capital

far as to state that “Development consists of the re-allocation of surplus agricultural workers, whose contribution to output may have been zero or negligible, to industry where they become productive members of the labor force at a wage equal (or tied to) the institutional wage in agriculture”.

It was Lewis (1954) who first systematized the process by which a developing economy, characterized by an abundance of labor, can grow through capital accumulation, gradually absorbing the surplus labor force. Given a subsistence wage that is institutionally fixed, the labor supply is infinitely elastic. In this setting, the growth of the capitalist sector depends on the mass of profits for reinvestment in capital accumulation. As there is no limitation on the availability of labor (hence no wage pressures), capitalists can appropriate the surpluses generated by increased productivity and continue the modernization process. From the perspective of the prospects of improving the standards of living, Lewis’s framework provides public policy planners with a strategy for relocating workers from less productive rural roles to more efficient urban occupations.

Initially, the gains in productivity are captured by capitalists, facilitating the continued expansion of the modern sector. Later, once the excess labor is absorbed, wages become determined by marginal productivity. From this point on, workers can benefit from higher wages, which are expected to increase well-being. Consequently, the modernization perspective expects an initial deterioration in the functional distribution (from the workers’ viewpoint), which nonetheless paves the way for increased employment, product, and wages in the long run.

Within the Lewis model, the institutionally determined wage corresponds to a form of normative distribution of the product, even among traditional workers. Lewis notes that in a market economy, wages would be determined at the margin. Consequently, in a developing economy, they are likely to be (sufficiently close to) zero because of the labor surplus, even though the average product is greater than zero⁸. Given the context of relative scarcity and near-zero marginal productivity, workers in the traditional sector share the produce of labor according to social norms, disregarding relative participation in the output. In this situation, the institutional or subsistence wage may act as a distributive mechanism ensuring survival. Thus, it equates to traditional forms of distribution, present even in European societies before the rise of capitalism (BRAUDEL, 1987), which have important social functions such as mitigating individual risks (including in situations where individuals do not

⁸The significance of the distinction between the average product and the marginal product of the agricultural sector for determining distribution is more elaborately explored in the open economy model presented at the end of his essay (LEWIS, 1954)

work, such as due to illness or old age) and avoiding civil upheavals.

Ranis & Fei (1961) also discuss the matter of the institutional wage, which they deem as dictated by the necessities of subsistence and “conventions.” Such conventions relate to the apportionment of the product among laborers within a family or community, irrespective of labor’s marginal productivity, which was observed before the complete commodification of the economy. Even Lewis acknowledges the existence of social norms that function as instruments of social protection in societies that are not shaped by the market economy. Accordingly:

"And even in the severest slump the agricultural or commercial employer is expected to keep his labour force somehow or other – it would be immoral to turn them out, for how would they eat, in countries where the only form of unemployment assistance is the charity of relatives?"

(LEWIS, 1954, p. 403)

The passage from such traditional forms of production and distribution to one in which livelihood depends on individual productivity brings further risks to the most vulnerable. Such transitions parallel in many aspects the processes analyzed by Polanyi (1944) in his masterpiece "The Great Transformation", which regard the progression to a market economy. In a mid-twentieth-century dual society, however, both forms of production coexist structurally, since the transformation remained incomplete.

In this context, the concept of duality in Lewis (1954) becomes essential for contemplating the economic development of low-income countries in the following decades. This is despite the fact that at the time of its publication, there was no clear distinction between the literature on growth and that on development, and even Lewis considered his framework suitable for analyzing the transition processes that had occurred centuries earlier in those economies already developed by the mid-20th century⁹ (BOIANOVSKY, 2019).

As noted earlier, duality is primarily understood in this literature as opposing urban and rural settings. Thus, the transition to a modern economy involves both rural-to-urban migration and the emergence of the labor market as a distribution mechanism. In fact, during that century, a considerable number of developing countries experienced an intense urbanization process. At that point, living

⁹On the other hand, for Furtado (1990) there is a vast difference between seeking to understand the enrichment of advanced countries, on one hand, and formulating strategies for the development of poor countries, on the other.

conditions in the rural rather than in the urban environment were still the most striking in the public eye. Nonetheless, in the decades that followed, the intense expansion of metropolitan areas in the developing world gradually moved the development theorists' focus toward issues related to penury and privation in urban areas, a phenomenon that increasingly became a more pressing matter.

Considering well-being from the perspective of material needs fulfillment, the essential issue in urbanization relates to securing subsistence means. In rural areas, access to water and arable land allows for the possibility of self-sustenance through cultivation and also provides enough space for establishing dwellings in available areas. In cities, however, access to water, food, and housing requires monetary income, which is by no means guaranteed in a market economy¹⁰, where the demand for labor depends on economic conditions beyond the workers' control.

Apart from the uncertainties involved in securing employment, urban workers are also subject to fluctuations in real wages. Ranis & Fei (1961) point out the concern regarding the relative pricing of agricultural goods, which, according to the authors, was overlooked by Lewis. They assert that Lewis's 1954 essay did not adequately address the growth of the agricultural sector, and for this reason, his model constitutes one of "balanced growth." Such a term denotes the growth of sectors that occur proportionally (though not necessarily at the same pace) in such a manner that systemic balance is maintained. Kalecki (1993b), on the other hand, displays an upright concern with the purchasing power of workers when he points out that agricultural crops may not respond rapidly enough to meet the increasing demand in developing countries that experience economic growth, which would result in a rise in food prices and a decrease in living conditions.

In regard to the transition from traditional to modern production relations, the influential model proposed by Ranis & Fei (1961) delineate three essential phases in development based on the correlation between market remuneration and institutional wages. The authors' central concern is to analyze the transition process (also referred as "take off") from its beginning to its conclusion, in other words, up to the point where sustained growth of the capitalist sector is achieved. In the first phase, there is redundant rural labor with zero marginal product, which can therefore be reallocated without reducing agricultural output. In the second phase, the marginal productivity of agrarian labor is positive but lower than the institutional wage, which still determines the remuneration of rural laborers. The boundary between the second and third phases is termed the "commercialization point" (p. 540),

¹⁰Except within stronger welfare state frameworks, which only emerged in the latter half of the 20th century, and this only in a few affluent nations (HOBSEAWM, 1995).

which indicates the prevalence of commercial farming that comes into effect from this phase forward. Later, as the third stage begins, the wage in the countryside equals the marginal productivity of farm labor, characterizing capitalistic production there.

Ranis & Fei (1961) also express apprehension regarding “the Malthusian issue” of population growth, which might negatively impact development by postponing the takeoff stage. According to their model, the scale of the so-called “modernization effort” is contingent on the pace of labor force expansion. A pace of capital accumulation compatible with the natural growth of the labor force is necessary to complete the takeoff process within a certain limited time horizon.

In contrast, Jorgenson (1961) presents a model which brings population growth as a pivotal variable, essential for ascertaining the long-term path: it can lead to either a steady-state trajectory with rising per capita output or a trap trajectory characterized by growth with a stable per capita income. In his schema, the presence of an agricultural surplus is critical since the “internal terms of trade” (meaning the relative price of farm goods relative to the industrial one) is considered essential. Nevertheless, in this scheme only urban workers are responsive to the relative wages across sectors, having the possibility of returning to rural areas in case the real wage in the urban zones is not sufficiently attractive. In the process devised by the authors, rural peasants are “released” to the industrial sector as the agricultural surplus expands. This implies that, as rural productivity expands, rural workers have no choice but to take the road to the cities.

This phenomenon is akin not only to the rural-urban migration of developing economies in the twentieth century but also, according to Braudel (1987), to the expansion of European cities by the end of the Middle Ages. So the question arises: to what degree are rural laborers drawn to urban areas by the opportunity for a better quality of life, and to what degree are they displaced from agricultural lands owing to enhanced productivity resulting in reduced demand for labor?

Only with the Harris & Todaro (1970) framework does urban unemployment come into the picture, as the risk of joblessness in the cities appears as a factor for the decisions of rural workers contemplating migration. Here, the key variable for labor allocation is the expected wage in the urban areas: given a wage level, the higher the urban unemployment, the lower the expected wage, and the lesser the exodus from the countryside. Migration can occur in both directions and may happen even if the marginal product of agricultural labor is positive. In certain situations, the absorption of unemployed urban workers by firms can lead to an increase in industrial output without a decrease in agricultural

production. This scenario is contrary to what is seen in typical dualist models, where the agrarian labor is the one that can be withdrawn with diminishing the output.

Urban unemployment, as already mentioned, serves as the impetus for the first protective policies and is one of the main factors significantly influencing the prevalence of harsh living conditions in the cities. At present, a large portion of developing countries has completed or is near completing their rural-to-urban transition. Yet, the vast majority of the poor in developing countries are engaged in low-productivity activities, not only in rural areas but also in urban contexts.

It is also essential to note the theoretical current that evolved alongside the dualist tradition in the mid-20th century (around the 1950s), although with more pessimistic outlooks than its counterpart. The movement that came to be known as Latin American structuralism became of significant relevance for the debate on structural change. From its point of view, the sectoral composition of the economy (that is, its productive structure) is central to the issue of underdevelopment. This school's primary distinction from the modernization theory is in recognizing the inherent contradiction in the productive structure as a barrier to development: given the restrictions that developing countries face, efforts to enlarge the modern sector result in the deepening of inequalities.

From this perspective, underdevelopment is not seen as a stage of development, as in Lewis (1954), Ranis & Fei (1961) and Jorgenson (1961), but rather as a “trap” situation created chiefly by the way in which underdeveloped economies have been integrated into the global economy (FURTADO, 1990; FURTADO, 2000). To escape this situation, an integrated development initiative would be necessary, which would only be possible through systematic planning and economic management by the public sector.

Being more pertinent to contemporary scenarios, this theoretical approach will be elaborated upon in section 2.5, which deals with informal urban labor and the forms of poverty pertaining to it. However, prior to addressing this approach, it is pertinent to explore Kalecki's insights on these issues, given that the theoretical structure he developed is fundamentally intertwined with the subjects being discussed, making his perspective a necessary starting point. His economic perspective not only provides essential context for the analysis that follows, but also serves as the intellectual backbone for the work presented in this thesis.

2.4 KALECKI'S STRUCTURAL APPROACH TO DEVELOPMENT

Unlike the main approaches that dominated development economics in the mid-20th century, Kalecki's framework integrates political economy, institutional factors, and sectoral dynamics into a comprehensive vision that remains remarkably relevant for contemporary analysis of developing economies. In his view, economic development cannot be reduced to the simple accumulation of capital or growth in aggregate output, but rather as a complex process that involves structural transformation, where the composition of output and the distribution of income play crucial roles (SAWYER, 1985; LÓPEZ, 2010). This perspective stands in marked contrast to the aggregate growth models that dominated mainstream development economics during this period, including early growth models and subsequent neoclassical approaches.

The distributional focus in his understanding of development differs substantially from both neoclassical growth models and certain Marxist approaches. While mainstream theories typically treated distribution as either exogenous or derivative of marginal productivity, and classical Marxist analysis emphasized exploitation through surplus value extraction, the Kaleckian approach centered on how distributional patterns shape sectoral dynamics and, consequently, development possibilities FitzGerald (1994). This framework allows for a more comprehensive examination of the effects of redistribution on both immediate welfare and long-term transformation in the sectoral composition, an idea later further developed in the theoretical debates on structural change and economic complexity.

His involvement in development issues crystallized significantly during his work with the United Nations in the late 1940s and early 1950s, a period that coincided with the ascendance of modernization theory (TOPOROWSKI, 2018). However, his approach diverged substantially from the dominant paradigms, offering a more multifaceted view of the structural challenges facing developing economies. This intellectual trajectory would later influence various heterodox schools, particularly Latin American structuralism and dependency theorists (FITZGERALD, 1994).

Regarding sectoral composition and its impact on income distribution, a fundamental insight of Kalecki's approach is seen in his seminal essay on "intermediate regimes", where he analyzes how the relative sizes of different economic sectors and their class relations shape national development possibilities (KALECKI, 1993a)[1967]. Unlike the Lewis (1954) dual-sector model, which emphasized the transfer of labor from traditional to modern sectors, Kalecki's framework pays particular attention

to the internal dynamics of intermediate social groups and their economic interests (SACHS, 1977).

This perspective on intermediate regimes recognized that in developing economies the capitalist class was not sufficiently strong as a political force, thus such nations contained not just the two broad classes of capitalists and workers, but complex social stratifications with distinct economic interests. In his analysis, he identified the critical role of intermediary classes, which often controlled significant portions of economic activity and political power in developing countries. Given their particular interests, these intermediate groups frequently pursued development strategies that differed from both classical capitalist accumulation and socialist planning. They often favored forms of state-led industrialization that expanded their own economic power while limiting the influence of both large landowners and foreign capital. This created distinctive accumulation patterns where the state played a central coordinating role in capital formation, yet without the clear class antagonisms of classical Marxist models. It explained apparent contradictions where states could simultaneously be interventionist in economic affairs but resistant to radical redistribution of wealth.

Central to this analysis is the role of essential consumption goods in determining both the living standards of workers and the overall dynamics of developing economies. In his well-known paper "The Problem of Financing Economic Development", Kalecki elaborates on how the production and distribution of basic necessities fundamentally shape the course of development process (KALECKI, 1993b). The availability of essential foodstuffs plays a dual role: it determines the real income of workers while simultaneously influencing the rate of capital accumulation possible within the economy. This interconnection creates what he describes as the actual development equation, where the capacity to expand the production of capital goods depends on the surplus generated in the staple goods sector.

For this reason, unlike other development economists of his time who focused on industrialization, the Polish author placed considerable emphasis on the constraints imposed by food production on the possibilities of growth. This agricultural bottleneck creates inflationary pressures that undermine real wages and destabilize the development process. In addition, he argues that control over these goods, particularly food, constitutes a form of power that shapes class relations and state policies in developing nations. This political economy dimension distinguishes his approach from both mainstream theories and certain heterodox perspectives that prioritize technical economic relationships over institutional and power influences.

It is essential to note that the sectoral composition of the economy in this perspective is not merely

descriptive but analytically insightful. The well-known three-department model (dividing the economy into investment goods, capitalists' consumption goods, and workers' consumption goods) provides a framework for analyzing how changes in distribution affect the overall economic outcomes (KALECKI, 1968). This approach reveals how distributional parameters (such as labor share), which are either institutional or behavioral, influence not only immediate living standards but also the sectoral dynamics that determine long-run growth possibilities.

In this regard, it is particularly pertinent to this point the observation that distinct industries display different levels of market power and profit margins, resulting in varying labor shares (KALECKI, 1956). When analyzing developing economies, it becomes evident that specific sectors are frequently controlled by monopolistic or oligopolistic entities. This dominance fosters patterns of "unbalanced" development, which in turn exacerbate income inequality. This point of view is consistent with studies on structural heterogeneity conducted by Latin American structuralists, highlighting the intrinsic disparities within these economies.

The key element for both income distribution and effective demand is wages which Kalecki viewed not only as a production cost but also as a demand source (LÓPEZ, 2010). This dual nature of labor income leads to complex interactions within developing economies. On the one hand, a rise in the mass of workers' earnings can increase demand, consequently stimulating market expansion. On the other hand, this can simultaneously exert pressure on investment, potentially limiting it in specific situations, particularly when there is a scarcity of critical basic goods.

The practical approaches to development planning, elaborated during Kalecki's work with the governments of Israel, India, and Cuba, provided concrete applications of his theoretical framework. In contrast to planning models that focus primarily on resource allocation, aligning with his previously mentioned theoretical considerations, he emphasized the importance of addressing distributional challenges, sectoral imbalances, and constraints related to effective demand (SACHS, 1977). This orientation influenced Latin American approaches to development planning, particularly in the work of ECLAC during the 1960s and 1970s (TOPOROWSKI, 2018).

In this regard, the treatment of external constraints in Latin American structuralism, particularly the analysis of balance of payments limitations on growth, a characteristic feature of the continent, also resonates with such insights (BÉRTOLA; OCAMPO, 2012). Although it was Thirlwall (1979) who later formalized this approach, structuralists had previously developed analyses of how foreign

exchange constraints limited domestic accumulation processes, a perspective that aligned with Kalecki's understanding of the international dimensions of development challenges Boianovsky & Solís (2014).

Another crucial element that resonated with Latin American structuralists was the analysis of the political economy of development. Both approaches recognized that development strategies were not merely technical choices, but reflected complex power dynamics and class interests. This understanding led to a more realistic assessment of the possibilities and limitations of developmentalist strategies in countries with pronounced social disparities, external dependences, and a more unbalanced distribution of power.

The contemporary relevance of this analytical framework lies precisely in its integrated approach to structural transformation, income distribution, and effective demand. As developing economies face challenges related to premature deindustrialization, persistent informality, and environmental constraints, these insights on sectoral dynamics and distributional patterns provide valuable analytical tools López (2010). This relevance extends to the contemporary challenges that will be explored in the subsequent essays in this thesis.

2.5 STRUCTURAL CHANGE, URBAN INFORMALITY, AND POVERTY

Ghani & Kanbur (2013) argue that development theories anticipated an “inexorable urbanization and inexorable formalization” of the labor force as underdeveloped economies progressed. However, despite steady urbanization processes in developing nations, formalization trends have shown signs of stagnation and even reversal over the past decades. Consequently, this has led to large numbers of informal workers in the large cities of developing countries, resulting in enclaves of poverty. In such regions, since urban laborers do not have access to the necessary resources to secure their livelihoods, as indicated above, they are entirely reliant on monetary earnings to purchase them in the marketplace. This circumstance is intrinsically connected to the severe living conditions observed within these regions.

Although urban wages are generally higher than rural ones, especially in the modern sector, the risks workers face are diverse and could be more intense in a city setting. Therefore, strategies to alleviate the harsh conditions in this context must differ from those discerned through the modernization approach discussed in the previous section. Consequently, it is no coincidence that the first state-led initiatives

for social protection were directed toward mitigating individual risks typical of city environments. Such risks became increasingly apparent with the progression of urbanization in Europe, still during the precapitalist era Beaudoin (2006), Lundahl *et al.* (2021b), a time that has witnessed the implementation of the first broad protective policies (as opposed to promotion (DREZE; SEN, 1990)).

Thus, the association between urbanization and manifestations of deprivation in the modern world is fundamental. Although in most mature economies redistribution strategies allow the reduction of acute adversities, with relative poverty becoming increasingly the pertinent form of dispossession, in developing countries, on the other hand, the availability of employment opportunities and the general level of income are still the main factors determining the extension of material scarcity. This happens even after industrialization occurs and the rural exodus is nearly complete. Indeed, migration to urban areas has sometimes occurred at a very rapid pace such that it would have been arguably difficult for accumulation to absorb this contingent. This was deemed an essential characteristic of many dualist economies as comments Furtado (1990), noting that the pace of job creation cannot compensate for the labor released by the destruction of traditional productive arrangements. Accordingly:

"In societies where productive activity is governed by market criteria, the employment level of the population depends on market conditions. The livelihood of workers is no longer ensured by social organization, as was the case in times when one inherited a trade or the right to access arable land. Personal safety can only be regained through a significant effort to organize the working masses and their access to the power structures that oversee the economic system."

(FURTADO, 1990, p. 176)

Although Furtado does not explicitly refer to social protection schemes, which have existed in Europe for several decades and in a few other developed countries, it is not entirely unreasonable to infer that he has in mind mechanisms of redistribution through state intervention. In any case, it is within this context that the informal economy emerges as an outcome of the risks to the urban poor, constituting one strategy of workers to cope with the scarcity of financial means. This understanding of urban informality as a coping strategy can help one to relate to the challenges faced by the low-income urban population and guide efforts to advance social well-being.

The phenomenon presently recognized as urban informality was previously noted by Lewis (1954)

as “petty jobs” in urban contexts. Nonetheless, it was in the field of economic anthropology that, in the 1970s, the term “informal economy” was conceptually formalized, originating from Keith Hart’s study on the economic activities of rural migrants in urban areas in Ghana (HART, 1973; HART, 1985). In his analysis, the author emphasizes that the proper application of economic theory, and thus the planning of public policy, would be seriously impaired by the direct and unreflective transfer of Western concepts and categories to the social structures of the underdeveloped world.

The proposed conceptualization had a significant impact and was adopted by the International Labour Organization (ILO) in the 1970s, not only as a theoretical reference, but also as a guide to the agency’s practical initiatives (GHANI; KANBUR, 2013; RAMOS, 2007a). This understanding also reached the academic debate. Although for many academic economists, informal employment was associated with a labor surplus, a segment of the literature perceived informality as arising from negative incentives created by excessive bureaucratic measures by states with diminished enforcement ability (CHEN, 2016).

In fact, in recent decades (especially since the 1990s), the dominant economic literature on informality, as reported by Ramos (2007a), is the neoclassical view, where rational individuals make decisions in (supposedly) competitive market environments¹¹. Thus, the existence and scope of urban informality could be explained by the choices made on the basis of advantages and costs, of formalizing or not a business, and of seeking employment with or without official documentation. This perspective commonly employs the concept of segmented labor markets, implying the hypothesis (often empirically tested, though with mixed results) that certain workers could be employed only on one side of the formality border.

Nevertheless, until the 1980s, there has been a prevalence of the theoretical approach to urban informality advanced by ECLAC¹², which centered on structural causes and hence is called structuralist (RAMOS, 2007a)¹³. From this angle, it is understood that the economy’s ability to generate jobs in the formal sector is not sufficient to absorb all urban workforce, let alone rural laborers who had been migrating (LOVE, 2018).

¹¹Yet, it is worth mentioning that assumptions regarding a variety of market failures are examined extensively in the mainstream literature, while still adhering to neoclassical tenets, as summarized by Ulyssea (2020).

¹²Or CEPAL in the abbreviation in Spanish and Portuguese, the reason why this approach is sometimes termed ‘cepalist’.

¹³Other theoretical strands explaining informal labor exist but are not covered in this study. For an overview of the main theories, refer to Chen (2016).

The capacity to absorb labor is also a focal point in the contributions of Fitzgerald (1988), who proposes a systematization in mathematical modeling based on Kalecki’s writings on development. The proposed framework is designed to represent a mixed economy¹⁴ and encompasses both rural-urban migration and urban informality in a multisectoral model that includes four sectors: the investment goods sector, the necessary goods sector, the non-essential goods sector and the urban informal sector. Capital is used for production only in the first and third sectors. This perspective allows informal labor to compete with formal employment: as urban workers are willing to spend a fraction of their income on informal goods, while this market remains unoccupied, the earnings are potentially higher than the industrial wage (which is also fixed in this model). In this manner, the size of the informal output is determined in this framework by the demand for it¹⁵. The competition between informal and formal goods might echo the neoclassical narrative, which denounces the flourishing of unregistered businesses thriving in specific markets while evading taxes and regulations. However, it becomes apparent that this is not the case when one notices that informality is, within this model and also empirically, strongly related to low productivity and poverty, especially in the context of developing countries (PORTA; SHLEIFER, 2014).

Furtado (1990) challenges the notion that gradual urbanization and formalization could be expected in poor countries as occurred in those now rich. This is because from the standpoint of Latin American structuralism, of which he was a proponent, the economies of the so-called peripheral countries are likely to experience a distinct transitional dynamic. This is the case because their social structures and their economies are thought to be of a particular kind, as they have been formed from the expansion of the central economies, conforming to them through a process of “external induction” (FURTADO, 1990, p. 177). Consequently, for structuralists, the concept of underdevelopment was not comprehensible within the framework of growth theories that surfaced after the war, from both neoclassical or post-Keynesian schools of thought¹⁶.

Like Hart (1973), Furtado also emphasized that the dominant economic concepts had been shaped by social structures formed under industrial capitalism, hence the need for a critical re-assessment of these concepts. This theoretical re-examination could only be sought through a new assessment of his-

¹⁴That is, a market economy governed by State planning, which was standard at that time in the 20th century, including in many Latin American countries.

¹⁵A feature worth keeping in mind since it constitutes an integral part of the model presented in two subsequent essays of this thesis

¹⁶The crucial distinction between theories of growth and development is also discussed in Boianovsky (2019).

tory, supported by the tools of the economists (FURTADO, 1990; FURTADO, 2000; BOIANOVSKY, 2010). In this vein, Furtado believed that the path to development would face obstacles not foreseen in the modernization narrative presented by Lewis (1954), Ranis & Fei (1961), Jorgenson (1961) and Harris & Todaro (1970), since there are contradictions that stem from the insertion of the developing world into the world economy, which deepen inequalities when a nation seeks to advance industrialization.

The cause lies in the fact that modern sectors employ a specific technology, often originating in rich countries, which is labor-saving and offers little to no flexibility in labor intensity. Consequently, the expansion of the modern sector itself leads to the dismantling of precapitalist productive units, as it replaces those products from which traditional workers derived their livelihood with modernly produced goods. Given the labor-saving technology and the high productivity associated with it, the modern sector cannot possibly absorb all the labor force released from the traditional economic activities it replaces.

In addition, the diffusion of new technologies, as it introduces new consumer goods, also implies the formation of new ways of living. The consumer behavior of individuals in the modern sector of developing regions is based on emulating the customs and lifestyles of the central countries. Thus, from this viewpoint, the very dissemination of the industrial civilization, insofar as it imposes not only the consumption standard but also the way of life of advanced countries upon all populations, is sufficient to produce forms of inequality such as relative deprivation. In other words, to embrace a particular lifestyle set as a reference in society, individuals require an array of goods and services that are distinct from those required for a traditional, precapitalistic way of life. The difficulty in accessing these products leads to exclusion from participation in that society.

In this sense, this proposition of Furtado (1990) concerning developing nations is connected to the observation of Beaudoin (2006) that industrialization leads to an increasing prevalence of relative rather than absolute poverty. It is worth mentioning that in the developing world, inequalities can lead to more pervasive forms of social exclusion, rather than just disparities in consumption levels. Because participation in certain social activities requires the availability of specific goods and services, an absence of them can significantly limit the range of life possibilities that individuals might otherwise pursue.

2.6 FINAL REMARKS

“Economics is, in essence, the study of poverty,” states (HARTWELL, 1972 apud RAVALLION, 2011). However, the history of ideas suggests that, although the topics of material harshness and well-being orbited the focus of economics from the very beginning of the discipline, they have been explicitly addressed only in a relatively narrow segment of the theoretical body of the discipline. Furthermore, it is only in recent times, particularly since the latter half of the twentieth century, that the matter of poverty has become the central concern for a significant group of prominent economists.

This interest arises in the same historical period as the development literature, at a time when living conditions in less advanced countries gained awareness in the rich world in the context of postwar social transformations and the political disputes of the Cold War era. Moreover, inequalities within industrialized countries were becoming increasingly noticed (especially with the heightened awareness of the racialization of poverty, deeply entrenched in the Americas due to enslavement). In this scenario, the emphasis of the theoretical production has been placed on growth and development, fields where answers to structural destitution and guidance for public policies are sought. Although direct references to improving living conditions are rarely found in this literature, it is still considered the response of economists to the challenges posed by perceived inequalities in the post-war context (LUNDAHL *et al.*, 2021a; RAVALLION, 2015).

Most often, the goal of theorists in the field does not seem to have been to analyze life quality itself. For instance, Ranis & Fei (1961), Jorgenson (1961) and Fitzgerald (1988) do not explicitly address the internal terms of trade as relevant variables for the well-being of workers, but rather as variables relevant to growth, whose adverse behavior could abruptly stop the development process. However, the tools developed by such efforts can be quickly adopted by economists to analyze the issue of welfare and inequality, either with these same models or with variations of them. The reason for this is that, as observed earlier, the theoretical frameworks created to deal with the question of development have progressively integrated elements that are pertinent to consider the material means of the marginalized groups.

In the subset of literature reviewed here, two main axes of analysis are noteworthy: the standard of living, on the one hand, and the risks to life or well-being, on the other. Within Lewis’ framework, only after a critical threshold is reached, beyond which surplus labor is exhausted, may wages grow,

thus increasing the standard of living. Since economic hardship was understood primarily as a rural phenomenon, with modernization through industrialization serving as the main solution, his model envisioned that as economies developed, labor would gradually shift from traditional to modern sectors, enhancing economic outcomes through increased productivity and urbanization.

In contrast, the model of Ranis & Fei (1961) allows one to examine the welfare questions of urban employees, as the prices of the consumer goods of workers, which are greatly influenced by agricultural product prices, play a significant role in the analysis. The internal terms of trade between the traditional and modern sectors pose a risk to the livelihood of the metropolitan workforce (alongside the threat of unemployment), as they can significantly affect real salaries.

This stands in stark contrast to traditional production methods, where individual risks are mitigated by distribution norms, while collective risks prevail (such as the occasional adverse weather that disrupts harvests). Consequently, the alteration in distribution rules that accompanies a society's shift to an urban setting within the realm of economic dualism is crucial for both the quantitative and qualitative evolution of material hardship. For workers contemplating the move from the land to the city, the heightened risks might be compensated by the prospect of a higher income than what could be achieved in traditional activities (as seen in Harris & Todaro (1970)). Nevertheless, this risk implies that urban poverty will certainly exist for a certain contingent, and society must debate how best to address it.

Still concerning rural-urban migration, it is essential to note that the causal relationships between increased productivity in the countryside, on one hand, and the development of urban sectors, on the other, do not seem to constitute an undisputed territory. Both in the European transition from feudalism to capitalism and in the transition of late-industrializing countries to modern production forms, rural exodus generally occurred concurrently with increased agricultural productivity and the evident rise in urban indigence (ANDERSON, 1987; BEAUDOIN, 2006). Therefore, it is relevant to question, for each specific transition process, whether rural workers were attracted to the cities or, on the contrary, expelled from the countryside. It is of note that, whereas in Lewis (1954) and Ranis & Fei (1961), the city attracts rural workers with the expansion of industrial employment, in Jorgenson (1961) on the other hand, these workers are expelled from the countryside by the increase in rural productivity which reduces the labor absorption in agriculture.

As the issues of inequality and well-being are now acknowledged to arise from various factors, they

exist at the crossroads of numerous fields, with economics being particularly influential. The discussions surrounding these topics tend to be complex and layered. Nonetheless, the urgency of this situation may only be comparable to that of environmental concerns, and its consequences in terms of profound human distress are immeasurable. For this reason, it is imperative that the factors directly linked to well-being be given the emphasis that growth enjoys in the majority of the theoretical literature.

Furthermore, in the structural literature thus far explored it becomes evident that the absorption of the informal workers by the expansion of the formal, modern economy is not at all a process that can be taken for granted. In fact, empirical observation shows that formal and informal sectors continue to coexist even after countries have completed their rural-to-urban transition and achieved substantial industrialization.

This resilience of economic dualism poses profound theoretical questions about the macroeconomic processes in such economies. If the informal sector is not simply absorbed as modern sectors expand, what dynamics might explain its persistence, and how do these dual structures respond to economic fluctuations and policy interventions? The following chapter explores these questions by adapting Kaleckian growth models to incorporate economic dualism explicitly. Rather than treating the informal sector as a residual phenomenon, the analysis investigates how its presence might fundamentally alter the macroeconomic mechanisms that lead to long-run equilibrium trajectories. By examining these dynamics, Chapter 3 aims to provide theoretical insights into why the transformation processes described by development economists have often remained incomplete, and how the interactions between formal and informal sectors might shape growth trajectories in ways not anticipated by conventional economic models.

CHAPTER 3

ADJUSTMENT TOWARD LONG-RUN EQUILIBRIUM IN DUAL ECONOMIES

3.1 INTRODUCTION

Despite sustained economic growth in several developing nations in recent decades, poverty continues to be a persistent challenge. This paradox reflects a deeper structural issue: growth alone is not sufficient to reduce deprivation when inequality remains embedded. The persistence of destitution in the context of growth is increasingly understood as a consequence of uneven development, where the benefits of expansion are disproportionately captured by specific sectors or groups.

In many developing economies, this inequality is closely tied to economic dualism, the coexistence of a dynamic, capital-intensive formal sector alongside a low-productivity, labor-intensive informal one. Rather than diminishing with progress, this duality has proven remarkably persistent and, in some cases, has even intensified during periods of economic expansion. The result is a segmented economy in which large portions of the population remain excluded from formal structures of accumulation, social protection, and upward mobility.

In view of this, the current chapter examines several extensively debated dynamic mechanisms suggested in the post-Keynesian theoretical framework, while making adjustments to reflect the conditions of middle-income, rather than developed, economies. Thus, a few modifications are put forward to apply such a theoretical framework to dual economies.

However, it is important to note that the understanding of a dual economy described here is slightly different from the concept proposed by Lewis (1954). In the present context, duality is mainly considered between a modern sector and an urban informal sector. In this setting, workers in the informal economy produce for sale rather than for their own consumption, therefore output is constrained by demand.

The pervasive presence of the informal economy is a distinctive, nearly defining characteristic of

developing countries. Although there was a wide belief in the early development literature that inevitable formalization would take place as countries progressed toward a 'modern' capitalistic economy in the sense of Lewis, in the past few decades informality levels remained stagnant or even increased amid economic growth (KANBUR, 2017). The perception of this phenomenon has raised renewed interest in the informal sector (IS), especially after the 1990s. Although a large share of the literature has been devoted to explaining the causes of informality, considering it to be an anomaly amid an otherwise modern economy, considerably less attention has been paid to the effects of informality on the long-run trajectory or on how its presence and size could alter standard adjustment mechanisms.

This issue could be even more relevant in a post-Keynesian setting, where aggregate demand plays a vital role in the determination of the output. In particular, it is not clear whether a larger IS would be expected to increase employment and consumption, especially of the poorest, thus adding to aggregate demand or, on the contrary, to diminish overall demand for formal goods, therefore hurting overall investment and, hence, long-run output growth. However, since both influences could occur, the net effect would depend on which one is dominant.

In this context, this chapter examines the macroeconomic consequences of dualism, particularly through the lens of the informal sector's interaction with the formal economy over the long run. Within a Kaleckian framework, the analysis focuses on how the informal sector, frequently overlooked or treated as a residual, plays a non-neutral role in shaping aggregate demand, capacity utilization, and investment dynamics. Special attention is paid to how its presence can modify the adjustment mechanisms that guide the economy toward an equilibrium position in the long-run.

The analysis aims to explore how the presence and size of the IS influence the macroeconomic trajectory of a developing economy within a Kaleckian framework. The main goal is to highlight the non-neutrality of the IS and point out a few mechanisms by which its presence and extension could impact the long-run growth path. This is done by adapting well-established post-Keynesian models to better reflect the realities of middle-income countries, where the informal sector plays a systemic and enduring role. These adaptations aim to capture how structural features of dualism, notably the scale and behavior of informal economic activity, can critically influence growth trajectories and stability in developing economies.

In this vein, there is first a redefinition of two crucial variables for the Dutt-Rowthorn Kaleckian investment function (DUTT, 1990; ROWTHORN, 1981) – the profit share and the rate of capacity

utilization – so the fact that a part of the economy runs outside the formal sector (FS) can be considered. Later, this modified investment function was incorporated into the Kaleckian reproduction scheme, which was also modified to accommodate the IS. Following this, various numerical simulations within this framework are conducted to illustrate how the key variables behave on the pathway to their steady-state values. There is reason to believe that the IS is a vital feature that should be taken into account in growth models, which could significantly alter the results of standard models. More importantly, it could affect the mechanisms by which macroeconomic variables adjust toward their dynamically stable values.

Another major point of debate resides in the fact that is not entirely clear by which means the utilization rate would be brought back to its normal level after it deviates due to external shocks or variations caused by endogenous adjustments. In this context, different adjustment mechanisms have been proposed by which convergence towards a long-run trajectory that is not path dependent is achieved, such as Shaikh (2007) and Duménil & Lévy (1999) among others, while different approaches to reconcile short- and long-run equilibria pursue the preservation of key Kaleckian characteristics, such as Cassetti (2006).

It is well known that stability issues arise in the extension of the Kaleckian framework to the mid- and long-run. This matter has received substantial attention in the literature in recent years. In particular, the investment function, which is crucial for the outcomes of the model, has been subject to intense dispute in the theoretical literature. The fact that Kaleckian models present a long-term investment function claimed to be better suited for short-term movements has been heavily criticized (LAVOIE, 1995b; SKOTT, 2012), an issue explored in greater depth in section 3.2.

In fact, the equilibrium profit rate and the capacity utilization rate in the earlier Kaleckian models for the long run can be understood as short- to mid-term steady states, whereas the long run is seen as a succession of shorter periods. In this case, the long-term trajectory could indeed be path-dependent. As (HEIN *et al.*, 2011) point out, it can be argued that it may be more fruitful to focus on these short- to mid-run provisional equilibria rather than searching for determined long-run trajectories, since the very existence of equilibrium values derived from parameters that do not remain constant over the long run can be called into question (CHICK, 2022).

In this vein, the approach adopted here involves analyzing such provisional equilibria to closely examine how they are affected by the presence and extension of the informal economy. Once the IS

has been included as a relevant piece of the set of mechanisms that bring about this adjustment, the analysis presented may provide new elements for the debate of adjustments toward mid- to long-run trajectories in the Kaleckian literature.

According to Hein (2017), the Bhaduri-Marglin formulation (BHADURI; MARGLIN, 1990) can be understood as a particular closure for a framework common to post-Keynesian and Marxian-classical models, meaning that there are fundamental elements maintained throughout these somewhat distinct perspectives. In this vein, the understanding adopted here is that the proposed modifications can be seen as an additional layer on the standard models since there is reason to believe they do not dramatically alter the mechanisms identified with the Kaleckian tradition. On the contrary, the present work seeks to point out how these mechanisms remain in operation after the IS has been considered.

Section 3.2 explores such mechanisms by examining how dual economies respond to shifts in capacity utilization and investment decisions when a significant informal sector is present. This analysis focuses specifically on two distinct modeling approaches: one where informal consumption responds directly to changes in capacity utilization rates, and another where it responds to labor market conditions. These complementary perspectives reveal how the informal sector can function as either a stabilizing or destabilizing force in developing economies, depending on whether its relationship with the formal sector is countercyclical or procyclical. By incorporating these dynamic relationships into the Kaleckian framework, one can achieve a more comprehensive understanding of how developing economies with persistent informality adjust toward equilibrium, potentially following different paths than those predicted by models designed for mature economies with negligible informal sectors.

The analysis proceeds through several interconnected sections that build a comprehensive framework for understanding dual economies. Section 3.3 investigates the specific stability concerns that emerge when extending Kaleckian models beyond advanced economies. Section 3.4 establishes the formal modeling approach for integrating informal sectors within the Kaleckian growth and distribution tradition. Section 3.5 elaborates on the theoretical mechanics of long-run adjustment when informality is present. The analytical framework is then applied in two complementary dynamic models: Section 3.6 examines a discrete-time formulation in which informal consumption varies with capacity utilization, while Section 3.7 presents an alternative specification where labor market conditions determine the behavior of the informal sector. Both approaches are illustrated through numerical simulations that reveal the complex adjustment dynamics in dual economies. Section 3.8 concludes with a discussion

of the theoretical and practical implications of these findings for economic development.

3.2 DUAL ECONOMIES AND ADJUSTMENT TOWARDS LONG-RUN EQUILIBRIUM IN KALECKIAN MODELS

In his seminal essay, Lewis (1954) initially introduced the concept that a significant portion of the economy in developing nations had not been fully integrated into the capitalist system, even well into the twentieth century. Since then, the concept of a dual economy has become crystallized in the economic literature, referring to the coexistence of a modern and a traditional economy in the same country. Nevertheless, the setting in which he develops his analysis is one of vast rural populations immersed in a subsistence economy, which means that individual households produce for their own consumption. In this case, the output is not limited by demand. However, the opposite is true when it comes to production for exchange, which is the case for the contemporary urban informal economy.

It is widely accepted that the term 'informal economy' first appeared in the 1970s, defined as the set of economic activities that take place beyond the regulatory reach of the state (HART, 1973). Now, this definition has been established in the context of urban informality, where informal workers do not produce for subsistence, but rather for exchange. Thus, informal output in this context can be thought of as being limited by demand.

If this situation arises, the expansion of the FS could stimulate the growth of the IS, as it would increase income, potentially boosting the demand for informal goods, alongside formal goods. In order for this to happen, the only condition is that income-elasticities of demand for informal-sector products must not be negative (that is, these must not be inferior goods). The empirical literature provides support that this condition is, in fact, met (ELGIN; BIRINCI, 2016; KANBUR, 2017; RAMOS, 2007a; ULYSSEA, 2020).

On the other hand, if these income-elasticities are less than the unity (i.e. remain in the (0,1) interval), then the long-run growth and the accompanying increase in per capita income would eventually decrease the demand for informal products relative to formal ones. Along the income growth path, a decreasing share of total income would be spent in the IS; thus, its share of total output would continuously decline, producing a structural change in the Pasinettian sense (PASINETTI, 1983; PASINETTI, 1993; ARAÚJO; TEIXEIRA, 2002). Such a mechanism may indeed explain the low prevalence of the

IS in mature economies. In this scenario, the interaction between the FS and the IS can be expected to influence the trajectory of the major macroeconomic variables in their path toward adjustment or possibly even alter the steady-state level. This would happen if the IS had any impact on aggregate demand in the FS. In this situation, any shifts in demand would affect the FS directly, which would then impact the IS, which would provoke another effect in aggregate demand (hence establishing feedback effects).

The present article examines the possibility of this interaction more closely. It seeks to stress that the influence of informality on the macroeconomic trajectory is such that it cannot be overlooked in models meant to be applied to developing countries.

3.3 SOME STABILITY ISSUES

One main issue in extending Kaleckian models to the long run concerns the stability of the equilibrium solutions. Two particular kinds of stability are sought: Keynesian and Harrodian stability. The former can essentially be translated into the condition that savings should react more strongly than investment to any surge in demand. The latter, in turn, refers to the absence of any mechanism that ensures that the growth rate of the capital stock that equilibrates the system in the short run (the 'warranted' rate) coincides with the growth rate compatible with the long-term equilibrium¹ (termed the 'natural' one). Even worse, any deviation, even if due to external factors, would push the economy even further away from the equilibrium position. It can be said that, in part, the debate around Harrod's model highlights the concern with stability in models of growth and distribution in the post-Keynesian tradition.

In the context of Kaleckian models, Keynesian stability generates little controversy in the academic literature, mainly because certain plausible combinations of parameters can guarantee it. In most specifications, the growth rate of savings follows closely the Cambridge equation, $g = sr$, in which the growth of both investment and savings (g) equals the profit rate (r) multiplied by the propensity to save out of profits (s), or particular versions of it. Conversely, investment is usually assumed to occur according to an investment function comprised of additive terms and characterized by behavioral

¹In Harrod's terminology, the so-called 'warranted growth rate' refers to the pace of accumulation that capitalists will be willing to pursue under certain structural conditions, while the 'natural rate' refers to the rate of growth that is necessary to the long-run balanced growth, including the consideration of the populational expansion rate (HARROD, 1939; HARROD, 1948; JORGENSEN, 1960; ASIMAKOPOULOS, 1986).

parameters. Considering the values frequently reported in the literature for these parameters, the Keynesian instability can be largely disregarded.

In two of the most known specifications of such an investment function, one component represents the Keynesian "animal spirits" and is taken to be exogenous. Another part of the investment is commonly assumed to respond to the utilization rate of the productive capacity (or, which for the present purposes may be taken as equivalent, the utilization rate (u) of the capital stock²):

$$g = \frac{I}{K} = \alpha_0 + \alpha_1 u \quad (3.1)$$

The rate of profit, closely related to the utilization rate, is often taken to determine another part of the investment:

$$g = \frac{I}{K} = \alpha_0 + \alpha_1 u + \alpha_2 r \quad (3.2)$$

Although ultimately equivalent, this latter formulation incorporates an additional exogenous parameter, as a result allowing greater flexibility in defining investment behavior. Since the utilization rate can be expressed as $u = Y/Y^P$, and since $Y/Y^P = (Y/P)(P/K)(K/Y^P)$, it becomes clear that $u = (v/h)r$. In this vein, since v and h are fixed, the functions in (3.1) and (3.2) are equivalent in economic meaning.

On the other hand, the functional form of the Bhaduri-Marglin model (BHADURI; MARGLIN, 1990; HEIN, 2017) is defined as:

$$g = \frac{I}{K} = \alpha_0 + \alpha_1 u + \alpha_2 h \quad (3.3)$$

Alternative specifications can be found. A particular, often employed version of Equation (3.2) expresses the impact of the utilization rate on investment in the form of deviations from a particular "normal" or "desired" rate of utilization, taken to be exogenous in the short run and given by conventions and expectations. In certain scenarios, this specification is perceived as representing the rise in demand anticipated by capitalists, where positive deviations from the norm are interpreted as an expected increase. In such cases, the Harrodian instability arises precisely because no mechanisms are in place to ensure that the equilibrium utilization rate (found by solving the system of equations that represent the Kaleckian model) will coincide with the desired or normal utilization rate.

This limitation presents a major challenge for the Kaleckian models when it comes to the determination of long-run equilibria. Numerous authors argue on theoretical grounds that it would not be

²For a discussion of the differences between the utilization rate of the capital stock and of the productive capacity, see Nikiforos (2016)

reasonable to expect companies to consistently operate above or below the desired utilization rate. Nevertheless, attempts to endogenize the normal or desired utilization rate would imply that two of the most essential features of the Kaleckian model disappear in the long run: the paradox of thrift and the paradox of cost (HEIN *et al.*, 2011). The latter ensures that any improvement in the functional income distribution to the advantage of the working class will increase output in the end, to the benefit of both workers and capitalists. The former implies that a collective effort to save results in reduced income, an outcome observed whenever the principle of effective demand holds true. For these results to be achieved, it is necessary that a deviation from the normal rate exist; therefore, they will not be valid in the long run when the normal rate is endogenous. These properties are crucial for the results devised in chapter 4 of the present thesis.

The limitations highlighted by the Harrodian instability and the debate around the endogeneity of normal utilization rates become even more complex when considering developing economies with significant informal sectors. The behavior of the informal sector introduces an additional layer of dynamics that can either reinforce or counteract the instability mechanisms present in standard Kaleckian models. For instance, the informal sector's greater flexibility and rapid response to demand changes might provide a stabilizing influence by absorbing excess labor during downturns, while its lower productivity and wage levels could amplify cyclical fluctuations through their effects on aggregate demand. Understanding these possibilities requires careful methodological choices that can capture the interplay between the formal and informal sectors, particularly with respect to the time structure of adjustments.

3.4 MODELING A DUAL ECONOMY IN KALECKIAN SETTING

The present section presents two possibilities for modeling a dual economy in a Kaleckian framework, considering the aforementioned issues. In both of them, the IS is determined by demand, as wage earners spend a fraction of their income in informal consumption goods.

The first model sees workers' decisions to buy informal products as influenced by the variation in the utilization rate, thus setting the size of the informal output as influenced by the performance of the formal economy. The logic underpinning this approach is that an economic recession in the FS would increase joblessness and uncertainty, thus leading laborers to shift consumption towards cheaper

informal goods. The second model explicitly incorporates the labor market, a feature not often present in Kaleckian models. In this stance, the choice to spend less on FS and more on IS products is directly linked to the unemployment rate. A crucial difference from the first model is that the level of joblessness depends not only on the FS performance but also on the rate of growth of the labor force, a trait that introduces new dynamic patterns, as will be discussed later.

The next subsection introduces the IS in the Dutt-Rowthorn investment function, which is common for both models, showing how the extension of informality affects the equilibrium level of the utilization and profit rates. The models are introduced in sequence, sharing a common foundation but differing in their closures. A brief overview initially introduces the rationale for the economic processes modeled before formalization is introduced.

3.4.1 Introducing the Informal Economy in the Kaleckian Growth and Distribution Model

The following analysis introduces systematic adjustments to the traditional Kaleckian reproduction scheme to incorporate the informal sector as an integral component of the economic system, rather than treating it as a residual category. This analysis follows the approach proposed by Paiva *et al.* (2023), which integrates two distinct frameworks from the Kaleckian tradition, adapting them to the structural characteristics of dual economies. The first framework concerns the economic structure and sectoral composition, drawing from Kalecki's reproduction scheme, which determines sectoral output from investment levels and a set of behavioral and structural parameters (KALECKI, 1968). The second framework focuses on the investment function, specifically the formulation developed by Steindl, Dutt and Rowthorn, which endogenizes investment decisions based on capacity utilization and profitability (STEINDL, 1979; DUTT, 1984; ROWTHORN, 1981).

By combining these two approaches while explicitly incorporating the informal sector as a systematic component rather than a residual phenomenon, this model captures how informal economic activities modify both the structural relationships that determine sectoral output and the behavioral functions that drive investment decisions. On the one hand, the Kaleckian interpretation of the Marxian reproduction scheme (KALECKI, 1968) is taken, which describes profits and output as determined by capitalist spending but leaves no indication of what determines the investment rate. On the other hand, the investment function à la Rowthorn (1981), Steindl (1979) and (DUTT, 1984), which

is normally used in a homogeneous composite output setting, has been employed here to endogenize investment in this structural framework.

It is worth recalling a few key features of the aforementioned reproduction scheme. Consider a closed private economy consisting of three sectors or departments: investment goods (I), capitalists' consumption goods (C_c), and workers' consumption goods (C_w); hence it is evident that $Y = I + C_w + C_c$, where Y is total production. Given that national income is composed of profits (P) and wages (W), and assuming that workers do not save any portion of their income, it follows that $C_w = W$, thus $I + C_c = P$. It is a major point made in Kalecki's essay that in the latter, the causation of the identity runs from the left to the right, that is, from investment and capitalists' consumption to profits. In fact, after defining the wage shares in each department as w_I , w_c , and w_w , respectively, it is shown that the output is given by:

$$Y = I + C_c + (w_I I + w_c C_c)/(1 - w_w) \quad (3.4)$$

This particular formulation does not require any specific form of investment determination and is demonstrably compatible with a broad spectrum of investment function classes, such as those of equations (3.1) and (3.2), among others (HEIN, 2014).

In this setting, the IS is introduced by defining the national output (Y) as comprised by a formal share (Y_f) and an informal one Y_i , thus:

$$Y = Y_i + Y_f \quad (3.5)$$

It is assumed that investment goods and capitalists' consumption goods can be produced only by the FS. Workers, on the other hand, spend a fraction of their consumption expenditures on informal goods. This share is designated by γ_f for FS workers and γ_i for those in the IS. Thus, the consumption of employees is split between a formal consumption goods sector, C_{wf} , and an informal one, C_i . Therefore, the FS output is given by:

$$Y_f = I + C_c + C_{wf} \quad (3.6)$$

In this setting, those informally employed also consume in the FS. For this reason, the increase in informal income has the effect of increasing the aggregate demand in the FS. Since C_{wf} is the consumption of laborers taking place in the FS, regardless of which sector the income for consuming comes from.

Let W_i be the income mass of informal labor, and W_f the mass of wages in the FS, then the formal workers' consumption goods sector output is given by:

$$C_{wf} = (1 - \gamma_f)W_f + (1 - \gamma_i)W_i \quad (3.7)$$

Informal output, on the other hand, is given by what workers in both the IS and FS spend in informal goods (C_i), thus:

$$C_i = \gamma_f W_f + \gamma_i W_i \quad (3.8)$$

Since the informal economy (Y_i) produces only workers' consumption goods, then $Y_i = C_i$. In addition, it is assumed that informal goods are produced without capital requirements. Thus, no profits are obtained in the IS, so that $W_i = Y_i$. Putting together the aforementioned expressions involving Y_i , C_i and W_i , particularly (3.7) and (3.8), and rearranging, results in:

$$Y_i = \frac{\gamma_f}{(1 - \gamma_i)} W_f \quad (3.9)$$

This equation simply establishes the informal output as determined by the formal wage mass and workers' consumption parameters. Now, in order to accommodate the informal sector (IS) in the investment function, it is necessary to properly define the relevant variables considering the new framework just described above. First of all, as in the presence of informality the national economy is divided into a formal portion (Y_f) and an informal one (Y_i), one can thus define the share of formalization of total output, denominated θ , as:

$$\theta \equiv \frac{Y_f}{Y} \quad (3.10)$$

In the absence of government activities and in a closed economy setting output as well as national income is of course, divided into wages and profits. However, since the IS output has only labor as a factor of production, all profits must come from the FS. In this context, the mass of profits (P) can be compared with total national income or, alternatively, to income from FS only. In the first case, the profit share can be defined as usual, as $h \equiv P/Y = P/(Y_f + Y_i)$. As for the second case, the profit share in the FS can be defined as $h_f = P/Y_f$. It is immediate to notice that:

$$h = \theta h_f \quad (3.11)$$

However, the profit share also affects the level of capacity utilization, since $u = vr/h$. Now, when evaluating the capacity of the whole economic system, it is fundamental to acknowledge that the informal sector (IS) also contributes to the creation of goods and services. Thus, the total output

includes both formal and informal activities. Even though it is generally assumed that no capital is involved in informal production, still this sector has the capacity to coordinate labor and increase output when there is increased demand for its products.

In this context, u can be considered in terms of the overall economy (Y), expressed as $u \equiv Y/Y^P$, where Y^P represents the potential output, determined by the existing capital stock (K) and the technological capital-to-output ratio ($v \equiv K/Y^P$). Assuming the potential output is achieved when the formal economy is at its full capacity utilization (thus $Y^P = Y_f^P$), results in the following relation:

$$u \equiv Y/Y^P = K/(Y_f^P)(P/K)(Y/P) = vr/h \quad (3.12)$$

On the other hand, one might also consider the connection between the FS output and the overall productive capacity, defining thus the utilization rate in the FS as:

$$u_f \equiv Y_f/Y^P = (K/Y^P)(P/K)(Y_f/P) = vr/h_f = \theta vr/h \quad (3.13)$$

In this vein, the connection between the utilization rate of the capital stock in the FS and the utilization rate of the economic system's total capacity can be represented by:

$$u_f = \theta u \quad (3.14)$$

As for the investment function, the measure of capacity utilization that matters is the one referring to the FS output, since this is the one that informs about the level of capital stock utilization and signals whether there is any necessity to expand it or not. With that in mind, the investment function can be written as:

$$g_I = I/K = \alpha_0 + \alpha_1 u_f + \alpha_2 r \quad (3.15)$$

Or, in terms of the formalization share, substituting (3.14) into the equation above:

$$g_I = I/K \alpha_0 + \alpha_1 \theta u + \alpha_2 r \quad (3.16)$$

This latter form makes explicit a point this section intends to make: after any increase in the capacity utilization u , if the IS output grows faster than the FS one (which can be regarded as a quite reasonable assumption in some contexts, as shall be argued later on), then θ will decrease, therefore decreasing g_I and then reducing u . The sensitivity of the IS output to changes in u may result in this variable reaching a level that is either above or below its previous state, a matter to be addressed in the numerical simulations presented later in this chapter. In any case, this mechanism might underscore the contribution of the IS response to adjusting u towards its usual rate in developing economies.

How strong should the change in θ be in order to guarantee the reversion of capacity utilization to its steady-state level is a question to be addressed in the numerical simulations. The possibility of a higher proportional response in the IS could be argued on the grounds of a lower rigidity on this side of the economy. Since it does not need to mobilize capital, when demand increases, the expansion of output should be faster. When overall economic activity is rising (thus u is increasing), informal goods would be more readily available (and presumably cheaper), thus increasing its market share in workers' consumption. In this case, the response of γ_f and γ_i is procyclical. The formalization rate θ , in turn, will decrease as u rises, therefore contributing to the reduction in investment and capacity utilization, according to Equation (3.16) above. In this procyclical case, the IS acts as a stabilizing force.

Of course, it could also be argued that informal consumption might be countercyclical, so that γ_f and γ_i will decrease as u increases, which leads to an increase in θ . This would happen if workers reacted to higher unemployment (lower u) by purchasing more informal goods relative to formal ones. Should this situation arise, the IS should amplify any fluctuations in capacity utilization. This implies that informality can contribute to instability in developing economies.

Given these opposing possibilities regarding the impact of informality on economic stability, it becomes essential to examine how the informal sector influences the mathematical properties of equilibrium solutions within the standard Kaleckian framework. The stability of the equilibrium values of u and r can be assessed by setting g_I equal to the savings growth rate g_s , in line with the tradition of Cambridge, being $g_s = sr$. Here, s represents the capitalists' propensity to save, with $0 < s < 1$. Then, solving for the equilibrium utilization rate u^* and substituting the resulting expression in (3.16) to find the equilibrium profit rate r^* , yields:

$$u^* = \frac{\alpha_0 v}{hs - \alpha_1 v \theta - \alpha_2 h} \quad (3.17)$$

$$r^* = \frac{\alpha_0}{s - \alpha_1 \theta \left(\frac{v}{h}\right) - \alpha_2} \quad (3.18)$$

The only difference to standard, handbook equilibrium values of the Kaleckian framework is that in these cases, $\theta = 1$, which means no informality at all. In that sense, the standard model can be seen as a particular case of the form where informality is incorporated.

Stability requires that $s > \alpha_1 \theta \frac{v}{h} + \alpha_2$. Since $0 < \theta < 1$, the increase in the relative size of the IS (that is, decrease in θ) will make stability more likely, for it diminishes the right-hand side of the

inequality. Moreover, it can be shown that $\partial u^*/\partial\theta > 0$ and $\partial r^*/\partial\theta > 0$, which means the decrease in informality raises the equilibrium values u^* and r^* , thus increasing long-run growth.

3.5 LONG-RUN ADJUSTMENT CONSIDERING THE INFORMAL ECONOMY

At this point, a note on dynamic economic models should be considered. The choice here has been made to employ discrete instead of continuous time, which means using difference instead of differential equations. This decision reflects the perspective that certain economic processes, such as the multiplier, occur within delimited time periods (say, a year) rather than continuously. Kalecki (1935) demonstrates that the introduction of time lags may be sufficient to generate endogenous cycles, a point emphasized by (ZAK, 1999). From a formal viewpoint, the stability of a linear system of difference or differential equations can be qualitatively investigated without solving the system. For continuous time, the Jacobian matrix assists in characterizing the equilibria in differentiable equations. For discrete-time systems, this is often done by representing the system in matrix form and analyzing certain properties of its matrix, particularly the eigenvalues. These eigenvalues hint at the possible equilibria and their stability.

However, the situation becomes significantly more intricate when dealing with non-linear systems of higher order. According to Sedaghat (2013, xii), "the mathematical equations that result in persistent oscillatory behavior that is asymptotically and structurally stable cannot be linear."³ Fortunately, as pointed out by Gandolfo (1997, p. 431), "a difference equation can, if necessary, be easily analyzed numerically, obtaining the precise time path corresponding to the given numerical values of the parameters and the initial conditions." In such circumstances, rather than forcing the model into a mathematically convenient framework that might yield formal stability conditions but sacrifice theoretical accuracy, the approach here maintains the relationships as informed by the Kaleckian perspective. This methodological choice prioritizes theoretical consistency over analytical elegance, recognizing that the numerical methods employed can provide robust insights into stability properties while preserving the model's economic content.

The two models that will be introduced in this chapter have a common set of equations which characterize the incorporation of the IS into the Kaleckian investment function that was discussed

³For a more comprehensive elucidation, see (SEDAGHAT, 2013, 166)

in the previous section. This set of equations is formally introduced in the current section. Later, the economic rationale of each model is described separately before the formal mathematical closure is discussed. This division is done for clarity and to highlight that both models have a common framework, diverging only in their final layer. In addition, it is intended to bring economic reasoning to the forefront, instead of mathematical underpinnings. Once the closure of each version is presented, numerical simulations illustrate the macrodynamics involved in each set of assumptions.

In both cases, the system is set in motion after an initial spending that comes from investment. The growth rate of the capital stock at present, denoted as g_t , depends on the profit, utilization, and formalization rates from the previous period (r_{t-1} , u_{t-1} , and θ_{t-1} , respectively). In this setting, the resolution of the models begins when the amount invested updates the capital stock, disregarding any depreciation for simplicity. Hence:

$$I_t = g_t K_{t-1} \quad (3.19)$$

$$g_t = \frac{I_t}{K_t} = \alpha_0 + \alpha_1 \theta u_t + \alpha_2 r_{t-1} \quad (3.20)$$

$$K_t = K_{t-1}(1 + g_t) \quad (3.21)$$

Capitalists' consumption is given by the previous period's profits and the saving rate:

$$C_t^c = (1 - s)P_{t-1} \quad (3.22)$$

Following Kalecki (1968)'s reproduction scheme, once the investment amount is known, workers' consumption sector output is determined:

$$C_t^w = \frac{1}{1 - w_w} [w_I I_t + C_t^c w_c] \quad (3.23)$$

Then the formal output is fully accounted for:

$$Y_t^f = I_t + C_t^c + C_t^w \quad (3.24)$$

Given the capital stock and the formal output, the utilization rate in the formal sector at time t , designated by u_t^f , is determined:

$$u_t^f = v \frac{Y_t^f}{K_t} \quad (3.25)$$

The sector labor shares, assumed exogenous, allow for the calculation of the mass of profits. The mass of formal wages is also easily calculated since $W_t^f = Y_t^f - P_t$. Then the profit rate can also be known:

$$P_t = (1 - w_I)I_t + (1 - w_c)C_t^c + (1 - w_w)C_t^w \quad (3.26)$$

$$r_t = P_t/K_t \quad (3.27)$$

In this setting, the point where the models diverge regards the response of workers' choice to consume informal products. In the subsequent analysis of section 3.6, for the sake of simplicity, any variations in consumption tendencies between formal and informal workers within the IS have been ignored. Instead, a single propensity, denoted by the parameter γ , will be applied to both groups. In the first model, γ responds to the utilization rate, considering that this pivotal variable, central to the current theoretical literature on Kaleckian macroeconomics, can represent the movements of aggregate demand, being, therefore, closely related to the business cycle movements. The second model, in turn, has γ responding to the employment rate. This adds a new dimension since such a rate is a result of both economic activity and populational growth (which can be considered exogenous in a wide variety of contexts).

This study employed computational numerical simulations to systematically investigate model properties across diverse scenarios. These exercises served three key purposes: to analyze equilibrium characteristics, to examine adjustment trajectories, and to assess model sensitivity to parameter variations. By testing multiple parameter configurations, it is possible to gain valuable insights into the robustness and limitations of our theoretical framework. The parameter values were chosen rooted in typical values found in the theoretical and empirical literature, in works such as (BLECKER, 2002), (FAZZARI; MOTT, 1986), (HEIN; OCHSEN, 2003), (HEIN; TARASSOW, 2010), (HEIN, 2014), (NA-ASTEPAD, 2006), (ONARAN; GALANIS, 2014), (STOCKHAMMER *et al.*, 2009), and (ALEXIOU, 2010), among others.

3.6 A DISCRETE-TIME VERSION WHERE INFORMAL CONSUMPTION RESPONDS TO THE UTILIZATION RATE

The mechanics of the first model can be summarized in a set of a few simple steps, as follows.

- The capitalists' investment in the current period I_t is determined by the profit rate r_{t-1} , utilization rate u_{t-1} and the formalization rate θ_{t-1} of the previous period.
- In turn, the investment determines both the capital stock K_t and the formal output level Y_t , also in the current period.

- The formal output Y_t^f together with the capital stock K determines the current utilization rate u_t . If a fixed parameter defines the income distribution, then the current profit rate r_t is also determined at this step.
- The share of expenditure on informal goods γ is also given by the shift in the current utilization rate u_t relative to its previous value u_{t-1} , reflecting the fact that consumer behavior adapts to market changes with a delay.
- The informal output Y_t^i , which is ultimately given by γ and Y_t^f , determines the current formalization rate θ_t , which will affect the investment level in the next period.

According to the closure of this model, γ varies according to changes in the utilization rate at a speed given by sensitivity parameter χ , as follows:

$$\gamma_t^f = \gamma_{t-1}^f \left(1 + \chi \left(\frac{\Delta u_t^f}{u_{t-1}^f} \right) \right) \quad (3.28)$$

Since γ determines the informal output Y_t^i , according to equation (3.9), and Y_t^i determines θ_t , according to equation (3.10), the feedback loop from informality level to investment is complete.

3.6.1 Numerical Simulation of the First Model

From a theoretical perspective, there are two possible dynamics associated with the IS. As mentioned earlier, one view states that the increase in the utilization rate should translate into better employment opportunities and more income for workers in general, providing a positive economic outlook that would lead to a decrease in demand for informal goods relative to formal ones. In this case, one would expect $\chi < 0$, implying that the IS reacts in a counter-cyclical manner to the FS.

In contrast, the possibility of pro-cyclical behavior, where $\chi > 0$, cannot be immediately ruled out, at least theoretically. This situation arises when the IS adapts more rapidly than the FS to the increasing demand, mainly due to its greater flexibility, which is largely attributed to its use of minimal capital and lower attrition in hiring and firing (RAMOS, 2007a; PORTA; SHLEIFER, 2014; MALONEY, 2004). Indeed, Fiess *et al.* (2010) find numerous historical episodes consistent with the pro-cyclicity of the IS in Latin American countries⁴.

⁴The authors analyze data for Argentina, Brazil, Colombia, and Mexico between 1983 and 2004.

However, the approach adopted here considers the countercyclical case more plausible, viewing the procyclical scenario as likely to occur only under certain specific conditions, particularly when demand grows too rapidly for the formal supply to respond adequately. This is the situation observed in certain Latin American countries in the 1990s, following successful currency stabilization plans. Thus, under most common circumstances, the countercyclical situation should prevail.

Figure 3.1 shows the utilization rate in the formal sector (u_f) in simulations for approximately thirty periods, considering three different behaviors for the propensity of workers to consume informally (γ). The first represents the case where there is no informality at all, therefore $\gamma = 0$, serving as a reference for the effect of contemporary urban informality in the macroeconomic trajectory. The second case considers a positive, however, fixed parameter, which was set to $\gamma = 0.1$. Lastly, the third case presents the situation in which γ adjusts endogenously in a countercyclical manner, according to (3.28).

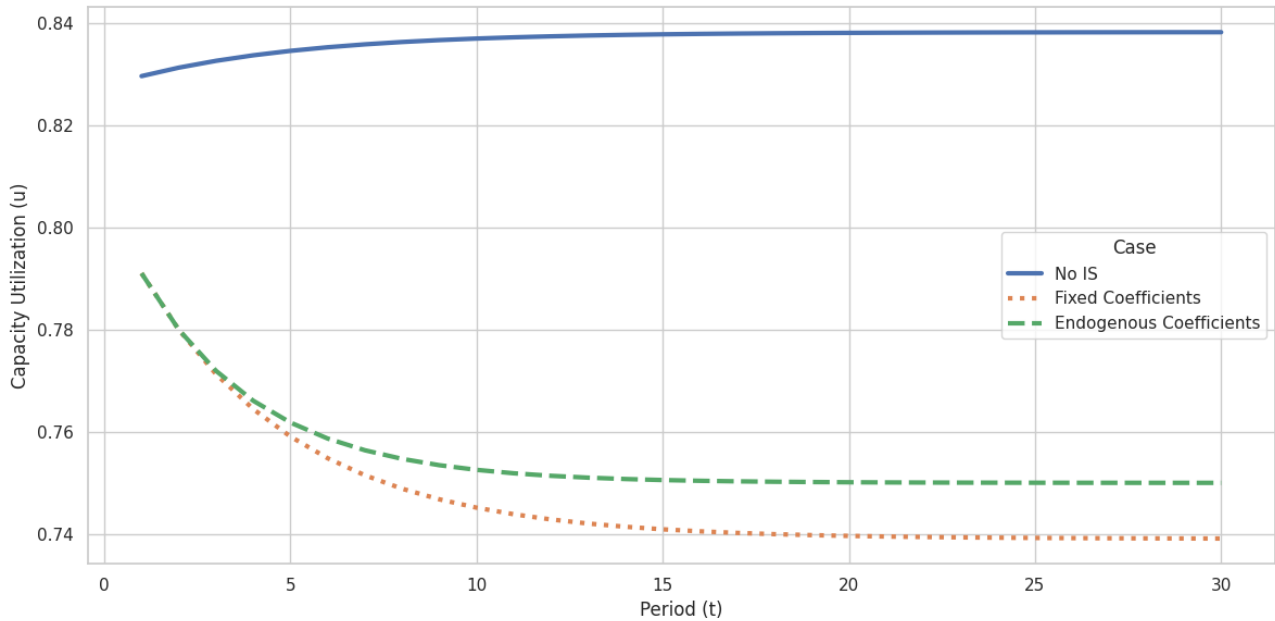


Figure 3.1. Utilization rate through time

In sequence, Figure 3.2 displays the profit share in the formal sector (h_t^f , on the left), which is a function of the sectoral composition of the formal output, and the formalization rate (θ_t , on the right). These figures inform that the presence of the IS reduces the utilization and profit rates, even more so when γ adjusts endogenously to the utilization rate. After steady-state is achieved, the IS causes a very small, nearly negligible impact on the profit share, if anything worsening the income distribution in the FS.

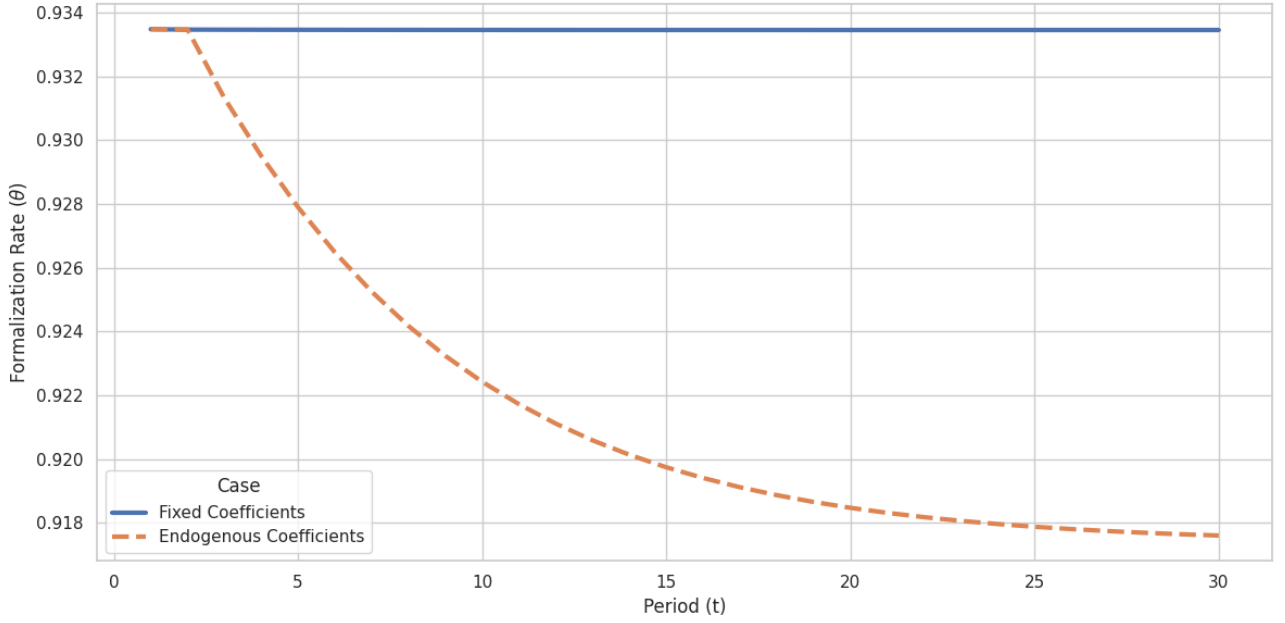


Figure 3.2. Formalization rate through time

In this scenario, all variables smoothly adjust to their equilibrium values, corresponding to the positions discussed in Section 3.4. This establishes that the model is stable for the given set of initial values and parameters. In this situation, it is interesting to analyze how the system behaves under disturbances. For this purpose, in the seventh period, a shock in the investment of approximately 15% its original level is given. Figures 3.3 and 3.4 illustrate the results, depicting the utilization rate in the formal sector (u_t^f) over time for scenarios with a negative shock (3.3) and a positive shock (3.4).

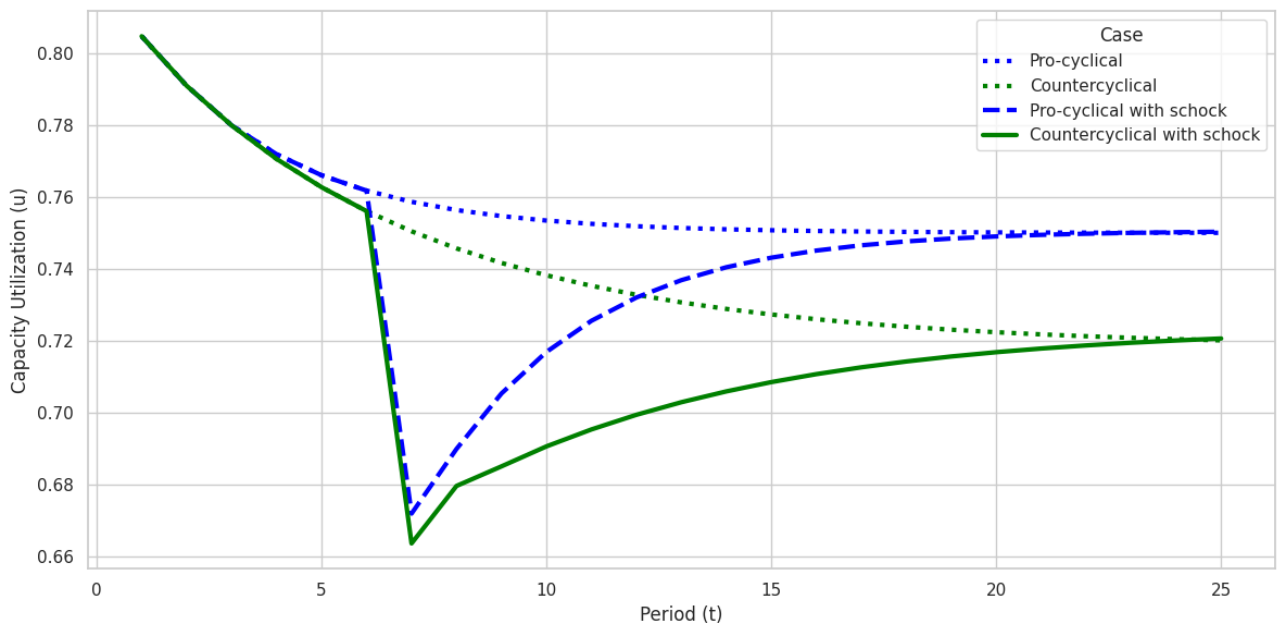


Figure 3.3. Capacity utilization rate (u) after a negative shock to investment

In this position, the procyclical and countercyclical possibilities for the reaction of informality are considered (which, once again, means taking $\chi > 0$ and $\chi < 0$ in equation (3.28), respectively). In the countercyclical scenario ($\chi < 0$), the informal sector expands during economic downturns as workers shift consumption to more affordable informal goods, thus helping to maintain some economic activity despite the contraction of the formal sector. In contrast, in the procyclical case ($\chi > 0$), the informal sector amplifies economic fluctuations, growing alongside the formal economy during expansions and contracting with it during downturns, potentially exacerbating economic volatility.

The graphs illustrate how the utilization rate responds differently to investment shocks depending on whether the informal sector behaves procyclically or countercyclically. A thorough inspection reveals that in all cases the utilization rate does not fully adjust to the previous value but comes close enough, narrowing the distances to negligible values (in the countercyclical case with positive shock depicted in Figure 3.4 the difference is the highest). The question remains open whether cases of hysteresis introduced by the behavior of the IS could be found for certain combinations of parameters.

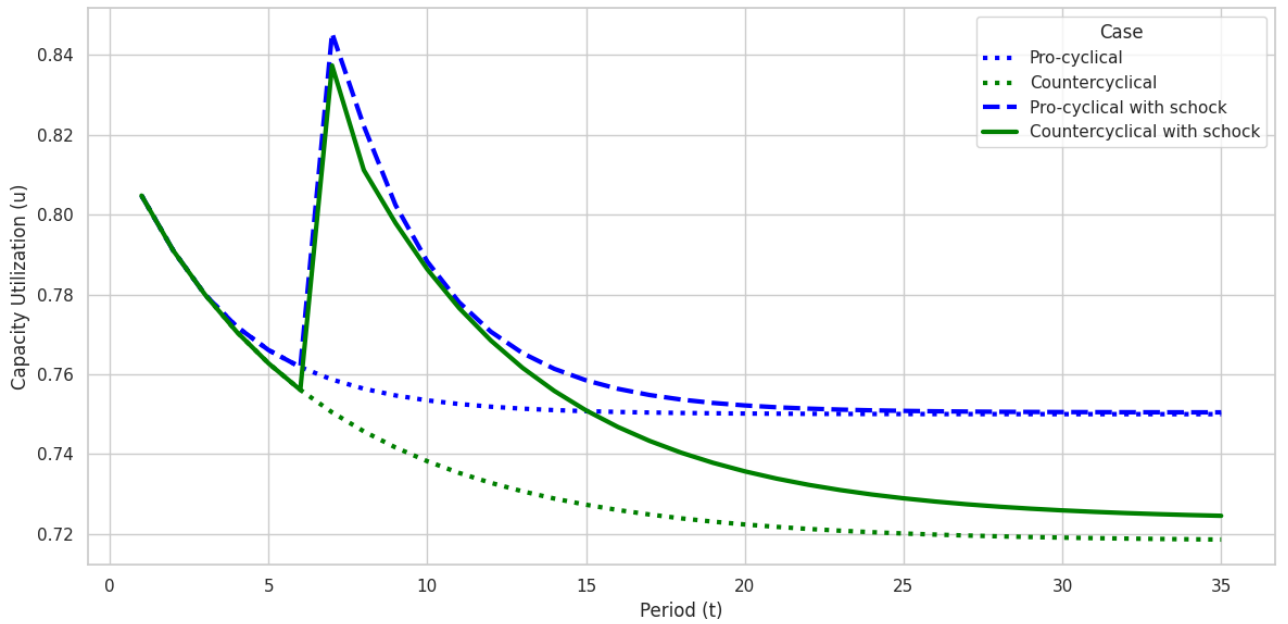


Figure 3.4. Capacity utilization rate (u) after a positive shock to investment

The adjustment path of the economy can be visualized and analyzed more thoroughly in the $(u \times \gamma)$ plane. This graphical representation provides significant insights into the system's dynamic behavior following economic shocks. The trajectory of the economy after both a positive (Figure 3.5) and a negative shock (Figure 3.6) is applied. The square with an "x" marker indicates the initial equilibrium point.

Prior to the shock, the system is moving along its natural trajectory toward its steady-state equilibrium position, following a predictable path determined by the model's parameters. After experiencing the disturbance, the trajectory temporarily diverts from its original path, creating distinct adjustment patterns in each case.

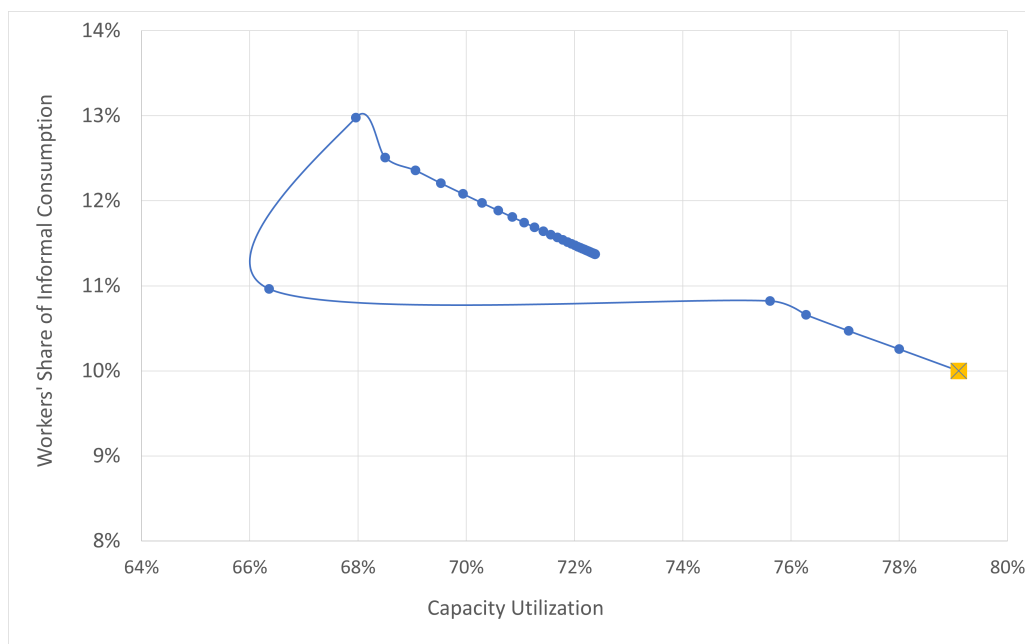


Figure 3.5. Workers' Share of informal consumption (γ) and utilization rate (u) after a negative shock to investment

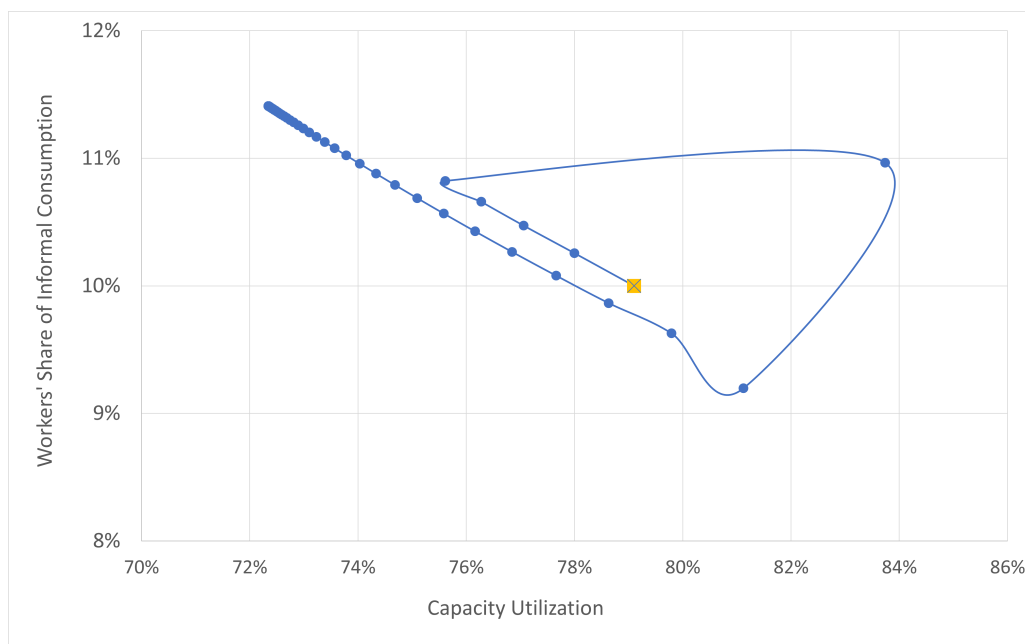


Figure 3.6. Workers' Share of informal consumption (γ) and utilization rate (u) after a positive shock to investment

Interestingly, the new equilibrium trajectory lies remarkably close to the original one, indicating that the economic structure maintains considerable stability despite the shock. However, the small but persistent divergence between the pre-shock and post-shock paths demonstrates that the system exhibits a form of path dependency or hysteresis – the economy "remembers" the shock it experienced. This has important implications for policy interventions, suggesting that temporary shocks can have lasting effects on economic structure, particularly regarding the formal-informal sector balance.

One key finding is that in the presence of informality in the countercyclical case (which is the one the present approach considers more likely to be found in real economies), not only is the equilibrium utilization rate lower, but the adjustment process takes longer. This indicates that such an economy is less stable in the presence of informality of this kind. The following section discusses an alternative formulation to the adjustment processes presently investigated, which constitute the second model to examine potential factors contributing to stability in the cyclical macroeconomic patterns related to the IS framework.

3.7 A MODEL WHERE INFORMAL CONSUMPTION RESPONDS TO THE LABOR MARKET

The economic reasoning behind this second model is that the IS could employ many more laborers relative to the FS for the same level of demand spending. This means that whenever purchase expenditures deviate from the FS to the IS, the absorption of idle workforce should increase. However, nothing can be said about the income mass of workers, for the liquid creation of employment opportunities in the IS comes at a lower remuneration. In a dual economy with excess labor, a higher formalization rate would mean fewer workers employed, though possibly at higher wages, a situation similar to the process described by Furtado, in which the acceleration of the modernization process deepens the inequalities (FURTADO, 1990; 2000).

For the purposes of the present model, it is assumed that the behavior of working-class consumers is influenced solely by the unemployment rate rather than by the absolute mass of wages. In this setting, the perception of an increase in employment opportunities and the diminution of unemployment spells would lead workers to gradually shift, with a certain delay, their purchases towards formal goods, which are pricier though of higher quality.

3.7.1 The Rationale of the Second Dynamic Model

When investment is falling short, the FS should lay off workers, therefore increasing unemployment. In this case, the propensity to informal consumption responds positively to a rise in unemployment, which will contribute to an increase in the informal economy. Since IS is less productive, the growth in demand for the informal product will quickly absorb excess labor. Then, the unemployment level will fall, and laborers will eventually increase their demand for formal goods, thus increasing the formal utilization and profit rates, contributing to investment pick-up again. As becomes clear, there is a cyclical trajectory involved. The order of resolution of the model is as follows:

- The current formal output Y_t^f is determined by capitalist investment decisions I_t , which is positively affected by the previous period values of the profit, utilization, and formalization rates (u_{t-1} , r_{t-1} , and θ_{t-1} , respectively).
- The formal output determines employment in the formal sector, L_t^f .
- The propensity of workers to consume in the IS, γ_t , adjusts to employment levels of the two previous periods, e_{t-1} and e_{t-2} , varying negatively with the employment rate (or, in other words, varying positively with the unemployment rate $1 - e_t$).
- Given the wage share in the FS, Y_t^f and γ , together, determine the current informal output Y_t^i .
- From Y_t^i , informal labor L_t^i is known. Thus, total employment in the current period is completely determined.
- Total employment, together with an exogenously given population trajectory, determines the current unemployment rate, which will change the parameter γ in the following periods.

3.7.2 The Closure of the Second Model

Population N_t grows according to an exogenous rate η :

$$N_t = (1 + \eta)N_{t-1} \quad (3.29)$$

Total labor utilized L_t is the sum of employment in each sector j , which in turn results from the

sectoral output Y_j and the constant labor-output coefficients $a_j \equiv L_j/Y_j$, resulting in:

$$L_t^f = a_I I_t + a_c C_t^c + a_w C_t^w \quad (3.30)$$

The employment rate $e_t \equiv L_t/N_t$ is given by the two previous variables, and the unemployment rate is simply $(1 - e_t)$. Then γ varies according to lagged unemployment levels, representing a gradual adaptation of consumer habits as economic circumstances change. The parameter χ , which represents the sensitivity of such adaptation, is crucial to imprint different dynamics to the model, as will be shown later on.

$$\gamma_t = \gamma_{t-1} \left[1 + \chi \left(1 - \frac{1 - e_{t-1}}{1 - e_{t-2}} \right) \right] \quad (3.31)$$

Once γ is defined, the size of the informal output can be determined in a similar fashion to equation (3.9), by:

$$Y_t^i = \frac{\gamma_t}{1 - \gamma_t} [w_I I_t + w_c C_t^c + w_w C_t^w] \quad (3.32)$$

Now informal labor has to be taken into account for the determination of the current unemployment level. Consider that the IS has a productivity gap relative to the FS equivalent to ϕ , with $\phi > 1$, so that the IS requires more labor than the FS for each unit of output, where the current labor productivity of FS, a_t^f , is the sectoral labor-output ratio weighted by the sectors' participation in the FS output Y_t^f :

$$L_t^i = Y_t^i \phi a_t^f \quad (3.33)$$

Finally, the current unemployment level is calculated, which will affect the change in the γ parameter in the two following periods:

$$L_t = L_t^f + L_t^i \quad (3.34)$$

$$e_t = \frac{L_t}{N_t} \quad (3.35)$$

It is worth noting that the expression in (3.31) tends to bring γ_t to stability as the variation in unemployment reduces (i.e. as e_{t-1} becomes ever closer to e_{t-2} as t progresses). However, shifts in the populational trend can disturb such stability, potentially forcing the system to find a new equilibrium position. This constitutes an additional layer of intrinsic flexibility to the model, which is inherently complex and capable of capturing various intriguing scenarios. The intricacies of such dynamics are better explored in a computational simulation framework, which is presented in the next section.

3.7.3 Numerical Simulation of the Second Model Model

A major point of interest in this simulation analysis is the examination of the sensitivity of the system to the parameter χ , as this variable controls the extent to which the informal economy responds to changes in the labor market. Concerning this aspect, the simulation results presented highlight the sensitivity of the system to χ , indicating that the responsiveness of the demand for informal goods to the labor market conditions is a key factor in imprinting specific dynamics on this simulated economy. When χ is relatively low, say below 50%, the main impact such a coefficient has on the dynamic of the system regards the speed of adjustment and the range covered by the endogenous variables. This indicates that a more adaptable informal sector introduces a degree of economic instability, albeit to a limited extent. Figure 3.7 illustrates this case, showing the values of γ over time for different levels of χ , where higher values of χ are shown in darker lines. For values above 50%, as shown in Figure 3.8, cyclical behavior of γ is to be seen. Then, for χ approaching 90% or higher, the system becomes unstable.

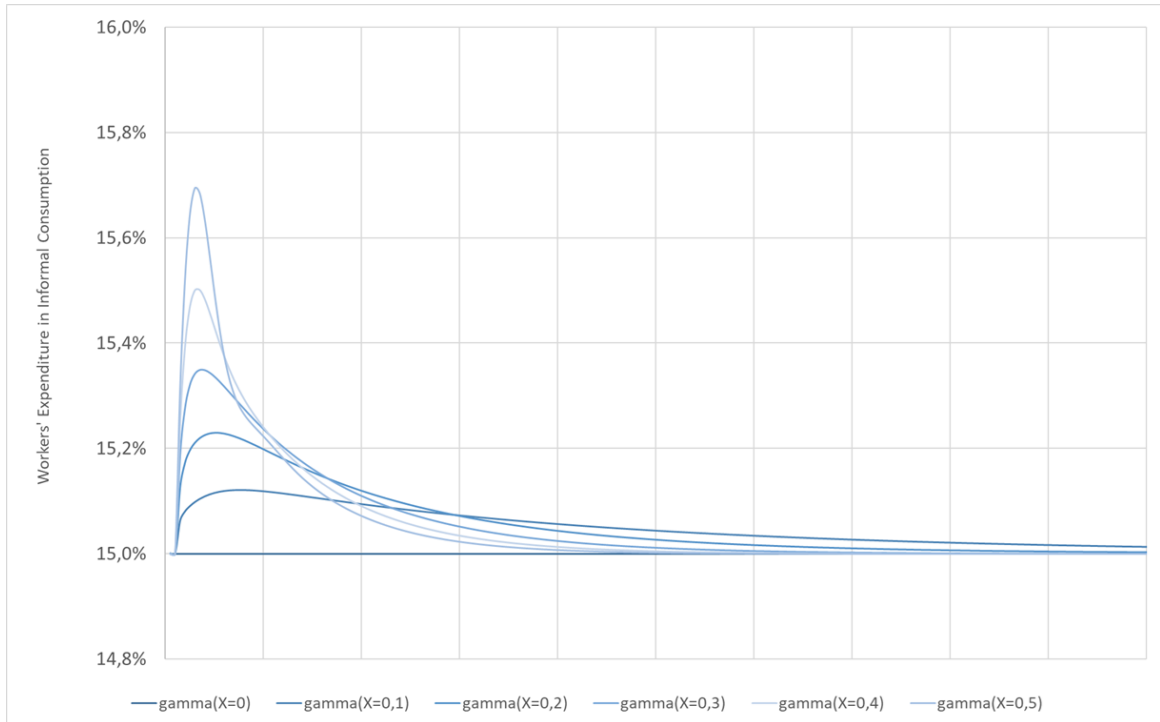


Figure 3.7. Adjustment paths of parameter γ for various levels of parameter χ , with $\chi \leq 0.5$

The path towards convergence is better visualized in the $(u \times \gamma)$ plane. These are the two most relevant endogenously adjusting variables of this dynamic system, for they represent the factors that ultimately adjust to each other. In each case, as the system converges from the initial capacity utili-

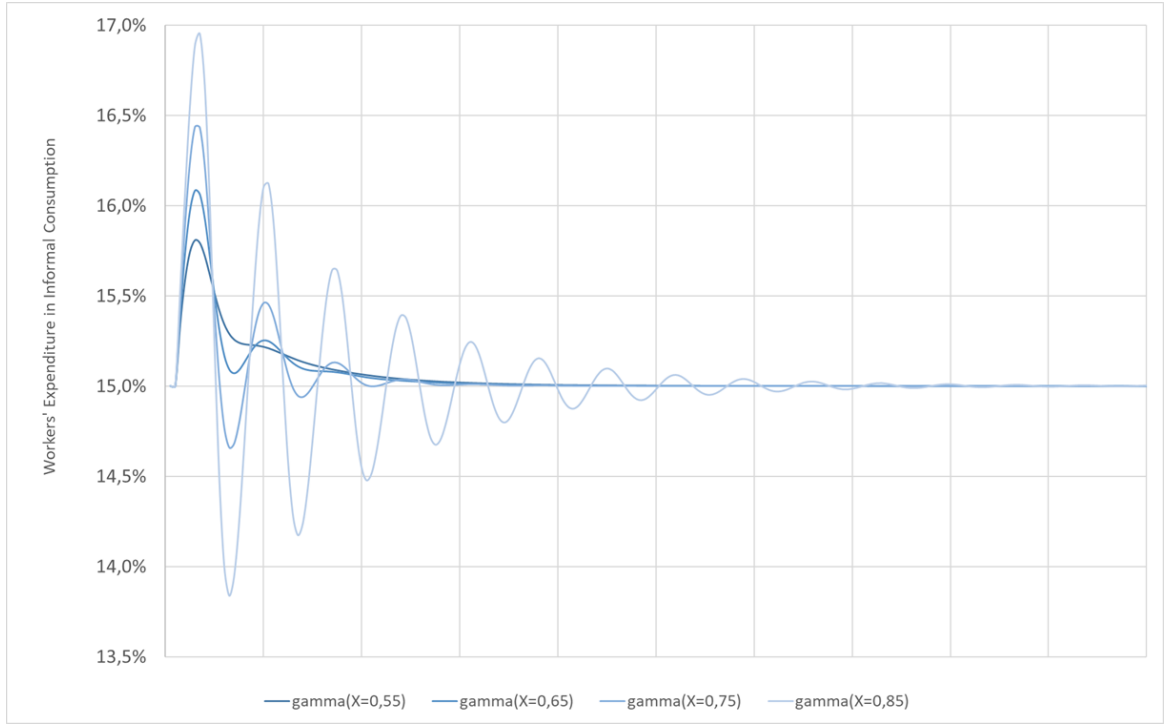
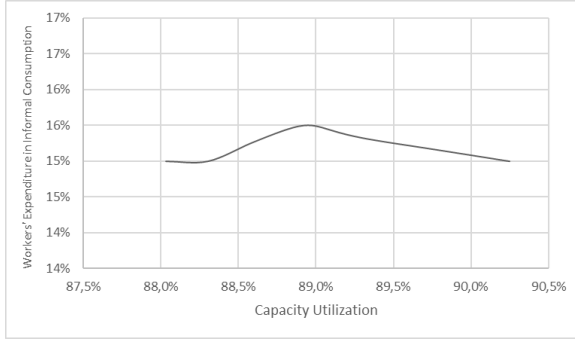
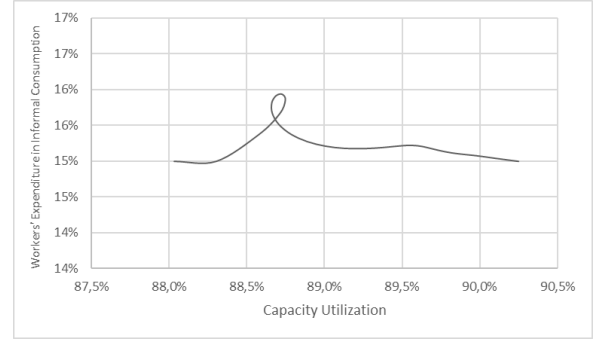
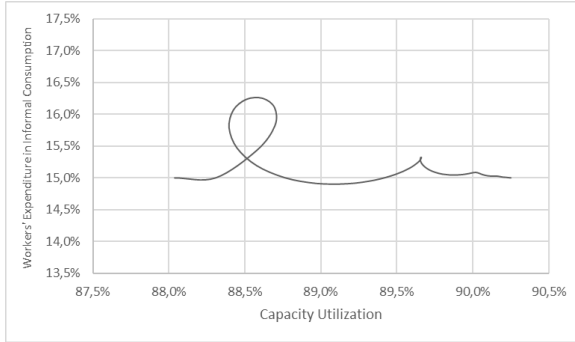
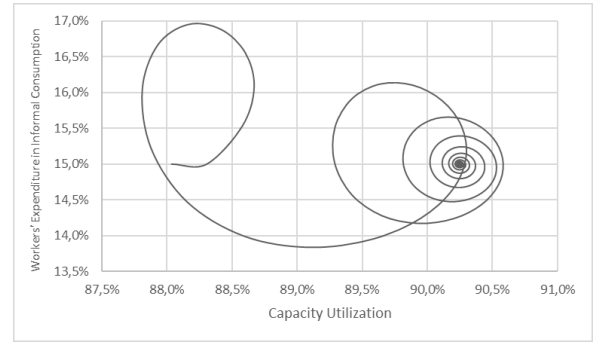


Figure 3.8. Adjustment paths of parameter γ for various levels of parameter χ , with $\chi > 0.5$

zation value to its equilibrium level, moving from the left to the right in the plane, the propensity of workers to consume informally does not change much for lower values of χ , as in Figures 3.9 and 3.10, where $\chi = 0.4$ and $\chi = 0.6$, respectively. In the first case, there is a mild feedback loop from γ_t to u_t .

For higher values, such as $\chi = 0.7$ and $\chi = 0.85$ (Figures 3.11 and 3.12, respectively), the movements in γ are large enough to have impacts in u_t that are high enough to impact γ_t back. This is evidenced by the loops in the last two figures, which correspond to the oscillations seen in Figure 3.8.

The numerical simulations of the second model reveal intricate dynamics that emerge when informal consumption responds to labor market conditions. The critical role of the sensitivity parameter χ becomes evident as it governs the extent of oscillatory behavior in the system. This behavior highlights how the informal sector's responsiveness to employment conditions can fundamentally alter the stability properties of the economy. The oscillations observed for higher values of χ demonstrate that the informal sector is not merely a passive buffer during economic fluctuations but actively shapes the trajectory toward equilibrium through its labor absorption capacity and its influence on aggregate demand patterns.

**Figure 3.9.** Parameter γ in the $u \times \gamma$ for $\chi = 0.4$ **Figure 3.10.** Parameter γ in the $u \times \gamma$ for $\chi = 0.6$ **Figure 3.11.** Parameter γ in the $u \times \gamma$ for $\chi = 0.7$ **Figure 3.12.** Parameter γ in the $u \times \gamma$ for $\chi = 0.85$

3.8 FINAL REMARKS

The present chapter focused on the macroeconomic effects of informality in the mid- to long-run trajectory. The informal sector (IS) is here understood as comprised mainly of contemporary urban labor, rather than in the sense of the traditional rural sector of modernization theory. Nevertheless, the idea of a dual economy still applies, as the current informal economy still lags behind in productivity, remuneration, and work conditions. The IS can be quite more flexible than the formal one because it utilizes typically very low levels of capital stock, if at all, and has fewer constraints in hiring and firing. This characteristic, together with its huge importance in the labor market in developing economies, has the potential to induce important macroeconomic impacts.

Exploring the impact of the IS on the macroeconomic trajectory of low and middle-income nations within a Kaleckian framework has revealed several key insights. The analysis underscores the non-neutrality of the IS, highlighting that its presence and size can significantly influence the long-run growth path of an economy. By redefining the profit share and the rate of capacity utilization to account for the informal economy and incorporating these into a modified Kaleckian investment function, this chapter has not only demonstrated the potential for the IS to alter the results of standard growth

models. It has also emphasized the need for a more comprehensive and inclusive economic model for developing economies that can better capture the dynamics of the informal sector.

The numerical simulations conducted have provided a visual representation of the behavior of the main variables as the economy moves toward its steady-state values, emphasizing the importance of considering the IS in growth models. Within this context, the results indicate that the IS can significantly influence both the mid- to long-run equilibrium levels and the adjustment path. These effects become more pronounced as the IS exhibits greater sensitivity to the overall economic environment. Furthermore, the discussion has contributed to the ongoing debate within the Kaleckian tradition regarding the adjustment mechanisms that guide economies toward their long-run trajectories. This approach allows for a closer examination of how the presence and extension of the IS affect these equilibria.

In conclusion, this chapter argues that the IS ought to be considered an essential element in the set of mechanisms that operate in the macroeconomic adjustments. The proposed modifications to the Kaleckian model are viewed as an extra layer that preserves its traditional dynamics, yet provides a deeper insight into the functioning of these processes when the IS is present. The insights gained here are poised to enrich the discourse on economic growth and adjustment processes, offering new elements for consideration in the growth literature applied to developing economies.

Analysis of the impact of the IS on the macroeconomic trajectory of developing economies within a Kaleckian framework has profound policy implications. Demand-side policies, such as public investment and public provision of basic services, can stimulate demand, leading to positive effects on employment and growth, especially in economies with a large IS. Ensuring macroeconomic stability is also crucial for sustainable development, which requires managing inflation, exchange rates, and fiscal deficits in a way that supports growth and reduces vulnerabilities associated with IS. Continued research and improved data collection on the IS are necessary to inform policy decisions and better understand the dynamic effects of the IS on the economy.

3.9 APPENDIX

3.9.1 Parameters of the First Model

Investment Function: $\alpha_0 = 0.02$, $\alpha_1 = 0.055$, $\alpha_2 = 0.07$

Sectoral Income Distribution: $w_w = 0.6$, $w_c = 0.5$, $w_I = 0.55$

Saving Rate: $s = 0.6$

Capital-Output Ratio: $\nu = 3$

3.9.2 Parameters of the Second Model

Investment Function: $\alpha_0 = 0.06$, $\alpha_1 = 0.024$, $\alpha_2 = 0.024$

Sectoral Income Distribution: $w_w = 0.6$, $w_c = 0.55$, $w_I = 0.5$

Saving Rate: $s = 0.6$

Capital-Output Ratio: $\nu = 2.5$

CHAPTER 4

MACROECONOMIC IMPLICATIONS OF WELFARE SPENDING IN DUAL ECONOMIES

4.1 INTRODUCTION

Latin America has long struggled to achieve sustainable and equitable economic development. Despite periods of rapid expansion, the region has consistently exhibited a pattern of stop-and-go growth, characterized by frequent economic crises and bouts of stagnation (BÉRTOLA; OCAMPO, 2012). This persistent economic volatility has been accompanied by a stark and unremitting level of income inequality, with a small elite capturing a disproportionately large share of national wealth, on one side, and widespread poverty, on the other. In this context, there have been calls for more comprehensive social policy, particularly those with a universal character. Such policies could play a crucial role in alleviating inequality while also helping to mitigate economic volatility by sustaining aggregate demand during periods of adverse shocks.

Nevertheless, the development of social protection schemes in the region has been marked by impediments and setbacks. There is a massive literature dedicated to tracing the history and circumstances of the emergence of welfare schemes of diverse kinds in the continent. While part of it seeks to establish the political determinants (PRIBBLE, 2013; HUBER *et al.*, 2008; ALTMAN; CASTIGLIONI, 2020), one important chunk is dedicated to evaluating and classifying the distinct characteristics of social policy instruments in different countries (often focusing on specific areas at a time, such as healthcare, education, or pension systems)(FRANZONI, 2010; BÉRTOLA, 2015). A common ground, however, is the understanding that social policy in Latin America generally evades the classical typology of welfare regimes in advanced economies stemming from Esping-Andersen (1991)¹.

The development of Latin American welfare systems is considered incomplete and fragmented (CRUZ-MARTÍNEZ, 2019). This means more specifically that initiatives arose at different periods and

¹Even though many programs, especially in the very early initiatives are widely considered to fall under the so-called corporatist tradition, one well-defined category.

from governments of diverse orientations, thus operating under different rationales and not integrated or even connected. At the same time, important sectors of society are left outside the reach of such policies. Often the ones excluded were precisely the most vulnerable, in great part because until recent decades social programs tended to be severely biased toward the urban formally employed workers.

Under such circumstances, present-day analysts, such as Filgueira (2014), Cecchini *et al.* (2015), Solano (2019), for example, push for universalization. Although this perspective is widely supported, economic limitations must be recognized as potential obstacles to sustained growth and institutionalization of welfare policies. In such a scenario, social programs would struggle to increase coverage and would risk being eventually defunded, as has occasionally occurred in different instances throughout the second half of the twentieth and also in the twenty-first centuries.

There are reasons for at least three major macroeconomic concerns regarding the expansion of social spending in Latin America. First, from a structuralist perspective, the propensity to import could be quite high in most countries, either for final or intermediate goods. Therefore, increased public spending to sustain consumption could rapidly drive an economy to a balance of payment restriction scenario, with all the negative consequences it entails.

Second, taxation necessary to sustain redistribution policies could impact the net profit rate and thus long-run growth. While this hypothesis is more often accentuated by orthodox views, it could not be a priori ruled out, and the model should be used to investigate to which extent (or under which conditions) it may hold. From a demand-led perspective in particular, if increased demand from additional consumption due to redistribution does not compensate for increased taxation, investment may fall short.

Third, the enormous extension of the informal sector in Latin America brings to the attention several issues faced by previous attempts to introduce social protection schemes. This matter is evidently more pressing in contributory regimes, where participation has tended to be attached to formal employment. While access regardless of contribution may be crucial for coverage expansion, the possibility of receiving the benefits without contributing may constitute an adverse incentive against formalization of labor. In such circumstances, the potentiality for funding assistance through payroll contributions, for instance, will be very limited. Thus alternative combinations of financing and participation should be explored.

With these issues in mind, the present work seeks to develop a framework to investigate the limits

and possibilities of different forms of welfare spending in middle-income economies, as is the typical Latin-American case. Departing from a demand-led perspective, particular attention is paid to the implications for long-run growth and sectoral composition. Although these are very important traits for economic development, it is clear that income convergence is, at best, a decades-long process that spans generations, whereas deprivation and economic hardship are very pressing matters, which should be addressed sooner rather than later.

Building on this foundation, Section 4.2 presents the analytical framework, and Section 4.3 enhances a demand-driven model to analyze its macroeconomic effects. Section 4.4 examines the consequences of different taxation and spending policies, leading to the initial findings in Section 4.5. Finally, Section 4.6 summarizes the key findings and provides a review of the limitations of the study, suggesting directions for future research.

4.2 THE BASIC MODEL

To capture impacts on long-run growth trends, a discrete-time macroeconomic model is proposed in which the economy converges to a steady-state path even after experiencing shocks. The analytical framework is grounded in the standard formulation of the Dutt-Rowthorn investment function within the Kaleckian tradition (ROWTHORN, 1981; DUTT, 1984).

For the present purposes, the value of this equation for the accumulation rate lies in its dependence on both the capacity utilization and the profit rates. The former variable captures consumption increases that would result from social spending and subsequently stimulate production, thus contributing favorably to growth. The latter variable, in contrast, accounts for potential investment decreases stemming from reduced after-tax profits, which may occur following increased taxation to fund welfare programs. Such investment function is specified as follows:

$$g = \frac{I_{t+1}}{K_t} = \alpha_0 + \alpha_1 u_t + \alpha_2 r_t \quad (4.1)$$

Where K denotes the capital stock and g its growth rate, whereas u and r are the rate of utilization of the existing productive capacity and the rate of profit, respectively, and α_0 , α_1 and α_2 are sensitivity parameters.

Notice the intertemporal dimension, given by the fact that the current utilization and profit rates determine the investment planned for the next period. According to the perspective outlined by Kalecki

(1968) and embraced by the broader post-Keynesian tradition, investment levels dictate output size, considering existing structural relationships. In Keynesian fashion, one could write $Y = \frac{1}{(1-c_1)}(C_o + I)$ for a closed economy without government. Being predetermined autonomous consumption (C_0), the level of investment (I) determines the level of output, given the marginal propensity to consume (c_1).

The same article goes a step further, providing a closer look at the income flow. The consumption sector is disaggregated into two: one for workers' and the other for capitalists' consumption goods. He shows that it is the expenditure of the former that accounts for the multiplier effect². In his model, from every expenditure (be it for investment or consumption), a fraction of the income generated corresponds to wages. Since by assumption workers do not save, all wages are spent in a sector named the 'workers' consumption sector' (C_w). As expenditure in this sector means that additional income is being created, thus a new round of wages is generated. Repetition of such an operation results in an income multiplier. After the model is resolved, income (Y) is determined by capitalists' spending on investment (I) and on purchases in the capitalists' consumption goods sector (C_c), as follows:

$$Y = I + C_c + \frac{w_I I + w_c C_c}{1 - w_w} \quad (4.2)$$

Where w_I , w_c and w_w are the labor shares in the investment, capitalists' consumption and workers' consumption sectors, respectively. From equation (4.2), it can be seen that output is comprised of capitalists' initial spending in investment and consumption ($I + C_c$) and by workers' consumption. The latter is amplified, as mentioned before because every worker's consumption spending generates more wages, which in turn will lead to additional consumption spending, and so on. In this vein, the labor share in the workers' consumption goods sector (w_w) dictates the extension of the multiplier.

Kalecki includes an additional (yet non-essential) hypothesis that there is a certain stable proportion between investment and capitalists' consumption. This would be given by $m \equiv C_c/I$. Substituting this in equation (4.2) yields equation (4.3) below, which makes explicit that investment determines output (together with a few given parameters):

$$Y = I \left[1 + m + \frac{w_I + w_c m}{1 - w_w} \right] \quad (4.3)$$

For the given purposes, these features above discussed can be very useful, since distributional issues should be in the first plane of the analysis. The division of consumption between the two sectors (C_c

²Multi-sector versions of the income multiplier can also be seen in Miyazawa (1976) and Araujo & Teixeira (2015).

and C_w) informs the appropriation of output. In this regard, in the present perspective the level of output is properly evaluated only when seen together with the distribution of final consumption.

In what follows, the level of investment given by equation (4.1) has been used to determine the output level and its structure in a similar fashion as in (4.3), although with some important changes. In the next section, some modifications to this basic framework will be introduced, to include additional sectors that are found relevant and also to tweak the parameters, as the aim is to interfere in the distribution through tax and spending.

4.3 REWRITING THE MODEL

When one undertakes the extension of this basic framework to include more sectors, additional equations rapidly proliferate. To handle that, the model has been written in matrix notation so that the number of operations presented will be sharply reduced. To this effect, the income flows that go to and come from the two consumption sectors C_c and C_w can be arranged in the matrix A below, where the income generated in each sector is represented in the rows, with the allocation of that income displayed in the columns. This is so because each sector has a flow of resources coming in (as revenues from sales of the output) and a flow of resources going out (as income of production factors, here capital and labor).

Since the Kaleckian hypothesis of full vertical integration holds, there are no intermediary inputs, and each sector contains the whole production chain, so that all revenue turns into wages and profits. It is assumed that workers consume all their incomes, while capitalists save a fraction s of theirs. For instance, since the first line and the first column represent sector C_w , matrix A informs that a percentage w_w (i.e., the labor share in that sector) of revenues from sector C_w is spent again in that same sector. Meanwhile, a percentage equivalent to the profit share $(1 - w_w)$ deducted from savings is spent on capitalists' consumption goods (C_c , represented here in the second line and second column).

The same goes for the second line, which indicates that the income created in sector C_c is divided into a fraction w_c (the labor share of that sector) which is spent in workers' consumption (C_w), and a share $(1 - w_w)(1 - s)$ (the profit share deducted of savings) spent in capitalists' consumption (C_c). Thus:

$$A \equiv \begin{bmatrix} w_w & (1 - w_w)(1 - s) \\ w_c & (1 - w_c)(1 - s) \end{bmatrix} \quad (4.4)$$

As in the original framework, the system is set in motion by an initial investment expenditure, which generates wages and profits in the investment goods sector (I), which are then channeled into the consumption sectors. This initial expenditure can be represented by a vector $\mathbf{z} \equiv \xi \begin{bmatrix} w_I & (1 - w_I)(1 - s) \end{bmatrix}$, where w_I is the labor share in the investment goods sector and ξ is a scalar that represents the amount invested.

The product $\mathbf{z}A$ gives the output in the consumption sectors C_c and C_w after this initial income from the investment sector is spent. However, C_c and C_w also employ labor and capital, thus generating a new round of wages and profits. These incomes will bring about more consumption, leading to more spending in C_c and C_w , and so on, hence starting an iterative process. In each round, there is a leakage due to savings, and for this reason, the process eventually comes to a halt. If the final consumption vector, after all iterations have taken place, is defined as $\mathbf{c} \equiv \begin{bmatrix} C_w & C_c \end{bmatrix}$, then the process can be described as the infinite sum $\mathbf{c} = \mathbf{z} + \mathbf{z}A + \mathbf{z}A^2 + \mathbf{z}A^3 + \dots$, etc.

Alternatively, representing the identity matrix by J (so to reserve the notation I to investment), the process can be written as $\mathbf{c} = \mathbf{z}(J + A + A^2 + A^3 + \dots)$. Since the term in parentheses can be approximated³ by $[J - A]^{-1}$, the final consumption of this simple economy is given by $\mathbf{c} = \mathbf{z}[J - A]^{-1}$. In the case of Kalecki's original formulation, it can be shown that this inverse is as follows, corresponding to the very same formulas the author presented for the analytical resolution of his model.

$$[J - A]^{-1} = \frac{1}{s(1 - w_w)} \begin{bmatrix} s + w_c(1 - s) & (1 - s)(1 - w_w) \\ w_c & (1 - w_w) \end{bmatrix} \quad (4.5)$$

After this convenient matrix notation is set up, it is straightforward to include more sectors (such as the public sector, the informal or the external sectors) simply by adding one extra line and one extra column to A for each additional sector. Additionally, the expressions can now be manipulated in a more tractable manner to obtain tighter control over the processes to be modeled. This allows taxes and transfers to be subsequently added, with the aim of capturing the impacts of different forms of social spending.

For instance, A can be decomposed into two movements: first, income created in each sector is distributed between workers and capitalists; second, this income (wages and profits) is spent in the consumption sectors (C_c and C_w). It is called the Repartition Matrix (R) which gets the income generated in each sector on the lines and gives the amount of wages and profits appropriated in the

³This approximation is analogous to "Leontieff's inverse" of input-output models, although here dealing with flows of income instead of physical quantities.

columns (the first column for wages, the second column for profits):

$$R = \begin{bmatrix} w_w & (1 - w_w) \\ w_c & (1 - w_c) \end{bmatrix} \quad (4.6)$$

Next, the Expenditure Matrix (E) can be defined as that which contains wages and profits in the rows and indicates the allocation of spending in C_c and C_w in the columns:

$$E = \begin{bmatrix} 1 & 0 \\ 0 & (1 - s) \end{bmatrix} \quad (4.7)$$

Matrix E simply indicates that all wage incomes (first line) are spent in C_w (first column), and that a fraction $(1 - s)$ of profit income (second line) is spent in C_c (second column). It is easy to see that $A = RE$, and the rest of the process follows as usual.

In the following section, new steps are introduced between R and E to generate the secondary income distribution (that is, after taxes on profits and transfers to families). Furthermore, value-added taxes (VAT) are incorporated into the framework to verify if any important differences in the macroeconomic path are stem from the forms of financing social spending. In the following stages, additional sectors with behavior deemed relevant to the macroeconomic path are incorporated.

4.4 EXTENDING THE MODEL

To analyze welfare spending, it is crucial to introduce the government within the framework. This is done by instituting a sector, denoted as G , that produces goods that the government consumes when it provides services to citizens. In line with Kaleckian tradition, this sector is assumed to be fully vertically integrated. When private firms sell supplies to the government (such as medicines for public hospitals or books to public schools), they earn a profit. They may also be obliged to collect a VAT tax. Thus, for analytical purposes, this sector can be treated as the others, with income divided into profits and wages and also generating tax revenues. One might have reason to believe that a large share of the government's expenditure on direct provision consists of wages paid directly to public-sector employees. For simplicity, it may just be assumed that for every dollar spent to deliver public services, a large share w_g goes to wages, and a smaller share goes to profits⁴.

Moving forward, it is essential to highlight one of the defining features of developing economies: the informal sector. Following the literature, this sector, denoted here as Y_i , is assumed to operate without

⁴It can be demonstrated that this assumption will not alter any relevant feature of the model.

capital equipment and therefore does not produce profits. Informal income is exclusively retained by the workers themselves. In this Kaleckian perspective, the informal output is determined by the demand for its product (as seen in Martins & Skott (2021), Ramos (2007b), among others). Unlike the perspective of 'modernization theory' à la Lewis (1954), informality is not seen as a 'traditional' sector located in rural areas and consisting of a subsistence economy. As a rule, today's Latin American societies are highly urbanized. Informal activities occur mostly in the cities where goods and services are not produced for their own consumption, as is the case in a rural subsistence economy, but rather for sale. For this reason, informal output is indeed limited by demand.

Initially, workers in the formal sector are assumed to generate demand for the informal product, as they spend a share γ_f of their income in this sector (C_i). As informal workers earn their income (which should be equal to the full amount spent in this C_i sector, since it is also assumed that it is fully vertically integrated and has labor as the only factor of production), they can also spend a fraction (γ_i) of their earnings on informal goods. Following this reasoning, the mass of informal incomes, W_i , and the mass of formal wages, W_f , are related by equation $W_i = C_i = \gamma_f W_f + \gamma_i W_i$.

In this setting, the expenditure matrix (E) looks like what follows, where each line, from the first to the last respectively, indicates the incomes W_i , W_f , the mass of profits P and the government revenue τ , while each column (from the first left to the last right, respectively) indicates the spending in the sectors C_i , C_w , C_f and G :

$$E = \begin{bmatrix} \gamma_i & 1 - \gamma_i & 0 & 0 \\ \gamma_f & 1 - \gamma_f & 0 & 0 \\ 0 & 0 & 1 - s & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad (4.8)$$

As the counterpart of the expenditure matrix, there is the repartition matrix (R), which indicates how the income generated in sectors C_i , C_w , C_f and G (in the lines, respectively), are appropriated as informal income W_i , formal wages W_f , profits P or VAT taxes V (in the columns, from the left to the right, respectively). Suppose the VAT tax rates are t_w , t_c and t_g for the last three sectors⁵. Hence:

$$R = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & (1 - t_l)w_w & (1 - t_w)(1 - w_w) & t_w \\ 0 & (1 - t_l)w_c & (1 - t_w)(1 - w_c) & t_c \\ 0 & (1 - t_l)w_g & (1 - t_g)(1 - w_g) & t_g \end{bmatrix} \quad (4.9)$$

Finally, a redistribution matrix is introduced between income appropriation and spending, which generates the secondary distribution that arises after the taxation of income and direct transfers to the

⁵Recall that private firms who produce goods consumed by the government in its provision of public services also pay taxes and earn profits. As for the informal sector, it is by definition beyond the reach of the government's enforcement.

families are carried out. This is done in two steps. Firstly, following the order of the types of income W_i , W_f , P and τ both for the lines and columns, the matrix T_1 below describes which percentage of each form of income appropriation is diverted to another form. Secondly, there are transfers to informal and formal workers. These transfers were separated because benefits for those formally employed may be very different in level and nature than for those with a different occupational status. The former may indeed require previous contribution (which would mean $\delta_w > 0$ and give rise to other scenarios to be modeled, which are left for another opportunity). On the other hand, informal transfers can be used to represent the degree of universalization of certain social policies.

Then, if δ_w and δ_π are the income tax rates on formal wages and profits, then T_1 indicates that a share of these incomes is going to the government revenue (τ), being the remaining kept by each income group⁶. Considering that T_1 indicates in each line the income before taxes, and in each column the income after taxes, then:

$$T_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 - \delta_f & 0 & \delta_f \\ 0 & 0 & 1 - \delta_p & \delta_p \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad (4.10)$$

In the same fashion, if the government transfers a share tr_i of its revenue to informal workers and a share tr_f to the formal ones, matrix T_2 indicates in the lines the incomes before transfers and in the columns the incomes after such transfers:

$$T_2 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ tr_i & tr_f & 0 & 1 - tr_i - tr_f \end{bmatrix} \quad (4.11)$$

In this setting, income after taxes and transfers is given by matrix T , with $T = T_1 T_2$, as follows.

$$T = \begin{bmatrix} 1 & 0 & 0 & 0 \\ \delta_w tr_i & 1 - \delta_w(1 - tr_w) & 0 & \delta_w(1 - tr_i - tr_w) \\ \delta_\pi tr_i & \delta_\pi tr_w & 1 - \delta_\pi & \delta_\pi(1 - tr_i - tr_w) \\ tr_i & tr_w & 0 & 1 - tr_i - tr_w \end{bmatrix} \quad (4.12)$$

In this extended version of the model, the matrix A is simply given by $A = (RT)E$. As before, given A , the final consumption is determined by the initial investment $\mathbf{z}$, according to $\mathbf{c} = \mathbf{z}[J - A]^{-1}$.

⁶Even though the actual numerical exercises do not consider taxation on formal wages, being the case that $\delta_w = 0$, this possibility has been kept in the analytical framework, since it constitutes a policy option in real economies.

4.5 COMPUTATIONAL SIMULATION RESULTS

The canonical Kaleckian investment function – which is used here as specified in Section 4.2 – gives rise to very stable solutions as long as the parameters obey some rather reasonable conditions. Due to this stability, concerns with convergence issues can be set aside for the time being, bringing the focus to the different equilibria levels that may arise from alternative policy choices. In each simulation case, the system converges to equilibrium values of the utilization (u) and profit (r) rates. Then, according to the investment function in equation (4.1), an equilibrium rate of growth of the capital stock (g) is also achieved, which leads to a steady growth of output. In this situation, the relative size of the consumption sectors (including public consumption) as a percentage of output remains stable. The equilibrium levels are the ones presented in this section⁷.

The purpose of this exercise is to compare, on one hand, the level of public services (G) and transfers that can be financed from certain forms of taxation and, on the other hand, its impacts on the long-run growth rate. One of the main concerns in mind regards the impact of the increased taxation that is required to sustain social spending on the profit rate and ultimately the growth rate. To address this concern, different taxation strategies are compared, relying either on VAT or income tax.

Another major concern is the impact of cash transfers on imports and the informal economy. Although the former is not considered in the current framework⁸, the latter is explicitly modeled. Therefore, the main focus of the limited set of simulations presented here concentrates on observing how taxation (either on income or on value-added) and government spending (either on direct provision or through cash hand-outs) can affect the long-run growth trend, on one side, and the sector structure, on the other.

At this point, the simulation strategy departs from a scenario where there is no government activity and thus no taxation. Then gradual increases are established, first, in the income tax on capitalists (up to 35%). Next, in the second batch of simulations, the income tax is set at a fixed and moderate level (10%), and then the VAT tax on consumption is increased. In these scenarios, there are no cash

⁷Even though it might be interesting to investigate the role that social spending as automatic stabilizers play in the adjustment towards equilibrium, a matter left for another occasion.

⁸However it can be easily added by introducing a marginal propensity to import in each sector and an exogenous export demand.

transfers and the government budget is assumed to be in equilibrium at all times⁹. This implies that the tax revenue directly determines how much the government can supply in direct provision of public services (in other words, taxation determines the size of sector G).

In the third batch of simulations, taxes on income and value-added are fixed at a positive rate, and then transfers to workers increase gradually. Finally, after the transfers reach their peak values, the income tax on profits is raised (from 10% to 20%) to simulate a scenario with higher transfers and higher taxes simultaneously. This set of cases opens up a restrained exploration of the framework's possibilities, whereas additional combinations remain available for future scenario simulations.

The initial conditions and the parameter values are informed in the Appendix to this chapter, together with the equations that inform the order of resolution of the model. The values of parameters were arbitrated, grounded in typical values observed within the theoretical and empirical literature, in works such as (BLECKER, 2002), (FAZZARI; MOTT, 1986), (HEIN; OCHSEN, 2003), (HEIN; TARASSOW, 2010), (HEIN, 2014), (NAASTEPAD, 2006), (ONARAN; GALANIS, 2014), (STOCKHAMMER *et al.*, 2009) and (ALEXIOU, 2010), among others.

Without transfers or VAT taxes, increasing income tax up to 35% creates room for the emergence of the public sector (G), which takes 16% of GDP when the tax rate is at its maximum, as shown in Figure 4.1. It should also be noted that both the workers' consumption sector (C_w) and the informal economy (Y_i) increase their share in output as the tax rate increases. This happens because government spending is supposed to have a high labor share, as discussed earlier, which brings about more spending by the wage-earners, both in formal and informal goods.

⁹Which also spares the need to model public debt, which would call for the introduction of a financial dimension, which will be left for another occasion.

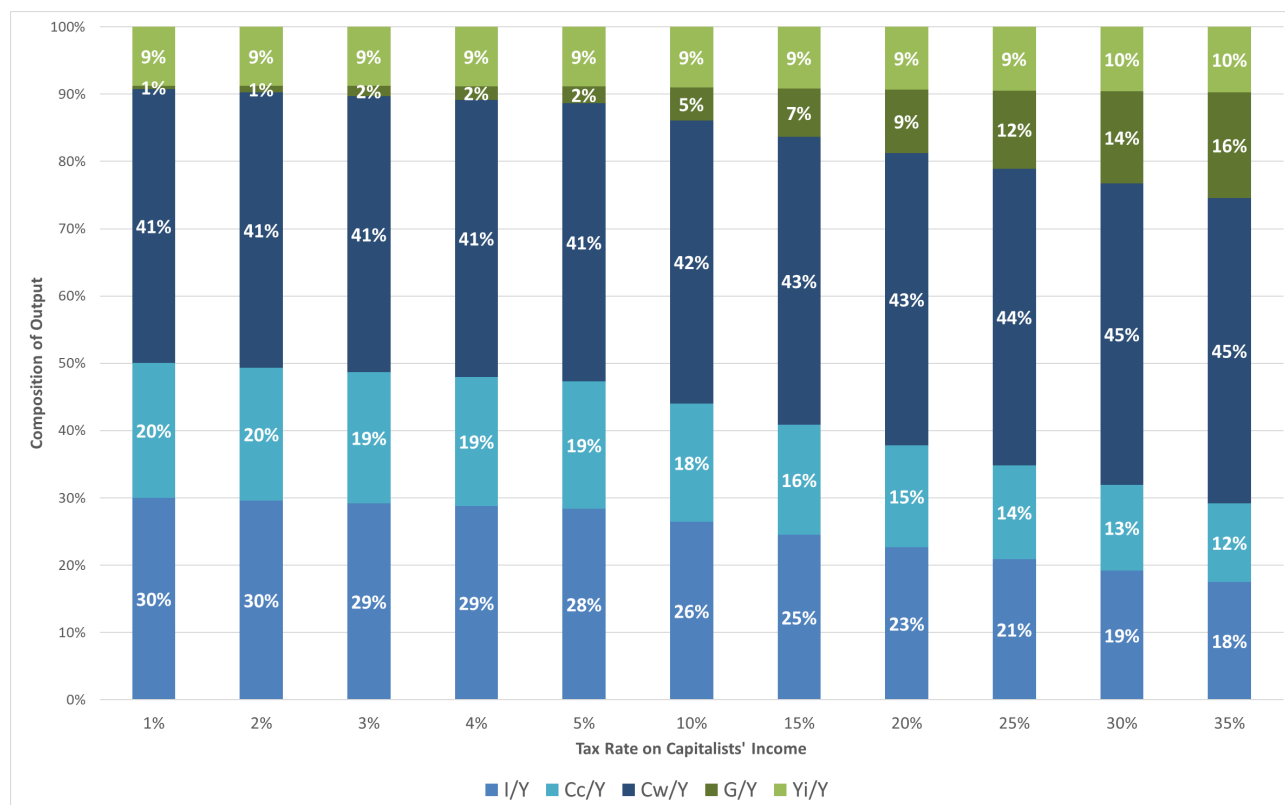


Figure 4.1. Composition of Output for Different Levels of Profit Taxation

As for the output growth rate, it can be seen that it continuously decreases, changing from 5.9% when tax is lowest to 4.9% when it is highest. The utilization rate of productive capacity increases since labor share rises, and as workers do not save consumption increases. Notwithstanding, this increase is not sufficient to counterbalance the decrease in after-tax profit rates, as shown in Figure 4.2.

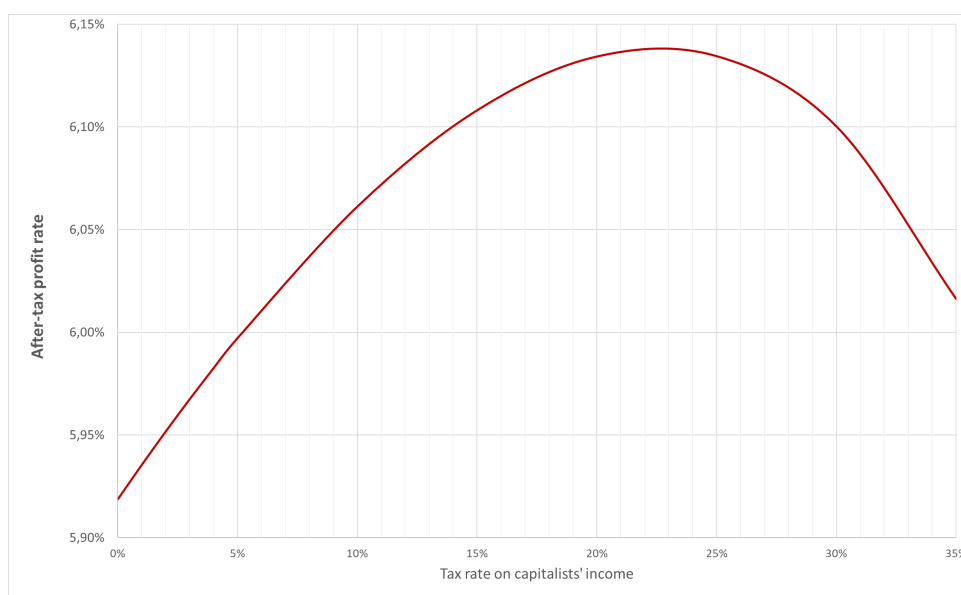


Figure 4.2. After-tax profit rate for Different Levels of Profit Taxation

Altogether the rate of accumulation (as stated in the investment function) diminishes. The inverted U shape of the after-tax profit rate in Figure 4.2 interestingly indicates that there might be optimal spots regarding taxation and spending. In the cases presently examined, this spot would be found in the range 20-25%. Of course, this theoretical exercise is not rooted in empirical parameters yet, and the optimal values may vary in distinct scenarios (for instance, when the combination of taxes and labor shares is different).

In the second batch of simulations, income tax was kept low at 10% and increased VAT taxes, first on capitalists' consumption (C_c) until 10%, and later both on capitalists' and workers' consumption (C_w), keeping the tax on the latter always 10p.p. lower than on the former. The process stopped when the VAT was 25% on C_c and 15% on C_w , making a (unweighted) average VAT of 20%. Since there was not much change in the sectoral composition in between, the presented chart compares only the first and last simulation cases (see Figure 4.3). The growth rate of formal output also decreases as taxes increase, as shown in Figure 4.4.

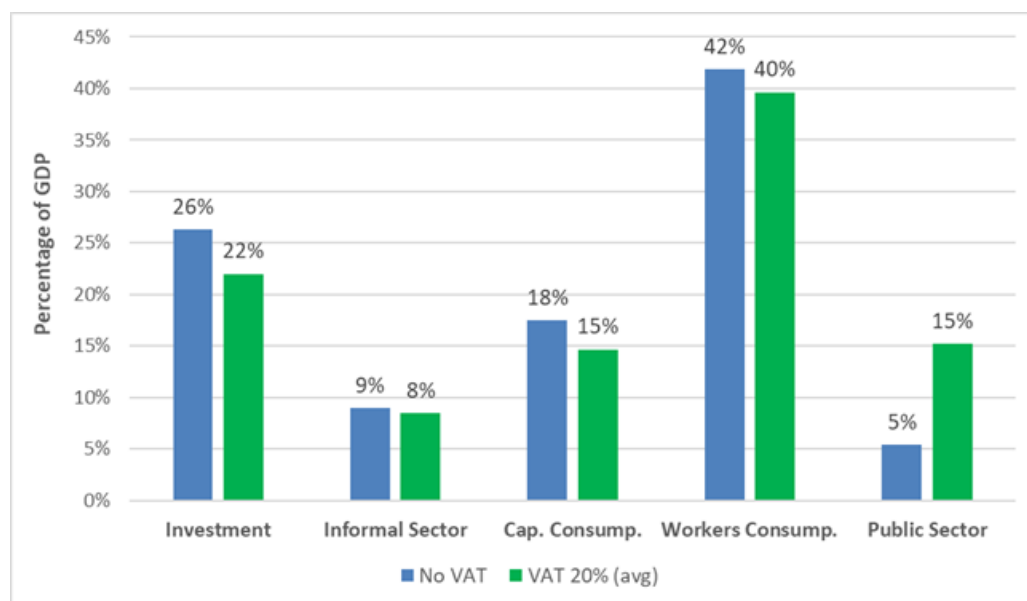


Figure 4.3. Composition of Output for Different Levels of VAT Taxation

The third batch simulates the case of robust cash transfers, a policy tool that is still limited in Latin America (except maybe for retirement payments in some countries). In this vein, transfers are made to workers, both formal and informal, as a percentage of government revenue, varying increasingly up to 10%. It is found that once taxes are fixed, the increase in transfers hurts neither the profit rate nor capital accumulation. Quite the opposite, transfers increase consumption and thus the utilization rate,

which then translates into higher profits, which stimulates investment. However, the effects are very limited. The formal output growth rate changes from 5.43% when no transfers occur to just 5.46% when transfers reach 10% of the government budget. This is in part due to the consumption in the informal sector, which also grows to supply part of workers' consumption as their incomes rise through transfers.

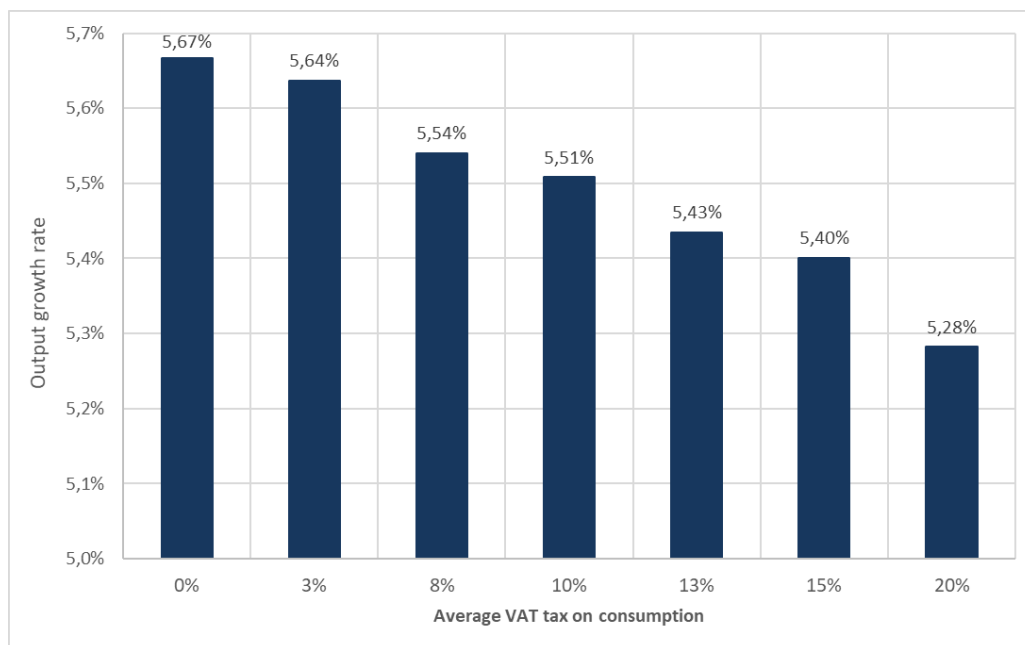


Figure 4.4. Growth Rate of the Formal Output for Different Levels of VAT Taxation

In this situation, there are a few changes in the sectoral composition. Figure 4.5 displays the percentage of output represented by each sector for each percentage of government budget dedicated to transfers.

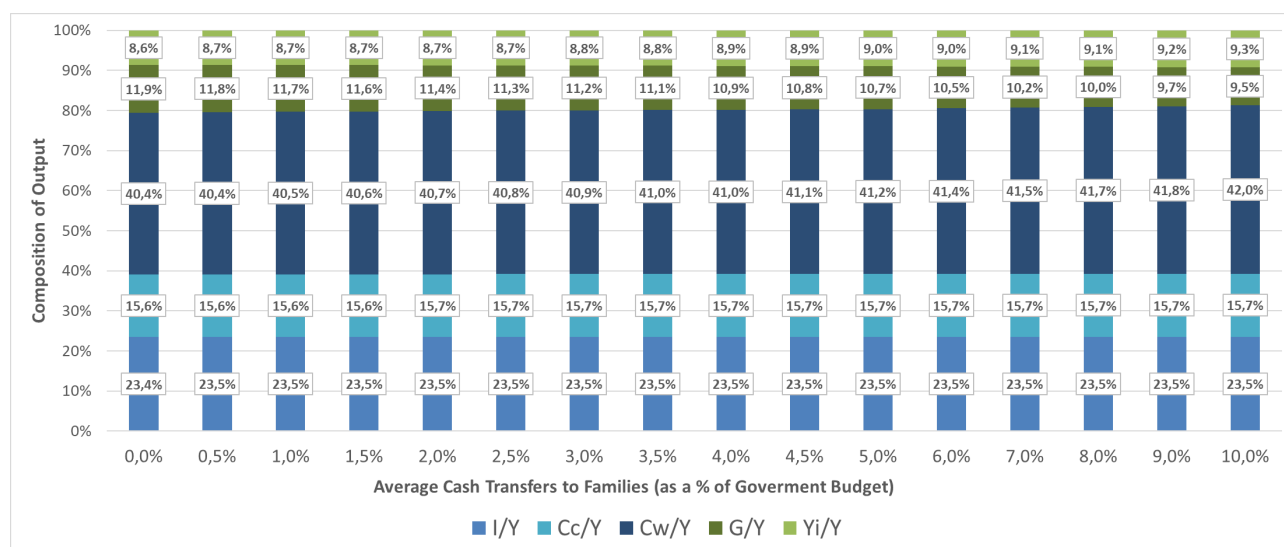


Figure 4.5. Composition of Output for Different Levels of Transfers to the Families

Although investment (I) and capitalists' consumption C_c remain nearly stable, the consumption of workers' C_w increases as a percentage of the output. The informal economy, which is ultimately sustained by workers' expenditures, also increases, for it must supply part of additional consumption, as mentioned earlier. In an open-economy setting, it might be plausible to think that imports would increase after transfers as well.

On the other hand, the government sector shrinks from 11.9% to 9.5% as transfers increase from zero to 10% of the public budget. This increase seems sharp, since such a small share (no higher than 10%) of revenue is spent on transfers, which may indicate a trade-off at some point between direct provisions of public services, on one side, and hand-outs, on the other. Of course, the optimal mix should depend on the well-being outcomes of each form of spending, a discussion that is beyond the scope of this work. Nevertheless, this question deserves a closer look and shall be explored in future research.

As a final step, the income tax is increased once again to see to which extent it would be possible to maintain a certain level of public sector activity (a desirable level would be above 15% of GDP) while keeping the distributional gains obtained from transfers. The retention of the tax rate at 20% while bringing transfers to formal and informal workers at 20% and 10%, respectively, led to a mild decrease in the growth rate of production, from 5.43% to 5.19%. The utilization rate was kept at 88% and the profit rate at 5.9% in the long-run equilibrium, which was, however, not sufficient to bring the public sector above 11.4% of output.

The results presented here offer a brief insight into the capabilities of this framework. By demonstrating these initial scenarios, a foundation has been established which illustrates the core capabilities while highlighting pathways for deeper investigation. This methodology offers remarkable versatility that extends well beyond these preliminary applications.

Future research should prioritize analyses of additional scenarios to fully realize the framework's potential. Expanding the scope to include diverse parameters, preferably grounded on empirical estimates and alternative policy combinations would yield valuable insights currently unexplored. Such extended applications would not only check the framework's robustness, but could also bring its application to concrete policy questions.

4.6 FINAL REMARKS

This study contributes to the debate on social spending and macroeconomic performance by developing a methodologically innovative framework that integrates sector-specific dynamics, formal-informal labor links, and distinct financing mechanisms for welfare expenditures. This allows a more nuanced understanding of how redistribution policies shape both growth and income distribution in middle-income economies such as those in Latin America. By bringing the Kaleckian disaggregation of consumption into workers' and capitalists' components, the model highlights the distributional consequences of social spending and its potential to stimulate working-class consumption.

In this vein, the model captures a fundamental feature of middle-income countries: the duality between modern and traditional sectors, which shapes both consumption patterns and fiscal constraints. In economies with large informal sectors, contributory social insurance models may be insufficient, requiring a greater role for universal and tax-financed programs. However, the extent to which such systems can be expanded depends on fiscal capacity, which in turn hinges on the tax base, economic structure, and the pace of output growth.

One of the key takeaways is that the macroeconomic effects of social spending depend not only on its magnitude but also on how it is financed and distributed. Taxation on profits and high-income earners, as opposed to broad-based consumption taxes, tends to exhibit a greater impact on sustaining aggregate demand. This approach aligns with the Kaleckian tradition, which posits that income distribution and wage share play crucial roles in shaping aggregate demand and capital accumulation. The findings reinforce the Kaleckian argument that higher wages and transfers can sustain demand, but also show that the sectoral allocation of such demand critically influences long-run growth prospects.

Nevertheless, the results show that while income redistribution policies can have positive multiplier effects, they are not without trade-offs. The simulations suggest that excessive reliance on direct transfers may lead to an increase in informal activity, reducing tax revenues in the long run. However, expansion of public services (such as education and healthcare) could have stronger long-term effects, both by improving productivity and by sustaining employment in labor-intensive sectors. Furthermore, excessive taxation on corporate profits, while increasing fiscal space, can depress investment and long-term growth. The policy challenge, therefore, is to design a balanced fiscal and social policy mix that maximizes the pro-growth and pro-equity effects of welfare spending.

The present framework synthesizes elements from various aspects of the Kaleckian tradition. For this reason, the complexity of the model has been deliberately constrained to permit an initial assessment of its fundamental properties. In order to maintain simplicity, important stylized facts regarding Latin American economies that might have been interesting to explore have been left out. These might be addressed in future research along the lines established here.

One of the important issues concerns the financial side. Introducing the financial sector will allow the addition of government deficit and/or surplus, thus permitting the introduction of fiscal policy. In addition, the presence of (possibly endogenous) interest rates can alter the response of investment to the profit and the utilization rates.

In addition to that, modeling the labor market even in the simplest form, together with an equation for (most likely exogenous) populational growth will allow the introduction of some forms of universal welfare policies that function as automatic stabilizers, such as unemployment benefits and minimum income guarantees. The accumulation rate and the populational growth rates will, together, produce patterns of unemployment and average income. These will enable a whole new set of analyses with low cost in terms of additional equations or mathematical complexity.

Finally, marginal propensity to import – which arguably high values are seen as an essential feature of Latin American economies, particularly from the structuralist perspective – will enable scenarios of balance of payments constrained growth. In this case, a commodity-exporting sector could also be added. In this regard, capitalists' and workers' consumption could be replaced by different consumption sectors, such as 'tradable' and 'non-tradable' consumption goods and services, for instance.

Since mark-ups and relative prices have been kept constant in all computational exercises, it has not been taken into account that the proportion of wages spent on informal goods might change when VAT rates on formal goods vary. Since workers consume basic necessities, the price elasticity might not be high; hence, this substitution effect should not be too intense. The same would not hold for capitalists' consumption once the economy is open to foreign goods.

In conclusion, this article has presented a novel framework for analyzing the macroeconomic effects of social spending in middle-income economies, building upon the Kaleckian tradition and emphasizing the crucial role of demand and sectoral composition in shaping economic outcomes. The results indicate that social spending can be a powerful tool for reducing inequality and sustaining demand, but its effectiveness depends on careful design and financing strategies. Policymakers must strike a balance

between direct transfers and public service provision, between short-term redistribution and long-term growth, and between fiscal expansion and external sustainability. By doing so, governments can leverage social spending not just as a safety net, but as a strategic instrument for inclusive and sustainable development.

4.7 APPENDIX

4.7.1 Standard Parameters Utilized

Parameters that were fixed for all the simulations:

Investment Function: $\alpha_0 = 0.06$, $\alpha_1 = 0.024$, $\alpha_2 = 0.024$

Saving Rate: $s = 0.6$

Sectoral Income Distribution: $w_w = 0.5$, $w_c = 0.4$, $w_g = 0.7$, $w_I = 0.4$, $w_i = 1$

Propensity to Consume Informally: $\gamma_f = 0.15$, $\gamma_i = 0.3$

VAT tax rates held fixed throughout the dynamic simulations: $t_I = 0.1$, $t_g = 0.1$

Initial Values: $K_0 = 100$, $r_0 = 0.074$, $u_0 = 0.89$

4.7.2 Order of Resolution

The cycle begins by the income injection coming from investment, which then adds to the capital stock.

$$g_t = \frac{I_t}{K_{t-1}} = \alpha_0 + \alpha_1 u_{t-1} + \alpha_2 r_{t-1} \quad (4.1)$$

$$I_t = g_t K_{t-1} \quad (4.2)$$

$$K_t = K_{t-1} + I_t \quad (4.3)$$

The investment sector's income is distributed as follows, with nothing going to the informal workers (first columns of the vector $\mathbf{z}$), then after-tax wages and profits (in the second and third columns,

respectively), and VAT taxes collected from investment goods sales.

$$\mathbf{z}_t = I_t \begin{bmatrix} 0 & w_I(1 - t_I) & (1 - w_I)(1 - t_I) & t_I \end{bmatrix} \quad (4.4)$$

$$\mathbf{c}_t = \begin{bmatrix} C_i^t & C_w^t & C_c^t & G_t \end{bmatrix} = \mathbf{z}_t [J - A]^{-1} \quad (4.5)$$

The output in each sector, as well as the sectoral distributional parameters such as labor share and specific tax rates allow for obtaining the income of each group. From this, the profit after tax profits (P'_t) and the profit rate is calculated.

$$W_t = \begin{bmatrix} W_i^t & W_t & P_t & T_T \end{bmatrix} = \mathbf{c}R \quad (4.6)$$

$$P'_t = P_t(1 - \delta_\pi) \quad (4.7)$$

$$r_t = P'_t / K_t \quad (4.8)$$

The formal product (Y_f) together with the capital-output ratio ($v = K/Y_f^P$, where Y_f^P is the potential, full-capacity output) determines the rate of utilization of the productive capacity (u):

$$Y_f^t = I_t + C_w^t + C_c^t + G_t \quad (4.9)$$

$$u_t = vY_f / K \quad (4.10)$$

This completes the cycle, as r_t and u_t determine the investment in period $t + 1$.

CHAPTER 5

THE FINANCIAL AND FOREIGN SECTORS AS ELEMENTS SUPPORTING EFFECTIVE DEMAND

5.1 EFFECTIVE DEMAND, EXTERNAL MARKETS AND THE SOURCES OF SUSTAINED GROWTH

The question of whether external sources of aggregate demand are necessary for sustained capitalist growth represents a long-standing debate in political economy, which arguably continues to be of great importance today. This matter deserves a thorough analysis from the Kaleckian point of view. In his early works, Kalecki showed certain affinities with Rosa Luxemburg's position regarding the necessity of external markets to solve realization problems in capitalism; however, as noted by LÓPEZ (2010), his later works indicated a significant analytical shift, acknowledging that internal demand possesses sufficient potential to sustain capitalist growth without the imperative expansion into external markets (KALECKI, 1971). However, he does acknowledge that income injections in addition to capitalist spending increase profits proportionally (KALECKI, 1942), which can promote continuous economic expansion in certain contexts.

The transformation of Kalecki's thought on these matters reflects his increasing recognition that "the self-propelled growth of the capitalist economy cannot be taken for granted" (Kalecki, cited in TOPOROWSKI, 2018). Certainly, this has been central to his attention in the entirety of his work. In his perspective, the complex interaction between autonomous demand components, government expenditure, and private investment decisions provides a fairly nuanced understanding of capitalist growth dynamics, which continues to be a contentious issue of discussion among post-Keynesian economists.

For instance, the Sraffian Supermultiplier (SSM) approach, developed decades later, resonates with fundamental aspects of this debate (FREITAS; SERRANO, 2015). The SSM perspective argues that since investment simultaneously creates demand and output potential, continuous growth requires supplementary demand components that do not create additional capacity. This theoretical framework

dialogues with Kalecki's analysis of government expenditure (especially military spending financed by loans or taxation of capitalists) as contributing to effective demand without offsetting declines in investment or consumption.

In this perspective, the crucial role of debt for increased aggregate demand and output, which is the core subject of the present essay, becomes apparent in the following passage from Kalecki's theory of profits:

"The counterpart of the export surplus is an increase in the indebtedness of the foreign countries towards the country considered. The counterpart of the budget deficit is an increase in the indebtedness of the government towards the private sector. Both of these surpluses of receipts over payments generate profits in the same way."

(KALECKI, 1956, pp. 51-52.)

As such spending influences production and ultimately affects profits, the earnings of capitalists will rise accordingly, thus generating the necessary funds to cover the heightened debt. Even though he concentrates on the public deficit, when analyzing the government's role in aggregate demand, it is critical to acknowledge that the fundamental problem in his perspective is the injection of resources that are supplementary to what capitalists could independently disburse.

In these circumstances, the financial sector plays a crucial role in providing the necessary funds to entrepreneurs or the public sector. Furthermore, it could be argued that the source of the income injection (whether from spending in excess of revenues by the government or by private companies) will demonstrably yield similar outcomes. Given this conceptual structure, the current study concentrates on the opportunities and, more crucially, on the constraints on maintaining effective demand imposed by the financial system.

In this context, this chapter develops an extension of the framework presented earlier, incorporating two important factors that contribute to sustaining aggregate demand. The initial point refers to exports, in line with the aforementioned debate concerning external markets. The subsequent point pertains to the financial sector, which enables the extension of private or public investment beyond the immediate availability of liquid resources. Although the subsequent analysis focuses on private sector borrowing, it can be shown that analogous outcomes on aggregate demand would be observed when borrowing originates from government deficit spending.

5.1.1 Long-run Growth in the Kaleckian-Marxian Reproduction Scheme

The well-known three-department Marxian-Kaleckian reproduction scheme is presented to the reader in a static setting. The volume of investment and capitalist consumption expenditure determines profits, wages, and thus output and income. In that particular analysis, there is no discussion about how exactly income and profits earned in one period are translated into expenditure decisions for the next, apart from a fixed savings rate, which leaves no room for autonomous decision-making. Although Kalecki points out elsewhere that the current state of economic activity can be understood as the main determinant of investment, only decades later this causal link will be further explored by Kaleckian authors, in the context of the debates around the investment function.

It is clear that the Kaleckian system establishes the determination of income and output as the operation of a multiplier over investment expenditures (in the case of a closed economy without government) or a multiplier over investment plus net exports plus the public deficit (in the case of an open economy with government). In a dynamic context where the structural and behavioral parameters remain constant, it can be demonstrated that economic growth requires an increase in at least one of these flows. This can be illustrated in the simplest case with the following example, along the lines of the Marxian reproduction scheme, following (KALECKI, 1968):

$$P_t = C_t^c + I_t \quad (5.1)$$

Where P represents profits, C_t^c capitalists' consumption and I_t investment in period t , with causation running from the right-hand to the left-hand side. In their turn, decisions on consumption and investment should follow past, not current, profits. As he puts it:

"Investment and capitalists' consumption in the short period considered are the outcome of decisions taken in the past and thus should be considered as given. With regard to investment, this follows directly from the time-lag dependent on the period of construction. But changes in capitalists' consumption also follow those in profits with some delay. Now, sales and profits in a given period cannot be a direct outcome of past decisions: the capitalists can decide how much they will invest and consume next year but they cannot decide how much they shall sell and profit."

(KALECKI, 1968, p. 75.)

In discrete-time setting, this means that:

$$I_t = sP_{t-1} \quad (5.2)$$

Put differently, the investment carried out in the current period arises from some decision made in the previous one, which was based on the profits then realized. Furthermore, it is adopted the assumption that there is a stable proportion between investment and consumption expenditures by entrepreneurs, expressed as $m_c \equiv C_t^c/I_t$. An important aspect to note is that fixing m_c is equivalent to setting a stable savings rate, since it shall be demonstrated that $m_c = (1-s)/s$ or, equivalently, $s = 1/(1-m_c)$.

Now (5.1) implies $P_{t-1} = I_{t-1} + C_{t-1}^c = I_{t-1} + m_c I_{t-1}$. Substituting this into (5.2), it follows that $I_t = s(I_{t-1} + m_c I_{t-1})$, hence implying:

$$I_t = s(1 + m_c)I_{t-1} \quad (5.3)$$

In this form, the connection between past and current investment decisions becomes evident. This link is actually established in the Kaleckian framework through realized profits. This chain of causation contrasts with Keynes' perspective, in which liquidity preference and uncertainty play such a crucial role that it would disturb the strength of this relationship.

Being the division of capitalists' outlays (m_c) stable as in the three-department model, one has the equivalence:

$$m_c \equiv \frac{C_t^c}{I_t} = \frac{(1-s)P_{t-1}}{sP_{t-1}} = \frac{1-s}{s} \quad (5.4)$$

Substituting this into (5.3) yields:

$$I_t = s \left(1 + \frac{1-s}{s} \right) I_{t-1} = I_{t-1} \quad (5.5)$$

Such expression states the fundamental result that, under the assumptions adopted, a closed economy without government where all investments are financed solely by retained profits is a stagnant one. Since within the framework of Kalecki's principle of effective demand the output is determined by investment through the operation of a multiplier (which can be designated by $m \equiv Y_t/I_t$), the previous result can be state as $Y_t = Y_{t-1}$.

It is unsurprising that Kalecki refers to Rosa Luxembour's discussion concerning the need of "external markets" for the continuation of the capitalist sustained growth. These external sources of demand could come from imperialist advances on other nations, from public deficits financed by

borrowing (such as in the case of armamentist expenditures), from positive net exports, or simply from incremental new credit that creates additional purchase power.

In fact, with the introduction of the financial sector, capitalists have the option to allocate their savings into assets distinct from fixed capital. Furthermore, both firm owners and the government may resort to borrowing in circumstances where intended disbursements exceed their available disposals. Such circumstances can effectively eliminate the stagnation scenario examined above, creating conditions for enhanced growth but also introducing the susceptibility to crises.

Consider the case in which there is supplementary cash flow directed toward a certain economy. The Kaleckian framework would ensure that these additional resources end up being channeled to profits¹. Being so, assume that during each period t , capitalists have access to credit in an amount represented by b_t , and denote b'_t as this inflow after deducting any applicable reductions, such as interest or amortization on existing loans. This would make it possible to invest in the period t an amount equal to $I_t = sP_{t-1} + b'_t$.

Now, define the ratio $\theta'_t = (sP_{t-1} + b'_t)/sP_{t-1}$, so that the investment can be written as $I_t = \theta'_t sP_{t-1}$. Thus, they can now invest an amount equivalent to:

$$I_t = \theta'_t sP_{t-1} \quad (5.6)$$

Therefore, the economy is growing whenever $\theta'_t > 1$. The accumulation rate $g_t = I_t/K_{t-1}$ is given by $g_t = \theta' sr_{t-1}$. Hence, if θ' is stable, in the medium to long run equilibrium when the profit rate is stable ($r_t = r_{t-1} = r^*$), the accumulation rate is:

$$g_t = \theta' sr^* \quad (5.7)$$

In this vein, it becomes clear that retained profits alone might not provide the continuous inflow of resources necessary to sustain economic growth in the long run. As Sawyer (2001) points out, Kalecki recognizes that investment expansion requires the creation of additional purchasing power. This chapter further discusses these issues, exploring increased investment (made viable through credit) and exports as additional sources of aggregate demand.

These insights invite consideration of additional channels through which effective demand can be sustained. In section 5.2 below, the analysis is extended to incorporate the foreign sector, examining

¹Which is a consequence of the assumption that all wages are immediately spent, combined with the fact that each expenditure will be translated into profits in a certain proportion

how international trade relations can provide an additional avenue for demand expansion surpassing domestic restrictions. Subsequently, section 5.3 analyzes the role of the financial sector in facilitating or obstructing continued economic growth, by either enabling or impeding investment beyond the constraints of retained profits.

5.2 THE FOREIGN SECTOR

In Chapter 4, a fairly comprehensive framework was developed to deal with the income flows that circulate in an economy that operates according to the principle of effective demand. Addressing open-economy issues within the model outlined in that chapter requires only slight modifications to the matrix equations system introduced there, which are described in this section. In the present version, the informal economy is not taken into account, as the focus is instead shifting to the external sector.

Consider that there are four sectors: consumption goods of workers (C_w), of capitalists (C_c), export goods (X), and government consumption goods (G). In addition, there are three types of income²

Consider the vector of initial income injection as defined below, where part of the initial expenditure comes from investment expenses and part from exports:

$$\mathbf{z} = I + X = \xi \begin{bmatrix} w_I & \pi_I & \tau_I \end{bmatrix} + \chi \begin{bmatrix} w_A & \pi_A & \tau_A \end{bmatrix} \quad (5.8)$$

Where ξ and χ are scalars that indicate the amount spent in investment and purchases by the external sector, respectively, and w_I , π_I and τ_I represent the share of capital goods' sector revenue corresponding to wages, profits and taxes, in that order, while w_A , π_A and τ_A represent the same shares for export goods sector.

Now χ can be considered an export sector, producing solely for external demand and fully vertically integrated, as are the other sectors. This form would spouse the common perspective on development stages in which a nation's economy is dependent on one or two export goods, normally minerals or agricultural commodities that do not, as a rule, serve internal demand. The framework does accommodate the possibility that industrial consumer goods are to be exported. Take, for instance, a scenario where exports consist of workers' and capitalists' consumption goods, with respective proportions of

²Recall that that it is not a requirement of the model that the number of sectors equals the number income types. Since each kind of earnings corresponds to a row in the repartition matrix (as defined in equation 4.9) and a column in the expenditure matrix (seen in equation 4.8), they will be conformable to multiplication and the matrix of transaction flows A will be square of order j , with j being the number of sectors.

ξ_w and ξ_c . This scenario is expressed as:

$$X = \xi_w \begin{bmatrix} w_w & \pi_w & \tau_w \end{bmatrix} + \xi_c \begin{bmatrix} w_c & \pi_c & \tau_c \end{bmatrix} \quad (5.9)$$

Regardless, in the open-economy case consumers spend a share m_k (for each income type k) of their earnings on the purchase of imported goods. Hence the expenditure matrix E becomes:

$$E = \begin{bmatrix} 1 - m_w & 0 & 0 \\ 0 & (1 - m_c)(1 - s) & 0 \\ 0 & 1 & 1 - m_g \end{bmatrix} \quad (5.10)$$

Here, the m_k coefficients function as a leakage in the iterative process of income circulation, just as the savings rate s acted in the previous, closed-economy version. Accordingly, if a share μ_j of revenue (for each sector j) is directed toward imported inputs, then the repartition matrix (R) is given by:

$$R = \begin{bmatrix} (1 - \mu_w)(1 - t_w)w_w & (1 - \mu_w)(1 - t_w)(1 - w_w) & (1 - \mu_w)t_w \\ (1 - \mu_c)(1 - t_c)w_c & (1 - \mu_c)(1 - t_c)(1 - w_c) & (1 - \mu_c)t_c \\ (1 - \mu_g)(1 - t_g)w_g & (1 - \mu_g)(1 - t_g)(1 - w_g) & (1 - \mu_g)t_g \end{bmatrix} \quad (5.11)$$

Given these modifications, the remaining of the model follows in the same manner as before. These adjustments enable a more thorough examination of the impact of structural dependency on imports, a critical concern for developing countries, especially relevant to Latin America's modern history. The implementation of Import Substitution Industrialization (ISI) policies from the 1950s through the 1970s represented a deliberate attempt to overcome these dependencies by developing domestic manufacturing capabilities. However, these strategies ultimately yielded mixed results, with many countries remaining vulnerable to external economic shocks due to continued reliance on imported capital goods and intermediate inputs. The debt crisis of the 1980s and subsequent structural reforms further transformed but did not eliminate these dependencies, as trade liberalization often reinforced specialization in primary exports while increasing dependency on imported manufactured goods, technology, and knowledge – a pattern that continues to constrain economic development across the region today (BÉRTOLA; OCAMPO, 2012; BULMER-THOMAS, 1998).

Of course, in a long-run scenario, which will not be explored at this opportunity in the open economy setting, the coefficients m_k and μ_j must be such that the equilibrium in the balance of trade is guaranteed. Conversely, this framework also allows for examining situations in which external imbalances occur.

Focusing once again on the domestic economy, the subsequent section delves into another crucial source of inflows for the economy: the financial sector. This domain serves as a critical channel for the

mobilization of additional purchase power, which is essential to foster economic growth in a context where the principle of effective demand applies.

5.3 THE KEY ROLE OF FINANCE IN KALECKI'S SYSTEM

Although Kalecki and Keynes share the centrality of the effective demand principle in their economic perspectives, with investment serving as the fundamental driver that determines output and income, the manner in which money and finance enter into investment determination differs substantially between them. At the core of this divergence lies the importance attributed to uncertainty and liquidity preference. Keynes (1936) argues that subjective forecasts about the future can exert strong influence on investment, either through interest rate variations provoked by changes in expectations (which are decisively influenced by liquidity preference) or through the marginal efficiency of capital as perceived by investors. Although the Polish economist does not frontally oppose this viewpoint, he typically minimizes, more or less implicitly, the strength of the association between changes in expectations in financial markets and variations in investment decisions in the productive sector.

This perspective is supported by Kalecki's observation, based on his own empirical assessment, that long-term interest rates behave in a notably stable manner, without major fluctuations throughout the business cycle, except perhaps in situations of severe economic crisis (TOPOROWSKI, 2018). In his study "The short-term rate and the long-term rate" (KALECKI, 1940), he used a historical series of prices for British government perpetual bonds (known as "Consols"), covering the period from 1849 to 1938, to evaluate the transmission of variations in short-term interest rates to long-term rates. The variations in market prices of these securities indicate the average expected short-term rate for the coming years. He observes that changes in short-term interest rates are only partly passed on to long-term rates, requiring sustained elevated short-term rates to affect long-term rates significantly, therefore suggesting their relative stability.

As a result, since the interest rate considered relevant for investment decisions is the long-term rate, many of the author's works do not treat the interest rate as a key determinant in capital formation decisions. This perspective was corroborated in his view by a series of interviews and questionnaires with presidents of large companies conducted within the Oxford Economists' Research Group in the 1930s, in which it was found that the interest rate was not taken into account by interviewees when making

investment decisions, although other factors such as demand level and return time were considered (TOPOROWSKI, 2018).

A similar position would later be endorsed by various authors of subsequent works in the same tradition. Hence, the notion often noted in academic debate that Kaleckians would spouse an approach of "effective demand principle without uncertainty" or, in other words, without money. This criticism also extends to some Keynesian economists who attempted to apply Keynes' framework to long-term analysis. However, as (KREGEL, 1989) argues, nothing in Kalecki's own work supports this interpretation; his theory fully acknowledges the critical role of money in determining output and income.

By habit, Kalecki wrote remarkably short essays. In general, he presented minimalist models that, through their formal simplicity and constructive parsimony, were objective and concise, while still capable of bringing incisive insights. To reach this clarity and achieve his usual surgical focus, it was commonplace to adopt simplifying hypotheses (closed economy without government, constant behavioral parameters, given prices, among others) which allowed to concentrate on the central mechanism under analysis. It is from this perspective that one can understand how he came to dispense with the interest rate in many of his models (as did authors who succeeded him in his school of thought). Given the stability of the relevant interest rate for investment, his analysis emphasizes other determinants.

By concentrating his efforts on examining the factors that impact investment decisions, he emphasizes the importance of income distribution as the fundamental aspect that influences the mechanism by which the principle of effective demand operates. In this pursuit, he distances himself from the analysis of variations in investor expectations. This is due to his emphasis on the significance of conventions, where the present state tends to be projected onto the horizon provided if there is no other information indicating otherwise. In this situation, the expectation of future demand tends to be influenced by the current state of demand (observed, for example, in the degree of productive capacity utilization and the profitability of the current fixed capital stock).

This observation does not imply that his approach neglected the crucial role of financial variables in determining investment and consequently aggregate income and employment. Indeed, his analysis evidences the centrality of financing for enabling the expansion of expenditures on fixed capital, even though, in line with the Keynesian view, his theoretical framework dispenses with the need for prior savings. In this sense, what he highlights is that credit restrictions can constitute an effective obstacle

to investment expansion, especially for smaller companies (KALECKI, 1937).

In fact, a central aspect of Kaleckian monetary analysis is found in money creation through bank credit (LEVY-ORLIK, 2023; TOPOROWSKI, 2018; SAWYER, 2001). As additional credit concessions necessarily imply money creation, the author develops an endogenous money perspective in which, under normal conditions, the banking system can accommodate companies' financing needs in a theoretically unbounded manner. Investments, he argues, finance themselves *ex post* at any interest rate, since in his perspective all investment expenditure returns to capitalists in the form of profits.

In this view, banks transcend the role of mere passive intermediaries, constituting themselves as agents endowed with the singular capacity to create additional purchasing power through the expansion of their balance sheets - what he calls credit inflation. This process of credit expansion is characterized by the simultaneous increase in bank assets and liabilities, conferring on the financial system not only the capacity to enable economic expansion but also to restrict or reverse it. Thus, although the interest rate does not play a central role in determining investment in Kaleckian models, the availability of financing is seen as a critical condition for its expansion.

In this context, the theory of profits appears as a nuclear element of Kaleckian monetary analysis. In his seminal work "A Theory of Profits" (KALECKI, 1942), later incorporated into "Studies in Economic Dynamics" (KALECKI, 2017), he develops an organic and systematic explanation for the genesis and circulation of profits, thus enabling the precise determination of the profit rate. For him, profits integrate in a vital way the process of monetary circulation that reintegrates to banks the resources that had been released in the form of credit, and which end up back in bank deposits (therefore increasing the availability for new credits) or liquidating previous credits.

For TOPOROWSKI (2018), such a theoretical construction fundamentally distinguishes itself from Keynes' approach, which, by conferring protagonism to the concept of marginal efficiency of capital (which is not observable), reveals itself incapable of establishing a determined relationship with the interest rate, restricting itself to *ex post* inferences about its relative behavior in different phases of the economic cycle. That is, if there is expansion, the marginal efficiency of capital is said to exceed the interest rate; if there is recession, the opposite.

Kalecki, in turn, identifies in profits themselves the engine of investment, and his method allows identifying it in monetary circulation. Still according to Toporowski, an important element of Kalecki's theory of profits, and absent in Keynes, is the consideration that interest does not constitute an

innocuous leakage of resources, but an influx to industries that provide for rentiers' consumption and to balances of resources available for new credits, thus reintegrating into the circuit (albeit with effects on income distribution).

By focusing on money through the opening of new credits, while considering interest rates generally little sensitive to cyclical variations, he would supposedly align with the post-Keynesian view known as "horizontalism," also present in Hein (2014). Although Kalecki did not explicitly develop a theory of money endogeneity in the same terms as the horizontalist approach, his emphasis on the active role of banks in creating credit to finance investment is compatible with this view.

However, it is also Kalecki who draws attention to what he called the "principle of increasing risk," (KALECKI, 1937) which would come to constitute a basal element of the financial fragility analysis later developed more comprehensively by MINSKY (1977, 1986). According to this principle, the greater the ability of companies to earn profit, the greater the volume of credit they have access to in the financial market. Companies finance themselves primarily through profit retention and, when these are insufficient in face of what they would like to add to the capital stock, then also through credit. Thus, in periods when profits are reduced, financing becomes more expensive, and access to it more difficult.

The apparent contradiction between the approximation to the 'horizontalist' view with the principle of increasing risk is resolved when one takes into account that the latter is applicable at the individual level of firms, and not to macroeconomic aggregates. Because capitalists' expenditures are subsequently recovered in their hands, the system's liquidity is restored, even though a subset of entrepreneurs may find themselves in a highly leveraged, liquidity-constrained position. This theoretical tradition demonstrates that it is precisely in profits that the mechanism by which additional credit returns the banking sector is to be found. In this way, the financial system finds itself once again in possession of the liquidity it had abdicated when agreeing to open new financing. Taken as a class, and not as individual entities, capitalists recover the expenditures made.

Kalecki's approach, with its emphasis on factors that influence investment decisions and its perception of the endogenous character of money, allows reconciling his insights about the dynamics of effective demand with a more stylized modeling of the monetary-financial side of the economy. In this background, the possibility of financial restrictions to aggregate demand and sustained growth is explored in the remaining of this chapter.

5.4 RENTIERS AND THE FINANCING OF ECONOMIC EXPANSION

It is common to model the financial sector after the Kaleckian tradition considering entrepreneur capitalists on one side and the rentier or financial capitalists on the other (see, for instance, (HEIN, 2014; LAVOIE, 1995a; HEIN; TREECK, 2010)). Generally, this modeling approach aims to analyze how the presence and behavior of rentiers shift the level of savings (and consequently the equilibrium in the goods market), affecting aggregate demand, growth, and distribution. They typically conceptualize these wealth holders as a distinct social class who derive income primarily from interest payments on loans to firms (and, occasionally, to the government), as well as, in some instances, from dividend payments on equity holdings. Other Kaleckian models, such as (LIMA; MEIRELLES, 2007), explicitly account for the banking system.

Rentiers are often characterized by specific consumption and saving behaviors that differ from industrial capitalists and workers, with their expenditure decisions directly influencing aggregate demand, and thus the accumulation rate. Usually, such an analytical framework is designed to assess how participation of financial capitalists in national income and their actions change macroeconomic performance, rather than focusing on credit creation driven by demand from entrepreneurial capitalists. The results commonly show that interest and amortization obligations diminish overall economic activity through two channels. Firstly, they reduce corporate retained earnings since part of revenue is allocated to debt servicing, thus constraining both spending capacity and borrowing potential of firms. Secondly, there is normally an inverse relationship between interest rates and the desired expansion of fixed capital, which is explicitly modeled in the investment function.

This methodological strategy maintains mathematical tractability while capturing the central aspects of the conflict between financial and industrial interests. It allows exploring dynamics such as the increasing share of dividends, interest, and capital gains in aggregate income and their effect on effective demand. Notwithstanding, the absence of an explicit banking sector hinders analysis of endogenous money creation and credit dynamics that are crucial to understanding investment financing in monetary economies, when one departs from the horizontalist viewpoint.

Without explicitly modeling banking activities, these models cannot address the creation of credit and the endogeneity of money, or even the possibility of credit rationing, leverage constraints, and limits posed by balance sheet dynamics. As a result, such frameworks may not fully capture how

financial conditions amplify or dampen business cycles.

In this vein, it is important to highlight that the emphasis here is on the manner in which the creation of money from credit can hinder or allow the expansion of the economic system. This creation depends on the demand for it by entrepreneurial capitalists, on the one hand, and on the willingness of the financial system to supply it, on the other. Subsequently, a concise model is introduced, illustrating the more severe constraints on credit expansion in the absence of a banking system. This is the case essentially because in the absence of banks, loans cannot be transformed into deposits, thereby further extending the liquidity constraint limit.

5.4.1 A Financial Sector Model with Rentier Credit Only

Consider the simplified version of the aggregate balance sheet of the rentier with the structure that follows. The assets (A^R) consist of the cash disposals of the rentier (D^R) and the stock of bonds that they have purchased from the entrepreneurs (B). On the other hand, the side of net worth plus liabilities is comprised only of the net worth of the rentier (N^R), since it is assumed they do not take deposits or loans and thus have no liabilities (L^R). Accordingly:

Assets (A^R)	Net Worth (N^R) + Liabilities (L^R)
B	N^R
D^R	

Table 5.1. Simplified Balance Sheet of the Rentiers

Without a banking system, an increase in credit supply occurs when rentiers purchase bonds issued by entrepreneurs³. In this process, these financial capitalists exchange part of their cash reserves (D^R) by an additional amount of bonds. In this fashion, let b represent the increment in the stock of bonds B . Then, when rentiers loan funds to industrialists by buying newly issued bonds, their money disposals change from D^R to $D^R - b$, and their stock of bonds from B to $B + b$. As the operation occurs, idle deposits come into circulation as entrepreneurs receive cash in exchange for recently emitted bonds. It should be noted that the net position of the rentiers remains unchanged.

The change in these stocks can be accurately described by indexing the variables in time, using

³In some Kaleckian models, the rentier also buy equity, a scenario will not be considered in the current analysis.

a subscript to indicate the specific period. Since assets always equal liabilities plus net worth, the relation $A_t^R = L_t^R + N_t^R$ must be valid at any point t in time, which in this case simplifies to $A_t^R = N_t^R$, since by assumption $L_t^R = 0$ at all times.

Suppose that in each period industrial capitalists amortize a fixed proportion ϕ (being $0 < \phi < 1$) of the previous debt stock B_{t-1} , in addition to interest payments on the previous debt at the fixed interest rate i , that is, iB_{t-1} . In this setting, suppose that in a certain time t , entrepreneurs demand an additional amount of credit b_t to expand the stock of fixed capital over their current disposals. In this scenario, the change in rentiers' stock of bonds (B_t) is:

$$B_t = B_{t-1} + b_t - \phi B_{t-1} \quad (5.12)$$

So the current stock of bond owned by the rentiers (which corresponds to the stock of debt owed by the industrialists) is given by the stock in the previous period plus additional loans minus amortizations. In this context, amortizations (ϕB_{t-1}) represent the destruction of debt, while new loans represent its creation.

On the other hand, money payments made by entrepreneurs to financiers increase the cash reserves of the latter. In this vein, the stock of their money holdings (D_t^R) is given by the previous stock (D_{t-1}^R) minus the additional loans granted (b_t) plus received amortizations (ϕB_{t-1}) and interest (iB_{t-1}) on the previous debts. Accordingly:

$$D_t^R = D_{t-1}^R - b_t + \phi B_{t-1} + iB_{t-1} \quad (5.13)$$

Concurrently, interest earned correspond to the income of financial capitalists. Since in this simplified scenario they do not consume or invest in fixed capital, this financial result is therefore incorporated into their wealth, increasing their net worth. Hence:

$$N_t^R = N_{t-1}^R + iB_{t-1} \quad (5.14)$$

This reflects the fact, present in the Kaleckian view, that interest payments contribute to increase the liquidity of the system, since these amounts lead to an increase in the balance of resources available for issuing new credits.

The aim of this subsection is to demonstrate that without the banking system, economic growth is limited by the liquidity constraints faced by rentiers in the short to medium term. In this context without banks, it is typical to consider a discount window with the Central Bank. This assumption

leads to the conclusion that the ultimate constraint on long-term lending is monetary expansion, which may be boundless from a horizontalist viewpoint. Yet, this approach is not aligned with Kalecki's interpretation of the potential for credit rationing.

Moving forward, assume that entrepreneurial capitalists also maintain an amount of cash, here denoted as D_t^E . This stock varies according to their current investment spending (I_t), interest and amortization obligations on previous debt (iB_{t-1} and ϕB_{t-1} , respectively), retained profits from previous investments (given by sP_{t-1} , where P_{t-1} represents the profits in the previous period and s the savings rate), and additional loans they can currently acquire (b_t). Thus, industrialists cash disposals vary according to:

$$D_t^E = D_{t-1}^E + sP_{t-1} - I_t + b_t - iB_{t-1} - \phi B_{t-1} \quad (5.15)$$

It can be shown that investment equals retained profits plus additional credit less the debt service and the net variation of cash reserves. This result can be demonstrated by rearranging the above equation and defining $\beta_t \equiv b_t/B_{t-1}$ to denote the gross expansion of the debt stock. Substituting β_t in (5.15) and solving for I_t results in:

$$I_t = sP_{t-1} + (\beta_t - i - \phi)B_{t-1} - (D_t^E - D_{t-1}^E) \quad (5.16)$$

It is interesting to notice that both the liquidity preference of rentiers and of entrepreneur appear in this formulation. The former appears as the permission or restriction to expand the total debt, represented by the parameter β . The latter manifests itself as the change in cash holdings. Each is capable of restricting investment and growth. If lenders become exceedingly cautious, leading to a scenario where $\beta_t < i + \phi$, investment will be negatively affected. On the other hand, industrialists will reduce investment if they wish to maximize the difference $(D_t^E - D_{t-1}^E)$.

To explicit the limits involved, define once again $\theta \equiv [sP_{t-1} + (\beta_t - i - \phi)B_{t-1} - (D_t^E - D_{t-1}^E)]/sP_{t-1}$ as the ratio of the accumulation rate with supplementary flows of resources to the accumulation rate without it. Recall that $\theta = 1$ implies $I_t = I_{t-1}$ and, consequently, $Y_t = Y_{t-1}$, indicating stagnation. In contrast, $\theta > 1$ signifies economic growth, whereas $\theta < 1$ indicates contraction. It can be seen from the expression that the expansionary case is granted if and only if:

$$(\beta_t - i - \phi)B_{t-1} - (D_t^E - D_{t-1}^E) > 0 \quad (5.17)$$

This equation indicates that a growing economy requires that the inflow from new loans, discounted by amortization and interest payments, be sufficiently high to offset the accumulation of cash reserves by

entrepreneurs. This relationship may give rise to different patterns that relate to scenarios of financial fragility and the phases of the business cycle.

In the short term, when the pace of creation of new loans (β) decreases (which could happen due to a more reticent credit supply side), according to equation (5.17) growth can still be positive if firm owners accept to decrease their cash holdings (i.e. $(D_t^E - D_{t-1}^E) < 0$) to maintain a certain accumulation rate. However, if the willingness to lend (and borrow) decreases at the same time as the desire to hoard increases due to uncertainty, that is, if β_t and $(D_t^E - D_{t-1}^E)$ are negatively correlated, then a phase of economic downturn should follow.

From a Kaleckian perspective, recessions can contribute to the recomposition of liquidity. In the current framework, if $\beta_t - i - \phi < 0$ due to a decrease in β_t with i and ϕ fixed, the volume of debt is decreasing, while the net worth and cash holdings of the financiers are increasing. This works to recompose their liquidity. In addition, for the entrepreneur, the decrease in their debt levels gives them flexibility to make additional loans in the next expansion phase⁴.

Kalecki sees a limit in the amount of credit firms can obtain which is given by their own capital. Consider the leverage of industrial capitalists as defined $\lambda_t \equiv B_t/K_t$. From this perspective, there must be a ceiling to the value of λ_t beyond which financiers might not be willing to extend credit. From that point on, the principle of increasing risk comes into play. This case exemplifies a situation in which a reduction in the debt stock is beneficial for future growth.

It is also important to consider that in the current scenario the maximum stock of debt cannot be higher than the net worth of the financier, and it might be significantly lower than their net worth if they have a strong liquidity preference. If credit is important to expand investment, this scenario without banks poses serious restrictions on the accumulation of fixed capital, since rentiers net worth can only at a pace dictated by the interest rate⁵. As will be demonstrated in the next section, when the financial system allows for loans originated from deposits, the ceiling on the debt stock becomes much higher. Also, the financial dynamics involved becomes more complex.

⁴Of course, in a scenario with banks the repayment of debt in excess of the issuance of new loans means the destruction of money, which deepens the recession.

⁵This can be seen by defining the allowed leverage of the financiers as $l \equiv B_t/N_t^R$. Now, according to equation (5.14), $N_t^R - N_{t-1}^R = iB_{t-1}$. Dividing through by N_{t-1}^R yields the growth rate of N_t^R , denoted $g^R = (N_t^R - N_{t-1}^R)/N_{t-1}^R$, which equals $g_t^R = iB_{t-1}/N_{t-1}^R$ or, equivalently, $g_t^R = il$.

5.5 BANKS AND THE LIQUIDITY PREFERENCE

Now, this section examines the context that involves financial institutions. Although the liquidity restriction does not disappear, it is immensely eased by the fact that each loan is deposited in a bank account, and, since deposits are liabilities for the banks, these institutions immediately increase their balances with the expansion of loans. The limits of the bank multiplier are thus much less restrictive.

Consider the simplified balance sheet of banks as follows:

Assets (A)	Liabilities (L) + Net Worth (N)
Reserves (R)	Deposits (D)
Free Funds (F)	
Bonds (B)	Net Worth (N)

Table 5.2. Simplified Balance Sheet of the Banking System

At any point t in time, the equality between assets and liabilities plus net worth must be valid:

$$A_t = L_t + N_t \quad (5.18)$$

Assume that bank reserves (R_t) are given by the deposits and a reserve rate ρ , being $0 < \rho < 1$:

$$R_t = \rho D_t \quad (5.19)$$

In this context, from the balance sheet displayed in table 5.2, it can be seen that the amount of funds free to be loaned (F_t) is given by $F_t = A_t - R_t - B_t$. In other words, the funds available for loaning are those that do not constitute the banks' reserves and that have not been loaned yet. Substituting equation (5.18) into this expression yields:

$$F_t = L_t + N_t - R_t - B_t \quad (5.20)$$

Since the liabilities of banks are the deposits of customers (in this model, the deposits of capitalists), then $L_t = D_t$. Substituting this and equation (5.18) into the above equation gives:

$$F_t = (1 - \rho)D_t + N_t - B_t \quad (5.21)$$

Whenever new loans in amount b_t are granted, the balance sheet grows on both sides, because deposits increase in the quantity b_t (on the liabilities side) and the stock of loans also increases an amount

equal to b_t (on the assets side). In this vein, representing the operation of an additional credit by substituting $(B_t + b_t)$ for B_t and $(D_t + b_t)$ for D_t gives the variation in F_t that happens due to this operation:

$$F_t = (1 - \rho)(D_t + b_t) + N_t - (B_t + b_t) \quad (5.22)$$

Which, after rearranging, amounts to:

$$F_t = (1 - \rho)D_t + N_t - B_t - \rho b_t \quad (5.23)$$

This expression shows that, since loans convert into deposits, the reduction in funds available for lending (F_t) is less than directly proportional to the amount loaned b_t . In fact, F_t decrease proportionally to the reserve ratio ρ . Even though there are still limits to credit expansion in the scenario with banks (provided they do not have limitless access to external sources of refinancing such as a benevolent central bank), it can be demonstrated that such boundaries are in this case much wider.

However, continued extension of credit must eventually bring the financial system to the limit given by the banking multiplier. Denote $B_t^{\max}$ the stock of credit achieved when such ceiling is attained. In this situation, one must have $F_t = 0$, which according to equation (5.21) implies $B_t^{\max} = (1 - \rho)D_t + N_t$.

However, the increase in B_t also leads to an expansion in D_t , since loans acquired by capitalists are deposited in bank accounts. In this scenario, consider a situation where the capitalists had not yet taken any loans and their deposits amounted to a given quantity M_t . In this case, if the credit stock is expanded to the limit, the deposits will grow until $D = M + B^{\max}$. Substituting this into equation (5.21) and considering $F_t = 0$ (a condition that characterizes the maximum credit point) and solving for $B_t^{\max}$ gives this credit ceiling as $B_t^{\max} = [(1 - \rho)M + N] / \rho$, a much wider limit compared to the earlier scenario without banks.

Nonetheless, there are restrictions on the balance sheets that must be taken into account. Specifically, when capitalists withdraw funds for investment expenses, significant changes occur in deposits, reserves, and free funds, which are all diminished by such debits. The binding restrictions are $D_t > 0$ and $F_t > 0$ for any t .

To examine the consequences of these conditions, refer to the following equations regarding the dynamics of net worth, the debt stock, and entrepreneurs' deposits. Firstly, as in the previous case, the net worth of banks (N_t) grow as they incorporate the earnings from interest payments (iB_{t-1}) into

their net worth:

$$N_t = N_{t-1} + iB_{t-1} \quad (5.24)$$

Secondly, the stock of debt varies according to the amortization payments, given by a constant fraction of the previous debt stock (ϕ) and the issuance of new bonds (in an amount b_t , variable for each period t):

$$B_t = B_{t-1} - \phi B_{t-1} + b_t \quad (5.25)$$

Then, capitalists funds in the banks increase as they deposit new loans obtained (b_t) retained profits from the previous period (sP_{t-1} , there s represents the savings rate and P_{t-1} the previous periods' profits). On the other hand, these funds decrease as they make payments of interest owed (iB_{t-1}) and amortizations (ϕB_{t-1}). Accordingly:

$$D_t = D_{t-1} + sP_{t-1} - I_t + b_t - iB_{t-1} - \phi B_{t-1} \quad (5.26)$$

Given this setting, substituting (5.24), (5.25) and (5.26) into (5.23) gives:

$$F_t = (1 - \rho)D_{t-1} + (1 - \rho)sP_{t-1} - (1 - \rho)I_t + N_{t-1} - B_{t-1} [1 + \rho(\beta - i - \phi)] > 0 \quad (5.27)$$

Resolving the above expression for I_t indicates the financial limits to investment:

$$I_t < D_{t-1} + sP_{t-1} + \frac{N_{t-1}}{1 - \rho} - B_{t-1} \left[\frac{1 + \rho(\beta - i - \phi)}{1 - \rho} \right] \quad (5.28)$$

Using the definitions of the capitalists leverage $\lambda_t \equiv B_t/K_t$, the banks' leverage $l_t \equiv B_t/N_t$ and the capitalists cash to fixed capital ratio $\lambda^D \equiv D_t/K_t$, and dividing (5.28) through by K_{t-1} , yields:

$$g_t = \frac{I_t}{K_{t-1}} < \lambda_{t-1}^D + sr_{t-1} + \frac{l_{t-1}}{1 - \rho} - \lambda_{t-1} \left[\frac{1 + \rho(\beta - i - \phi)}{1 - \rho} \right] \quad (5.29)$$

Where $g_t = I_t/K_{t-1}$ is the growth rate of the capital stock. This equation may be designated as Condition I, stipulating that free funds (F_t) must remain non-negative. Moreover, it must be guaranteed that the deposit balance will also not fall below zero; thus:

$$D_{t-1} + sP_{t-1} - I_t + b_t - iB_{t-1} - \phi B_{t-1} > 0 \quad (5.30)$$

Which, solving for I_t results in:

$$I_t < D_{t-1} + sP_{t-1} + B_{t-1}(\beta - \phi - i) \quad (5.31)$$

Dividing through by K_{t-1} yields Condition II:

$$g_t < \lambda_{t-1}^D + sr_{t-1} + \lambda_{t-1}(\beta - \phi - i) \quad (5.32)$$

However, the requirement that cash deposits need to be only positive could be perceived as a rather loose one. The liquidity preference of capitalists may dictate that a minimum amount of cash reserves should be kept at all times. Under these circumstances, suppose capitalists are unwilling to withdraw more than a fraction σ of their cash deposits at once. Therefore, the condition, to be referred to as II-b (and the previous one as II-a), becomes:

$$D_{t-1} + sP_{t-1} - I_t + b_t - iB_{t-1} - \phi B_{t-1} > \sigma D_{t-1} \quad (5.33)$$

Then, again, solving for I_t and dividing through by k_{t-1} gives:

$$g < (1 - \sigma)\lambda_{t-1}^D + sr_{t-1} + \lambda_{t-1}(\beta - \phi - i) \quad (5.34)$$

These three conditions can be represented in the $\lambda \times g$ plane, where restrictions on the growth rate from the banks' balance sheet perspective are delimited in terms of the firms' leverage (see Figure 5.1). The ratio of entrepreneurs cash disposals to the capital stock (λ_t^D) should be small in equilibrium. Consequently, the primary determinant of constraints on growth is most likely the leverage position held by capitalists.

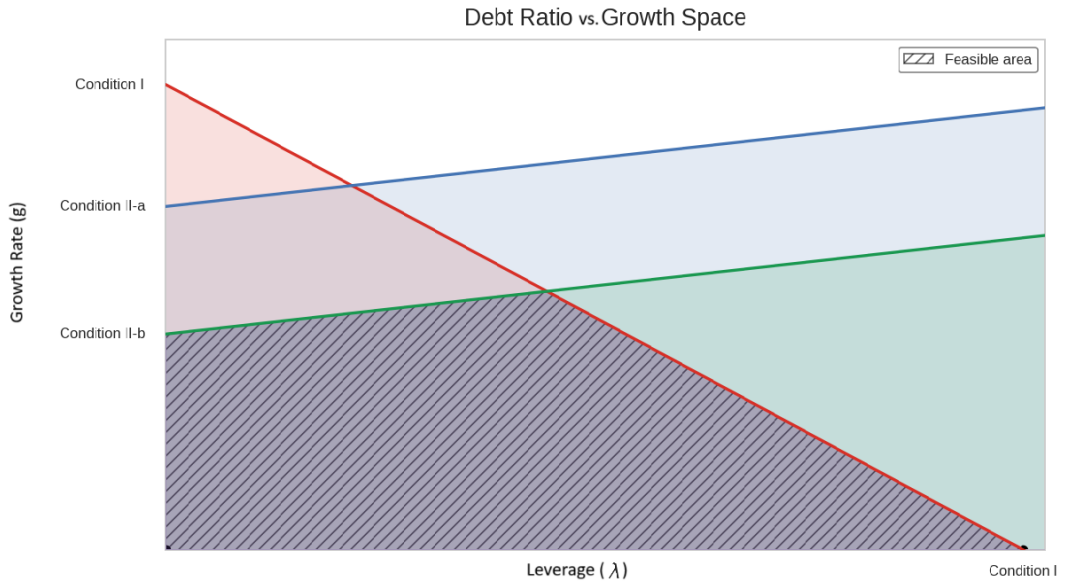


Figure 5.1. Banks Balance Sheets Restrictions on Growth and Leverage

As can be seen in the figure, because liquidity preference of capitalists imposes the retention of a substantial part of their cash reserves, Condition II-b is more restrictive. Of course, parameters like interest and savings rates will impact the feasible space by either shifting the curves or changing their slope. Numeric simulations with reasonable values for the key structural parameters show that

Condition II (in particular its variant represented in Condition II-b) is more likely to be the binding restriction to credit expansion and growth. This indicates that, in reality, it is improbable for the financial system to extend its lending to the absolute limit of their balance sheets, as indicated by Condition I. Instead, entrepreneurs' liquidity constraints, as shown in Condition II, should be more often the limiting factor. This case is further investigated in the subsequent analysis of section 5.6.

In any case, these conditions merely establish the highest possible leverage and growth achievable in a given financial scenario. In reality, it is the choices made by capitalists to invest and by financial agents to supply liquidity will ultimately dictate the specific points within the feasible area that will be accomplished. The scenarios in which these decisions remain in the interior set of the boundaries above delineated will be analyzed in the next section.

5.6 CREDIT RESTRICTIONS WITHIN THE KALECKIAN FRAMEWORK

As discussed previously, credit restrictions could be a damper for economic growth from a Kaleckian perspective. From the supply side, the unwillingness of banks to provide additional loans can hinder economic growth or even induce a recession or a crisis. From the demand side, in turn, entrepreneurial capitalists must seek credit for the bank multiplier's money-creation process to occur.

Before committing to major expenses, investors must evaluate their self-financing capacity as they formulate their investment plans. They assess investment possibilities by taking into account profitability and capacity utilization, along with reviewing their available liquid resources and potential access to financial markets. In this setting, the first step is to establish the desired investment for the period (I_t^d) , given by:

$$I_t^d = \alpha_0 + \alpha_1 u_{t-1} + \alpha_2 r_{t-1} \quad (5.35)$$

Under the assumption that the capitalist liquidity preference rule remains as before, maintaining a proportion σ of deposits idle, the maximum funds accessible for self-financing are:

$$F_t^{C, \max} = (1 - \sigma) D_t \quad (5.36)$$

Nevertheless, the actual amount expended from such funds may be less, as it is theoretically possible that the intended investment amount is below $F_t^{C, \max}$. Consequently, the actual deployment of own

resources to fund fixed capital expansion is:

$$F_t^C = \min\{I_t^d, F_t^{C, \max}\} \quad (5.37)$$

Therefore, demand for credit is:

$$b_t^d = I_t^d - F_t^C \quad (5.38)$$

Hence, $b_t^d = 0$ if and only if $F_t^C = I_t^d$.

On the supply side, banks can consider a myriad of financial metrics when deciding the extent of their credit expansion. Indeed, the previous section examined the limits imposed by the banks' balance sheet. Here, however, the debt-to-asset ratio (λ), a widely used metric in financial markets, will be adopted as the binding restriction on the leverage of firms imposed by the banking system.

If financial institutions have a predetermined upper limit to leverage, denoted by $\lambda^{\max}$, the highest admissible debt stock at any moment is linked to the capital stock by $B_t^{\max} = \lambda^{\max} K_t$. Accordingly, banks are prepared to offer a supply of debt that is not greater than $B_t^{\max} - B_{t-1}$. It is important to note that any change in the economic or political landscape that increases the liquidity preference of lenders could trigger a shift in $\lambda^{\max}$, consequently restricting available credit. In fact, there are scenarios where $\lambda^{\max}$ may reduce so rapidly that the anticipated limit $B_t^{\max}$ exceeds the current unresolved debt level B_t . To incorporate this possibility, the credit supply is defined as:

$$b_t^s = \min\{B_t^{\max} - B_{t-1}, 0\} \quad (5.39)$$

So, the supply will under no circumstances exceed the maximum established by the leverage limit. The sum of new loans actually granted in each period is then give by:

$$b_t = \min\{b_t^s, b_t^d\} \quad (5.40)$$

Be that as it may, this formulation opens the possibility for the granted credit to fall short of what is necessary to achieve the desired capital accumulation, as one could have $b_t = b^s < b^d$. When this occurs, the actual investment will be lower than the desired level. For this reason, it is necessary to define the effective (I_t^{ef}) investment, which is as follows:

$$I_t^{ef} = \min\{I_t^d, F_t^C + b_t\} \quad (5.41)$$

Under these circumstances, different equilibrium patterns may emerge, depending on which side of equations (5.36), (5.39), (5.40) and (5.41) the economy finds itself. As for (5.36), the left side is the

situation in which firms possess all the internal funds they need to finance the desired expansion, so no credit is required, a scenario not of particular relevance for the present purposes. Hence, it is assumed that the economy is always on the right side of the said expression. Likewise, the possibility of being on the right side of equation (5.39) will be ignored, since it is not the focus of the present work to explore the case when banks reduce the allowed leverage $\lambda^{\max}$ so much, to a level below B_{t-1} , that they completely cease all credit concessions.

According to equation (5.40), the stagnation in credit growth can be attributed either to insufficient demand—indicating capitalists’ reluctance to increase investments—or to restricted supply, where banks refrain from issuing additional loans. This represents the central examination point of financial constraints within the Kaleckian framework which was initially intended to be investigated here. Given that enlargement of credit is essential for economic growth, the pace at which it expands reflects the allowed rate of economic growth, making it crucial to understand the origin of such restrictions on lending.

Examining equation (5.38), it is evident that the position on the right side of (5.41) is attainable only when $b_t < b_t^d$, indicating that the credit supply acts as the binding constraint in this scenario. This situation represents the financial bottleneck that Kalecki was particularly concerned with in his analysis of capitalist growth dynamics. While Keynes focused on how changes in expectations and subsequent interest rate movements can deter investment, Kalecki emphasized how banks’ unwillingness to extend credit—often irrespective of prevailing interest rates—could effectively choke off the accumulation process. This supply-side credit restriction thus becomes a crucial transmission mechanism through which financial conditions directly impacts real economic outcomes in a way that interest rate variations alone cannot fully capture.

Furthermore, for Kalecki, interest rate increases play a dual role in the dynamics of economic growth. On the one hand, they represent a significant drain on entrepreneurs’ liquid resources, diminishing their capacity to self-finance future investment by reducing retained profits available for accumulation, an outcome observable via equation (5.34). On the other hand, these same interest payments contribute to some extent to the restoration of liquidity in the financial system by increasing the net worth of rentiers and financial institutions, a phenomenon represented in equation (5.29). While the repayment of debts in a system involving banks results in the destruction of money, it simultaneously reduces the leverage position of capitalists, thereby making room for future borrowing.

It is fundamental to emphasize that the Kaleckian perspective differs markedly from the conventional view that higher interest rates simply discourage investment through cost mechanisms. Instead, his approach recognizes the redistributive element of interest payments, transferring resources from industrial to financial capitalists, and how this redistribution simultaneously constrains productive investment while rebuilding the financial system's capacity to extend credit in subsequent periods, potentially setting the stage for future expansion phases.

5.6.1 Equilibrium under Financial Constraints

Now turn to the case central to the present chapter, where industrial capitalists desire to expand fixed capital at a faster pace than the financial system is willing to provide liquidity. In this situation, the resulting growth rate will be compromised, which is to be calculated here. Given that this situation stipulates $b_t = b_t^s$, from equation (5.39), then assuming a positive credit supply, results:

$$b_t = \lambda_t^{\max} K_{t-1} - B_{t-1} \quad (5.42)$$

Substituting the definition of the firms' leverage $\lambda_t \equiv B_t/K_t$ into this expression and rearranging yields:

$$b_t = \left(\frac{\lambda_{t-1}^{\max}}{\lambda_{t-1}} - 1 \right) B_{t-1} \quad (5.43)$$

This relation brings to mind the growth rate of the debt stock, defined as $\beta \equiv b_t/B_{t-1}$. In this scenario, this results in $\beta_t = \lambda_{t-1}^{\max}/\lambda_{t-1} - 1$, indicating that under such constraints the financial system decreases the pace of credit expansion as the debt stock approaches the limit, even as the limit has not yet been reached.

From (5.36), (5.37), and (5.41), it follows that the effective investment is actually given by $I_t^{ef} = F_t^C + b_t^s$. Hence, substituting (5.36) and (5.43) into such expression results:

$$I_t^{ef} = (1 - \sigma)D_{t-1} + \left(\frac{\lambda_{t-1}^{\max}}{\lambda_{t-1}} - 1 \right) B_{t-1} \quad (5.44)$$

Dividing through by K_{t-1} and dispensing with the time subscripts for in the long run the ratios stabilize, such as $\lambda_t = \lambda_{t-1} = \lambda$ for instance, then the equilibrium growth rate is:

$$g^* = (1 - \sigma)\lambda^D + (\lambda^{\max} - \lambda) \quad (5.45)$$

This relation demonstrates that, under such conditions of credit restriction, the growth rate is limited

by the current cash disposals of entrepreneurs plus the availability of credit within the financial system. A result that is notably aligned with the Kaleckian perspective.

An example of this scenario can be demonstrated through a computational simulation. As a starting point, plausible assumptions have been adopted for financial parameters⁶. The starting values for K_0 , B_0 , N_0 , and D_0 were chosen to give capitalists a relatively strong liquidity position at the beginning of the trajectory, making up roughly 20% of the capital stock - compared to an equilibrium level slightly above 5%. This afforded them the freedom to accumulate capital in line with the pace dictated by the investment function in the early periods. These values were set in such a manner that there was no requirement for loans during the initial period, with self-financing being adequate. From the second period through the eleventh, additional credit was necessary, but the banking system was capable of providing the requested amounts. This setting was configured in order to allow an evaluation of the dynamics of the credit market in different phases.

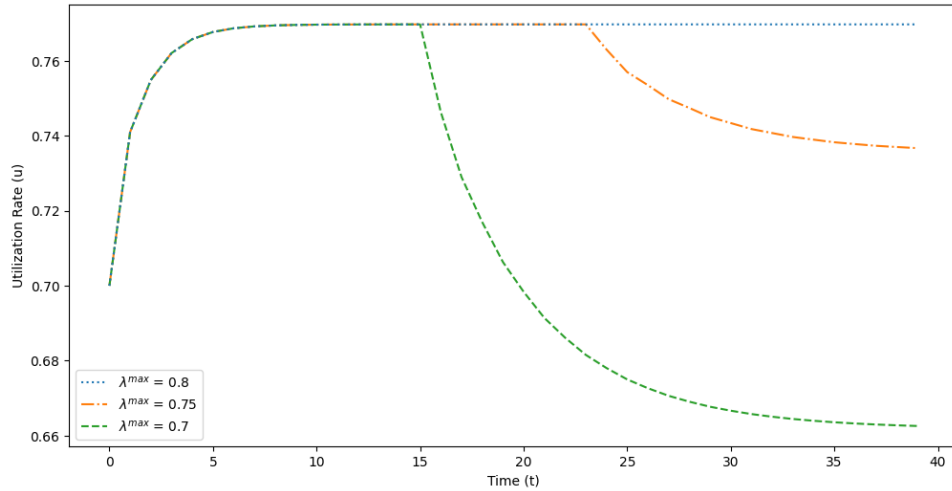


Figure 5.2. Utilization rate path for different levels of leverage restriction

When the maximum leverage set by the financial sector is significantly high – sufficiently above the equilibrium level that would be achieved with the desired investment – the system faces no constraints, and the utilization rate converges to the level dictated by the structural parameters. In this computational example, this is the case whenever $\lambda^{\max} > 0.78$. However, as soon as credit supply becomes the active restriction on loan expansion, equation (5.45) becomes binding. In this case, the mere approximation of λ to $\lambda^{\max}$ reduces the equilibrium growth rate, which is reflected in the utilization rate, as

⁶Such values were $\rho = 0.4$, $\phi = 0.05$, $i = 0.02$, $\sigma = 0.3$, and $\lambda^{\max} = 0.75$ and structural parameters with values in line with the broad literature, with $\nu = 3$, $h = 0.6$, $s = 0.6$, and finally a Dutt-Rowthorn investment function defined by $\alpha_0 = 0.05$, $\alpha_1 = 0.12$, and $\alpha_2 = 0.05$.

seen in Figure 5.2. The utilization rate for different levels of $\lambda^{\max}$ is plotted there.

As can be observed, if $\lambda^{\max}$ falls below the threshold mentioned above, the equilibrium utilization rate will be substantially lower. This occurs since investment is restricted, preventing the realization of profits. Clearly, the lower the upper limit on the leverage, the lower the equilibrium utilization rate. In this instance, the reduction to $\lambda^{\max} = 0.75$ (thus three percentage points from the threshold of 0.78) brings the equilibrium capacity utilization from an otherwise 77.0% to 73.5%. The ratio of the effective to the desired investment levels reaches 97.8% in equilibrium.

It is important to stress that it is not necessary, in the present framework, that $B_t = B_t^{\max}$ for credit rationing to occur. According to equation (5.43), as B_{t-1} approaches $B_t^{\max}$, the supply of loans acceptable by banks decreases accordingly (as $\lambda_{t-1}^{\max}/\lambda_{t-1}$ approaches unity). Given that this supply might not meet the firms' demand, the economy may experience a condition of liquidity supply restriction at a point significantly lower than $\lambda_t^{\max}$.

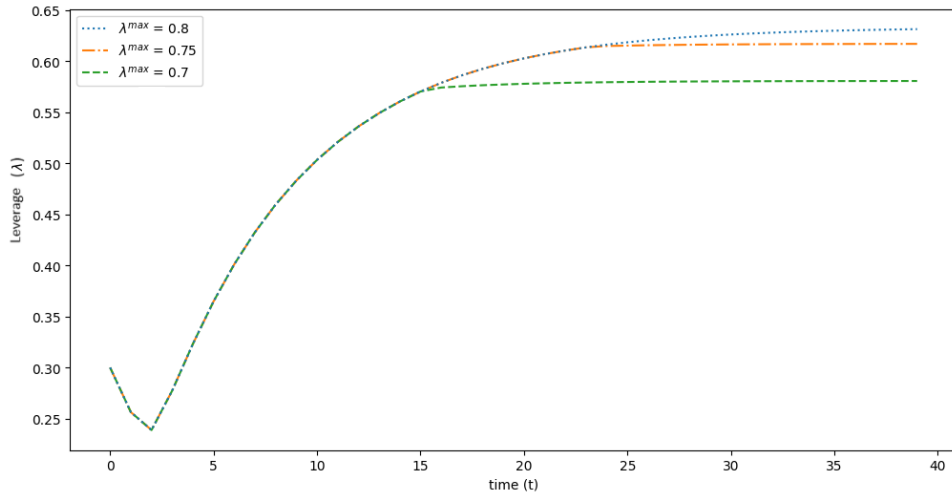


Figure 5.3. Equilibrium leverage for different levels of leverage restriction

In this numerical simulation, the equilibrium value of λ reached 0.633, 0.617 and 0.581 for the leverage limits $\lambda^{\max}$ of 0.8, 0.75 and 0.7, respectively. In the last two cases, where the credit supply constraint is binding, the long-run growth rate (g) experienced a decline of 20.2% and 28.4% relative to the baseline condition without loan supply limitations.

5.7 FINAL REMARKS

This essay has explored the critical role of the financial and foreign sectors as essential elements that support effective demand within a Kaleckian framework. The three-department Marxian-Kaleckian reproduction scheme, as presented in the chapter, demonstrates that in closed economies without government, growth financed solely by retained profits within a closed economy is shown to be inherently limited, often resulting in stagnation. External sources of demand, whether through exports, government deficit spending, or credit creation, emerge as important factors that can enhance effective demand and support sustained economic growth in capitalist economies. This theoretical tension establishes the foundation for investigating how both the financial and foreign sectors contribute to effective demand.

The analysis of the foreign sector through an extended matrix equation system offers methodological contributions to the modeling of open economies. By incorporating export sectors and accounting for import dependencies, the framework accommodates various development scenarios, from economies dependent on commodity exports to those with more diversified export profiles. This approach allows for systematic examination of structural dependencies on imports, a critical concern for developing economies, particularly in Latin America, while also providing tools to analyze external imbalances that may arise during the growth process.

As for the financial sector, the banking system fundamentally transforms the dynamics of economic expansion by relieving the stringent liquidity constraints that would otherwise limit growth. Through the endogenous creation of money, banks enable investment expenditures to exceed the immediate availability of resources. This system introduces a dual nature to the accumulation process: while facilitating growth beyond what self-financing allows, it can establish new constraints through credit rationing mechanisms. In addition, interest and amortization payments may further reduce entrepreneurs' liquidity if not met by a counterbalancing increase in additional resources made available. The balance between accessible credit and the liquidity preferences of entrepreneurs and banks (or rentiers) becomes a critical factor in determining the equilibrium growth rate of the system and the utilization of capacity.

This perspective provides important nuances to Kalecki's insights on effective demand by highlighting how financial conditions can determine real economic outcomes through mechanisms distinct

from interest rate variations alone. Moreover, the treatment of liquidity and credit supply constraints - articulated through the models of rentier credit and banking money creation — sheds light on how the stability of key ratio variables (such as leverage and deposit balances) can either foster or restrict sustained expansion. In environments where banks enforce strict leverage limits or where capitalists adopt conservative liquidity management practices, the constraints on credit supply act as a bottleneck for effective investment. This refined perspective draws attention to the redistributive and stabilizing roles financial variables play within the broader economic system.

CHAPTER 6

A NOTE ON THE ECOLOGICAL CONSEQUENCES OF POVERTY RELIEF

6.1 INTRODUCTION

From a post-Keynesian point of view, a core dilemma emerges: if economic expansion is fundamentally propelled by demand, then maintaining expenditure is crucial. This presents a direct conflict with environmental goals that often require limiting consumption. This challenge is particularly pronounced when considering poverty reduction efforts, which necessarily involve increasing consumption among those with unmet basic needs.

In these circumstances, one of the most prominent environmental concerns about poverty reduction is the drag on natural resources. Poverty is characterized not only by the lack of an income flow (as some definitional proposals bring to the fore), but ultimately by reduced access to goods necessary for the social reproduction of families. Increasing the production of such items can intensify the pressure on the planet, even if drastic redistribution measures come into effect to reduce the consumption of the world's wealthy. In addition, it can be expected that increasing the production of essential items should increase CO₂ emissions, as well as pollution and waste associated with production processes.

In this context, numerous studies have been attempting to incorporate ecological systems into macroeconomic models. This literature has been particularly vibrant in the post-Keynesian tradition. Numerous scholars have developed ecological extensions of canonical growth models, examining how distribution, accumulation, and environmental sustainability interact ((REZAI *et al.*, 2013; BLAUWHOF, 2012; JACKSON; VICTOR, 2016; KEMP-BENEDICT, 2018)). These models typically introduce environmental constraints and feedbacks into traditional post-Keynesian frameworks, recognizing that economic activities create ecological pressures through resource extraction, energy use, and waste generation. The integration of ecological considerations has revealed complex trade-offs between social objectives such as poverty reduction and environmental imperatives.

The so-called "degree of materialization" concept, a crucial ecological measure ((TORRAS, 2003; WERNICK *et al.*, 1996)), is particularly relevant in the context of poverty reduction and environmental sustainability. It quantifies the amount of raw materials and natural resources embedded in one monetary unit spent on consumption, providing a clear framework for understanding the ecological impact of economic output. This measure is not static; it varies over time and across regions, sectors, and income groups.

There has also been a stimulating debate about the limits and possibilities of what is termed the decoupling economic growth from ecological footprint. Some researchers argue that absolute decoupling, where environmental impacts decrease while the economy grows, is achievable through technological innovation and structural economic changes (CANSINO *et al.*, 2016; AKIZU-GARDOKI *et al.*, 2018; MARDANI *et al.*, 2019). Others maintain that only relative decoupling, where impacts grow more slowly than the economy, is feasible within our current economic system, suggesting that more fundamental transformations may be necessary (CSEREKLYEI; STERN, 2015; HABERL *et al.*, 2020; WIEDENHOFER *et al.*, 2020). This debate has significant implications for poverty reduction strategies, as it determines whether increasing the material well-being of the poor is compatible with environmental sustainability.

Materials science, a branch of chemical engineering, has immense potential in reducing the degree of materialization over time. This reduction should be accompanied by concerted efforts to improve the environmental quality of materials, such as minimizing the use of non-renewable resources and the production of non-biodegradable waste or CO² emissions during manufacturing. This potential of materials science is crucial in the context of discussion of redistribution policies and environmental sustainability. Moreover, anti-poverty action is urgent and should be addressed immediately.

Shifting consumption patterns towards services can also contribute to reducing materialization. In this regard, one can think of the consumption of wealthier families as less materialized since they might consume a higher share of their incomes with services compared to the poorest citizens, who have more needs consisting of tangible items. In addition, luxury goods typically have a high price for the consumer in relation to the amount of raw materials used.

In general, the rich still pollute more and cause more environmental damage per person than the poorest, a result corroborated in numerous studies (see, for instance (STEINBERGER *et al.*, 2012; PIKETTY; CHANCEL, 2015; FRITZ; KOCH, 2016; DUARTE *et al.*, 2019; WIEDMANN *et al.*,

2020)). However, the degree of materialization refers to the resource content of each dollar spent, not of each person. This metric is particularly relevant for the debate on inequality and redistribution policies: if each dollar taken from the rich and given to the poor will translate into a higher demand for physical resources, then redistribution actions, if they are bold enough to address the rampant inequalities of this century, can result in additional impacts on the ecological systems. In fact, when analyzing the growth trends of population, GDP, and material utilization throughout the twentieth century, (KRAUSMANN *et al.*, 2009) observe that an increase in GDP leads to a decrease in material use per unit of GDP, although not per capita. This phenomenon is referred to as "material productivity". They conclude that their "results indicate that an increase in material productivity is a general feature of economic development". Thus, this potential impact on environmental systems is a critical concern in the debate on inequality and redistribution policies.

In this context, the present chapter evaluates the limits and possibilities of redistribution policies considering environmental restrictions with respect to the use of physical natural resources. Drawing from the Kaleckian perspective, it is shown that, under given circumstances, redistribution might be achieved even under severe ecological constraints, possibly at the cost of reducing growth.

6.2 SPENDING AND USE OF RESOURCES

Kalecki's pricing equation can be written as follows ((HEIN, 2014)).

$$p_j = (1 + m_j) [wa_j + p_m \mu_j] \quad (6.1)$$

Where p_j , m_j , a_j , and μ_j are, respectively, the final price, the sectoral markup, the labor content per unit of product, and the raw material content of an unit of good j . It is postulated that w is the fixed salary, and p_m is the price of a raw material unit.

Consider the well-known reproduction scheme where the economy is divided into the investment goods sector (I), workers' consumption sector (C_w), and capitalists' consumption sector C_c . If Q_j is the number of units physically produced in a given industry C_j , it follows that the total amount spent in such sector is $C_j = Q_j p_j$. Likewise, if M_j is the total amount of resources consumed in the production in that sector, then:

$$M_j = Q_j \mu_j \quad (6.2)$$

Since $Q_j = C_j/p_j$, one might write (6.2) as:

$$M_j = \mu_j \left(\frac{C_j}{p_j} \right) \quad (6.3)$$

This form provides a convenient manner to capture the degree of materialization within the Kaleckian framework. Recall that μ_j is the physical amount of material contained in one unit of output, and the price p_j represents the number of monetary units to purchase this unit of output. Then, the ratio of these two values then gives the degree of materialization, which should be denoted by θ_j for sector j , being:

$$\theta_j \equiv \frac{\mu_j}{p_j} \quad (6.4)$$

As usual, total output (Y) comprises spending in the three industries being considered:

$$Y = I + C_c + C_w \quad (6.5)$$

From equations (6.5) and (6.4) above, the total material usage can be devised as follows:

$$M = \theta_I I + \theta_c C_c + \theta_w C_w \quad (6.6)$$

Dividing (6.6) through by Y gives the average consumption of material resources per unit of spending in the economy. In this form, it becomes clear that the economy-wide degree of materialization is the average of the sectoral degrees weighted by each industry's participation in the economy. Consequently, the composition of output matters for the overall ecological impact of production. That is:

$$\frac{M}{Y} = \theta_I \frac{I}{Y} + \theta_c \frac{C_c}{Y} + \theta_w \frac{C_w}{Y} \quad (6.7)$$

Now (6.7) can be rewritten in terms of two exogenous parameters, which are central to the Kaleckian tradition (and to the post-Keynesian traditions at large), namely the profit share (h) and the propensity

to save out of profits (s). In this regard, it can be readily demonstrated that $I/Y = sh$, $C_c/Y = (1-s)h$, and $C_w/Y = 1 - h$. Thus:

$$\frac{M}{Y} = \theta_I hs + \theta_c h(1 - s) + \theta_w(1 - h) \quad (6.8)$$

Such expression allows the analysis of the degree of materialization regarding these key institutional and behavioral parameters.

6.3 ESTABLISHING LIMITS TO THE ENVIRONMENTAL IMPACTS

Each industry's exact degree of materialization stems from technical relations concerning each production process. For the present purposes, the precise value of such parameters is less relevant than the gap between them, since the current analysis is based on sectoral differences. As discussed previously, it might be reasonable to assume that spending on investment goods (including construction, machinery, and vehicles) may have a higher degree of material content than spending on workers' consumption goods, mainly comprised of essential consumption items, such as food, clothing, and even durable products high in material content.

In this context, it is assumed that:

$$0 < \theta_c < \theta_w < \theta_I \quad (6.9)$$

Given these relations, it is convenient to establish the referred gaps among them as follows:

$$\delta_1 \equiv \frac{\theta_w}{\theta_I} \quad (6.10)$$

$$\delta_2 \equiv \frac{\theta_c}{\theta_w} \quad (6.11)$$

Naturally, (6.9) coupled with the fact that each $\theta_j > 0$ implies that $0 < \delta_1 < 1$ and $0 < \delta_2 < 1$. Moreover, θ_w and θ_c can be expressed in terms of θ_I , which represents the most intense use of physical resources and may, therefore, be conveniently used as a baseline for the progress in the materialization degree of the whole economy. Therefore:

$$\theta_w = \delta_1 \theta_I \quad (6.12)$$

$$\theta_c = \delta_1 \delta_2 \theta_I \quad (6.13)$$

The overall materialization degree that appears on the left-hand side of (6.7) can be expressed as $m \equiv M/Y$. Now, one may pursue economy-wide ecological goals to be achieved regarding the use of physical resources, possibly given by the velocity the planet takes to replace them (in the case of renewables) or by the proximity to their depletion (in the case of nonrenewables). Regardless of the situation, an exogenous target will be given, which is here denoted $\bar{m}$. Employing this notation, thereafter substituting (6.12) and (6.13) in (6.7) yields:

$$\bar{m} = \theta_I h s + \delta_1 \delta_2 \theta_I h (1 - s) + \delta_1 \theta_I (1 - h) \quad (6.14)$$

Once again, the absolute value of $\bar{m}$ is not as relevant for the present purposes as its gap relative to the other measures of material use in the economy. Recall that θ_I was taken earlier as a reference value for being the most environmentally damaging. In this stance, an appropriate measure for the ecological restriction would be how much lower the degree of materialization in the overall economy ($\bar{m}$) should be in relation to the degree registered in the most harmful sector. In this vein, it is convenient to define $\psi \equiv \bar{m}/\theta_I$ to express such measure. Of course, the environmental policy need not, in practice, be expressed in terms of such a ratio. However, there is no loss of generality in such form since any absolute value set for $\bar{m}$ can be expressed as a percentage of ψ , where $0 < \psi < 1$. Dividing (6.14) through by θ_I and substituting ψ gives:

$$\psi = h s + \delta_1 \delta_2 h (1 - s) + \delta_1 (1 - h) \quad (6.15)$$

The pertinent relations for the present analysis are conveniently expressed in equation (6.15). Since δ_1 , δ_2 and ψ are exogenous parameters given by technical relations (in the case of δ_1 and δ_2) or by the physical limit of resources (in the case of $\bar{m}$), said equation represents a relationship between h and s , the only institutional parameters remaining. Solving (6.15) for s yields:

$$s = \frac{\psi - \delta_1 + \delta_1 h - h\delta_1\delta_2}{h(1 - \delta_1\delta_2)} \quad (6.16)$$

Such expression states that given a desired functional income distribution expressed by the profit share h , there is a unique saving rate s compatible with the environmental target set by ψ . This relationship represents a trade-off between distribution and growth. It translates the fact that there will be a rise in the overall degree of materialization when workers' consumption assumes a higher share of the output. If the use of resources per unit of spending is to be kept constant, then investment must contract. In this situation, if institutions allow it, society may collectively decide to keep a lower pace of economic growth, provided poverty levels are starkly diminished.

The denominator in (6.16) is undoubtedly positive since all parameters lie between zero and one. As for the numerator, one might assume it to be positive, which is true in most combinations of allowed parameter values. The exceptions are the situations when ψ is too low to compensate for a high δ_1 , a configuration that would mean that the environmental restriction is so tight that no economic growth is possible for that specific income distribution. In other words, there is no positive value for the saving rate compatible with the given profit share and the ecological limit set. In this scenario, an increase in workers' consumption cannot occur amid economic growth; instead, it can only be achieved by redistribution alone and coupled with 'degrowth'.

Such trade-off may be better understood by rearranging equation (6.16) as follows, where the right-hand side is split into two terms, and the saving rate compatible with the ecological restriction s^* appears as a function of h . That is:

$$s^*(h) = \frac{\delta_1(1 - \delta_2)}{1 - \delta_1\delta_2} + \frac{\psi - \delta_1}{h(1 - \delta_1\delta_2)} \quad (6.17)$$

The above expression is a function of the form $y = a + b/x$, where the first term on the right-hand side is unambiguously positive, while the sign of the second one depends on whether $\psi > \delta_1$. In a situation where such inequality holds, the ratio δ_1 between workers' consumption degree of materialization (θ_w) and capital goods' degree of materialization (θ_I) is lower than the ratio between the desired overall degree of materialization $\bar{m}$ and capital goods' degree of materialization (θ_I). This means that the impact of the spending of one monetary unit on laborers' consumption goods is lower than the desired average impact of one unit of spending in the economy overall. In other words, $\psi > \delta_1$ implies

$\theta_w < \bar{m}$. Accordingly, this case is depicted in Figure 6.1, which shows the saving rate compatible with the environmental restriction decreasing in h , with $\partial s^*/\partial h < 0$ and $\partial^2 s^*/\partial h^2 > 0$:

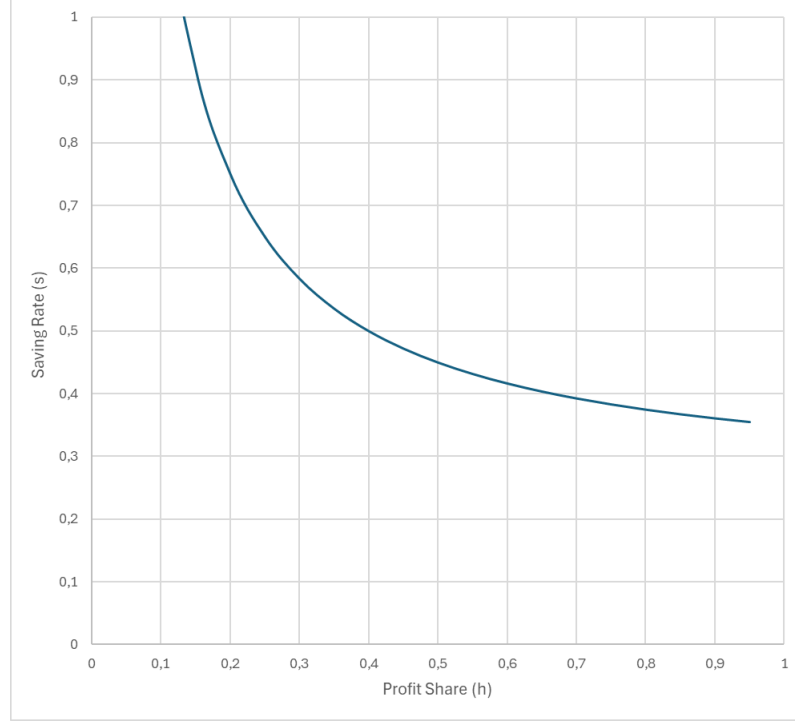


Figure 6.1. If $\theta_w < \bar{m}$, a decrease in the profit share is compatible with an increase in the saving rate, given the environmental restriction

Under these circumstances, the increase in wage-earners share in the appropriation of output contributes to the contention of environmental damage from human economic activity. Thus, the decrease in the profit share may be accompanied by an increase in the saving rate, therefore maintaining a certain pace of economic growth.

On the other hand, if $\psi < \delta_1$, implying $\theta_w > \bar{m}$, then workers' consumption contributes to bringing m above the threshold $\bar{m}$. Consequently, any improvement in the income distribution must be compensated by a decrease in the capital goods sector participation in output, which means a lower saving rate and a slower pace of economic growth. This situation is depicted in Figure 6.2.

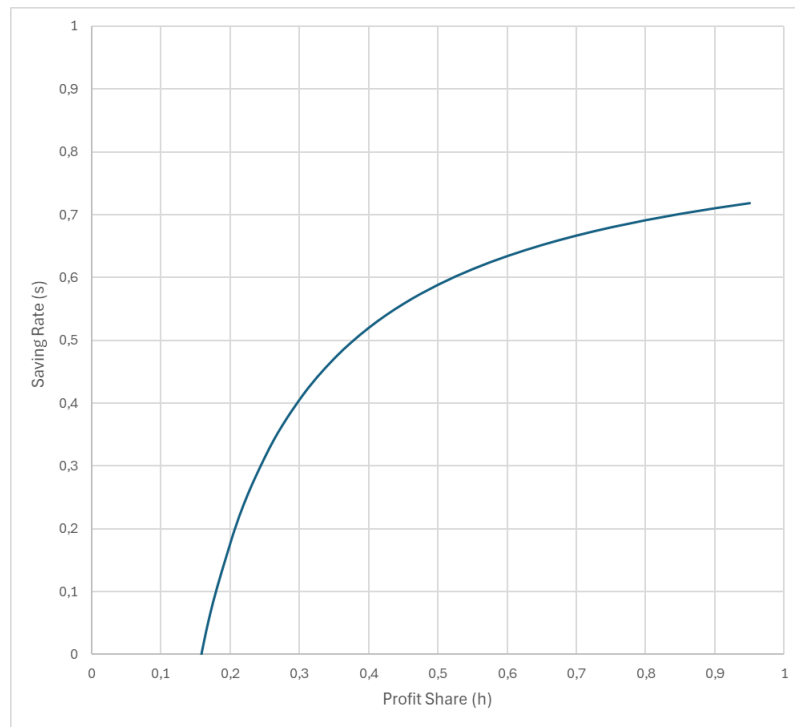


Figure 6.2. If $\theta_w > \bar{m}$, a decrease in the profit share requires a decrease in the saving rate, given the environmental restriction

Thus, depending on the relative values of the ecological limits and the current degree of materialization of wage-earners consumption given by technology, a stark trade-off between redistribution and growth may occur.

6.4 SECTORAL INCOME DISTRIBUTION AND LIMITS TO GROWTH

In the previous section, the income distribution is expressed in terms of the aggregated profit share in the economy, h . Nevertheless, one interesting aspect of Kalecki's work lies in the decomposition of consumption.

In his three-department model, he shows that the output can be expressed as a function of the amount disbursed in investment, as:

$$Y = I + dI + \left[\frac{w_I - dw_c}{(1 - w_w)} \right] I \quad (6.18)$$

Where $d \equiv C_c/I$, as defined by Kalecki himself ((KALECKI, 1968)), represents the division of the spending of capitalists between consumption and investment. It can be shown that d is equivalent to

the saving ratio¹ s .

Similarly to the calculation of the material usage presented in equation (6.6), the total consumption of resources can be expressed with the aid of the degree of materialization in each sector as follows:

$$M = \theta_I I + \theta_c dI + \theta_w \left[\frac{w_I - dw_c}{(1 - w_w)} \right] I \quad (6.19)$$

Dividing through by I and substituting (6.10) and (6.11), yields:

$$\left(\frac{M}{I} \right) / \theta_I = 1 + \delta_1 \delta_2 d + \delta_1 \left[\frac{w_I - dw_c}{(1 - w_w)} \right] \quad (6.20)$$

Here, (M/I) represents the material usage per unit of spending in the capital goods sector, considering the multiplier effect that investment has on output (in other words, considering the income that will be generated after investment spending and the consumption that will follow).

Along the same lines, the left-hand side of (6.21) compares that ratio to θ_I , which is the reference value for the pulling of resources. Given this perspective, it is convenient to define $\phi \equiv (M/I) / \theta_I$. Keeping in mind that $\theta_I \equiv M_I/I$, where M_I is the absorption of raw materials in the investment goods sector, it follows that $\psi = M/M_I$, which constitutes a suitable measure of the extent to which the income generation process adds pressure on resources.

$$\phi = 1 + \delta_1 \delta_2 d + \delta_1 \left[\frac{w_I - dw_c}{(1 - w_w)} \right] \quad (6.21)$$

Here, it is expected that $\phi > 1$, which is the case whenever the income multiplier is above unity. From equation (6.21), it can be seen that this must be the case whenever $w_I > dw_c$. As it happens, this is the very same condition that is necessary in the original model to ensure that the output in the workers' consumption goods sector is positive, as can be seen in (6.18), where such output is equivalent to the third term on the right-hand side.

In this connection, substituting $d = (1 - s)/s$ in (6.21) gives a relationship between ϕ and s . This can be used to trace the values of ϕ as the saving rate varies, while examining the effect of changes in the sectoral income distributions. Such relationships can be seen in Figures (6.3) to (6.5), where

¹Since $I = sP$, where P is the mass of profits, and $C_c = (1 - s)P$, then $d = (1 - s)P/sP = (1 - s)/s$. The previous equation can be solved for s , yielding $s = 1/(1 + m)$.

different labor shares shift the curve that relates a certain savings rate to a corresponding level of the parameter ϕ .

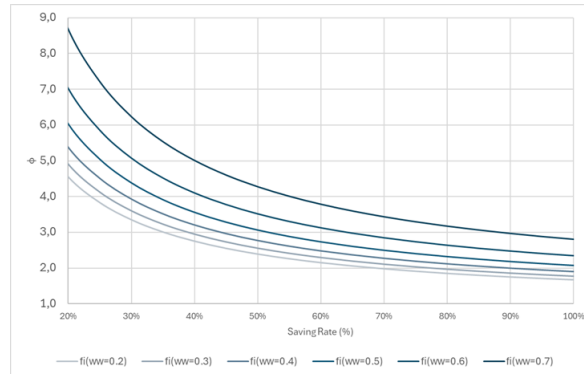


Figure 6.3. Saving rate $\times \phi$, for various values of w_w

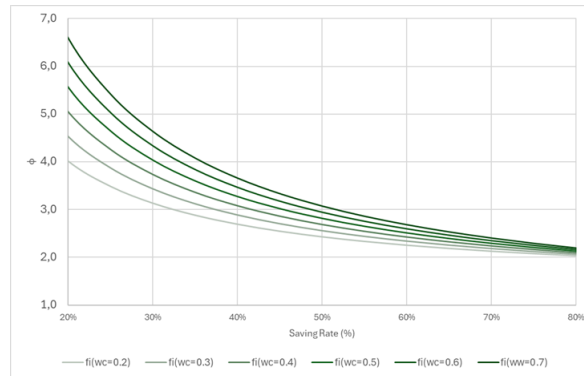


Figure 6.4. Saving rate $\times \phi$, for various values of w_c

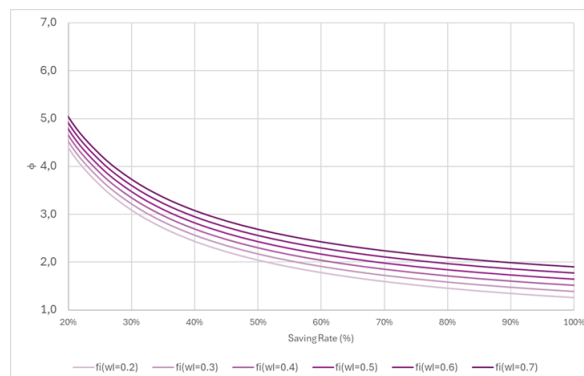


Figure 6.5. Saving rate $\times \phi$, for various values of w_I

The different shapes of the curves in each figure indicate that the impact of income redistribution is not the same between industries. Figure 6.3 shows that the higher the labor share in the workers' consumption sector, the more sensitive the ecological impact becomes to the saving rate. The impact

of changes in the labor share of capitalists' consumption sector diminishes as the savings rate increases, as shown by Figure 6.4. This constitutes an expected result since capitalists' consumption diminishes (as a share of output) as the saving rate increases. Finally, changes in income distribution in the investment goods sector appear to merely shift the restriction. From these results, it becomes evident that a multi-sector analysis might be relevant to the issue of the environmental impacts of redistribution policies.

6.5 FINAL REMARKS

The wealthy are commonly perceived as major contributors to environmental damage, which is actually true. This viewpoint considers the overall impact on a per capita basis. However, it's essential to recognize that this approach may oversimplify the complex dynamics of environmental damage caused by consumption. When discussing redistributive policies, the focus must be shifted. Rather than solely examining the impacts on a per-person basis, one should consider the use of resources per dollar of expenditure. This perspective acknowledges that wealth redistribution can influence environmental outcomes directly. The degree of materialization emerges as a pivotal concept in this discourse, highlighting the ecological footprint of economic activities. The redistribution of wealth, though noble in its intent to alleviate poverty, must be approached with caution, as it may inadvertently exacerbate environmental degradation.

In the present study, the Kaleckian framework was employed to address the issue at hand. Building upon the discussion of raw material usage, as explored by Kalecki in his work on development, integration of input utilization into the discussion on redistributive policies was sought. It has been demonstrated that a trade-off between growth and distribution shall occur whenever the pull on physical resources per monetary unit of workers' consumption exceeds the limit set by the environmental constraint. In this case, redistribution policies may take place only at the cost of a lower saving rate, which means a slower pace of economic growth.

The pursuit of anti-poverty measures must, therefore, be coupled with innovative strategies that transcend traditional production and consumption models. Embracing an economy with a lower materialization degree and fostering sustainable consumption patterns among the affluent can mitigate the environmental impact. However, this shift must be equitable, ensuring that the basic needs of the

poorest are met without compromising the planet's health.

In this regard, the most promising results cannot be expected to arise without economic policy intervention. Since such issues are spread over national borders, governments worldwide and international organizations alike must coordinate efforts on both fronts. The goal should be devising a viable strategy for decoupling economic development from environmental degradation. This shift necessitates a reorientation of consumption patterns, particularly among the affluent, to favor services over material goods, thereby reducing the overall material footprint.

Furthermore, the discourse on wealth redistribution must be reframed to account for its potential ecological impact. Policies that merely transfer monetary resources from the rich to the poor without addressing the underlying material demands may inadvertently intensify the strain on natural resources. Thus, a holistic approach that integrates redistribution with sustainable consumption and production practices is paramount. The preservation of nature and social inequality appear to be the most pressing concerns of the contemporary era. With this in mind, the current study sought a connection between these matters, situating them within the ambit of Kalecki's analytical framework and exploring the possibilities and constraints of profound redistributive policies under the limitation of the planet's physical resource utilization.

CHAPTER 7

CONCLUDING REMARKS

This thesis has demonstrated the continued relevance and versatility of Kaleckian economics for understanding contemporary economic challenges, particularly those faced by developing economies with persistent dualism. By extensively adapting the author's frameworks to account for structural heterogeneity, informality, financial constraints, and environmental considerations, this work has developed analytical tools that illuminate both the obstacles to and possibilities for more inclusive and sustainable development paths.

The analysis has focused primarily on countries with dual economic structures, particularly those in Latin America, where persistent informality exists alongside formal market activities, creating unique macroeconomic dynamics. Several broad conclusions regarding development strategies emerge from this analysis. First, the thesis demonstrates that structural features of developing economies, particularly the presence of large informal sectors, significantly influence the effectiveness of conventional growth policies. The mechanisms through which growth translates (or fails to translate) into improved living conditions depend crucially on sectoral dynamics and distributional patterns that standard aggregative approaches often overlook.

Second, this work challenges the assumption that informality will naturally diminish with economic development. The models suggest that under certain conditions, growth may actually increase rather than decrease the relative size of the informal sector. This implies that development strategies must explicitly account for and work with informality rather than simply disregarding it in economic models designed for mature economies.

The examination of urban informality revealed it to be not merely a residual or transitional phenomenon but an enduring and systemic feature of developing economies. This perspective confronted conventional views of development as a linear process of formalization, suggesting instead that different patterns of economic organization can coexist indefinitely, with significant implications for well-being and policy approaches. The informality-formality relationship emerges here as bidirectional and com-

plex, with each sector influencing the other through demand linkages, labor market interactions, and financial flows.

In this context, investigation of welfare systems in dual economies highlighted distinctive challenges stemming from structural heterogeneity. Unlike in advanced economies where social protection typically operates within predominantly formal labor markets, developing countries must contend with dual employment and consumption patterns, which require different policy designs. The modeling revealed important trade-offs between redistribution, public service provision, and accumulation, while also identifying conditions under which welfare expansion can support rather than hinder long-term growth.

Additionally, the exploration of the financial and foreign sectors underscored their critical roles in facilitating or constraining the growth process. Extending the matrix structure presented in the preceding chapter allowed for the incorporation of trade flows into the model. This additional layer permits the use of the analytical framework here developed for the analysis of export dependence and import constraints.

Notably, the modeling of financial constraints, considering Kalecki's emphasis on the possibility of credit shortage, demonstrated how credit availability, leverage limits, and balance sheet dynamics can act as significant bottlenecks to investment and growth, independent of interest rate levels alone. The comparison between rentier-based finance and a bank-centered system starkly illustrated how financial structure conditions growth possibilities. The analysis demonstrated that the modeling strategies adopted by economists can significantly impact the reach of the frameworks designed to analyze monetary economies. By developing formal models that address leverage limits and liquidity preferences, the thesis outlines specific conditions under which financial variables act as constraints on accumulation. This reinforces the Kaleckian view that financial structures are not passive mediators but key agents of real economic activity.

Finally, the last essay explores potential trade-offs between distribution, growth, and environmental sustainability, considering whether certain redistribution strategies might be compatible with ecological constraints. The study incorporates the concept of "degree of materialization" into a Kaleckian framework to consider environmental impacts within models traditionally focused on distribution and effective demand.

By examining how material resource intensity may differ across consumption categories, the analysis

suggests that the sectoral composition of output, which is influenced by income distribution, affects aggregate environmental impact. The analysis addresses a key tension in the discourse on development by exploring whether redistribution could lead to ecological costs, especially if lower-income households consume goods that are more intensive in material resources per unit of spending. The analysis finds that, under specific conditions, environmental limits may not hinder equity-promoting policies, although trade-offs are apparent in more constrained situations.

In sum, this thesis demonstrates the continued relevance of Kaleckian economic insights for understanding contemporary development challenges. By adapting these principles to the specific structural features of developing economies, it provides analytical tools for designing more effective poverty reduction strategies. The resulting framework maintains the essential Kaleckian emphasis on demand and distribution while addressing the particular obstacles faced by developing economies in the twenty-first century.

Several avenues for future research emerge directly from this work. Integrating a more explicit analysis of features that were not addressed here due to limitations of scope would provide a richer understanding of specific economic policies. Empirical estimation and calibration of the proposed models for specific countries or regions would be invaluable for testing their robustness and generating more concrete policy insights. Further refining the financial model, perhaps incorporating uncertainty more explicitly or examining a wider range of financial tools might represent a fertile ground for future inquiry. Regarding the model concerning the adjustment to the long-run equilibrium trajectory, alternative behavioral functions could be explored.

In addition to that, extending the environmental analysis to other relevant factors, such as energy usage, greenhouse gases (GHG) emissions and waste production, could bring a more comprehensive perspective. Moreover, empirically estimating the parameters within the model, despite potentially being challenging because of the complicated nature of the required data, would be beneficial for achieving a more realistic analysis.

While acknowledging its limitations, the aspiration is that the analytical frameworks developed and the insights generated offer valuable resources for those seeking to forge paths towards more equitable, stable, and sustainable economic futures, particularly in the developing world. The potential within the Kaleckian perspective for tackling contemporary issues remains vast and warrants continued exploration.

The overarching contribution of this thesis lies in demonstrating that Kaleckian economics, far from being an outdated or narrowly scoped tradition, retains an immense capacity for intellectual adaptation. By enriching it with insights from structuralism, ecological economics, and financial considerations, the work presents a pluralist yet coherent framework that is acutely sensitive to the complexities of modern developing economies.

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